STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Authorized Representative:
Macauley Whiting, Jr., President

Air Permit No. PSD-FL-292
Project No. 1050336-001-AC
Project: Three 170 MW Gas Turbines

Peace River Station
Polk County, Florida

Enclosed is Final Permit No. PSD-FL-292 for Project No. 1050336-001-AC. This permit authorizes Peace River Station, L.L.C. to construct a new power generating plant consisting of three new 170 MW simple cycle gas turbines. The project will be located in Polk County on West County Road 630 approximately one-quarter mile west of Ft. Meade, Florida. As noted in the Final Determination (attached), the Department made only minor changes to the Final Permit. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under section 120.68 of the Florida Statutes, by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12/27/00 to the persons listed:

Mr. Macauley Whiting, Jr., Peace River Station*
Mr. Ken Kosky, Golder Associates
Mr. Gerald Kissel, SWD
Ms. Iris Hill, Polk County
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Martha Jenell Wise 12/27/00
(Clerk) (Date)

7099 3400 0000 1453 2986

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Mr. Macauley Whiting, Peace River Sta.
Street, Apt. No., or PO Box No.
163 East Morse Blvd., Ste. 200
City, State, ZIP+4
Winter Park, FL 32789

PS Form 3800, July 1999 See Reverse for Instructions.

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- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
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1. Article Addressed to:

Mr. Macauley Whiting, Jr.
Peace River Station, L.L.C.
163 East Morse Blvd., Ste. 200
Winter Park, FL 32789

COMPLETE THIS SECTION ON DELIVERY

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NOTICE AND PUBLICATION

The Department distributed a public notice package on October 6, 2000 for a project that will create a new 510 MW electric power generating plant located on West County Road 630 approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The applicant, Peace River Station, L.L.C., proposes to install three combustion turbine-electrical generator sets, each having a nominal generating capacity of 170 MW. The applicant published the required notice of the project in the Lakeland Ledger on November 13, 2000. The Department received the proof of publication on November 27, 2000.

EPA REGION 4 COMMENTS

The Department received comments from EPA Region 4 regarding the preliminary determination on November 8, 2000. The following summarizes the comments and the Department's response.

1. The applicant may have "double-counted" costs for the hot SCR catalyst and inappropriately included an addiitional "annual contingency" cost.
2. The "double-counting" aspect is pointed out again and it is noted that these comments are also applicable to the cost effectiveness for the CO oxidation catalyst.
3. The applicant should not include lost revenue in the cost analysis.

Response: The Department acknowledges all comments made by EPA Region 4. However, even considering the changes, the control costs remain within in the Department's estimated range for both the hot SCR and the CO oxidation catalyst control options as stated in the Technical Evaluation and Preliminary Determination. The slightly lower costs do not change the Department's determination to reject theses control options as not cost effective.

APPLICANT'S COMMENTS

The Department received comments from the applicant regarding the Draft Permit on November 27, 2000. The following summarizes the comments and the Department's response.

1. Section III. Specific Condition No. 3: The applicant requests changing "two" to "three" combustion turbines in the first line due to a typographical error.

   Response: The Department accepts the requested change.

2. Section III. Specific Condition No. 12: The applicant requests a permitting note regarding "tuning" of the combustion turbines.

   Response: The Department included text similar to the applicant's request to define "tuning" of the combustion turbines.

3. Section III. Specific Condition No. 12: The applicant requests clarification that notification is not required for excess emissions authorized under Specific Condition No. 17.

   Response: The applicant is correct in that notification is not required for any individual NOx CEMS hourly average higher than the NOx emissions standard. Notification *is* required for NOx emissions in excess of the NOx limit based on a 3-hour average. Specific Condition No. 17 only authorizes the *exclusion* of specifically defined NOx data and does not authorize NOx emissions in excess of the 3-hour standard. However, to respond to the applicant's request, the Department clarified Specific Condition No. 17 by changing the first sentence to, "Emissions During Startup, Shutdown, and Malfunctions: During periods of startup, shutdown, and documented unavoidable malfunction, each combustion turbine is subject to the following conditions." The title "NOx CEMS Data Exclusion" was also added as a title for the corresponding conditions regarding NOx emissions. In Specific Condition No. 25(d), the term "excess emissions" was replaced with "elevated NOx emissions".

OTHER COMMENTS

The public, the Department's Southwest District Office, the National Park Service, and the Polk County Environmental Services Department provided no comments regarding the project.

CONCLUSION

The final action of the Department is to issue the final permit with the changes mentioned above and to correct minor typographical errors. As detailed in the previously issued Technical Evaluation and Preliminary Determination, the emissions standards for CO, NOx, PM/PM_{10}, SAM, and SO_2 specified in the Final Permit and summarized in Appendix B represent the Best Available Control Technology (BACT) for this project. Additional details of this analysis may be obtained by contacting the project engineer at 850/414-7268 or the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

PERMITTEE:

Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Authorized Representative:
Macauley Whiting, Jr., President

ARMS Permit No.	1050336-001-AC
Air Permit No.	PSD-FL-292
Facility ID No.	1050336
SIC No.	4911
Expires:	August 1, 2002

PROJECT AND LOCATION

This permit authorizes construction of a new 510 MW electrical generating plant consisting of three simple cycle, dual-fuel, General Electric Model PG7241(FA) combustion turbine-electrical generator sets, each having a nominal generating capacity of 170 MW. The new plant will be located on West County Road 630 approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The UTM coordinates are Zone 17, 419.5 km E, 3069.7 km N and the map coordinates are Latitude 27° 45' 04", Longitude 89° 49' 00".

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and 40 CFR 52.21. Specifically, this permit is issued pursuant to the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality, Rule 62-212.400, F.A.C. The permittee is authorized to install the proposed equipment in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

APPENDICES

The following Appendices are attached as part of this permit.

Appendix A - Terminology
Appendix B - BACT Emissions Standards Summary
Appendix GC - Construction Permit General Conditions
Appendix GG - NSPS Subpart GG Requirements for Gas Turbines
Appendix XS - CEMS Excess Emissions Report

for Howard L. Rhodes, Director
Division of Air Resources Management

12/22/00
(Date)

FACILITY DESCRIPTION

The new 510 MW electrical generating plant will consist of three 170 MW simple cycle combustion turbine-electrical generator sets, evaporative inlet air foggers, and two 1.5 million gallon distillate oil storage tanks.

NEW EMISSIONS UNITS

The proposed project will construct the following new emissions units.

EU ID No.	Emission Unit Description
001 002 003	Simple Cycle Unit Nos. 1, 2, and 3: Each simple cycle unit is a General Electric Model PG7241(FA) combustion turbine-electrical generator set designed to produce a nominal 170 MW of direct power.
004	Two, 1.5 million-gallon storage tanks supply low sulfur distillate oil as a backup fuel to simple cycle combustion turbines.

REGULATORY CLASSIFICATION

HAPs: Based on available data, the new facility is not a major source of hazardous air pollutants (Title III).

Acid Rain: The new facility is subject to the acid rain provisions of the Clean Air Act (Title IV).

Title V Major Source: The new facility is a Title V major source of air pollution because potential emissions of at least one regulated pollutant exceed 100 tons per year. Regulated pollutants include carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOC).

PSD Major Source: The new facility is considered a major source of air pollution with respect to PSD because emissions of at least one regulated pollutant exceed 250 tons per year. Therefore, each new project requires a PSD applicability review. For each potential emission increase greater than the Significant Emissions Rates specified in Table 62-212.400-2, F.A.C., a determination of Best Available Control Technology (BACT) is required. For this project, emissions of CO, NO_x, PM/PM_{10}, SAM, and SO_2 are significant and subject to the BACT standards specified in this permit.

NSPS Sources: Emissions units are subject to the New Source Performance Standards in 40 CFR 60 for the gas turbines (Subpart GG) and the oil storage tanks (Subpart Kb).

RELEVANT DOCUMENTS

- Permit application received on June 12, 2000 and all related correspondence.
- Initial Draft Permit issued on October 6, 2000 and subsequent comments.

The following conditions apply to all emissions units and activities defined for this project.

GENERAL REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blair Stone Road. Tallahassee, Florida 32399-2400 and phone number 850/488-0114.

2. Compliance Authority: All documents related compliance activities such as reports, tests, and notifications should be submitted to the Air Resources Section of the Southwest District Office, Florida Department of Environmental Protection, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218. The phone number is 813/744-6100 and the fax number is 813/744-6084.

3. Terminology: The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. *Appendix A* lists frequently used abbreviations and explains the format used to cite rules and regulations in this permit.

4. General Conditions: The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

5. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.); Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.); and the Title 40, Parts 52, 60, 72, 73, and 75 of the Code of Federal Regulations (CFR), adopted by reference in Rule 62-204.800, F.A.C. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]

6. PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]

7. Permit Expiration: For good cause, the permittee may request that this PSD air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, and 62-210.300(1), F.A.C]

8. BACT Determination: In conjunction with extension of the 18 month period to commence or continue construction, phasing of the project, or an extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for the source. [Rule 62-212.400(6)(b), F.A.C. and 40 CFR 52.166(j)(4)]

9. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

10. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

11. Application for Title IV Permit: At least 24 months before the date on which the new unit begins serving an electrical generator greater than 25 MW, the permittee shall submit an application for a Title IV Acid Rain Permit to the Region 4 office of the U.S. Environmental Protection Agency in Atlanta, Georgia and a copy to the Department's Bureau of Air Regulation in Tallahassee. [40 CFR 72]

12. Title V Permit: This permit authorizes construction of the permitted emissions unit and initial operation to determine compliance with Department rules. A Title V operation permit is required for routine operation of the permitted emissions units. The permittee shall apply for and obtain a Title V operation permit in accordance with Rule 62-213.420, F.A.C. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's Bureau of Air Regulation and a copy to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

EMISSIONS AND CONTROLS

13. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

14. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

15. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. [Rule 62-210.700(4), F.A.C.]

16. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify the Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]

TESTING REQUIREMENTS

17. Test Notification: The permittee shall notify the Compliance Authority in writing at least 30 days prior to any initial NSPS performance tests and at least 15 days prior to any other required tests. [Rule 62-297.310(7)(a)9., F.A.C. and 40 CFR 60.7, 60.8]

18. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

19. Applicable Test Procedures

    (a) *Required Sampling Time.* Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be sixty (60) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur. [Rule 62-297.310(4)(a)1. and 2., F.A.C.]

(b) *Minimum Sample Volume.* Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet. [Rule 62-297.310(4)(b), F.A.C.]

(c) *Calibration of Sampling Equipment.* Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C. [Rule 62-297.310(4)(d), F.A.C.]

20. Determination of Process Variables

(a) *Required Equipment.* The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards. [Rule 62-297.310(5)(a), F.A.C.]

(b) *Accuracy of Equipment.* Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5)(b), F.A.C.]

21. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

RECORDS

22. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2., F.A.C.]

REPORTS

23. Emissions Performance Test Reports: A report indicating the results of any required emissions performance test shall be submitted to the Compliance Authority no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.].

24. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

A. Combustion Turbines

This section of the permit addresses the following new emissions units.

EU No.	Common Emission Unit Description
001 002 003	Simple Cycle Unit Nos. 1, 2, and 3: Each simple cycle unit consists of a General Electric Model PG7241(FA) combustion turbine-electrical generator set, an automated gas turbine control system, an inlet air filtration system, an evaporative inlet air cooling system, an exhaust stack that is 60 feet tall and 21 feet in diameter, and associated support equipment. Natural gas is the primary fuel with very low sulfur distillate oil as a limited backup fuel. Emissions of CO, PM/PM_{10}, SAM, SO_2, and VOC are minimized by the efficient combustion of these clean fuels at high temperatures. NOx emissions are reduced by dry low-NOx (DLN) combustion technology during gas firing and by water injection during distillate oil firing. The capacities for each fuel are: *Natural Gas*: At a compressor inlet air temperature of 32° F and firing 1863 mmBTU per hour of gas, each unit produces a maximum 184 MW. The automated gas turbine control system modulates critical parameters of the dry low-NOx combustors to achieve a lean, pre-mix steady state operation. Exhaust gases exit the stack with a volumetric flow rate of approximately 2,464,800 acfm at 1076° F. *Distillate Oil*: At a compressor inlet air temperature of 32° F and firing 1965 mmBTU per hour of distillate oil as a backup fuel, each unit produces a maximum 192 MW. The water injection rate for NOx control will be approximately 131,000 pounds per hour. Exhaust gases exit the stack with a volumetric flow rate of approximately 2,495,000 acfm at 1054° F. Note: All heat input values are based on the higher heating values (HHV) of the fuels.

Applicable Standards and Regulations

1. BACT Determinations: The emissions units addressed in this section are subject to Best Available Control Technology (BACT) determinations for carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfuric acid mist (SAM) and sulfur dioxide (SO_2). [Rule 62-212.400, F.A.C.]

2. NSPS Requirements: Each combustion turbine shall comply with all applicable requirements of 40 CFR 60, adopted by reference in Rule 62-204.800(7)(b), F.A.C.

   (a) *Subpart A, General Provisions*, incuding:

   - 40 CFR 60.7, Notification and Record Keeping
   - 40 CFR 60.8, Performance Tests
   - 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
   - 40 CFR 60.12, Circumvention
   - 40 CFR 60.13, Monitoring Requirements
   - 40 CFR 60.19, General Notification and Reporting Requirements

   (b) *Subpart GG, Standards of Performance for Stationary Gas Turbines* are identified in *Appendix GG* of this permit. These provisions include a requirement to correct test data to ISO conditions; however, such correction is not used for compliance determinations with the BACT standards.

Performance Restrictions

3. Combustion Turbines: The permittee is authorized to install, tune, operate and maintain three new General Electric Model PG7241(FA) combustion turbines with electrical generator sets, each designed to produce a nominal 170 MW of electrical power. [Applicant Request; Design]

4. Permitted Capacity: The heat input rates (HHV) to each combustion turbine shall not exceed the following:

   (a) Normal Gas Firing: 1863 mmBTU per hour with a compressor inlet air temperature of 32° F and producing a maximum 184 MW.

   (b) Distillate Oil Firing: 1965 mmBTU per hour with a compressor inlet air temperature of 32° F and producing a maximum 192 MW.

   The heat input rates are based on the higher heating values (HHV) of 23,877 BTU/lbm for natural gas and 19,674 BTU/lbm for distillate oil. The permittee shall provide the manufacturer's performance curves (or equations) that correct for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Compliance shall be determined by data compiled from the automated gas turbine control system. This data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Design; Rule 62-210.200(PTE), F.A.C.]

5. Simple Cycle Operation Only: Each combustion turbine shall operate only in simple cycle mode. This restriction is based on the permittee's request, which formed the basis of the CO and NOx BACT determinations and resulted in the emission standards specified in this permit. Specifically, the CO and NOx BACT determinations eliminated several control alternatives based on technical considerations due to the elevated temperatures of the exhaust gas as well as costs related to restricted operation. Any request to convert these units to combined cycle operation or increase the allowable hours of operation shall be accompanied by a revised CO and NOx BACT analysis and the approval of the Department through a permit modification in accordance with Chapters 62-210 and 62-212, F.A.C. The results of this analysis may validate the initial BACT determinations or result in the submittal of a full PSD permit application, new control equipment, and new emissions standards. [Applicant Request; Rules 62-210.300 and 62-212.400, F.A.C.]

6. Allowable Fuels: Each combustion turbine shall be designed and tuned for a primary fuel of pipeline-quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet of gas. As a backup fuel, each combustion turbine may be fired with low sulfur No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. No other fuels shall be fired. It is noted that both limitations are much more stringent than the sulfur dioxide limitation in 40 CFR 60, NSPS Subpart GG and assure compliance with regulations 40 CFR 60.333 and 60.334 of this subpart. The permittee shall demonstrate compliance with the fuel sulfur limits by keeping the records specified in this permit. [Application; Rule 62-210.200(PTE), F.A.C.]

7. Restricted Operation: Each combustion turbine shall operate no more than 3390 hours during any consecutive 12 months. Of this total allowable operation, no more than 720 hours during the 12-month period shall be distillate oil firing. The permittee shall install, calibrate, operate and maintain a monitoring system for each combustion turbine to measure and accumulate the fuel consumption and number of hours each fuel was fired. [Applicant Request; Rules 62-212.400(BACT) and 62-210.200(PTE), F.A.C.]

8. Operating Procedures: The Best Available Control Technology (BACT) determinations established by this permit rely on "good operating practices" to minimize emissions. Therefore, all operators and supervisors shall be properly trained to operate and maintain the combustion turbines and pollution control systems in accordance with the guidelines and procedures established by the manufacturer. The training shall include good operating practices as well as methods of minimizing excess emissions. [Applicant Request; Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]

EMISSIONS CONTROLS

9. Automated Control System: In accordance with the manufacturer's recommendations, the permittee shall install, calibrate, tune, operate, and maintain a Speedtronic™ automated gas turbine control system for each unit. Each system shall be designed and operated to monitor and control the gas turbine combustion process and operating parameters including, but not limited to: air/fuel distribution and staging, turbine speed, load conditions, temperatures, heat input, and fully automated startup and shutdown. [Design; 62-212.400(BACT), F.A.C.]

10. DLN Combustion Technology: In accordance with the manufacturer's recommendations, the permittee shall install, tune, operate and maintain the General Electric dry low-NOx combustion system (DLN 2.6 or better) to control NOx emissions from each gas turbine. [Design; Rule 62-212.400(BACT), F.A.C.]

11. Tuning: Prior to the initial emissions performance tests for each gas turbine, the dry low-NOx combustors and automated gas turbine control systems shall be tuned to optimize the reduction of CO, NOx, and VOC emissions. Thereafter, each system shall be maintained and tuned in accordance with the manufacturer's recommendations to minimize these pollutant emissions. The permittee shall provide at least 5 days advance notice prior to any tuning session. {Permitting Note: Tuning is defined as the physical or operational change of the DLN combustion system, including computer controls, for the express purpose of adjusting the NOx emissions. Tuning does not include routine maintenance of the DLN combustion system as specified by the manufacturer.} [Design; Rule 62-212.400(BACT), F.A.C.]

EMISSIONS STANDARDS

{Permitting Note: Mass emissions limits are based on 100% base load and a compressor inlet temperature of 32° F. A summary table of the emissions standards is provided in Appendix B of this permit.}

12. Carbon Monoxide (CO)

    (a) *Gas Firing*: When firing natural gas, CO emissions from each combustion turbine shall not exceed 34.2 pounds per hour and 8.2 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load.

    (b) *Oil Firing*: When firing low sulfur distillate oil as a backup fuel, CO emissions from each combustion turbine shall not exceed 68.0 pounds per hour and 14.2 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load.

    The permittee shall demonstrate compliance with these standards by conducting performance tests in accordance with EPA Method 10 and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

13. Nitrogen Oxides (NOx)

    (a) *Gas Firing*: When firing natural gas, NOx emissions from each combustion turbine shall not exceed 68.2 pounds per hour and 9.0 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load. This emissions standard shall apply during the initial compliance test and for the next required compliance test conducted after tuning a combustion turbine. In addition, NOx emissions shall not exceed 10.0 ppmvd corrected to 15% oxygen based on a 3-hour rolling average of data collected from the NOx continuous emissions monitor.

    (b) *Oil Firing*: When firing low sulfur distillate oil as a backup fuel, NOx emissions from each combustion turbine shall not exceed 330.6 pounds per hour and 42.0 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load. In addition, NOx emissions shall not exceed 42.0 ppmvd corrected to 15% oxygen based on a 3-hour rolling average of data collected from the NOx continuous emissions monitor.

NOx emissions are defined as oxides of nitrogen measured as NO_2. The permittee shall demonstrate compliance by conducting performance tests and emissions monitoring in accordance with EPA Methods 7E, 20, and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.; 40 CFR 60.332]

14. Particulate Matter (PM/PM_{10}), Sulfuric Acid Mist (SAM), and Sulfur Dioxide (SO_2)

    (a) *Particulate Matter*: When firing natural gas, particulate matter emissions from each combustion turbine shall not exceed 9.0 pounds per hour based on a 3-hour test average conducted at base load. When firing distillate oil, particulate matter emissions from each combustion turbine shall not exceed 17.0 pounds per hour based on a 3-hour test average conducted at base load. The permittee shall demonstrate compliance with this standard by conducting tests in accordance with EPA Method 5 and the performance testing requirements of this permit. Only the front half catch shall be used to determine compliance. It shall be assumed that all PM is PM_{10}.

    (b) *VE Standard*. When firing natural gas or distillate oil, visible emissions from each combustion turbine shall not exceed 10% opacity, based on a 6-minute average. The permittee shall demonstrate compliance with this standard by conducting tests in accordance with EPA Method 9 and the performance testing requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

    (c) *Fuel Specifications*. Emissions of PM/PM_{10}, SAM, and SO_2 shall be limited by the use of pipeline-quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet of gas as the primary fuel. The backup fuel shall be limited to No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. These fuel specifications are work practice standards established as BACT limits for PM/PM_{10}, SAM, and SO_2 emissions. The permittee shall demonstrate compliance with the fuel sulfur limits by maintaining the records specified in this permit. [Rule 62-212.400(BACT), F.A.C.; 40 CFR 60.333]

15. Volatile Organic Compounds (VOC)

    (a) *Gas Firing*: When firing natural gas, VOC emissions shall not exceed 4.0 pounds per hour based on a 3-hour test average conducted at base load. {Permitting Note: This is equivalent to approximately 1.7 ppmvd corrected to 15% oxygen.}

    (b) *Oil Firing*: When firing distillate oil, VOC emissions shall not exceed 8.0 pounds per hour based on a 3-hour test average conducted at base load. {Permitting Note: This is equivalent to approximately 2.9 ppmvd corrected to 15% oxygen.}

    The VOC standards are established as PSD-synthetic minor limits. VOC emissions shall be measured and reported in terms of methane. The permittee shall demonstrate compliance with these standards by conducting tests in accordance with EPA Method 25A and the performance testing requirements of this permit. Optional testing in accordance with EPA Method 18 may also be conducted to account for the actual non-regulated methane fraction of the measured VOC emissions. [Design; Rule 62-4.070(3), F.A.C.]

EXCESS EMISSIONS

16. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. All such preventable emissions shall be included in the calculation of the 3-hour averages to demonstrate compliance with the continuous NOx emissions standard. [Rule 62-210.700(4), F.A.C.]

17. Emissions During Startup, Shutdown, and Malfunctions: During periods of startup, shutdown, and documented unavoidable malfunction, each combustion turbine is subject to the following conditions.

(a) Operators employ best operational practices to minimize the amount and duration of excess emissions.

(b) Operation below 50% of base load shall not exceed 120 minutes during any calendar day.

(c) During startup and shutdown, visible emissions excluding water vapor shall not exceed 20% opacity for up to ten, 6-minute observation periods during any calendar day. Data for each observation period shall be exclusive for the ten periods.

(d) NOx CEMS Data Exclusion:

1. During all startups, shutdowns, and malfunctions, the NOx CEMS shall monitor and record NOx emissions. For each calendar day, up to two 1-hour monitoring averages may be excluded from the continuous NOx compliance demonstration for each combustion turbine due to excess NOx emissions resulting from startup, shutdown, and documented unavoidable malfunction. For excess NOx emissions due to malfunction, the permittee shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident.

2. If the permittee provides at least 5 days advance notice prior to tuning performed in accordance with the manufacturer's recommendations, up to three 1-hour monitoring averages may be excluded from the continuous NOx compliance demonstration for each gas turbine due to excess NOx emissions resulting from tuning. {Permitting Note: It is expected that no more than two tuning sessions would occur each year.}

[Design; Rule 62-210.700(1) and (5); Rule 62-4.130, F.A.C.; Rule 62-212.400 (BACT), F.A.C.]

EMISSIONS PERFORMANCE TESTING

18. <u>Sampling Facilities</u>: The permittee shall design the combustion turbine stack to accommodate adequate testing and sampling locations in order to determine compliance with the applicable emission limits specified by this permit. Permanent stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C. [Rules 62-4.070 and 62-204.800, F.A.C.; 40 CFR 60.40a(b)]

19. <u>Test Methods</u>: Compliance tests shall be performed in accordance with the following reference methods as described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C.

(a) EPA Method 5 - Determination of Particulate Matter Emissions from Stationary Sources

(b) EPA Method 7E - Determination of Nitrogen Oxide Emissions from Stationary Sources

(c) EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources

(d) EPA Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources

(e) EPA Method 20 - Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines

(f) EPA Method 25A - Determination of Volatile Organic Concentrations *{Permitting Note: When using EPA Method 25A, optional testing in accordance with EPA Method 18 may also be conducted to account for the non-regulated methane fraction of the measured VOC emissions.}*

No other methods may be used for compliance testing unless prior written approval is received from the administrator of the Department's Emissions Monitoring Section in accordance with an alternate sampling procedure pursuant to 62-297.620, F.A.C. [40 CFR 60, Appendix A; Rule 62-204.800, F.A.C.]

20. <u>Initial Tests Required</u>: Initial performance tests to demonstrate compliance with each emission standard for gas firing and backup distillate oil firing shall be conducted within 60 days after achieving the maximum

production rate, but not later than 180 days after initial operation of each emissions unit. Initial performance tests shall be conducted for CO, NOx, PM, VOC and visible emissions. Tests for CO, NOx, and VOC shall be conducted concurrently. Tests for PM and visible emissions shall be conducted concurrently. NOx performance tests shall be conducted in accordance with the requirements of 40 CFR 60, Subpart GG. For the initial performance tests, emissions data shall be presented in units of the BACT standards as well as the units specified in the Subpart GG emission standards. [Rule 62-297.310(7)(a)1., F.A.C.; 40 CFR 60.335]

21. Annual Performance Tests: Annual performance tests shall be conducted for each combustion turbine to demonstrate compliance with CO, NOx, and visible emissions standards for gas firing and backup distillate oil firing. Tests required on an annual basis shall be conducted at least once during each federal fiscal year (October 1st to September 30th). CO and NOx performance tests shall be conducted concurrently. If conducted at permitted capacity, NOx emissions data collected during the annual NOx continuous monitor RATA required pursuant to 40 CFR 75 may be substituted for the required annual performance test. For each combustion turbine that fires distillate oil for less than 200 hours during the previous federal fiscal year, the annual performance tests when firing distillate oil for the current federal fiscal year of operation are not required.

    [Rule 62-297.310(7)(a)4., F.A.C.]

22. Tests Prior to Permit Renewal: Prior to renewing air operation permits, performance tests shall be conducted for each combustion turbine to demonstrate compliance with the CO, NOx, PM, VOC and visible emissions standards for gas firing and backup oil firing. Tests for CO, NOx, and VOC emissions shall be conducted concurrently. Tests for PM and visible emissions shall be conducted concurrently. All tests shall be conducted within the 12 months prior to renewing the air operation permit. [Rule 62-297.310(7)(a)3., F.A.C.]

23. Tests After Substantial Modifications: All performance tests required for initial startup shall also be conducted after any substantial modification and appropriate shakedown period of air pollution control equipment, including the replacement of dry low-NOx combustors. Shakedown periods shall not exceed 100 days after re-starting the combustion turbine. This does not apply to routine maintenance. [Rules 62-297.310(7)(a)4. and 62-4.070(3), F.A.C.]

24. Combustion Turbine Testing Capacity

    (a) Initial performance tests shall be conducted in accordance with 40 CFR 60.8 and 40 CFR 60.335 for pollutants subject to New Source Performance Standards (NSPS) in Subpart GG for gas turbines.

    (b) Other required performance tests to demonstrate compliance with standards specified in this permit shall be conducted with the combustion turbine operating at permitted capacity for each allowable fuel. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average compressor inlet air temperature during the test (with 100 percent represented by a curve depicting heat input vs. compressor inlet temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. However, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for inlet temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Emissions performance tests shall meet all applicable requirements of Chapters 62-204 and 62-297, F.A.C.

    [Rule 62-297.310(2), F.A.C.; 40 CFR 60.335]

CONTINUOUS MONITORING REQUIREMENTS

25. NOx CEMS: The permittee shall install, calibrate, operate, and maintain a continuous emissions monitoring system (CEMS) to measure and record NOx and oxygen concentrations in each combustion turbine exhaust stack to meet the requirements of the Acid Rain program and to demonstrate compliance with the NOx BACT standards specified by this permit. A monitor for carbon dioxide may be used in place of the oxygen monitor, but the system shall be capable of correcting the emissions to 15% oxygen. The NOx monitoring devices shall comply with the certification requirements, quality assurance procedures, and all other provisions of the Acid Rain monitoring requirements of 40 CFR Part 75. A monitoring plan shall be provided to the Department's Emissions Monitoring Section, EPA Region 4, and the Compliance Authority for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62. The plan shall consist of the following information: CEMS equipment specifications, manufacturer, model, type, calibration and maintenance needs, and the proposed location.

   (a) *Installation.* Each CEMS shall be installed, calibrated, and properly functioning prior to the initial performance tests. Each device shall comply with the applicable monitoring system requirements of 40 CFR 75.62.

   (b) *Data Collection.* Emissions shall be monitored and recorded at all times including startup, operation, shutdown, and malfunction except for continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments. Each valid 1-hour average shall be calculated using at least two valid data points at least 15 minutes apart.

   (c) *Data Reporting.* Data collected by the CEMS shall be used to demonstrate compliance with the emissions standards specified for each 3-hour average. Emissions shall be reported in units of ppmvd corrected to 15% oxygen for each hour of operation. The compliance averages shall be determined by calculating the arithmetic average of three valid 1-hour emission rates. When a monitoring system reports emissions in excess of the standards allowed by this permit, the permittee shall notify the Compliance Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. Notification shall include a written letter, a phone call, or a fax transmittal to the Compliance Authority. The Department may request a written report summarizing the excess emissions incident. The permittee shall also report excess emissions in a quarterly report as required by this permit.

   (d) *Data Exclusion for Compliance.* Unless prohibited by Rule 62-210.700(4), F.A.C., valid 1-hour monitoring averages shall not include periods of elevated NOx emissions due to startup, shutdown, documented unavoidable malfunction, or the result of tuning as described and limited under Specific Condition 17 of this permit. Because such data may be excluded, the 3-hour average to determine compliance need not consist of *consecutive* 1-hour averages.

   [Rules 62-4.130, 62-4.160(8), 62-204.800, 62-210.700, 62-212.400(BACT), and 62-297.520, F.A.C.; 40 CFR 60.7; 40 CFR 75]

RECORDS

26. Fuel Records: The permittee shall demonstrate compliance with the fuel sulfur limits specified in this permit by maintaining the following records of the sulfur contents.

   (a) The permittee shall obtain data sheets from the vendor indicating the average sulfur content of the natural gas being supplied by the pipeline for each month of operation. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D3246-81 or equivalent methods.

(b) The permittee shall obtain data sheets from the vendor indicating the quantity and sulfur content of the distillate oil for each shipment delivered. Methods for determining the sulfur content of distillate oil shall be ASTM D 2880-71 or equivalent methods.

These methods shall be used to determine the sulfur content of the natural gas fired in accordance with any EPA-approved custom fuel monitoring schedule (see Alternate Monitoring Plan), natural gas supplier data or the natural gas sulfur content referenced in 40 CFR 75 Appendix D. The analysis may be performed by the permittee, a service contractor retained by the permittee, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e). However, the permittee is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used to determine the fuel sulfur content for compliance with the SO_2 standard in 40 CFR 60.333. [Rules 62-4.070(3) and 62-4.160(15), F.A.C.]

27. Alternate Monitoring Plan: Subject to EPA approval, the following alternate monitoring may be used to demonstrate compliance with the monitoring requirements of 40 CFR 60, Subpart GG.

   (a) Data collected from the NOx CEM shall be used in lieu of the water-to-fuel monitoring system required for reporting excess emissions in accordance with 40 CFR 60.334(c)(1) of NSPS, Subpart GG.

   (b) When requested by the Department, the CEMS emission rates for NOx on this unit shall be corrected to ISO conditions to demonstrate compliance with the NOx standard established in 40 CFR 60.332.

   (c) A *custom fuel monitoring schedule* pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334(b)(2), provided:

      (1) The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.

      (2) The permittee shall submit a monitoring plan, certified by the Authorized Representative, that commits to using a primary fuel of pipeline-supplied natural gas containing no more than 20 grain of sulfur per 100 SCF of gas pursuant to 40 CFR 75.11(d)(2).

      (3) Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

   This custom fuel-monitoring schedule will only be valid when pipeline-quality natural gas is used as the primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d). [40 CFR 60, Subpart GG; Applicant Request]

28. Monthly Operations Summary: By the fifth calendar day of each month, the permittee shall record the monthly fuel consumption and hours of operation for each combustion turbine. The information shall be recorded in a written or electronic log and shall summarize the previous month of operation and the previous 12 months of operation. Information recorded and stored as an electronic file shall be available for inspection and printing within at least three days of a request from the Compliance Authority. [Rule 62-4.160(15), F.A.C.]

REPORTS

29. Quarterly Excess Emissions Reports: Following the NSPS format provided in Appendix XS of this permit, periods of startup, shutdown and malfunction shall be monitored, recorded and reported as excess emissions when emission levels exceed the standards specified in this permit. Within 30 days following each calendar quarter, the permittee shall submit a report on any periods of excess emissions that occurred during the previous calendar quarter to the Compliance Authority. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C.; and 40 CFR 60.7]

B. STORAGE TANKS

This section of the permit addresses the following new emissions units.

EU ID No.	Emission Unit Description
004	Oil Storage Tanks: Two, 1.5 million-gallon storage tanks supply low sulfur distillate oil as a backup fuel to the simple cycle combustion turbines (EUs 001, 002, and 003).

RULE APPLICABILITY

1. NSPS Subpart Kb Applicability: NSPS Subpart Kb applies to any storage tank with a capacity greater than or equal to 10,300 gallons (40 cubic meters) that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.110b(a)]

2. Exemption from Portions of NSPS Subpart Kb : Tanks with a capacity greater than or equal to 40,000 gallons (151 cubic meters) storing a liquid with a maximum true vapor pressure less than 3.5 kPa are exempt from the General Provisions (40 CFR 60, Subpart A) and from the provisions of NSPS Subpart Kb, *except* for the record keeping requirements specified below. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.110b(c)]

PERFORMANCE RESTRICTIONS

3. Equipment: The permittee is authorized to install two 1.5 million gallon distillate oil storage tanks designed to provide low sulfur distillate oil to the simple cycle combustion turbines (EUs 001, 002, and 003). [Applicant Request]

4. Hours of Operation: The hours of operation for the distillate oil storage tanks are not restricted (8760 hours per year). [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

PERFORMANCE REQUIREMENTS

RECORDS

5. Records: For purposes of reporting in the Annual Operating Report, the permittee shall keep records sufficient to document the annual throughput of distillate oil through the storage tank. [Rule 62-210.370(3), F.A.C.]

6. Oil Tank Records: The permittee shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage tank. Records shall be retained for the life of the facility. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.116b(a) and (b)]

APPENDIX A - TERMINOLOGY

ABBREVIATIONS AND ACRONYMS

°F	-	Degrees Fahrenheit
DEP	-	State of Florida, Department of Environmental Protection
DARM	-	Division of Air Resource Management
EPA	-	United States Environmental Protection Agency
F.A.C.	-	Florida Administrative Code
F.S.	-	Florida Statute
SOA	-	Specific Operating Agreement
UTM	-	Universal Transverse Mercator
CT	-	Combustion Turbine
HRSG	-	Heat Recovery Steam Generator
DLN	-	Dry Low-NOx Combustion Technology
SCR	-	Selective Catalytic Reduction
OC	-	Oxidation Catalyst Technology for CO Control

RULE CITATIONS

The following examples illustrate the methods used in this permit to abbreviate and cite the references of rules, regulations, permit numbers, and identification numbers.

Florida Administrative Code (F.A.C.) Rules:

Example: [Rule 62-213.205, F.A.C.]
Where:
62 - identifies the specific Title of the F.A.C.
62-213 - identifies the specific Chapter of the F.A.C.
62-213.205 - identifies the specific Rule of the F.A.C.

Facility Identification (ID) Number:

Example: Facility ID No. 099-0001
Where:
099 - identifies the specific county location
0221 - identifies the specific facility

New Permit Numbers:

Example: Permit No. 099-2222-001-AC or 099-2222-001-AV
Where:
AC - identifies the permit as an Air Construction Permit
AV - identifies the permit as a Title V Major Source Air Operation Permit
099 - identifies the specific county that project is located in
2222 - identifies the specific facility
001 - identifies the specific permit project

Old Permit Numbers:

Example: Permit No. AC50-123456 or AO50-123456
Where:
AC - identifies the permit as an Air Construction Permit
AO - identifies the permit as an Air Operation Permit
123456 - identifies the specific permit project

SECTION IV.

APPENDIX B - BACT EMISSIONS STANDARDS SUMMARY

EMISSIONS SUMMARY TABLE

For informational purposes only, the following table summarizes the emissions standards specified in this permit. [Rules 62-212.400(BACT) and 62-4.070(3), F.A.C.]

EU-001, 002 and 003: General Electric Model PG7241(FA) Combustion Turbines

Pollutant	*Fuel*	*Emission Standard*	*Compliance Method*
BACT Emission Standards			
CO	Gas Firing	8.2 ppmvd @ 15% O_2, 3-hr test avg. and 34.2 lb/hr, 3-hr test avg.	Base load; initial and annual tests
	Oil Firing	14.2 ppmvd @ 15% O_2, 3-hr test avg. and 68.0 lb/hr, 3-hr test avg.	Base load; initial and annual tests
NO_x	Gas Firing	9.0 ppmvd @ 15% O_2, 3-hr test avg. and 68.2 lb/hr, 3-hr test avg. 10.0 ppmvd @ 15% O_2, 3-hr rolling avg.	Base load; initial, annual, and tuning tests All loads, certified CEM data
	Oil Firing	42.0 ppmvd @ 15% O_2, 3-hr test avg. and 330.6 lb/hr, 3-hr test avg. 42.0 ppmvd @ 15% O_2, 3-hr rolling avg.	Base load; initial, annual, and tuning tests All loads, certified CEM data
PM, PM_{10}, SAM, SO_2	Gas Firing	9.0 lb PM/hr 2 grains of sulfur per 100 SCF of natural gas Visible emissions ≤ 10% opacity	Base load; initial/renewal tests Fuel records Base load; initial and annual tests
	Oil Firing	17.0 lb PM/hr Distillate oil with ≤ 0.05% sulfur by weight Visible emissions ≤ 10% opacity	Base load; initial/renewal tests Fuel records Base load; initial and annual tests
PSD-Synthetic Minor Emission Standards			
VOC	Gas Firing	4.0 lb/hr, 3-hr test avg. measured as methane (Equivalent to 1.7 ppmvd @ 15% O_2)	Base load; initial/renewal tests
	Oil Firing	8.0 lb/hr, 3-hr test avg. measured as methane (Equivalent to 2.9 ppmvd @ 15% O_2)	Base load; initial/renewal tests

Notes: Emission limits were based on the following:

- *Gas Firing*: At a compressor inlet air temperature of 32° F and firing 1863 mmBTU per hour of gas, each unit produces a maximum 184 MW.
- *Oil Firing*: At a compressor inlet air temperature of 32° F and firing 1965 mmBTU per hour of oil as a backup fuel, each unit produces a maximum 192 MW.
- Heat input values are based on the higher heating values (HHV) of the fuels.
- The BACT standards in this table were based on the following control technologies:
  - Dry low-NO_x combustion design for NO_x when firing gas.
  - Wet injection for NO_x when firing distillate oil.
  - Combustion design for CO when firing gas or oil.
  - Combustion design and clean fuels for PM/PM_{10}, SAM, and SO_2 when firing gas or oil.

BACT DETERMINATIONS

The Department's technical review and rationale for the determinations of Best Available Control Technology (BACT) are presented in Technical Evaluation and Preliminary Determination issued on October 6, 2000 with the Draft Permit.

Determination By:

Jeffery F. Koerner	12-22-00

J. F. Koerner, P.E., Project Engineer	(Date)
New Source Review Section

Recommended By:

C H Fancy	12/22/00

C. H. Fancy, Chief	(Date)
Bureau of Air Regulation

Approved By:

C H Fancy	12/22/00

For Howard L. Rhodes, Director	(Date)
Division of Air Resources Management

APPENDIX GC - CONSTRUCTION PERMIT GENERAL CONDITIONS

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance; and
(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by

Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology (X);

(b) Determination of Prevention of Significant Deterioration (X); and

(c) Compliance with New Source Performance Standards (X).

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

APPENDIX GG - NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

40 CFR 60, SUBPART A - NSPS GENERAL PROVISIONS

This emissions unit is subject to the applicable portions of 40 CFR 60, Subpart A, General Provisions, including:

- 40 CFR 60.7, Notification and Record Keeping
- 40 CFR 60.8, Performance Tests
- 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
- 40 CFR 60.12, Circumvention
- 40 CFR 60.13, Monitoring Requirements
- 40 CFR 60.19, General Notification and Reporting Requirements

For copies of these requirements, please contact the Department's New Source Review Section.

40 CFR 60, SUBPART GG - STATIONARY GAS TURBINES

This emissions unit is subject to 40 CFGR 60, Subpart GG for stationary gas turbines adopted by reference in Rule 62-204.800(7)(b), F.A.C. The following conditions follow the original NSPS rule language and numbering scheme. Regulations that are not applicable were omitted for clarity. Because this emissions units is subject to an NSPS, it is also subject to the following federal provisions: 40 CFR 60, Subpart A, General Provisions for sources subject to an NSPS, adopted by reference in Rule 62-204.800(7)(d), F.A.C.; 40 CFR 60, Appendix A - Test Methods, Appendix B - Performance Specifications, Appendix C - Determination of Emission Rate Change, Appendix D - Required Emissions Inventory Information, Appendix F - Quality Assurance Procedures, adopted by reference in Rule 62-204.800(7)(e).

40 CFR 60.330 APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY.

(a) The provisions of this subpart are applicable to all stationary gas turbines with a heat input at peak load equal to or greater than 10 million BTU per hour, based on the lower heating value of the fuel fired.

40 CFR 60.331 DEFINITIONS.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) Stationary gas turbine means any simple cycle gas turbine, regenerative cycle gas turbine or any gas turbine portion of a combined cycle steam/electric generating system that is not self propelled. It may, however, be mounted on a vehicle for portability.

(b) Simple cycle gas turbine means any stationary gas turbine which does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or which does not recover heat from the gas turbine exhaust gases to heat water or generate steam.

(d) Combined cycle gas turbine means any stationary gas turbine which recovers heat from the gas turbine exhaust gases to heat water or generate steam.

(f) Ice fog means an atmospheric suspension of highly reflective ice crystals.

(g) ISO standard day conditions means 288 degrees Kelvin, 60 percent relative humidity and 101.3 kilopascals pressure.

(h) Efficiency means the gas turbine manufacturer's rated heat rate at peak load in terms of heat input per unit of power output based on the lower heating value of the fuel.

(i) Peak load means 100 percent of the manufacturer's design capacity of the gas turbine at ISO standard day conditions.

(j) Base load means the load level at which a gas turbine is normally operated.

(p) Gas turbine model means a group of gas turbines having the same nominal air flow, combustor inlet pressure, combustor inlet temperature, firing temperature, turbine inlet temperature and turbine inlet pressure.

(q) Electric utility stationary gas turbine means any stationary gas turbine constructed for the purpose of supplying more than one-third of its potential electric output capacity to any utility power distribution system for sale.

60.332 STANDARD FOR NITROGEN OXIDES.

(a) On and after the date of the performance test required by Sec. 60.8 is completed, every owner or operator subject to the provisions of this subpart as specified in paragraphs (b) of this section shall comply with one of the following, except as provided in paragraphs (e) of this section.

(1) No owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of:

$$STD = (0.0075)\frac{(14.4)}{Y} + F$$

Where:

STD = allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO emission allowance for fuel-bound nitrogen as defined in the following table:

(3) F shall be defined according to the nitrogen content of the fuel as follows:

Fuel-Bound Nitrogen (Percent By Weight)	"F" (NOx Percent By Volume)
N < 0.015	0
0.015 < N < 0.1	0.04(N)
0.1 < N < 0.25	0.004 + 0.0067(N – 0.1)
N > 0.25	0.005

Where, N = the nitrogen content of the fuel (percent by weight).

(b) Electric utility stationary gas turbines with a heat input at peak load greater than 100 million Btu per hour based on the lower heating value of the fuel fired shall comply with the provisions of paragraph (a)(1) of this section.

(f) Stationary gas turbines using water or steam injection for control of NOx emissions are exempt from paragraph (a) when ice fog is deemed a traffic hazard by the owner or operator of the gas turbine.

40 CFR 60.333 STANDARD FOR SULFUR DIOXIDE.

On and after the date on which the performance test required to be conducted by Sec. 60.8 is completed, every owner or operator subject to the provision of this subpart shall comply with one or the other of the following conditions:

(b) No owner or operator subject to the provisions of this subpart shall burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

40 CFR 60.334 MONITORING OF OPERATIONS.

(a) The owner or operator of any stationary gas turbine subject to the provisions of this subpart and using water injection to control NOx emissions shall install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine. This system shall be accurate to within +/- 5.0 percent and shall be approved by the Administrator.

(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:

(1) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.

(c) For the purpose of reports required under Sec. 60.7(c), periods of excess emissions that shall be reported are defined as follows:

(1) Nitrogen oxides. Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with Sec. 60.332 by the performance test required in Sec. 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in Sec. 60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under Sec. 60.335(a).

(2) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

(3) Ice fog. Each period during which an exemption provided in Sec. 60.332(g) is in effect shall be reported in writing to the Administrator quarterly. For each period the ambient conditions existing during the period, the date and time the air pollution control system was deactivated, and the date and time the air pollution control system was reactivated shall be

reported. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter.

40 CFR 60.335 TEST METHODS AND PROCEDURES.

(a) To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the Administrator to determine the nitrogen content of the fuel being fired.

(b) In conducting the performance tests required in Sec. 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided for in Sec. 60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.

(c) The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in Secs. 60.332 and 60.333(a) as follows:

(1) The nitrogen oxides emission rate (NOx) shall be computed for each run using the following equation:

$$NOx = (NOxo)\,(P_r/P_o)^{0.5}\,(e^{19\,(Ho - 0.00633)})\,(288°K/T_a)^{1.53}$$

Where

NOx	=	emission rate of NOx at 15 percent oxygen and ISO standard ambient conditions, volume percent.
NOxo	=	observed NOx concentration, ppm by volume.
P_r	=	reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.
P_o	=	observed combustor inlet absolute pressure at test, mm Hg.
Ho	=	observed humidity of ambient air, g H_2O/g air.
E	=	transcendental constant, 2.718.
T_a	=	ambient temperature, °K.

(2) The monitoring device of Sec. 60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with Sec. 60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

(3) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of this section.

(d) The owner or operator shall determine compliance with the sulfur content standard in Sec. 60.333(b) as follows: ASTM D 2880-71 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels (incorporated by reference--see Sec. 60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

(e) To meet the requirements of Sec. 60.334(b), the owner or operator shall use the methods specified in paragraphs (a) and (d) of this section to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

APPENDIX XS - CEMS EXCESS EMISSIONS REPORT
FIGURE 1 – QUARTERLY PERFORMANCE SUMMARY REPORT
GASEOUS AND OPACITY EXCESS EMISSION AND MONITORING SYSTEMS

[Note: This form is referenced in 40 CFR 60.7, Subpart A-General Provisions]

Pollutant *(Circle One)*: SO_2 NOx TRS H_2S CO Opacity

Reporting period dates: From ____________________ to ____________________

Company: ____

Emission Limitation: ____

Address: ____

Monitor Manufacturer and Model No.: ____

Date of Latest CMS Certification or Audit: ____________________

Process Unit(s) Description: ____

Total source operating time in reporting period [a]: ____________________

Emission data summary [a]		CMS performance summary [a]	
1. Duration of Excess Emissions In Reporting Period Due To:		1. CMS downtime in reporting period due to:	
a. Startup/Shutdown		a. Monitor Equipment Malfunctions	
b. Control Equipment Problems		b. Non-Monitor Equipment Malfunctions	
c. Process Problems		c. Quality Assurance Calibration	
d. Other Known Causes		d. Other Known Causes	
e. Unknown Causes		e. Unknown Causes	
2. Total Duration of Excess Emissions		2. Total CMS Downtime	
3. [Total Duration of Excess Emissions] x (100%) / [Total Source Operating Time] [b]		3. [Total CMS Downtime] x (100%) / [Total source operating time]	

[a] For opacity, record all times in minutes. For gases, record all times in hours.

[b] For the reporting period: If the total duration of excess emissions is 1 percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report form and the excess emission report described in 40 CFR 60.7(c) shall be submitted.

Note: On a separate page, describe any changes since last quarter in CMS, process or controls.

I certify that the information contained in this report is true, accurate, and complete.

____
Name

____
Title

____ ____________________
Signature *Date*

Florida Department of Environmental Protection

Memorandum

TO:	Howard L. Rhodes
THRU:	Clair Fancy Al Linero *ал*
FROM:	Jeff Koerner *JK*
DATE:	December 13, 2000
SUBJECT:	Project No. 1050336-001-AC (PSD Permit No. PSD-FL-292) Peace River Station, L.L.C. Three Nominal 170 MW Simple Cycle Combustion Turbines

Attached is the Final Permit package to construct a new 510 MW electrical generating plant located approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The new plant will consist of three new General Electric Model PG7241(FA) simple cycle gas turbines with electrical generator sets, each capable of producing a nominal 170 MW of electrical power. Each unit will be fired primarily by natural gas with very low sulfur distillate oil as a backup fuel. Operation is restricted to 3390 hours during any consecutive 12 months with no more than 720 hours of very low sulfur oil firing. When firing gas, NOx emissions are controlled with dry low-NOx combustion technology to less than 10.0 ppmvd corrected to 15% oxygen based on a 3-hour average. When firing oil, NOx emissions are controlled with water injection to less than 42.0 ppmvd corrected to 15% oxygen based on a 3-hour average.

The Public Notice of Intent to Issue was published in the Lakeland Ledger on November 13, 2000. The Department received the proof of publication on November 27, 2000. The public, the Department's Southwest District Office, the National Park Service, and the Polk County Environmental Services Department provided no comments regarding the project. EPA Region 4 provided written comments on the preliminary determination regarding control costs that resulted in no changes to the permit. The applicant requested minor changes to the permit as summarized in the attached Final Determination.

I recommend your approval and signature. Day 90 is January 15, 2000.

Attachments

CHF/AAL/jfk

(DRAFT)

PERMITTEE:

Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Authorized Representative:
Macauley Whiting, Jr., President

ARMS Permit No.	1050336-001-AC
PSD Permit No.	PSD-FL-292
Facility ID No.	1050336
SIC No.	4911
Expires:	August 1, 2002

PROJECT AND LOCATION

This permit authorizes construction of a new 510 MW electrical generating plant consisting of three simple cycle, dual-fuel, General Electric Model PG7241(FA) combustion turbine-electrical generator sets, each having a nominal generating capacity of 170 MW. The new plant will be located on West County Road 630 approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The UTM coordinates are Zone 17, 419.5 km E, 3069.7 km N and the map coordinates are Latitude 27° 45' 04", Longitude 89° 49' 00".

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.) and 40 CFR 52.21. Specifically, this permit is issued pursuant to the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality, Rule 62-212.400, F.A.C. The permittee is authorized to install the proposed equipment in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department.

APPENDICES

The following Appendices are attached as part of this permit.

Appendix A - Terminology
Appendix B - BACT Emissions Standards Summary
Appendix GC - Construction Permit General Conditions
Appendix GG - NSPS Subpart GG Requirements for Gas Turbines
Appendix XS - CEMS Excess Emissions Report

(DRAFT)

Howard L. Rhodes, Director (Date)
Division of Air Resources Management

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

RECEIVED

NOV 27 2000

BUREAU OF AIR REGULATION

Golder Associates

November 22, 2000

9939562

Mr. C. H. Fancy, P.E., Chief Bureau of Air Regulation
Florida Department of Environmental Protection
Bureau of Air Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Attention: Mr. A. A. Linero, P.E., Administrator of New Source Review Section

RE: Comments to Draft Permit
Peace River Station
Three 170 MW Simple Cycle Gas Turbines
DEP File No. 1050336-001-AC (PSD-FL-292)

Dear Al:

This correspondence is submitted on behalf of Peace River Station, L.L.C. and provides comments to the Draft Permit for the Peace River Station. The comments on the Draft Permit are presented below:

Section III. Specific Condition 3.
Combustion Turbines:

In the first line the "two" appears to be a typographical error. The project is for "three" combustion turbines as described in the application, technical evaluation, public notice, intent to issue and PE certification statement.

Section III. Specific Condition 12.
Tuning:

The concept of "tuning" is not specifically defined in the Department's rules and can lead to confusion regarding whether "tuning" is "routine maintenance". It is requested that the Department consider adding a permitting note to this condition to clarify what "tuning" means. The suggested permitting note is: {Permitting Note: Tuning is defined as the physical change or operational change of the DLN combustion system, including computer controls, for the express purpose of adjusting the NO_x emissions from the combustion turbine. Tuning does not include routine maintenance of the DLN system as specified by the manufacturer.}

Section III. Specific Condition 25.
NO_x CEMs: Paragraph (c) Data Reporting.

The condition would appear to require notification of excess emissions even for excess emissions authorized under Specific Condition 17. Notification to the

Department of authorized excess emissions does not appear appropriate given that these are reported in the required quarterly reports. It is suggested that Department add the following to the conditions: "Notification is not required for excess emissions authorized under Specific Condition 17 above."

The opportunity to provide these comments is appreciated. Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Kennard F. Kosky

Kennard F. Kosky, P.E.
Principal

KFK/arz

cc: Jeffery Koerner, P.E., FDEP BAR
Macauley Whiting, Jr. President, Peace River Station, L.L.C.
C. Carlson

P:\Projects\1999\9939\9939562a\02\Permit Comments to FDEP.doc

B. Thomas, SWD
G. Spence, Polk Co.
G. Worley, EPA
J. Bunyak, NPS

TRANSMITTAL MEMO

GOLDER ASSOCIATES INC.

5405 West Cypress Street, Suite 215
Tampa, Florida 33607 USA

Telephone No. (813) 287-1717
Fax. No. (813) 287-1716

Date: November 22, 2000

RECEIVED
NOV 27 2000
BUREAU OF AIR REGULATION

TO: Jeff Koerner
Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida, 32301

FROM: Richard Zwolak, Golder Associates

QUANTITY	DESCRIPTION	SENT BY
1	Copy of affidavit and published Public Notice of Intent to Issue Air Construction Permit for the Peace River project near Fort Meade, Florida.	BR

REMARKS:

Transmitting a copy of the affidavit and published Public Notice of Intent to Issue Air Construction Permit for the Peace River project near Fort Meade, Florida. This noticed was published one time, on Monday, November 13, 2000 in the legal advertisement section of the Lakeland Ledger, pursuant to the requirements Chapter 50, Florida Statutes. This transmittal is being provided to FDEP, via FedEx overnight service, on the same day as received in the Golder Associates Inc. office.

cc: J. Koerner
C. Carlson
B. Thomas, SW Dist.
J. Spence, Polk Co.
G. Worley, EPA
J. Bunyak, NPS

Golder Associates

AFFIDAVIT OF PUBLICATION
THE LEDGER
Lakeland, Polk County, Florida

Case No ....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared Nelson Kirkland, who on oath says that he is Classified Advertising Manager of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

Notice of Intent

....

....

in the matter of Peace River Stations, L.L.C.

....

....

in the..

....

Court, was published in said newspaper in the issues of.........................

11-13; 2000

....

....

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed..
Nelson Kirkland
Classified Advertising Manager
Who is personally known to me.

Sworn to and subscribed before me this 17TH ....

day of November .... A.D. 20 00 ....

Patricia Ann Rouse
Notary Public
PATRICIA ANN ROUSE

PATRICIA ANN ROUSE
MY COMMISSION # CC 976018
EXPIRES: October 17, 2004
Bonded Thru Notary Public Underwriters

(Seal)

My Commission Expires..

BP770220 E749 Golder Project 933-9562-0

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Peace River Station, L.L.C.

Project No. 1050336-001-AC
Draft Permit PSD-FL-292

510 MW Simple Cycle Gas Turbine Plant
Emissions Units 001 - 004

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to the Peace River Station, L.L.C. to construct a nominal 510 MW simple cycle gas turbine plant, which will be located approximately one quarter mile west of Ft. Meade in Polk County, Florida. The applicant proposes to install three new simple cycle gas turbines, inlet air fogging systems, two 1.5 million-gallon distillate oil tanks, and support equipment. Each gas turbine is a General Electric Model PG7241(FA) combustion turbine-electrical generator set with a nominal generating capacity of 170 MW. A determination of Best Available Control Technology (BACT) was required for carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM10), sulfuric acid mist (SAM), and sulfur dioxide (SO2) pursuant to Rule 62-212.400, F.A.C., the Prevention of Significant Deterioration (PSD) of Air Quality. The new plant is not subject to the requirements of the Power Plant Siting Act because it does not produce steam-generated electrical power. The applicant's authorized representative is Mr. Macauley Whiting, Jr., President of Peace River Station, L.L.C. The applicant's mailing address is 163 East Morse Boulevard, Suite 200, Winter Park, Florida 32789.

The simple cycle gas turbines will be fired primarily by natural gas with low sulfur distillate oil as a backup fuel. Operation is restricted to 3390 hours during any consecutive 12 months with no more than 720 hours of very low sulfur oil firing. Nitrogen oxide emissions will be controlled with dry low-NOx combustion technology when firing natural gas and with water injection when firing distillate oil. Emissions of carbon monoxide, particulate matter, sulfuric acid mist, sulfur dioxides, and volatile organic compounds will be minimized by the efficient combustion of clean fuels.

The following table summarizes the final project emissions in tons per year, identifies the corresponding PSD Significant Emissions Rate, and indicates whether or not a BACT determination was required for the pollutant.

Pollutant	Project Potential Annual Emissions (Tons Per Year)	Significant Emissions Rate (Tons Per Year)	Significant? (Table 212.400-2)	BACT Required ?
CO	199	100	Yes	Yes
NOx	605	40	Yes	Yes
PM	54	25	Yes	Yes
PM10	54	15	Yes	Yes
SAM	35	7	Yes	Yes
SO2	144	40	Yes	Yes
VOC	26	40	No	No

An air quality impact analysis was conducted by the applicant and reviewed by the Department. The ambient impact analysis predicted all pollutant emissions to have an insignificant impact on Class I and Class II Areas. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standard. The Department will issue the Final Permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for *a period of 30 (thirty) days from the date of publication of this Public* Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection
Bureau of Air Regulation
111 S. Magnolia Drive, Suite 4
Tallahassee, Florida, 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Department of Environmental Protection
Southwest District Office - Air Resources
3804 Coconut Palm Drive,
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

The complete project file includes the application, Technical Evaluation and Preliminary Determination, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Department's reviewing engineer for this project, Jeff Koerner, at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.
E749 - 11-13; 2000

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

NOV 0 6 2000

RECEIVED
NOV 0 8 2000
BUREAU OF AIR REGULATION

4APT-ARB

A. A. Linero, P.E.
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SUBJ: Preliminary Determination and Draft PSD Permit for Peace River Station, LLC (PSD-FL-292) located in Ft. Meade, Polk County, Florida

Dear Mr. Linero:

Thank you for sending the preliminary determination and draft prevention of significant deterioration (PSD) permit for Peace River Station, LLC dated October 6, 2000. The preliminary determination is for the proposed construction and operation of three simple cycle combustion turbines (CTs) with a total nominal generating capacity of 510 MW. The combustion turbines proposed for the facility are General Electric, frame 7FA units. The CTs will primarily combust pipeline quality natural gas with No. 2 fuel oil combusted as backup fuel. As proposed, the CTs will be allowed to fire natural gas up to 3,390 hours per year and fire No. 2 fuel oil a maximum of 720 hours per year. Total emissions from the proposed project are above the thresholds requiring PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter (PM/PM_{10}).

Based on our review of the preliminary determination and draft PSD permit, we have the following comments regarding the economic analyses presented in the PSD permit application:

1. The "Direct Annual Costs" section of both the SCR and catalytic oxidation cost analyses list an "Inventory Cost" (capital recovery for 1/3 catalyst) of $40,663/year and $21,960/year, respectively. These figures are in addition to the "Catalyst Cost" already included in the "Direct Annual Costs" section of the economic analyses ($370,333/year and $236,747/year, respectively). Information should be provided in order to evaluate the need for both costs and verify that catalyst costs are not being double-counted.

   Additionally, the "Direct Annual Costs" section of both the SCR and catalytic oxidation cost analyses includes a 3% annual contingency fee in addition to the 3% capital contingency fee found in the "Indirect Costs" section. This approach is inconsistent with the *OAQPS Control Cost Manual*. If there is reason to suggest the need for an annual contingency fee in addition to the one included in the capital cost section, the applicant should provide this reason.

2. The Annualized Total Direct Capital cost in Table B-4 ($605,942) is too high because it contains a double-counting of catalyst cost. Catalyst cost is already included in the annualized catalyst replacement cost and should be deducted from the Total Direct, Indirect, and Capital Cost when calculating capital recovery. This concept is explained in the following excerpt from the *OAQPS Control Cost Manual*: "However, whenever there are parts in the control system that must be replaced before the end of its useful life, Equation 2.2 [the capital recovery cost calculation equation] must be adjusted, to avoid double-counting." (These comments on double-counting also apply to the catalytic oxidation cost evaluation in Table B-9.)

3. The "Energy Costs" sections of both the SCR cost analysis (Table B-4) and the catalytic oxidation cost analysis (Table B-9) include a "Heat Rate Penalty" value. Although it is appropriate to calculate the cost of using additional natural gas to compensate for the lost power resulting from pressure drops across the catalyst bed, lost revenue should not be included in the cost analysis. The "Energy Costs" section refers to an EPA document; however, it is unclear what document "EPA, 1993 (Page 6-20)" references.

Thank you for the opportunity to comment on the Peace River Station, LLC preliminary determination and draft PSD permit. If you have any questions regarding these comments, please direct them to either Katy Forney at 404-562-9130 or Jim Little at 404-562-9118.

Sincerely,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

cc: A. Koerner
C. Carlson
K. Kosky, Golder
B. Thomas, SW Dist.
J. Spence, Polk Co.
J. Bunyak, NPS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

FACSIMILE TRANSMITTAL SHEET

To	Jeff Koerner
Fax Number	(850) 922-6979
From	Jim Little Air and Radiation Technology Branch, Air Permits Section Phone: (404) 562-9118 Fax: (404) 562-9095 E-mail: little.james@epa.gov
Subject	Peace River Station
Date	November 6, 2000
Pages	3 (including this sheet)

Original letter will be mailed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

NOV 0 6 2000

4APT-ARB

A. A. Linero, P.E.
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SUBJ: Preliminary Determination and Draft PSD Permit for Peace River Station, LLC (PSD-FL-292) located in Ft. Meade, Polk County, Florida

Dear Mr. Linero:

Thank you for sending the preliminary determination and draft prevention of significant deterioration (PSD) permit for Peace River Station, LLC dated October 6, 2000. The preliminary determination is for the proposed construction and operation of three simple cycle combustion turbines (CTs) with a total nominal generating capacity of 510 MW. The combustion turbines proposed for the facility are General Electric, frame 7FA units. The CTs will primarily combust pipeline quality natural gas with No. 2 fuel oil combusted as backup fuel. As proposed, the CTs will be allowed to fire natural gas up to 3,390 hours per year and fire No. 2 fuel oil a maximum of 720 hours per year. Total emissions from the proposed project are above the thresholds requiring PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter (PM/PM_{10}).

Based on our review of the preliminary determination and draft PSD permit, we have the following comments regarding the economic analyses presented in the PSD permit application:

1. The "Direct Annual Costs" section of both the SCR and catalytic oxidation cost analyses list an "Inventory Cost" (capital recovery for 1/3 catalyst) of $40,663/year and $21,960/year, respectively. These figures are in addition to the "Catalyst Cost" already included in the "Direct Annual Costs" section of the economic analyses ($370,333/year and $236,747/year, respectively). Information should be provided in order to evaluate the need for both costs and verify that catalyst costs are not being double-counted.

   Additionally, the "Direct Annual Costs" section of both the SCR and catalytic oxidation cost analyses includes a 3% annual contingency fee in addition to the 3% capital contingency fee found in the "Indirect Costs" section. This approach is inconsistent with the *OAQPS Control Cost Manual*. If there is reason to suggest the need for an annual contingency fee in addition to the one included in the capital cost section, the applicant should provide this reason.

2. The Annualized Total Direct Capital cost in Table B-4 ($605,942) is too high because it contains a double-counting of catalyst cost. Catalyst cost is already included in the annualized catalyst replacement cost and should be deducted from the Total Direct, Indirect, and Capital Cost when calculating capital recovery. This concept is explained in the following excerpt from the *OAQPS Control Cost Manual*: "However, whenever there are parts in the control system that must be replaced before the end of its useful life, Equation 2.2 [the capital recovery cost calculation equation] must be adjusted, to avoid double-counting." (These comments on double-counting also apply to the catalytic oxidation cost evaluation in Table B-9.)

3. The "Energy Costs" sections of both the SCR cost analysis (Table B-4) and the catalytic oxidation cost analysis (Table B-9) include a "Heat Rate Penalty" value. Although it is appropriate to calculate the cost of using additional natural gas to compensate for the lost power resulting from pressure drops across the catalyst bed, lost revenue should not be included in the cost analysis. The "Energy Costs" section refers to an EPA document; however, it is unclear what document "EPA, 1993 (Page 6-20)" references.

Thank you for the opportunity to comment on the Peace River Station, LLC preliminary determination and draft PSD permit. If you have any questions regarding these comments, please direct them to either Katy Forney at 404-562-9130 or Jim Little at 404-562-9118.

Sincerely,

Douglas Neeley

R. Douglas Neeley
Chief
Air and Radiation Technology Branch
Air, Pesticides and Toxics
Management Division

FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

October 6, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Macauley Whiting, Jr., President
Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Re: Project No. 1050336-001-AC
Draft Permit No. PSD-FL-292
Proposed Peace River Station
Three 170 MW Simple Cycle Gas Turbines

Dear Mr. Whiting:

Enclosed is one copy of the Draft Permit to construct a new 510 MW electrical generating plant located approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The Department's "Technical Evaluation and Preliminary Determination", "Intent to Issue Permit", and the "Public Notice of Intent to Issue Permit" are also included.

The "Public Notice of Intent to Issue Permit" must be published one time only, as soon as possible, in the legal advertisement section of a newspaper of general circulation in the area affected, pursuant to the requirements Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within seven days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please contact Jeff Koerner at 850/414-7268.

Sincerely,

A. A. Linero, P.E. 10/6
for C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/AAl/jfk

Enclosures

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

7099 3400 0000 1453 3051

Article Sent To:

Postage	$	10/6/00
Certified Fee		Postmark Here
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		
Tc		

Nar Macauley Whiting, Jr., President
Peace River Station, L.L.C.
Stre 163 East Morse Blvd., Ste. 200
City Winter Park, Fl 32789

PS F... for Instructions

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Macauley Whiting, Jr., President
Peace River Station, L.L.C.
163 East Morse Blvd., Ste. 200
Winter Park, FL 32789

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)* SYLVE DAVIS
B. Date of Delivery 10 10 00

C. Signature
X [signature]
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Copy from service label)*
7099 3400 0000 1453 3051

PS Form 3811, July 1999 Domestic Return Receipt 102595-99-M-1789

In the Matter of an
Application for Air Permit by:

Macauley Whiting, Jr., President
Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Project No. 1050336-001-AC
Draft Permit No. PSD-FL-292
Peace River Station
Emission Units 001 – 004
Polk County, Florida

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of Draft Permit attached) for the proposed project as detailed in the application and the enclosed Technical Evaluation and Preliminary Determination, for the reasons stated below. The applicant, Peace River Station, L.L.C., applied on June 12, 2000 to the Department for an air construction permit to construct a new 510 MW electrical generating plant located approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The Draft Permit authorizes the construction of three simple cycle, dual-fuel, General Electric Model PG7241(FA) combustion turbines-electrical generator sets, each having a nominal generating capacity of 170 MW.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit is required to perform proposed work. The Department intends to issue this air construction permit based on the belief that the applicant has provided reasonable assurances to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue Air Construction Permit. The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114 / Fax 850/ 922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of Public Notice of Intent to Issue Air Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Mediation is not available in this proceeding. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.

A A L—, P.E. 10/6
for C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Intent to Issue Air Construction Permit package (including the Public Notice of Intent to Issue Air Construction Permit, Technical Evaluation and Preliminary Determination, and the Draft Permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 10/6/00 to the person(s) listed:

Macauley Whiting, Jr., Peace River Station*
Mr. Ken Kosky, Golder Associates
Mr. Bill Thomas, SWD

Ms. Iris Hill, Polk County
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Charlotte Hayes 10/6/00
(Clerk) (Date)

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Protection	Department of Environmental Protection
Bureau of Air Regulation	Southwest District Office – Air Resources
111 S. Magnolia Drive, Suite 4	3804 Coconut Palm Drive,
Tallahassee, Florida, 32301	Tampa, Florida 33619-8218
Telephone: 850/488-0114	Telephone: 813/744-6100
Fax: 850/922-6979	Fax: 813/744-6084

The complete project file includes the application, Technical Evaluation and Preliminary Determination, Draft Permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Department's reviewing engineer for this project, Jeff Koerner, at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION
(Including Draft BACT Determinations)

Peace River Station, L.L.C.

ARMS Facility ID No. 1050336

New Electrical Generating Plant

Emissions Units 001 - 004

Three Simple Cycle 170 MW Gas Turbines and Support Equipment

Polk County

Project No. 1050336-001-AC

Draft Permit No. PSD-FL-292

Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
New Source Review Section

September 20, 2000

{Filename: PSD-FL-292 TEPD.DOC}

This document describes the overall project, rule applicability, determination of Best Available Control Technology, analysis of air quality impacts, and makes a preliminary determination. It is organized in the following sections:

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Peace River Station, L.L.C.

Project No. 1050336-001-AC
Draft Permit PSD-FL-292

510 MW Simple Cycle Gas Turbine Plant
Emissions Units 001 - 004

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to the Peace River Station, L.L.C. to construct a nominal 510 MW simple cycle gas turbine plant, which will be located approximately one quarter mile west of Ft. Meade in Polk County, Florida. The applicant proposes to install three new simple cycle gas turbines, inlet air fogging systems, two 1.5 million-gallon distillate oil tanks, and support equipment. Each gas turbine is a General Electric Model PG7241(FA) combustion turbine-electrical generator set with a nominal generating capacity of 170 MW. A determination of Best Available Control Technology (BACT) was required for carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfuric acid mist (SAM), and sulfur dioxide (SO_2) pursuant to Rule 62-212.400, F.A.C., the Prevention of Significant Deterioration (PSD) of Air Quality. The new plant is not subject to the requirements of the Power Plant Siting Act because it does not produce steam-generated electrical power. The applicant's authorized representative is Mr. Macauley Whiting, Jr., President of Peace River Station, L.L.C. The applicant's mailing address is 163 East Morse Boulevard, Suite 200, Winter Park, Florida 32789.

The simple cycle gas turbines will be fired primarily by natural gas with low sulfur distillate oil as a backup fuel. Operation is restricted to 3390 hours during any consecutive 12 months with no more than 720 hours of very low sulfur oil firing. Nitrogen oxide emissions will be controlled with dry low-NOx combustion technology when firing natural gas and with water injection when firing distillate oil. Emissions of carbon monoxide, particulate matter, sulfuric acid mist, sulfur dioxides, and volatile organic compounds will be minimized by the efficient combustion of clean fuels.

The following table summarizes the final project emissions in tons per year, identifies the corresponding PSD Significant Emissions Rate, and indicates whether or not a BACT determination was required for the pollutant.

Pollutant	Project Potential Annual Emissions (Tons Per Year)	Significant Emissions Rate (Tons Per Year)	Significant? (Table 212.400-2)	BACT Required?
CO	199	100	Yes	Yes
NOx	605	40	Yes	Yes
PM	54	25	Yes	Yes
PM_{10}	54	15	Yes	Yes
SAM	35	7	Yes	Yes
SO_2	144	40	Yes	Yes
VOC	26	40	No	No

An air quality impact analysis was conducted by the applicant and reviewed by the Department. The ambient impact analysis predicted all pollutant emissions to have an insignificant impact on Class I and Class II Areas. Emissions from the facility will not significantly contribute to or cause a violation of any state or federal ambient air quality standard. The Department will issue the Final Permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue Air Construction Permit. Written comments and requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

1.0 APPLICATION INFORMATION

1.1 Applicant Name and Address

Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Authorized Representative:
Macauley Whiting, Jr., President

1.2 Processing Schedule

06/12/00 Department received the application for a PSD air pollution construction permit.

06/14/00 Department mailed copies to EPA Region 4 and the National Park Service.

07/10/00 Department requested additional information.

08/14/00 Department received additional information; application complete.

1.3 Facility Description and Location

The new 510 MW electrical generating plant will consist of three 170 MW simple cycle combustion turbine-electrical generator sets, evaporative inlet air foggers, and two-1.5 million gallon distillate oil storage tanks. It will be located on West County Road 630 approximately one-quarter mile west of Ft. Meade in Polk County, an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to a National Ambient Air Quality Standard (NAAQS). The UTM coordinates are Zone 17, 419.5 km E, 3069.7 km N and the map coordinates are Latitude 27° 45' 04", Longitude 89° 49' 00". This location is approximately 124 km from the Chassahowitzka National Wilderness Area, the closest PSD Class I Area.

1.4 Standard Industrial Classification Code (SIC)

Industry Group No. 49, Electric, Gas, and Sanitary Services

Industry No. 4911, Electric Services

1.5 Regulatory Categories

HAPs: Based on available data, the new facility is not a major source of hazardous air pollutants (Title III).

Acid Rain: The new facility is subject to the acid rain provisions of the Clean Air Act (Title IV).

Title V Major Source: The new facility is a Title V major source of air pollution because potential emissions of at least one regulated pollutant exceed 100 tons per year. Regulated pollutants include carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOC).

PSD Major Source: The new facility is considered a major source of air pollution with respect to PSD because emissions of at least one regulated pollutant exceed 250 tons per year. Therefore, each new project requires a PSD applicability review. For each potential emission increase greater than the Significant Emissions Rates specified in Table 62-212.400-2, F.A.C., a determination of Best Available Control Technology (BACT) is required. For this project, emissions of CO, NOx, PM, PM_{10}, SAM, and SO_2 are significant and subject to the BACT standards specified in this permit.

NSPS Sources: Emissions units are subject to the New Source Performance Standards in 40 CFR 60 for the gas turbines (Subpart GG) and the oil storage tanks (Subpart Kb).

2.0 PROPOSED PROJECT

2.1 Description

The applicant, Peace River Station L.L.C., proposes to construct a new electrical generating plant in Polk County consisting of three new simple cycle combustion turbines, two distillate oil storage tanks, and associated support equipment. Each combustion turbine consists of a General Electric Model PG7241(FA) gas turbine-electrical generator set, an automated gas turbine control system, an inlet air filtration system, an evaporative inlet air cooling system, and an exhaust stack that is 60 feet tall and 21 feet in diameter. Each unit is designed to produce a nominal 170 MW of electrical power fired with natural gas as the primary fuel and low sulfur distillate oil as a backup fuel. The applicant proposes to limit use of the gas turbines as "peaking units" by restricting operation of each unit to no more than 3390 hours per year. Of this operation, no more than 720 hours will occur when firing low sulfur distillate oil as a backup fuel. To control nitrogen oxide emissions, the applicant proposes dry low-NOx (DLN) combustion technology for gas firing and water injection for oil firing. Combustion design with clean fuels will minimize emissions of other pollutants.

2.2 Potential Emissions

Table 2.2 This table summarizes potential project emissions and the resulting PSD applicability.

Pollutant	Proposed [a] PTE (Tons Per Year)	Draft Permit [a] PTE (Tons Per Year)	Significant Emissions Rate (Tons Per Year)	Significant? Table 62-212.400-2, F.A.C.	BACT Required?
CO	212	199	100	Yes	Yes
NOx	645	605	40	Yes	Yes
PM	68	54	25	Yes	Yes
PM_{10}	68	54	15	Yes	Yes
SAM	35	35	7	Yes	Yes
SO_2	152	144	40	Yes	Yes
VOC	25	26 [b]	40	No	No

[a] The potential emissions from each gas turbine were based on 2390 hours of gas firing per year, 720 hours of oil firing per year and the "annual" hourly emission rates based on a compressor inlet air temperature of 59° F.

[b] Potential emissions include 1 TPY estimate for VOC emissions from the distillate oil tanks.

Based on potential emissions, this project is significant for CO, NOx, PM, PM_{10}, SAM, and SO_2. The Department is required to make a determination of the Best Available Control Technology (BACT) for these pollutants.

3.0 PSD PRECONSTRUCTION REVIEW PROCESS

3.1 Applicability Requirements

The Department regulates major air pollution sources in accordance with Florida's Prevention of Significant Deterioration (PSD) program, as approved by the EPA and defined in Rule 62-212.400, F.A.C. A PSD review is only required in areas that are currently in attainment with the National Ambient Air Quality Standard (AAQS) for a given pollutant or areas designated as "unclassifiable" for the pollutant. A new facility is considered "major" with respect to PSD if the facility emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant, or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the 28 Major Facility Categories (Table 62-212.400-1, F.A.C.), or
- 5 tons per year of lead.

For new projects at PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates listed in Table 62-212.400-2, F.A.C. Pollutant emissions from the project exceeding these rates are considered "significant" and the applicant must employ the Best Available Control Technology (BACT) to minimize emissions of each such pollutant. Although a facility may be "major" with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

3.2 PSD Preconstruction Review Requirements

For projects subject to PSD preconstruction review, Rule 62-212.400(5), F.A.C. requires the applicant to:

(a) Obtain a PSD permit before beginning construction on the project.

(b) Comply with all applicable emission limitations contained in 40 CFR Part 60, 40 CFR Part 61, and specified as the Best Available Control Technology (BACT) for the project.

(c) Apply BACT for each pollutant subject to the PSD preconstruction review requirements.

(d) Conduct an ambient impact analysis that demonstrates the increase in allowable emissions from the proposed project, together with all other applicable increases and decreases in emissions resulting from the construction or modification (including secondary emissions), will not cause or contribute to a violation of any ambient air quality standard or exceed the maximum allowable PSD increment.

(e) Analyze the following additional impacts:

- The impairment to visibility and soils, and to vegetation having a significant commercial or recreational value, that would occur as a result of the facility or modification and associated commercial, residential, industrial and other growth;
- The air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the facility or modification; and
- The impairment to visibility, if any, which would occur in any Federal Class I area within 100 kilometers of the facility or modification, with the exception of the Bradwell Bay National Wilderness Area, as a result of emissions from the facility or modification.

(f) Provide an analysis of the preconstruction air quality.

(g) Provide post-construction monitoring data, if required by the Department.

(h) Provide this information in a PSD permit application to the Department.

3.3 BACT Determination Process

The applicant reviews current control technologies and techniques for similar projects and proposes control options and emissions standards for the project. The ambient impacts of the project are analyzed to ensure compliance with the Ambient Air Quality Standards, compliance with the available PSD increments, and to ensure that additional impacts are minimized. The Department reviews the information provided by the applicant with other available information and makes a determination of the Best Available Control Technology (BACT) for each "significant" regulated pollutant.

The BACT determination must be based on the maximum degree of emissions reduction that the Department determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. The Department's determination is made on a case by case basis for each proposed project, taking into account energy, environmental and economic impacts. In addition to the information submitted by the applicant, the Department may rely upon other available information in making its BACT determination and shall also give consideration to:

- Any EPA determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (NSPS) or 40 CFR Part 61 (NESHAP).
- All scientific, engineering, and technical material and other information available to the Department.
- The emission limiting standards or BACT determinations of any other state.
- The social and economic impacts of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent control option is evaluated first and selected as BACT unless it is technically infeasible for the proposed project or rejected due to adverse energy, environmental or economic impacts. If the control option is eliminated, the next most stringent alternative is considered. This top-down approach continues until BACT is determined.

The BACT evaluation must be performed for each emissions unit and pollutant under consideration. In general, EPA has identified five key steps in the top-down BACT process:

1. Identify alternative control technologies;
2. Eliminate technically infeasible options;
3. Rank remaining technologies by control effectiveness;
4. Evaluate the most effective controls considering energy, environmental, and economic impacts;
5. Select BACT.

BACT determinations must result in the selection of control technologies capable of achieving at least the applicable emission standards regulated by 40 CFR Part 60 (NSPS) or 40 CFR Part 61 (NESHAP). The Department will consider the control or reduction of "non-regulated" air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts and stated policy for pollution prevention.

3.4 Project Applicability

As shown in Table 2.2, potential emissions of one or more regulated pollutants from the new facility will exceed 250 tons per year. Also, the new facility will be located in Polk County, an area that is currently in attainment (or designated as unclassifiable) for each pollutant subject to a National Ambient Air Quality Standard (NAAQS). Emissions of CO, NOx, PM/PM_{10}, SAM and SO_2 exceed the PSD significant emission rates specified in Table 62-212.400-2, F.A.C. Therefore, the new facility is a PSD-major source of air pollution and the project is subject to PSD preconstruction review for CO, NOx, PM/PM_{10}, SAM and SO_2.

4.0 RULE APPLICABILITY

4.1 State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the following state rules and regulations of the Florida Administrative Code.

Citation	Description
Chapter 62-4	Permitting Requirements
Chapter 62-204	Ambient Air Quality Protection and Standards, PSD Increments, and Federal Regulations Adopted by Reference

Chapter 62-210	Required Permits, Public Notice and Comments, Reports, Stack Height Policy, Circumvention, Excess Emissions, Forms and Instructions,
Chapter 62-212	Preconstruction Review, PSD Requirements, and BACT Determinations
Chapter 62-213	Operation Permits for Major Sources of Air Pollution
Chapter 62-214	Acid Rain Program Requirements
Chapter 62-296	Emission Limiting Standards
Chapter 62-297	Test Requirements, Test Methods, Supplementary Test Procedures, Capture Efficiency Test Procedures, Continuous Emissions Monitoring Specifications, and Alternate Sampling Procedures

4.2 Federal Regulations

This project is also subject to the applicable federal provisions regarding air quality as established by the EPA in the Code of Federal Regulations (CFR) and summarized below.

Citation	Description
40 CFR 52.21	Prevention of Significant Deterioration
40 CFR 52.166	Prevention of Significant Deterioration
40 CFR 60	Subpart A - General Provisions for NSPS Sources
40 CFR 60	NSPS Subpart GG – Stationary Gas Turbines
40 CFR 60	NSPS Subpart Kb - Volatile Organic (Including Petroleum) Liquid Storage Vessels
40 CFR 60	Applicable Appendices
40 CFR 72	Acid Rain Permits
40 CFR 73	Allowances
40 CFR 75	Monitoring
40 CFR 77	Acid Rain Program - Excess Emissions

5.0 DRAFT BACT DETERMINATIONS

5.1 Available Information

For this project, the following pollutants are subject to BACT determinations: CO, NOx, PM, PM_{10}, SAM and SO_2. The applicant proposed control strategies for these pollutants as part of the application for a PSD construction permit. In addition to the information submitted by the applicant, the Department also relied on the following information to make these determinations:

- On 07/05/00, the Fish and Wildlife Service noted that it has no questions or comments on this project;
- EPA Region 4 provided no comments during application processing;
- DOE web site information on Advanced Turbine Systems Project;
- General Electric technical documents regarding DLN emissions and the gas turbine control system;
- Englehard equipment cost quotes for a CO oxidation catalyst and selective catalytic NOx reduction;
- Alternative Control Techniques Document – NOx Emissions from Stationary Gas Turbines (1993);
- Proposed AP-42 changes to Section 3.1 for gas turbines (04/00);
- Recently issued Department permits for the General Electric Model PG7241(FA) gas turbine;

must be maintained between 450° F and 850° F. SCR is a commercially available, demonstrated control technology currently employed on numerous combined cycle combustion turbine projects capable of very low NOx emissions (< 3.5 ppmvd) with control efficiencies up to 98%. This control alternative is not feasible for simple cycle projects because the gas turbine exhaust temperature (1100° F) is above the design temperature range for this technology.

Selective Non-Catalytic Reduction (SNCR): In the SNCR process, ammonia or urea is injected at high temperatures without a catalyst to reduce NOx emissions to nitrogen and water vapor. However, the exhaust temperature must be maintained above 1600°F to allow the reaction to occur, otherwise uncontrolled NOx will be emitted as well as unreacted ammonia. In addition, the exhaust temperature must not exceed 2000°F or ammonia will actually be oxidized creating additional NOx emissions. For boilers, SNCR has achieved control efficiencies in the 40% to 60% range. This control alternative is not feasible for simple cycle projects because the gas turbine exhaust temperature (1100°F) is below the design limit (1600° F) for this technology.

Non-Selective Catalytic Reduction (NSCR): NSCR uses a platinum/rhodium catalyst to reduce NOx to nitrogen and water vapor in exhaust gas streams containing less than 3% oxygen. This technology has only been applied to automobiles and stationary reciprocating engines with variable control efficiencies. This control alternative is not feasible for simple cycle projects because the oxygen content of the combustion turbine exhaust (13% to 15%) is above the design level for this technology.

SCONOx™: This technology is a NOx and CO control system developed by Goal Line Environmental Technologies and distributed by ABB for large gas turbine projects. Specialized potassium carbonate catalyst beds reduce CO and NOx emissions using an oxidation-absorption-regeneration cycle. The required operating temperature range is between 300°F and 700°F which requires a heat recovery steam generator for use with a combined cycle gas turbine. SCONOx™ can achieve control efficiencies in the 90% to 98% range. This control alternative is not feasible for simple cycle projects because the gas turbine exhaust temperature of 1100°F is above the design limit for this technology.

XONON™: This is an emerging technology that partially burns fuel in a low-temperature pre-combustor and completes combustion in a catalytic combustor. The result is partial combustion with a lower temperature (and less NOx formation) followed by flame-less catalytic combustion to further inhibit NOx formation. This technology has been demonstrated, but will be specific to each manufacturer and model of gas turbine. It is anticipated that control efficiencies will be in the 80% to 95% range. This emerging technology is model-specific and not yet commercially available for the General Electric Model PG7241(FA).

"Hot" Selective Catalytic Reduction (SCR): Due to temperature limitations of conventional SCR catalysts, vendors have developed specially formulated catalysts designed to further the reduction reaction at temperatures up to 1025° F. Also, cooling air can be added to reduce the gas temperatures to the appropriate design range. Hot SCR can deliver NOx control efficiencies of 70% to 95%.

Dry Low-NOx Combustor Design (DLN): The U.S. Department of Energy has provided millions of dollars of funding to a number of combustion turbine manufacturers to develop inherently lower pollutant-emitting units. Efforts over the last ten years have focused on reducing the peak flame temperature for natural gas fired units by staging combustors and premixing fuel and air prior to combustion in the primary zone. Typically, this occurs in four distinct modes: primary, lean-lean, secondary, and premix. In the primary mode, fuel is supplied only to the primary nozzles to ignite, accelerate, and operate the unit over a range of low- to mid-loads and up to a set combustion reference temperature. Once the first combustion reference temperature is reached, operation in the lean-lean mode begins when fuel is also introduced to the secondary nozzles to achieve the second combustion reference temperature. After the second combustion reference temperature is reached, operation in the secondary mode begins by shutting off fuel to the primary nozzle and extinguishing the flame in the primary zone. Finally, in the premix mode, fuel is reintroduced to the primary zone for premixing fuel and air. Although fuel is supplied to both the primary and secondary nozzles in the premix mode, there is only flame in the secondary stage. The premix mode of operation occurs at loads between 50% to 100% of base load and provides the lowest NOx emissions. Due to the intricate air and fuel staging necessary for dry low-NOx combustor technology, the automated gas turbine control system becomes a critical component of the overall system. DLN systems result in control efficiencies of 80% to 95%. DLN technology research for oil firing continues.

Wet Injection (WI): Water or steam is injected into the primary combustion zone to reduce the flame temperature, resulting in lower NOx emissions. Water injected into this zone acts as a heat sink by absorbing heat necessary to vaporize the water and raise the temperature of the vaporized water to the temperature of the exhaust gas stream. Steam injection uses the same principle, excluding the heat required to vaporize the water. Therefore, much more steam is required (on a mass basis) than water to achieve the same level of NOx control. However, there is a physical limit to the amount of water or steam that may be injected before flame instability or cold spots in the combustion zone would cause adverse operating conditions for the combustion turbine. Standard combustor designs with wet injection can generally achieve NOx emissions of 42/65 ppmvd for gas/oil firing. Advanced combustor designs generate lower NOx emissions to begin with and can tolerate greater amounts of water or steam injection before causing flame instability. Advanced combustor designs with wet injection can achieve NOx emissions of 25/42 ppmvd for gas/oil firing. Wet injection results in 60% to 80% control efficiencies.

Applicant's Proposed NOx Controls

The applicant recognized "hot" selective catalytic reduction as the top control option followed by dry low-NOx (DLN) combustion technology and water injection. Although identified as potentially feasible, the applicant does not believe hot SCR has been successfully demonstrated for this size unit. The applicant also makes the following claims regarding additional adverse impacts of hot SCR.

Energy Impacts: Due to a pressure drop across the catalyst, hot SCR would reduce electrical energy production by nearly 2.0 million kWh per year. The lost energy is roughly equivalent to the needs of 170 residential customers.

Environmental Impacts: Hot SCR would generate additional emissions of ammonia (as high as 42.7 tons per year per unit) and additional particulate matter (as high as 20.8 tons per year per unit). Power lost as a result of the hot SCR system would have to be replaced and may result in an additional 2.3 tons per year per unit of criteria pollutants and carbon dioxide.

Economic Impacts: The applicant analyzed the cost effectiveness of adding hot SCR based on NOx emission rates of 10 ppmvd @ 15% oxygen for gas firing and 42 ppmvd @ 15% oxygen for oil firing. This is approximately a 65% reduction for both fuels. Based on this assumption, installation of hot SCR would result in total capital costs of $5,518,594 and annualized costs of $1,462,292 per year. Based on a NOx reduction of approximately 140 TPY from hot SCR over the DLN-only system, the incremental cost effectiveness would be $10,500 per ton of NOx removed. If "other" pollutants (ammonia, particulate matter, etc.) are included, the cost effectiveness would increase to $19,800 per ton of NOx removed.

Applicant's Proposal: The applicant rejected hot SCR primarily based on high costs associated with controlling the low NOx emissions available from this project. Therefore, the applicant proposed the following NOx standards based on DLN combustion for gas firing and wet injection for oil firing.

Gas Firing: 10.0 ppmvd @ 15% oxygen

Oil Firing: 42.0 ppmvd @ 15% oxygen

The applicant concludes by stating that DLN combustion and water injection provide the most cost effective alternatives, are pollution-preventing, result in low ambient impacts, and are consistent with recent BACT determinations for similar simple cycle combustion turbine projects made by Florida and other states.

Department's Draft NOx BACT Determination

The Department also recognizes hot selective catalytic reduction (hot SCR) combined with dry low-NOx (DLN) combustion technology as the top control option followed DLN technology alone and water injection for oil firing. However, the Department notes that General Electric has guaranteed NOx emissions when firing gas of 9 ppmvd @ 15% oxygen with DLN technology for the Model PG7242(FA). The Department has the following comments regarding the applicant's discussion of additional adverse impacts.

Energy Impacts: Installation of hot SCR would result in a small energy penalty of approximately 0.5%, mostly due to the pressure drop across the catalyst bed.

Environmental Impacts: Hot SCR would result in some ammonia "slip" or emissions of unreacted ammonia. However, estimating ammonia and particulate matter emissions based on 9-10 ppm of slip is misleading. Manufacturers of SCR systems typically design and guarantee systems with a 9 to 10 ppm of ammonia slip based on the end of the catalyst life. This is not representative of actual emissions. An operator would attempt to reduce ammonia slip whenever possible to minimize operating costs.

Economic Impacts: In general, the Department agrees that adding hot SCR to the General Electric Model PG7241(FA) gas turbine would result in cost effectiveness in the range of $9,000 to $12,000 per ton of NOx removed. The high costs are partially the result of substantial expenses related to equipment, installation, maintenance, catalyst replacement, energy consumption, and ammonia usage. However, the Department also recognizes that the analysis is significantly influenced by three critical constraints: the applicant's request for simple cycle operation only, the applicant's request for restricted operation as peaking units (3390 hours per year per gas turbine), and the inherently low emissions of the General Electric Model PG7241(FA) gas turbine. Should the applicant later request operation of these gas turbines as base load units, conversion to combined cycle operation, or the substitution of a another gas turbine model, it is essential that the NOx BACT determination be reevaluated.

At this time, the Department rejects hot SCR as not cost effective for this simple cycle project based on the restricted level of operation requested by the applicant. Therefore, the dry low-NOx combustion technology designed into the General Electric Model PG7241(FA) is determined to represent the NOx BACT for gas firing. Wet injection and restricted operation is determined to represent NOx BACT for oil firing. Dry low NOx combustion and wet injection technologies are pollution preventing in nature, avoid emissions of several non-regulated pollutants such as ammonia, and are consistent with recent BACT determinations made in Florida and other states. The Department establishes the following NOx standards as BACT for this project.

Draft NOx BACT Determination

Gas Firing: 9.0 ppmvd @ 15% oxygen based on a 3-hour test average at base load

10.0 ppmvd @ 15% oxygen based on a 3-hour rolling CEMS average

Oil Firing: 42.0 ppmvd @ 15% oxygen based on a 3-hour test average at base load

42.0 ppmvd @ 15% oxygen based on a 3-hour rolling CEMS average

Corresponding mass emission limits will also be established for each method of operation. The Department will limit operation to simple cycle mode only and no more than 3390 hours per year per gas turbine. Of this allowable operation, no more than 720 hours of oil firing per year per gas turbine will be allowed. Because NOx emissions may be higher when operating below 50% of base load, operation below this rate will be restricted to no more than two hours per day (including startup and shutdown).

This BACT determination is much more stringent than the standards of NSPS, Subpart GG. Compliance with the BACT emissions standards shall be demonstrated by conducting initial and annual performance tests in accordance with EPA Method 20. In addition, the permittee shall install, calibrate, operate, and maintain a certified NOx continuous emissions monitor (CEMS) to demonstrate continuous compliance with the BACT limits.

5.3 Carbon Monoxide CO

Discussion

Emissions of carbon monoxide (CO) will result from incomplete fuel combustion while operating the combustion turbine. In general, CO emissions are inversely proportional to NOx emissions from gas turbines. However, new advanced combustor designs have also been able to greatly reduce CO emissions concurrently with lower NOx emissions.

Applicant's Proposed CO Controls

The applicant identified two control options that are technically feasible and commercially available for combustion turbines: an oxidation catalyst and efficient combustion design. (SCONOx™ was again mentioned as not technically feasible for simple cycle projects because of the high exhaust temperatures.) An oxidation catalyst consists of a noble metal catalyst section incorporated into the combustion turbine exhaust. The catalyst would promote oxidation of CO to carbon dioxide (CO_2) at much lower temperatures (650°F to 1150°F) than under normal conditions. The control efficiency is primarily a function of gas residence time and can exceed 90%. For this project, the exhaust gas temperature of 1100°F is in the proper design range. The applicant recognized an oxidation catalyst as the top control. However, the applicant asserts that an oxidation catalyst would result in the following additional adverse impacts.

Energy Impacts: Installation of an oxidation catalyst would result in an energy penalty due to the pressure drop across the catalyst bed of approximately 2 inches of water column. The lost energy is approximately 1,182,432 kWh per year at base load, which is roughly equivalent to the electrical needs of 99 residential customers per year.

Environmental Impacts: The air quality impacts of a DLN system are well below the significant impact levels for CO. There is no additional environmental benefit gained by installing an oxidation catalyst. The air quality impacts of a DLN system alone are well below the PSD significant levels and less than 0.2% of the AAQS.

Economic Impacts: Installation of an oxidation catalyst would result in capital cost of $1,623,323 per unit. The annualized cost was estimated to be $534,770 per year. It was assumed that the catalytic system could remove an additional 64 tons of CO per year (90% control efficiency) over a DLN-only system at 12 ppmvd @ 15% O_2. This results in a cost effectiveness for the oxidation catalyst of nearly $8400 per ton of CO removed. No such costs would be associated with the efficient combustion of the Model PG7241(FA) gas turbine.

Applicant's Proposal

The applicant rejected the oxidation catalyst as not cost effective and not producing any measurable reductions in air quality impacts. The applicant proposed the following CO standards based on the combustion design of the Model PG7241(FA).

Gas Firing: 12.0 ppmvd

Oil Firing: 20.0 ppmvd

Department's Draft CO BACT Determination

The Department also recognizes an oxidation catalyst as the top control for CO emissions. It is noted that General Electric has guaranteed CO emissions performance for the Model PG7241(FA) at 9.0 ppmvd. The Department has the following comments regarding the applicant's discussion of additional adverse impacts.

Energy Impacts: The Department agrees that installation of an oxidation catalyst would result in an energy penalty due to the pressure drop across the catalyst.

Environmental Impacts: The Department rejects the applicant's argument that the further reduction of CO emissions would have negligible ambient impacts. Ambient impacts are evaluated in the modeling analysis and are not considered in making the BACT determination. The Department notes that an oxidation catalyst may reduce emissions of hazardous air pollutants, such as formaldehyde.

Economic Impacts: In general, the Department agrees that the addition of an oxidation catalyst would result in a cost effectiveness in the range of $6000 to $8500. The high costs are partially the result of substantial expenses related to equipment, installation, maintenance, catalyst replacement, and energy consumption. Similar to the discussion for NOx controls, the Department recognizes that the cost analysis has been significantly constrained for this project by the applicant's requested operation.

The Department rejects the addition of an oxidation catalyst as not cost effective for the project based on the restricted level of operation requested by the applicant. Therefore, the combustion design of the General Electric Model PG7241(FA) is determined to represent the CO BACT for this project. Again, the Department notes that General Electric has guaranteed CO emission rates for gas firing at 9.0 ppmvd and the application indicates emission rates based on 10 ppmvd. Therefore, the Department establishes the following CO standards as BACT for this project.

Draft CO BACT Determination

Gas Firing: 8.2 ppmvd @ 15% oxygen based on a 3-hour test average at base load

Oil Firing: 14.2 ppmvd @ 15% oxygen based on a 3-hour test average at base load

These limits are corrected to 15% oxygen (as is the case for the NOx standards) and are taken from the application. Corresponding mass emission limits will also be established for each mode of operation. Compliance with the BACT emissions standards shall be demonstrated by conducting initial and annual performance tests in accordance with EPA Method 10. The Department will include the specific conditions identified with the NOx BACT determination to ensure that a switch to based loaded units, conversion to combined cycle operation, or substitution with a different make or model of gas turbine will trigger the appropriate permitting actions.

5.4 Particulate Matter (PM/PM_{10}), Sulfuric Acid Mist (SAM), and Sulfur Dioxide (SO_2)

Discussion

Emissions of particulate matter (PM/PM_{10}), sulfuric acid mist (SAM), and sulfur dioxide (SO_2) will result from the combustion of natural gas and low sulfur distillate oil. Limited testing indicates that nearly all of the particulate matter emitted from the combustion turbine will be less than 10 microns in diameter (PM_{10}). Particulate matter emissions increase with incomplete fuel combustion as well as with higher concentrations of ash, sulfur, and trace elements in the fuel. Sulfuric acid mist and sulfur dioxide emissions will increase with higher fuel sulfur contents. However, natural gas and very low sulfur distillate oil are clean fuels containing little ash, sulfur, or other contaminants.

Applicant's Proposed Controls for PM/PM_{10}, SAM, and SO_2

The applicant indicated that a review of the EPA RACT/BACT/LAER Clearinghouse did not reveal any post-combustion controls previously required for any gas/oil-fired combustion turbine projects. Uncontrolled particulate matter emissions are estimated to be less than 0.01 grains per dscf of exhaust gas, which is approximately the level of controlled emissions from a baghouse. The limited use of pipeline-quality natural gas as the primary fuel (≤ 3390 hour per year) and very low sulfur distillate oil as a backup fuel (≤ 720 hours per year) will result in very low emissions of SO_2. The applicant indicated that recent determinations for large combustion turbine projects specified such clean fuels as BACT.

Applicant's Proposal

Operation of each gas turbine shall be restricted to no more than 3390 hours per year. The primary fuel shall be pipeline-quality natural gas (≤ 2 grain of sulfur per 100 SCF). Low sulfur distillate oil containing no more than 0.05% sulfur by weight shall be fired only as a backup fuel for no more than 720 hours per year.

Department's Draft PM/PM_{10}, SAM, and SO_2 BACT Determinations

The Department identifies several available control technologies for particulate matter removal including centrifugal collectors, electrostatic precipitators, fabric filters, and wet scrubbers. Similarly, there is acid gas scrubbing technology available to further reduce SAM and SO_2 emissions. The applicant proposes to fire pipeline-quality natural gas as the primary fuel and to fire a restricted amount of very low sulfur distillate oil as the backup fuel. The Department agrees that further control of particulate matter, sulfuric acid mist, and sulfur dioxide emissions with one of these add-on control technologies would be cost prohibitive due to the very low uncontrolled emissions. The fuel sulfur contents proposed are clearly more stringent than the NSPS standard of 0.8% sulfur by weight. The specification of clean fuels constitutes a pollution prevention technique and is given favorable consideration in this case.

Draft PM/PM_{10}, SAM, and SO_2 BACT Determinations

Gas Firing: The primary fuel is limited to pipeline-quality natural gas containing no more than 2 grains of sulfur per 100 SCF of natural gas.

Oil Firing: The backup fuel is limited to No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight.

Compliance with the fuel sulfur limits shall be demonstrated by maintaining the fuel quality records. Limiting the fuel sulfur content also effectively limits the potential emissions of SAM and SO_2, so additional emissions standards are unnecessary.

Draft PM/PM_{10} BACT Determination

In addition to the fuel specifications listed above, the Department determines following emissions standards as PM/PM_{10} BACT to validate the emissions factors and establish potential emissions from this project.

Gas Firing: 9.0 pounds per hour based on a 3-hour test average at base load

Oil Firing: 17.0 pounds per hour based on a 3-hour test average at base load

Visible emissions shall not exceed 10% opacity when firing either fuel.

The permittee shall demonstrate compliance by conducting tests in accordance with EPA Method 5 for particulate matter and EPA Method 9 for visible emissions. Only the front half catch shall be used to determine compliance. It shall be assumed that all PM is PM_{10}.

5.5 <u>BACT Excess Emissions Allowed</u>

Based on the design of the gas turbines and Rules 62-210.700 and 62-4.130, F.A.C., the following conditions will be included in the permit to address periods of excess emissions.

Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. All such emissions shall be included in the calculation of the 3-hour averages to demonstrate compliance with the continuous NOx emissions standard. [Rule 62-210.700(4), F.A.C.]

Excess Emissions Allowed: For each combustion turbine, excess NOx and visible emissions during startup, shutdown, and documented unavoidable malfunction shall be allowed, providing:

- Operators employ best operational practices to minimize the amount and duration of excess emissions.
- Operation below 50% of base load shall not exceed 120 minutes during any calendar day.

- During startup and shutdown, visible emissions excluding water vapor shall not exceed 20% opacity for up to ten, 6-minute observation periods during any calendar day. Data for each observation period shall be exclusive for the ten periods.
- During all startups, shutdowns, and malfunctions, the NOx CEMS shall monitor and record NOx emissions. For each calendar day, up to two 1-hour monitoring averages may be excluded from the continuous NOx compliance demonstration for each combustion turbine due to excess NOx emissions resulting from startup, shutdown, and documented unavoidable malfunction. For excess NOx emissions due to malfunction, the permittee shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident.
- If the permittee provides at least 5 days advance notice prior to tuning performed in accordance with the manufacturer's recommendations, up to three 1-hour CEMS averages may be excluded from the continuous NOx compliance demonstration due to excess NOx emissions resulting from tuning. {Permitting Note: It is expected that no more than two tuning sessions would occur each year.}

5.6 PSD-Synthetic Minor Limits for Volatile Organic Compounds (VOC)

Gas Turbine Emissions

VOC emissions result from incomplete combustion when firing natural gas and low sulfur distillate oil. Large combustion turbines such as the Model PG7241(PA) offer high temperatures with very efficient combustion resulting in low levels of volatile organic compounds. Based on the applicant's request, the Department establishes the following standards as PSD-synthetic minor limits for VOC.

Gas Firing: 4.0 pounds per hour measured as methane based on a 3-hour test avg. at base load
(equivalent to 1.4 ppmvd corrected to 15% oxygen)

Oil Firing: 8.0 pounds per hour measured as methane based on a 3-hour test avg. at base load
(equivalent to 2.4 ppmvd corrected to 15% oxygen)

These standards limit the potential annual emissions of VOC to less than the Significant Emission Rate of 40 tons per year. Initial compliance with the VOC emissions standards shall be demonstrated by conducting performance tests in accordance with EPA Method 25A. Optionally, EPA Method 18 may also be used to account for the non-regulated methane fraction of the measured VOC emissions. Compliance shall also be demonstrated during the fiscal year prior to renewing each operation permit.

Fuel Oil Storage Tank Emissions

Two fuel oil storage tanks (1.5 million gallons, each) supply low sulfur distillate oil as a backup fuel to simple cycle combustion turbines. Because VOC emissions are estimated to be less than 1 ton per year, the Department believes the storage of only distillate oil in these tanks and compliance with NSPS Subpart Kb is sufficient. Subpart Kb requires the permittee to keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage tank. These records shall be retained for the life of the facility.

Table 5.1 - Brief Summary of Recent CO, NOx, and PM BACT Standards for Similar Simple Cycle, Gas Fired Units

Project Location	Unit MW	Date	Technology	CO Limit ppmvd @ 15% O2	NOx Limit Ppmvd @ 15% O2	PM Limit	Comments
Peace River Station, FL	170MW GE 7FA	09/00, D	DLN	8.2	9 (initial, tuning) 10, 3-hr CEMS	9 lb/hr 10% opacity	720 hr/yr oil firing
FPL Martin Plant, FL	170MW GE 7FA	04/00, P	DLN	9 15 w/PA	10, 3-hr CEMS 12 w/PA, 3-hr CEMS	5% Opacity	500 hr/yr oil firing 500 hr/yr PA mode
Palmetto Power, FL	170 MW WH 501FD	03/00, P	DLN	Initial: 25 (12 months) Final: 15	15, 3-hr CEMS	10% opacity	No oil firing
Desoto Power, FL	170 MW GE 7FA	03/00, P	DLN	12	9, 24-hr CEMS	10% opacity	1000 hr/yr oil firing
Shady Hills Pasco, FL	170 MW GE 7FA	01/00, P	DLN	12	9, 24-hr CEMS	10% opacity	1000 hr/yr oil firing
Vandolah Hardee, FL	170 MW GE 7FA	11/99, P	DLN	12	9, 24-hr CEMS	10% opacity	1000 hr/yr oil firing
Oleander Brevard, FL	170 MW GE 7FA	11/99, P	DLN	12	9, 24-hr CEMS	10% opacity	1000 hr/yr oil firing
JEA Baldwin, FL	170 MW GE 7FA	10/99, P	DLN	12	10.5, 24-hr CEMS	10% opacity	750 hr/yr oil firing
Reliant Osceola, FL	170 MW GE 7FA	11/99, P	DLN	10.5	10.5, 24-hr CEMS	10% opacity	750 hr/yr oil firing
TEC Polk Power, FL	165 MW GE 7FA	10/99, P	DLN	15	10.5, 24-hr CEMS	10% opacity	750 hr/yr oil firing
Dynegy Heard, GA	170 MW WH 501F	10/99, P	DLN	25	15	10% opacity	No oil firing
Tenaska Heard, GA	170 MW GE 7FA	12/98, P	DLN	15	15	Unknown	720 hr/yr oil firing
Calvert City, KY	170 MW GE 7FA	1999, D	WI	30, base load 90, other	25	Unknown	? hr/yr oil firing
Mid-GA Cogen	119 MW WH 501D5A	06/98, O	DLN, SCR	10	9	18 lb/hr	? hr/yr oil firing
Dynegy Reidsville, NC	180 MW WH 501F	06/99, P	DLN	25	Initial: 25 Final: 15 (by 2002)	6 lb/hr	1000 hr/yr oil firing
Lyondell Harris, TX	160 MW WH 501F	11/99, P	DLN	25	25	Unknown	No oil firing
Southern Energy, WI	175 MW GE 7FA	01/99, P	DLN	12	15, 1-hr 12, 24-hr	18 lb/hr	800 hr/yr oil firing
RockGen Cristiana, WI	175 MW GE 7FA	01/99, P	DLN	12	15, 1-hr 12, 24-hr	18 lb/hr	800 hr/yr oil firing

Abbreviations:

Manufacturer	Date	Controls	Other
GE – General Electric	D – Draft	DLN – Dry Low-NOx	LAER – Lowest Achievable Emission Rate
WH – Westinghouse	O – Operating	HSCR – Hot Selective Catalytic Reduction	CEMS – Continuous Emissions Monitoring System
ABB – Asea Brown Boyan	P – Permitted	SCR - Selective Catalytic Reduction	PA – Power Augmentation (Steam Injection)
		WI = Water or Steam Injection	

Notes: All data presented is for intermittent simple cycle units > 100 MW firing natural gas.

6.0 AIR QUALITY ANALYSIS

6.1 Summary

The proposed project will increase emissions of five pollutants at levels in excess of PSD significant amounts: CO, NOx, PM/PM_{10}, SAM, and SO_2. NOx, PM_{10}, and SO_2 are criteria pollutants and have national and state ambient air quality standards (AAQS), PSD increments, and significant impact levels defined for them. CO is a criteria pollutant and has only AAQS and significant impact levels defined for it. There are no applicable PSD increments or AAQS for SAM.

The applicant's initial CO, NOx, PM/PM_{10}, and SO_2 air quality impact analyses for this project predicted no significant impacts; therefore, further applicable AAQS and PSD increment impact analyses for these pollutants were not required. Also, the maximum predicted impacts for each of these pollutants were below their respective *de minimis* ambient impact levels. Therefore, pre-construction monitoring at the proposed site was not required for this project. Based on the preceding discussion, the air quality analyses required by the PSD regulations for this project were the following:

- A significant impact analysis for CO, NOx, PM_{10}, and SO_2;
- An analysis of impacts on soils, vegetation, visibility, and of growth-related air quality modeling impacts.

Based on these required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A more detailed discussion of the required analyses follows.

6.2 Models and Meteorological Data Used in the Air Quality Analysis

PSD Class II Area

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project in the surrounding Class II Area. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. It incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfied the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Tampa, Florida (surface data) and Ruskin, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

PSD Class I Area

The California Puff (CALPUFF) dispersion model was used to evaluate the pollutant emissions from the proposed project in the Chassahowitzka National Wilderness Area (CNWA). CALPUFF is a non-steady state, Lagrangian, long-range transport model that incorporates Gaussian puff dispersion algorithms. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, line, area, and volume sources. The CALPUFF model has the capability to treat time-varying sources. It is also suitable for modeling domains from tens of meters to hundreds of kilometers, and has mechanisms to handle rough or complex terrain situations. Finally, the CALPUFF model is applicable for inert pollutants as well as pollutants that are subject to linear removal and chemical conversion mechanisms.

The meteorological data used in the CALPUFF model was processed by the California Meteorological (CALMET) model. The CALMET model utilizes data from multiple meteorological stations and produces a three-dimensional modeling grid domain of hourly temperature and wind fields. The wind field is enhanced by the use of terrain data, which is also input into the model. Two-dimensional fields such as mixing heights, dispersion properties, and surface characteristics are produced by the CALMET model as well. For this project, the CALMET model produced a modeling domain centered over eastern Pasco County that was approximately 280 km in the north-south direction by 250 km in the east-west direction . This modeling domain was produced by utilizing 1990 meteorological data from 3 upper air, 6 surface, and 14 precipitation stations located throughout the state of Florida.

6.3 <u>Significant Impact Analysis</u>

Typically, in order to conduct a significant impact analysis, the applicant conducts modeling using only the proposed project's emissions at worst load conditions. The highest predicted short-term concentrations and highest predicted annual averages predicted by this modeling are compared to the appropriate significant impact levels for the Class I and Class II Areas. If this modeling at worst load conditions shows significant impacts, additional modeling that includes the emissions from surrounding facilities is required to determine the project's impacts on the existing air quality and any applicable AAQS or PSD increments. If no significant impacts are shown, the applicant does not have to conduct any further modeling.

The significant impact analysis submitted for this project contained two separate analyses; one for the surrounding Class II Area, and another for the CNWA, which is the nearest Class I Area. The following paragraphs explain the methodologies and results of these analyses:

PSD Class II Area

Receptors were placed around the proposed facility, which is located in a PSD Class II Area. A combination of fence line, near-field, mid-field, and far-field receptors were utilized for predicting maximum concentrations in the vicinity of the project. The fence line receptors consisted of discrete Cartesian receptors spaced at less than 100 meter intervals around the facility fence line. The remaining receptors consisted of a polar receptor grid with 52 logarithmically spaced rings and 10° spacing radials out to a distance 20 km from the facility. For each pollutant subject to PSD increment and/or AAQS analyses, this modeling compares maximum predicted impacts due to the project with PSD significant impact levels to determine whether significant impacts due to the project are predicted in the vicinity of the facility.

The following table shows the results of the significant impact modeling for the Class II Area. As shown, the results of the significant impact modeling indicate that there are no significant impacts predicted due to the emissions from this project; therefore, no further modeling was required in the surrounding Class II Area.

Maximum Air Quality Impacts from the Peace River Station Compared to the PSD Class II Significant Impact Levels

Pollutant	Averaging Time	Maximum Predicted Impact (ug/m^3)	Class II Significant Impact Level (ug/m^3)	Significant Impact?
SO_2	Annual	0.07	1	No
	24-Hour	0.9	5	No
	3-Hour	4.2	25	No
PM_{10}	Annual	0.02	1	No
	24-Hour	0.3	5	No
CO	8-Hour	1.5	500	No
	1-Hour	5.7	2000	No
NO_2	Annual	0.2	1	No

PSD Class I Area

Thirteen discrete receptors were placed along the border of the Chassahowitzka National Wilderness Area (CNWA), which is the closest PSD Class I Area. The CNWA is located approximately 124 km north-northwest of the project. The maximum predicted impacts for all applicable pollutants due to the proposed project were compared to the Class I significant impact levels to determine whether there was a significant impact on the CNWA. The following table shows the results of the Class I significant impact modeling.

Maximum Air Quality Impacts from the Peace River Station Compared to the PSD Class I Significant Impact Levels (CNWA)

Pollutant	Averaging Time	Maximum Predicted Impact (ug/m^3)	Proposed Class I Area Significant Impact Level (ug/m^3)	Significant Impact?
SO_2	Annual	0.007	0.1	No
	24-Hour	0.1	0.2	No
	3-Hour	0.5	1.0	No
PM_{10}	Annual	0.002	0.2	No
	24-Hour	0.03	0.3	No
NO_2	Annual	0.004	0.1	No

The results of the significant impact modeling revealed that there were no significant impacts predicted due to the emissions from this project in the CNWA Class I Area. Therefore, full impact modeling was not required for this project in the CNWA.

6.4 Additional Impacts Analysis

Impact on Soils, Vegetation, and Wildlife

Very low emissions are expected from these natural gas-fired combustion turbines in comparison with conventional power plants generating equivalent power. Emissions of acid rain and ozone precursors will be very low. The maximum ground-level concentrations predicted to occur for CO, NO_x, PM/PM_{10}, SAM, and SO_2 as a result of the proposed project, including background concentrations and all other nearby sources, will be less than the respective ambient air quality standards (AAQS). The project impacts are less than the significant impact levels, which, in turn, are less than the allowable increments for each pollutant.

Because the AAQS are designed to protect both the public health and welfare and the project impacts are less than significant, it is reasonable to assume the impacts on soils, vegetation, and wildlife will be minimal or insignificant.

Impact on Visibility

Natural gas is a clean fuel and produces little particulate emissions. The low NO_2 and SO_2 emissions will also minimize plume opacity. Because no add-on control equipment and no reagents are required, there will be no steam plume or tendency to form ammoniated particulate species.

Due to the proximity of this project to the CNWA Class I Area, a regional haze analysis was performed. The CALPUFF dispersion model was recommended by the Department of the Interior for use because of its ability to handle atmospheric chemical transformations as well as wet/dry deposition. The results of the refined CALPUFF analysis predicted a change in visibility of 2.18%. This impact is below the NPS threshold of 5%, and it indicates that the proposed project will not have an adverse impact on visibility and regional haze in the CNWA.

Growth-Related Air Quality Impacts

There will be short-term increases in the labor force to construct the project. These temporary increases will not result in significant commercial and residential growth in the vicinity of the project. Operation of the additional internal combustion engines will require few new permanent employees, which will cause no significant impact on the local Area.

The Public Service Commission has determined that a number of power projects will be needed over the next few years to meet the rising electrical power needs throughout the State of Florida. This project is a response to predicted statewide growth and an effort to meet the required reserve capacity. There are no adequate procedures under the PSD rules to fully assess these impacts. However, the proposed project has a small overall physical "footprint," low water requirements, and low air emissions per unit of electric power generated compared to similar gas turbine projects with intermittent operation.

Hazardous Air Pollutants

The project is not believed to be a major source of hazardous air pollutants (HAPs) and is not subject to any industry-specific HAP control requirements pursuant to Section 112 of the Clean Air Act.

7.0 PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the Draft Permit. This determination is based on a technical review of the complete PSD application, reasonable assurances provided by the applicant, the draft determinations of Best Available Control Technology (BACT), review of the Air Quality Analysis, and the conditions specified in the Draft Permit. Chris Carlson is the project meteorologist responsible for reviewing and validating the Air Quality Analysis for this project. Jeff Koerner is the project engineer responsible for reviewing the application, recommending the BACT determination, and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at 850/488-0114 or the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

FACILITY DESCRIPTION

The new 510 MW electrical generating plant will consist of three 170 MW simple cycle combustion turbine-electrical generator sets, evaporative inlet air foggers, and two 1.5 million gallon distillate oil storage tanks.

NEW EMISSIONS UNITS

The proposed project will construct the following new emissions units.

EU ID No.	Emission Unit Description
001 002 003	Simple Cycle Unit Nos. 1, 2, and 3: Each simple cycle unit is a General Electric Model PG7241(FA) combustion turbine-electrical generator set designed to produce a nominal 170 MW of direct power.
004	Two, 1.5 million-gallon storage tanks supply low sulfur distillate oil as a backup fuel to simple cycle combustion turbines.

REGULATORY CLASSIFICATION

HAPs: Based on available data, the new facility is not a major source of hazardous air pollutants (Title III).

Acid Rain: The new facility is subject to the acid rain provisions of the Clean Air Act (Title IV).

Title V Major Source: The new facility is a Title V major source of air pollution because potential emissions of at least one regulated pollutant exceed 100 tons per year. Regulated pollutants include carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), and volatile organic compounds (VOC).

PSD Major Source: The new facility is considered a major source of air pollution with respect to PSD because emissions of at least one regulated pollutant exceed 250 tons per year. Therefore, each new project requires a PSD applicability review. For each potential emission increase greater than the Significant Emissions Rates specified in Table 62-212.400-2, F.A.C., a determination of Best Available Control Technology (BACT) is required. For this project, emissions of CO, NOx, PM/PM_{10}, SAM, and SO_2 are significant and subject to the BACT standards specified in this permit.

NSPS Sources: Emissions units are subject to the New Source Performance Standards in 40 CFR 60 for the gas turbines (Subpart GG) and the oil storage tanks (Subpart Kb).

RELEVANT DOCUMENTS

- Permit application received on 06/12/00 and all related correspondence.
- Initial Draft Permit issued on (DRAFT) and subsequent comments.

The following conditions apply to all emissions units and activities defined for this project.

GENERAL REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number 850/488-0114.

2. Compliance Authority: All documents related compliance activities such as reports, tests, and notifications should be submitted to the Air Resources Section of the Southwest District Office, Florida Department of Environmental Protection, 3804 Coconut Palm Drive, Tampa, Florida 33619-8218. The phone number is 813/744-6100 and the fax number is 813/744-6084.

3. Terminology: The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. *Appendix A* lists frequently used abbreviations and explains the format used to cite rules and regulations in this permit.

4. General Conditions: The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

5. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.); Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.); and the Title 40, Parts 52, 60, 72, 73, and 75 of the Code of Federal Regulations (CFR), adopted by reference in Rule 62-204.800, F.A.C. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]

6. PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]

7. Permit Expiration: For good cause, the permittee may request that this PSD air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, and 62-210.300(1), F.A.C]

8. BACT Determination: In conjunction with extension of the 18 month period to commence or continue construction, phasing of the project, or an extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for the source. [Rule 62-212.400(6)(b), F.A.C. and 40 CFR 52.166(j)(4)]

9. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

10. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

11. Application for Title IV Permit: At least 24 months before the date on which the new unit begins serving an electrical generator greater than 25 MW, the permittee shall submit an application for a Title IV Acid Rain Permit to the Region 4 office of the U.S. Environmental Protection Agency in Atlanta, Georgia and a copy to the Department's Bureau of Air Regulation in Tallahassee. [40 CFR 72]

12. Title V Permit: This permit authorizes construction of the permitted emissions unit and initial operation to determine compliance with Department rules. A Title V operation permit is required for routine operation of the permitted emissions units. The permittee shall apply for and obtain a Title V operation permit in accordance with Rule 62-213.420, F.A.C. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's Bureau of Air Regulation and a copy to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

EMISSIONS AND CONTROLS

13. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

14. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

15. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. [Rule 62-210.700(4), F.A.C.]

16. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify the Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]

TESTING REQUIREMENTS

17. Test Notification: The permittee shall notify the Compliance Authority in writing at least 30 days prior to any initial NSPS performance tests and at least 15 days prior to any other required tests. [Rule 62-297.310(7)(a)9., F.A.C. and 40 CFR 60.7, 60.8]

18. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

19. Applicable Test Procedures

    (a) *Required Sampling Time.* Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be sixty (60) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur. [Rule 62-297.310(4)(a)1. and 2., F.A.C.]

(b) *Minimum Sample Volume.* Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet. [Rule 62-297.310(4)(b), F.A.C.]

(c) *Calibration of Sampling Equipment.* Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C. [Rule 62-297.310(4)(d), F.A.C.]

20. Determination of Process Variables

(a) *Required Equipment.* The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards. [Rule 62-297.310(5)(a), F.A.C.]

(b) *Accuracy of Equipment.* Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value. [Rule 62-297.310(5)(b), F.A.C.]

21. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

RECORDS

22. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2., F.A.C.]

REPORTS

23. Emissions Performance Test Reports: A report indicating the results of any required emissions performance test shall be submitted to the Compliance Authority no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.].

24. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

A. COMBUSTION TURBINES

This section of the permit addresses the following new emissions units.

EU ID No.	Common Emission Unit Description
001 002 003	<u>Simple Cycle Unit Nos. 1, 2, and 3:</u> Each simple cycle unit consists of a General Electric Model PG7241(FA) combustion turbine-electrical generator set, an automated gas turbine control system, an inlet air filtration system, an evaporative inlet air cooling system, an exhaust stack that is 60 feet tall and 21 feet in diameter, and associated support equipment. Natural gas is the primary fuel with very low sulfur distillate oil as a limited backup fuel. Emissions of CO, PM/PM_{10}, SAM, SO_2, and VOC are minimized by the efficient combustion of these clean fuels at high temperatures. NOx emissions are reduced by dry low-NOx (DLN) combustion technology during gas firing and by water injection during distillate oil firing. The capacities for each fuel are: *Natural Gas*: At a compressor inlet air temperature of 32° F and firing 1863 mmBTU per hour of gas, each unit produces a maximum 184 MW. The automated gas turbine control system modulates critical parameters of the dry low-NOx combustors to achieve a lean, pre-mix steady state operation. Exhaust gases exit the stack with a volumetric flow rate of approximately 2,464,800 acfm at 1076° F. *Distillate Oil*: At a compressor inlet air temperature of 32° F and firing 1965 mmBTU per hour of distillate oil as a backup fuel, each unit produces a maximum 192 MW. The water injection rate for NOx control will be approximately 131,000 pounds per hour. Exhaust gases exit the stack with a volumetric flow rate of approximately 2,495,000 acfm at 1054° F. Note: All heat input values are based on the higher heating values (HHV) of the fuels.

APPLICABLE STANDARDS AND REGULATIONS

1. <u>BACT Determinations</u>: The emissions units addressed in this section are subject to Best Available Control Technology (BACT) determinations for carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM/PM_{10}), sulfuric acid mist (SAM) and sulfur dioxide (SO_2). [Rule 62-212.400, F.A.C.]

2. <u>NSPS Requirements</u>: Each combustion turbine shall comply with all applicable requirements of 40 CFR 60, adopted by reference in Rule 62-204.800(7)(b), F.A.C.

   (a) *Subpart A, General Provisions*, incuding:

   - 40 CFR 60.7, Notification and Record Keeping
   - 40 CFR 60.8, Performance Tests
   - 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
   - 40 CFR 60.12, Circumvention
   - 40 CFR 60.13, Monitoring Requirements
   - 40 CFR 60.19, General Notification and Reporting Requirements

   (b) *Subpart GG, Standards of Performance for Stationary Gas Turbines* are identified in *Appendix GG* of this permit. These provisions include a requirement to correct test data to ISO conditions; however, such correction is not used for compliance determinations with the BACT standards.

PERFORMANCE RESTRICTIONS

3. <u>Combustion Turbines</u>: The permittee is authorized to install, tune, operate and maintain two new General Electric Model PG7241(FA) combustion turbines with electrical generator sets, each designed to produce a nominal 170 MW of electrical power. [Applicant Request; Design]

4. Permitted Capacity: The heat input rates (HHV) to each combustion turbine shall not exceed the following:
   (a) Normal Gas Firing: 1863 mmBTU per hour with a compressor inlet air temperature of 32° F and producing a maximum 184 MW.
   (b) Distillate Oil Firing: 1965 mmBTU per hour with a compressor inlet air temperature of 32° F and producing a maximum 192 MW.

   The heat input rates are based on the higher heating values (HHV) of 23,877 BTU/lbm for natural gas and 19,674 BTU/lbm for distillate oil. The permittee shall provide the manufacturer's performance curves (or equations) that correct for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Heat input rates will vary depending upon ambient conditions and the combustion turbine characteristics. Compliance shall be determined by data compiled from the automated gas turbine control system. This data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Design; Rule 62-210.200(PTE), F.A.C.]

5. Simple Cycle Operation Only: Each combustion turbine shall operate only in simple cycle mode. This restriction is based on the permittee's request, which formed the basis of the CO and NOx BACT determinations and resulted in the emission standards specified in this permit. Specifically, the CO and NOx BACT determinations eliminated several control alternatives based on technical considerations due to the elevated temperatures of the exhaust gas as well as costs related to restricted operation. Any request to convert these units to combined cycle operation or increase the allowable hours of operation shall be accompanied by a revised CO and NOx BACT analysis and the approval of the Department through a permit modification in accordance with Chapters 62-210 and 62-212, F.A.C. The results of this analysis may validate the initial BACT determinations or result in the submittal of a full PSD permit application, new control equipment, and new emissions standards. [Applicant Request; Rules 62-210.300 and 62-212.400, F.A.C.]

6. Allowable Fuels: Each combustion turbine shall be designed and tuned for a primary fuel of pipeline-quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet of gas. As a backup fuel, each combustion turbine may be fired with low sulfur No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. No other fuels shall be fired. It is noted that both limitations are much more stringent than the sulfur dioxide limitation in 40 CFR 60, NSPS Subpart GG and assure compliance with regulations 40 CFR 60.333 and 60.334 of this subpart. The permittee shall demonstrate compliance with the fuel sulfur limits by keeping the records specified in this permit. [Application; Rule 62-210.200(PTE), F.A.C.]

7. Restricted Operation: Each combustion turbine shall operate no more than 3390 hours during any consecutive 12 months. Of this total allowable operation, no more than 720 hours during the 12 month period shall be distillate oil firing. The permittee shall install, calibrate, operate and maintain a monitoring system for each combustion turbine to measure and accumulate the fuel consumption and number of hours each fuel was fired. [Applicant Request; Rules 62-212.400(BACT) and 62-210.200(PTE), F.A.C.]

8. Operating Procedures: The Best Available Control Technology (BACT) determinations established by this permit rely on "good operating practices" to minimize emissions. Therefore, all operators and supervisors shall be properly trained to operate and maintain the combustion turbines and pollution control systems in accordance with the guidelines and procedures established by the manufacturer. The training shall include good operating practices as well as methods of minimizing excess emissions. [Applicant Request; Rules 62-4.070(3) and 62-212.400(BACT), F.A.C.]

EMISSIONS CONTROLS

9. Automated Control System: In accordance with the manufacturer's recommendations, the permittee shall install, calibrate, tune, operate, and maintain a Speedtronic™ automated gas turbine control system for each unit. Each system shall be designed and operated to monitor and control the gas turbine combustion process and operating parameters including, but not limited to: air/fuel distribution and staging, turbine speed, load conditions, temperatures, heat input, and fully automated startup and shutdown. [Design; 62-212.400(BACT), F.A.C.]

10. DLN Combustion Technology: In accordance with the manufacturer's recommendations, the permittee shall install, tune, operate and maintain the General Electric dry low-NOx combustion system (DLN 2.6 or better) to control NOx emissions from each gas turbine . [Design; Rule 62-212.400(BACT), F.A.C.]

11. Tuning: Prior to the initial emissions performance tests for each gas turbine, the dry low-NOx combustors and automated gas turbine control systems shall be tuned to optimize the reduction of CO, NOx, and VOC emissions. Thereafter, each system shall be maintained and tuned in accordance with the manufacturer's recommendations to minimize these pollutant emissions. The permittee shall provide at least 5 days advance notice prior to any tuning session. [Design; Rule 62-212.400(BACT), F.A.C.]

EMISSIONS STANDARDS

{Permitting Note: A summary table of the emissions standards is provided in Appendix E of this permit.}

12. Carbon Monoxide (CO)

    (a) *Gas Firing*: When firing natural gas, CO emissions from each combustion turbine shall not exceed 34.2 pounds per hour and 8.2 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load.

    (b) *Oil Firing*: When firing low sulfur distillate oil as a backup fuel, CO emissions from each combustion turbine shall not exceed 68.0 pounds per hour and 14.2 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load.

    The permittee shall demonstrate compliance with these standards by conducting performance tests in accordance with EPA Method 10 and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

13. Nitrogen Oxides (NOx)

    (a) *Gas Firing*: When firing natural gas, NOx emissions from each combustion turbine shall not exceed 68.2 pounds per hour and 9.0 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load. This emissions standard shall apply during the initial compliance test and for the next required compliance test conducted after tuning a combustion turbine. In addition, NOx emissions shall not exceed 10.0 ppmvd corrected to 15% oxygen based on a 3-hour rolling average of data collected from the NOx continuous emissions monitor.

    (b) *Oil Firing*: When firing low sulfur distillate oil as a backup fuel, NOx emissions from each combustion turbine shall not exceed 330.6 pounds per hour and 42.0 ppmvd corrected to 15% oxygen based on a 3-hour test average conducted at base load. In addition, NOx emissions shall not exceed 42.0 ppmvd corrected to 15% oxygen based on a 3-hour rolling average of data collected from the NOx continuous emissions monitor.

    NOx emissions are defined as oxides of nitrogen measured as NO_2. The permittee shall demonstrate compliance by conducting performance tests and emissions monitoring in accordance with EPA Methods 7E, 20, and the requirements of this permit. [Rule 62-212.400(BACT), F.A.C.; 40 CFR 60.332]

14. Particulate Matter (PM/PM_{10}), Sulfuric Acid Mist (SAM), and Sulfur Dioxide (SO_2)

(a) *Particulate Matter*: When firing natural gas, particulate matter emissions from each combustion turbine shall not exceed 9.0 pounds per hour based on a 3-hour test average conducted at base load. When firing distillate oil, particulate matter emissions from each combustion turbine shall not exceed 17.0 pounds per hour based on a 3-hour test average conducted at base load. The permittee shall demonstrate compliance with this standard by conducting tests in accordance with EPA Method 5 and the performance testing requirements of this permit. Only the front half catch shall be used to determine compliance. It shall be assumed that all PM is PM_{10}.

(b) *VE Standard.* When firing natural gas or distillate oil, visible emissions from each combustion turbine shall not exceed 10% opacity, based on a 6-minute average. The permittee shall demonstrate compliance with this standard by conducting tests in accordance with EPA Method 9 and the performance testing requirements of this permit. [Rule 62-212.400(BACT), F.A.C.]

(c) *Fuel Specifications.* Emissions of PM/PM_{10}, SAM, and SO_2 shall be limited by the use of pipeline-quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet of gas as the primary fuel. The backup fuel shall be limited to No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. These fuel specifications are work practice standards established as BACT limits for PM/PM_{10}, SAM, and SO_2 emissions. The permittee shall demonstrate compliance with the fuel sulfur limits by maintaining the records specified in this permit. [Rule 62-212.400(BACT), F.A.C.; 40 CFR 60.333]

15. Volatile Organic Compounds (VOC)

(a) *Gas Firing*: When firing natural gas, VOC emissions shall not exceed 4.0 pounds per hour based on a 3-hour test average conducted at base load. {Permitting Note: This is equivalent to approximately 1.7 ppmvd corrected to 15% oxygen.}

(b) *Oil Firing*: When firing distillate oil, VOC emissions shall not exceed 8.0 pounds per hour based on a 3-hour test average conducted at base load. {Permitting Note: This is equivalent to approximately 2.9 ppmvd corrected to 15% oxygen.}

The VOC standards are established as PSD-synthetic minor limits. VOC emissions shall be measured and reported in terms of methane. The permittee shall demonstrate compliance with these standards by conducting tests in accordance with EPA Method 25A and the performance testing requirements of this permit. Optional testing in accordance with EPA Method 18 may also be conducted to account for the actual non-regulated methane fraction of the measured VOC emissions. [Design; Rule 62-4.070(3), F.A.C.]

EXCESS EMISSIONS

16. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction, shall be prohibited. All such emissions shall be included in the calculation of the 3-hour averages to demonstrate compliance with the continuous NOx emissions standard. [Rule 62-210.700(4), F.A.C.]

17. Excess Emissions Allowed: For each combustion turbine, excess NOx and visible emissions during startup, shutdown, and documented unavoidable malfunction shall be allowed, providing:

(a) Operators employ best operational practices to minimize the amount and duration of excess emissions.

(b) Operation below 50% of base load shall not exceed 120 minutes during any calendar day.

(c) During startup and shutdown, visible emissions excluding water vapor shall not exceed 20% opacity for up to ten, 6-minute observation periods during any calendar day. Data for each observation period shall be exclusive for the ten periods.

(d) During all startups, shutdowns, and malfunctions, the NOx CEMS shall monitor and record NOx emissions. For each calendar day, up to two 1-hour monitoring averages may be excluded from the continuous NOx compliance demonstration for each combustion turbine due to excess NOx emissions resulting from startup, shutdown, and documented unavoidable malfunction. For excess NOx emissions due to malfunction, the permittee shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident.

(e) If the permittee provides at least 5 days advance notice prior to tuning performed in accordance with the manufacturer's recommendations, up to three 1-hour monitoring averages may be excluded from the continuous NOx compliance demonstration for each gas turbine due to excess NOx emissions resulting from tuning. {Permitting Note: It is expected that no more than two tuning sessions would occur each year.}

[Design; Rule 62-210.700(1) and (5); Rule 62-4.130, F.A.C.; Rule 62-212.400 (BACT), F.A.C.]

EMISSIONS PERFORMANCE TESTING

18. Sampling Facilities: The permittee shall design the combustion turbine stack to accommodate adequate testing and sampling locations in order to determine compliance with the applicable emission limits specified by this permit. Permanent stack sampling facilities shall be installed in accordance with Rule 62-297.310(6), F.A.C. [Rules 62-4.070 and 62-204.800, F.A.C.; 40 CFR 60.40a(b)]

19. Test Methods: Compliance tests shall be performed in accordance with the following reference methods as described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C.

    (a) EPA Method 5 - Determination of Particulate Matter Emissions from Stationary Sources

    (b) EPA Method 7E - Determination of Nitrogen Oxide Emissions from Stationary Sources

    (c) EPA Method 9 - Visual Determination of the Opacity of Emissions from Stationary Sources

    (d) EPA Method 10 - Determination of Carbon Monoxide Emissions from Stationary Sources

    (e) EPA Method 20 - Determination of Oxides of Nitrogen Oxide, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines

    (f) EPA Method 25A - Determination of Volatile Organic Concentrations *{Permitting Note: When using EPA Method 25A, optional testing in accordance with EPA Method 18 may also be conducted to account for the non-regulated methane fraction of the measured VOC emissions.}*

    No other methods may be used for compliance testing unless prior written approval is received from the administrator of the Department's Emissions Monitoring Section in accordance with an alternate sampling procedure pursuant to 62-297.620, F.A.C. [40 CFR 60, Appendix A; Rule 62-204.800, F.A.C.]

20. Initial Tests Required: Initial performance tests to demonstrate compliance with each emission standard for gas firing and backup distillate oil firing shall be conducted within 60 days after achieving the maximum production rate, but not later than 180 days after initial operation of each emissions unit. Initial performance tests shall be conducted for CO, NOx, PM, VOC and visible emissions. Tests for CO, NOx, and VOC shall be conducted concurrently. Tests for PM and visible emissions shall be conducted concurrently. NOx performance tests shall be conducted in accordance with the requirements of 40 CFR

60, Subpart GG. For the initial performance tests, emissions data shall be presented in units of the BACT standards as well as the units specified in the Subpart GG emission standards. [Rule 62-297.310(7)(a)1., F.A.C.; 40 CFR 60.335]

21. Annual Performance Tests: Annual performance tests shall be conducted for each combustion turbine to demonstrate compliance with CO, NOx, and visible emissions standards for gas firing and backup distillate oil firing. Tests required on an annual basis shall be conducted at least once during each federal fiscal year (October 1st to September 30th). CO and NOx performance tests shall be conducted concurrently. If conducted at permitted capacity, NOx emissions data collected during the annual NOx continuous monitor RATA required pursuant to 40 CFR 75 may be substituted for the required annual performance test. For each combustion turbine that fires distillate oil for less than 200 hours during the previous federal fiscal year, the annual performance tests when firing distillate oil for the current federal fiscal year of operation are not required.

    [Rule 62-297.310(7)(a)4., F.A.C.]

22. Tests Prior to Permit Renewal: Prior to renewing air operation permits, performance tests shall be conducted for each combustion turbine to demonstrate compliance with the CO, NOx, PM, VOC and visible emissions standards for gas firing and backup oil firing. Tests for CO, NOx, and VOC emissions shall be conducted concurrently. Tests for PM and visible emissions shall be conducted concurrently. All tests shall be conducted within the 12 months prior to renewing the air operation permit. [Rule 62-297.310(7)(a)3., F.A.C.]

23. Tests After Substantial Modifications: All performance tests required for initial startup shall also be conducted after any substantial modification and appropriate shakedown period of air pollution control equipment, including the replacement of dry low-NOx combustors. Shakedown periods shall not exceed 100 days after re-starting the combustion turbine. This does not apply to routine maintenance. [Rules 62-297.310(7)(a)4. and 62-4.070(3), F.A.C.]

24. Combustion Turbine Testing Capacity

    (a) Initial performance tests shall be conducted in accordance with 40 CFR 60.8 and 40 CFR 60.335 for pollutants subject to New Source Performance Standards (NSPS) in Subpart GG for gas turbines.

    (b) Other required performance tests to demonstrate compliance with standards specified in this permit shall be conducted with the combustion turbine operating at permitted capacity for each allowable fuel. Permitted capacity is defined as 90-100 percent of the maximum heat input rate allowed by the permit, corrected for the average compressor inlet air temperature during the test (with 100 percent represented by a curve depicting heat input vs. compressor inlet temperature). If it is impracticable to test at permitted capacity, the source may be tested at less than permitted capacity. However, subsequent operation is limited by adjusting the entire heat input vs. ambient temperature curve downward by an increment equal to the difference between the maximum permitted heat input (corrected for inlet temperature) and 110 percent of the value reached during the test until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purposes of additional compliance testing to regain the permitted capacity. Emissions performance tests shall meet all applicable requirements of Chapters 62-204 and 62-297, F.A.C.

    [Rule 62-297.310(2), F.A.C.; 40 CFR 60.335]

CONTINUOUS MONITORING REQUIREMENTS

25. NOx CEMS: The permittee shall install, calibrate, operate, and maintain a continuous emissions monitoring system (CEMS) to measure and record NOx and oxygen concentrations in each combustion turbine exhaust stack to meet the requirements of the Acid Rain program and to demonstrate compliance with the NOx BACT standards specified by this permit. A monitor for carbon dioxide may be used in place of the oxygen monitor, but the system shall be capable of correcting the emissions to 15% oxygen. The NOx monitoring devices shall comply with the certification requirements, quality assurance procedures, and all other provisions of the Acid Rain monitoring requirements of 40 CFR Part 75. A monitoring plan shall be provided to the Department's Emissions Monitoring Section, EPA Region 4, and the Compliance Authority for review no later than 45 days prior to the first scheduled certification test pursuant to 40 CFR 75.62. The plan shall consist of the following information: CEMS equipment specifications, manufacturer, model, type, calibration and maintenance needs, and the proposed location.

    (a) *Installation.* Each CEMS shall be installed, calibrated, and properly functioning prior to the initial performance tests. Each device shall comply with the applicable monitoring system requirements of 40 CFR 75.62.

    (b) *Data Collection.* Emissions shall be monitored and recorded at all times including startup, operation, shutdown, and malfunction except for continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments. Each valid 1-hour average shall be calculated using at least two valid data points at least 15 minutes apart.

    (c) *Data Reporting.* Data collected by the CEMS shall be used to demonstrate compliance with the emissions standards specified for each 3-hour average. Emissions shall be reported in units of ppmvd corrected to 15% oxygen for each hour of operation. The compliance averages shall be determined by calculating the arithmetic average of three valid 1-hour emission rates. When a monitoring system reports emissions in excess of the standards allowed by this permit, the permittee shall notify the Compliance Authority within one (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. Notification shall include a written letter, a phone call, or a fax transmittal to the Compliance Authority. The Department may request a written report summarizing the excess emissions incident. The permittee shall also report excess emissions in a quarterly report as required by this permit.

    (d) *Data Exclusion for Compliance.* Unless prohibited by Rule 62-210.700(4), F.A.C., valid 1-hour monitoring averages shall not include periods of excess emissions due to startup, shutdown, documented unavoidable malfunction, or the result of tuning as described and limited under Specific Condition 17 of this permit. Because such data may be excluded, the 3-hour average to determine compliance need not consist of *consecutive* 1-hour averages.

    [Rules 62-4.130, 62-4.160(8), 62-204.800, 62-210.700, 62-212.400(BACT), and 62-297.520, F.A.C.; 40 CFR 60.7; 40 CFR 75]

RECORDS

26. Fuel Records: The permittee shall demonstrate compliance with the fuel sulfur limits specified in this permit by maintaining the following records of the sulfur contents.

    (a) The permittee shall obtain data sheets from the vendor indicating the average sulfur content of the natural gas being supplied by the pipeline for each month of operation. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D3246-81 or equivalent methods.

(b) The permittee shall obtain data sheets from the vendor indicating the quantity and sulfur content of the distillate oil for each shipment delivered. Methods for determining the sulfur content of distillate oil shall be ASTM D 2880-71 or equivalent methods.

These methods shall be used to determine the sulfur content of the natural gas fired in accordance with any EPA-approved custom fuel monitoring schedule (see Alternate Monitoring Plan), natural gas supplier data or the natural gas sulfur content referenced in 40 CFR 75 Appendix D. The analysis may be performed by the permittee, a service contractor retained by the permittee, the fuel vendor, or any other qualified agency pursuant to 40 CFR 60.335(e). However, the permittee is responsible for ensuring that the procedures in 40 CFR 60.335 or 40 CFR 75 are used to determine the fuel sulfur content for compliance with the SO_2 standard in 40 CFR 60.333. [Rules 62-4.070(3) and 62-4.160(15), F.A.C.]

27. Alternate Monitoring Plan: Subject to EPA approval, the following alternate monitoring may be used to demonstrate compliance with the monitoring requirements of 40 CFR 60, Subpart GG.

(a) Data collected from the NOx CEM shall be used in lieu of the water-to-fuel monitoring system required for reporting excess emissions in accordance with 40 CFR 60.334(c)(1) of NSPS, Subpart GG.

(b) When requested by the Department, the CEMS emission rates for NOx on this unit shall be corrected to ISO conditions to demonstrate compliance with the NOx standard established in 40 CFR 60.332.

(c) A *custom fuel monitoring schedule* pursuant to 40 CFR 75 Appendix D for natural gas may be used in lieu of the daily sampling requirements of 40 CFR 60.334(b)(2), provided:

(1) The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.

(2) The permittee shall submit a monitoring plan, certified by the Authorized Representative, that commits to using a primary fuel of pipeline-supplied natural gas containing no more than 20 grain of sulfur per 100 SCF of gas pursuant to 40 CFR 75.11(d)(2).

(3) Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

This custom fuel-monitoring schedule will only be valid when pipeline-quality natural gas is used as the primary fuel. If the primary fuel for these units is changed to a higher sulfur fuel, SO_2 emissions must be accounted for as required pursuant to 40 CFR 75.11(d). [40 CFR 60, Subpart GG; Applicant Request]

28. Monthly Operations Summary: By the fifth calendar day of each month, the permittee shall record the monthly fuel consumption and hours of operation for each combustion turbine. The information shall be recorded in a written or electronic log and shall summarize the previous month of operation and the previous 12 months of operation. Information recorded and stored as an electronic file shall be available for inspection and printing within at least three days of a request from the Compliance Authority. [Rule 62-4.160(15), F.A.C.]

REPORTS

29. Quarterly Excess Emissions Reports: Following the NSPS format provided in Appendix XS of this permit, periods of startup, shutdown and malfunction shall be monitored, recorded and reported as excess emissions when emission levels exceed the standards specified in this permit. Within 30 days following each calendar quarter, the permittee shall submit a report on any periods of excess emissions that occurred during the previous calendar quarter to the Compliance Authority. [Rules 62-4.130, 62-204.800, 62-210.700(6), F.A.C.; and 40 CFR 60.7]

B. STORAGE TANKS

This section of the permit addresses the following new emissions units.

EU ID No.	Emission Unit Description
004	Oil Storage Tanks: Two, 1.5 million-gallon storage tanks supply low sulfur distillate oil as a backup fuel to the simple cycle combustion turbines (EUs 001, 002, and 003).

RULE APPLICABILITY

1. NSPS Subpart Kb Applicability: NSPS Subpart Kb applies to any storage tank with a capacity greater than or equal to 10,300 gallons (40 cubic meters) that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.110b(a)]
2. Exemption from Portions of NSPS Subpart Kb: Tanks with a capacity greater than or equal to 40,000 gallons (151 cubic meters) storing a liquid with a maximum true vapor pressure less than 3.5 kPa are exempt from the General Provisions (40 CFR 60, Subpart A) and from the provisions of NSPS Subpart Kb, *except* for the record keeping requirements specified below. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.110b(c)]

PERFORMANCE RESTRICTIONS

3. Equipment: The permittee is authorized to install two 1.5 million gallon distillate oil storage tanks designed to provide low sulfur distillate oil to the simple cycle combustion turbines (EUs 001, 002, and 003). [Applicant Request]
4. Hours of Operation: The hours of operation for the distillate oil storage tanks are not restricted (8760 hours per year). [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

PERFORMANCE REQUIREMENTS

RECORDS

5. Records: For purposes of reporting in the Annual Operating Report, the permittee shall keep records sufficient to document the annual throughput of distillate oil through the storage tank. [Rule 62-210.370(3), F.A.C.]
6. Oil Tank Records: The permittee shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage tank. Records shall be retained for the life of the facility. [Rule 62-204.800(7)(b)16., F.A.C.; 40 CFR 60.116b(a) and (b)]

APPENDIX A - TERMINOLOGY

ABBREVIATIONS AND ACRONYMS

°F	-	Degrees Fahrenheit
DEP	-	State of Florida, Department of Environmental Protection
DARM	-	Division of Air Resource Management
EPA	-	United States Environmental Protection Agency
F.A.C.	-	Florida Administrative Code
F.S.	-	Florida Statute
SOA	-	Specific Operating Agreement
UTM	-	Universal Transverse Mercator
CT	-	Combustion Turbine
HRSG	-	Heat Recovery Steam Generator
DLN	-	Dry Low-NOx Combustion Technology
SCR	-	Selective Catalytic Reduction
OC	-	Oxidation Catalyst Technology for CO Control

RULE CITATIONS

The following examples illustrate the methods used in this permit to abbreviate and cite the references of rules, regulations, permit numbers, and identification numbers.

Florida Administrative Code (F.A.C.) Rules:

Example:	[Rule 62-213.205, F.A.C.]	
Where:	62	- identifies the specific Title of the F.A.C.
	62-213	- identifies the specific Chapter of the F.A.C.
	62-213.205	- identifies the specific Rule of the F.A.C.

Facility Identification (ID) Number:

Example:	Facility ID No. 099-0001	
Where:	099	- identifies the specific county location
	0221	- identifies the specific facility

New Permit Numbers:

Example:	Permit No. 099-2222-001-AC or 099-2222-001-AV	
Where:	AC	- identifies the permit as an Air Construction Permit
	AV	- identifies the permit as a Title V Major Source Air Operation Permit
	099	- identifies the specific county that project is located in
	2222	- identifies the specific facility
	001	- identifies the specific permit project

Old Permit Numbers:

Example:	Permit No. AC50-123456 or AO50-123456	
Where:	AC	- identifies the permit as an Air Construction Permit
	AO	- identifies the permit as an Air Operation Permit
	123456	- identifies the specific permit project

SECTION IV.

APPENDIX B - BACT EMISSIONS STANDARDS SUMMARY

For informational purposes only, the following table summarizes the emissions standards specified in this permit. [Rules 62-212.400(BACT) and 62-4.070(3), F.A.C.]

EU-001, 002 and 003: General Electric Model PG7241(FA) Combustion Turbines

Pollutant	*Fuel*	*Emission Standard*	*Compliance Method*
		BACT Emission Standards	
CO	Gas Firing	8.2 ppmvd @ 15% O_2, 3-hr test avg. and 34.2 lb/hr, 3-hr test avg.	Base load; initial and annual tests
	Oil Firing	14.2 ppmvd @ 15% O_2, 3-hr test avg. and 68.0 lb/hr, 3-hr test avg.	Base load; initial and annual tests
NOx	Gas Firing	9.0 ppmvd @ 15% O_2, 3-hr test avg. and 68.2 lb/hr, 3-hr test avg. 10.0 ppmvd @ 15% O_2, 3-hr rolling avg.	Base load; initial, annual, and tuning tests All loads, certified CEM data
	Oil Firing	42.0 ppmvd @ 15% O_2, 3-hr test avg. and 330.6 lb/hr, 3-hr test avg. 42.0 ppmvd @ 15% O_2, 3-hr rolling avg.	Base load; initial, annual, and tuning tests All loads, certified CEM data
PM, PM_{10}, SAM, SO_2	Gas Firing	9.0 lb PM/hr 2 grains of sulfur per 100 SCF of natural gas Visible emissions ≤ 10% opacity	Base load; initial/renewal tests Fuel records Base load; initial and annual tests
	Oil Firing	17.0 lb PM/hr Distillate oil with ≤ 0.05% sulfur by weight Visible emissions ≤ 10% opacity	Base load; initial/renewal tests Fuel records Base load; initial and annual tests
		PSD-Synthetic Minor Emission Standards	
VOC	Gas Firing	4.0 lb/hr, 3-hr test avg. measured as methane (Equivalent to 1.7 ppmvd @ 15% O_2)	Base load; initial/renewal tests
	Oil Firing	8.0 lb/hr, 3-hr test avg. measured as methane (Equivalent to 2.9 ppmvd @ 15% O_2)	Base load; initial/renewal tests

Notes: Emission limits were based on the following:

- *Gas Firing*: At a compressor inlet air temperature of 32° F and firing 1863 mmBTU per hour of gas, each unit produces a maximum 184 MW.
- *Oil Firing*: At a compressor inlet air temperature of 32° F and firing 1965 mmBTU per hour of oil as a backup fuel, each unit produces a maximum 192 MW.
- Heat input values are based on the higher heating values (HHV) of the fuels.
- The BACT standards in this table were based on the following control technologies:
  - Dry low-NOx combustion design for NOx when firing gas.
  - Wet injection for NOx when firing distillate oil.
  - Combustion design for CO when firing gas or oil.
  - Combustion design and clean fuels for PM/PM_{10}, SAM, and SO_2 when firing gas or oil.

SECTION IV.

APPENDIX GC - CONSTRUCTION PERMIT GENERAL CONDITIONS

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance; and
(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

G.9 In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by

Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extend it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology (X);

(b) Determination of Prevention of Significant Deterioration (X); and

(c) Compliance with New Source Performance Standards (X).

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

APPENDIX GG - NSPS SUBPART GG REQUIREMENTS FOR GAS TURBINES

40 CFR 60, SUBPART A - NSPS GENERAL PROVISIONS

This emissions unit is subject to the applicable portions of 40 CFR 60, Subpart A, General Provisions, including:

- 40 CFR 60.7, Notification and Record Keeping
- 40 CFR 60.8, Performance Tests
- 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
- 40 CFR 60.12, Circumvention
- 40 CFR 60.13, Monitoring Requirements
- 40 CFR 60.19, General Notification and Reporting Requirements

For copies of these requirements, please contact the Department's New Source Review Section.

40 CFR 60, SUBPART GG - STATIONARY GAS TURBINES

This emissions unit is subject to 40 CFGR 60, Subpart GG for stationary gas turbines adopted by reference in Rule 62-204.800(7)(b), F.A.C. The following conditions follow the original NSPS rule language and numbering scheme. Regulations that are not applicable were omitted for clarity. Because this emissions units is subject to an NSPS, it is also subject to the following federal provisions: 40 CFR 60, Subpart A, General Provisions for sources subject to an NSPS, adopted by reference in Rule 62-204.800(7)(d), F.A.C.; 40 CFR 60, Appendix A - Test Methods, Appendix B - Performance Specifications, Appendix C - Determination of Emission Rate Change, Appendix D - Required Emissions Inventory Information, Appendix F - Quality Assurance Procedures, adopted by reference in Rule 62-204.800(7)(e).

40 CFR 60.330 APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY.

(a) The provisions of this subpart are applicable to all stationary gas turbines with a heat input at peak load equal to or greater than 10 million BTU per hour, based on the lower heating value of the fuel fired.

40 CFR 60.331 DEFINITIONS.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

(a) Stationary gas turbine means any simple cycle gas turbine, regenerative cycle gas turbine or any gas turbine portion of a combined cycle steam/electric generating system that is not self propelled. It may, however, be mounted on a vehicle for portability.

(b) Simple cycle gas turbine means any stationary gas turbine which does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or which does not recover heat from the gas turbine exhaust gases to heat water or generate steam.

(d) Combined cycle gas turbine means any stationary gas turbine which recovers heat from the gas turbine exhaust gases to heat water or generate steam.

(f) Ice fog means an atmospheric suspension of highly reflective ice crystals.

(g) ISO standard day conditions means 288 degrees Kelvin, 60 percent relative humidity and 101.3 kilopascals pressure.

(h) Efficiency means the gas turbine manufacturer's rated heat rate at peak load in terms of heat input per unit of power output based on the lower heating value of the fuel.

(i) Peak load means 100 percent of the manufacturer's design capacity of the gas turbine at ISO standard day conditions.

(j) Base load means the load level at which a gas turbine is normally operated.

(p) Gas turbine model means a group of gas turbines having the same nominal air flow, combustor inlet pressure, combustor inlet temperature, firing temperature, turbine inlet temperature and turbine inlet pressure.

(q) Electric utility stationary gas turbine means any stationary gas turbine constructed for the purpose of supplying more than one-third of its potential electric output capacity to any utility power distribution system for sale.

60.332 STANDARD FOR NITROGEN OXIDES.

(a) On and after the date of the performance test required by Sec. 60.8 is completed, every owner or operator subject to the provisions of this subpart as specified in paragraphs (b) of this section shall comply with one of the following, except as provided in paragraphs (e) of this section.

(1) No owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any stationary gas turbine, any gases which contain nitrogen oxides in excess of:

$$STD = (0.0075)\frac{(14.4)}{Y} + F$$

Where:

STD = allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F = NO emission allowance for fuel-bound nitrogen as defined in the following table:

(3) F shall be defined according to the nitrogen content of the fuel as follows:

Fuel-Bound Nitrogen (Percent By Weight)	"F" (NOx Percent By Volume)
N < 0.015	0
0.015 < N < 0.1	0.04(N)
0.1 < N < 0.25	0.004 + 0.0067(N – 0.1)
N > 0.25	0.005

Where, N = the nitrogen content of the fuel (percent by weight).

(b) Electric utility stationary gas turbines with a heat input at peak load greater than 100 million Btu per hour based on the lower heating value of the fuel fired shall comply with the provisions of paragraph (a)(1) of this section.

(f) Stationary gas turbines using water or steam injection for control of NOx emissions are exempt from paragraph (a) when ice fog is deemed a traffic hazard by the owner or operator of the gas turbine.

40 CFR 60.333 STANDARD FOR SULFUR DIOXIDE.

On and after the date on which the performance test required to be conducted by Sec. 60.8 is completed, every owner or operator subject to the provision of this subpart shall comply with one or the other of the following conditions:

(b) No owner or operator subject to the provisions of this subpart shall burn in any stationary gas turbine any fuel which contains sulfur in excess of 0.8 percent by weight.

40 CFR 60.334 MONITORING OF OPERATIONS.

(a) The owner or operator of any stationary gas turbine subject to the provisions of this subpart and using water injection to control NOx emissions shall install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water to fuel being fired in the turbine. This system shall be accurate to within +/- 5.0 percent and shall be approved by the Administrator.

(b) The owner or operator of any stationary gas turbine subject to the provisions of this subpart shall monitor sulfur content and nitrogen content of the fuel being fired in the turbine. The frequency of determination of these values shall be as follows:

(1) If the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source.

(2) If the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily. Owners, operators or fuel vendors may develop custom schedules for determination of the values based on the design and operation of the affected facility and the characteristics of the fuel supply. These custom schedules shall be substantiated with data and must be approved by the Administrator before they can be used to comply with paragraph (b) of this section.

(c) For the purpose of reports required under Sec. 60.7(c), periods of excess emissions that shall be reported are defined as follows:

(1) Nitrogen oxides. Any one-hour period during which the average water-to-fuel ratio, as measured by the continuous monitoring system, falls below the water-to-fuel ratio determined to demonstrate compliance with Sec. 60.332 by the performance test required in Sec. 60.8 or any period during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during the performance test required in Sec. 60.8. Each report shall include the average water-to-fuel ratio, average fuel consumption, ambient conditions, gas turbine load, and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures developed under Sec. 60.335(a).

(2) Sulfur dioxide. Any daily period during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent.

(3) Ice fog. Each period during which an exemption provided in Sec. 60.332(g) is in effect shall be reported in writing to the Administrator quarterly. For each period the ambient conditions existing during the period, the date and time the air pollution control system was deactivated, and the date and time the air pollution control system was reactivated shall be

reported. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter.

40 CFR 60.335 TEST METHODS AND PROCEDURES.

(a) To compute the nitrogen oxides emissions, the owner or operator shall use analytical methods and procedures that are accurate to within 5 percent and are approved by the Administrator to determine the nitrogen content of the fuel being fired.

(b) In conducting the performance tests required in Sec. 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided for in Sec. 60.8(b). Acceptable alternative methods and procedures are given in paragraph (f) of this section.

(c) The owner or operator shall determine compliance with the nitrogen oxides and sulfur dioxide standards in Secs. 60.332 and 60.333(a) as follows:

(1) The nitrogen oxides emission rate (NOx) shall be computed for each run using the following equation:

$$NOx = (NOxo)\,(P_r/P_o)^{0.5}\,(e^{19\,(Ho - 0.00633)})\,(288°K/Ta)^{1.53}$$

Where

NOx = emission rate of NOx at 15 percent oxygen and ISO standard ambient conditions, volume percent.

NOxo = observed NOx concentration, ppm by volume.

P_r = reference combustor inlet absolute pressure at 101.3 kilopascals ambient pressure, mm Hg.

P_o = observed combustor inlet absolute pressure at test, mm Hg.

Ho = observed humidity of ambient air, g H_2O/g air.

E = transcendental constant, 2.718.

T_a = ambient temperature, °K.

(2) The monitoring device of Sec. 60.334(a) shall be used to determine the fuel consumption and the water-to-fuel ratio necessary to comply with Sec. 60.332 at 30, 50, 75, and 100 percent of peak load or at four points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. All loads shall be corrected to ISO conditions using the appropriate equations supplied by the manufacturer.

(3) Method 20 shall be used to determine the nitrogen oxides, sulfur dioxide, and oxygen concentrations. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of the load conditions specified in paragraph (c)(2) of this section.

(d) The owner or operator shall determine compliance with the sulfur content standard in Sec. 60.333(b) as follows: ASTM D 2880-71 shall be used to determine the sulfur content of liquid fuels and ASTM D 1072-80, D 3031-81, D 4084-82, or D 3246-81 shall be used for the sulfur content of gaseous fuels (incorporated by reference--see Sec. 60.17). The applicable ranges of some ASTM methods mentioned above are not adequate to measure the levels of sulfur in some fuel gases. Dilution of samples before analysis (with verification of the dilution ratio) may be used, subject to the approval of the Administrator.

(e) To meet the requirements of Sec. 60.334(b), the owner or operator shall use the methods specified in paragraphs (a) and (d) of this section to determine the nitrogen and sulfur contents of the fuel being burned. The analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency.

APPENDIX XS - CEMS EXCESS EMISSIONS REPORT
FIGURE 1 – QUARTERLY PERFORMANCE SUMMARY REPORT
GASEOUS AND OPACITY EXCESS EMISSION AND MONITORING SYSTEMS

[Note: This form is referenced in 40 CFR 60.7, Subpart A-General Provisions]

Pollutant *(Circle One)*: SO_2 NOx TRS H_2S CO Opacity

Reporting period dates: From ____________________ to ______________________

Company: ____

Emission Limitation: ____

Address: ____

Monitor Manufacturer and Model No.: ____

Date of Latest CMS Certification or Audit: ______________________________

Process Unit(s) Description: ____

Total source operating time in reporting period [a]: _________________________

Emission data summary [a]		**CMS performance summary** [a]	
1. Duration of Excess Emissions In Reporting Period Due To:		1. CMS downtime in reporting period due to:	
a. Startup/Shutdown		a. Monitor Equipment Malfunctions	
b. Control Equipment Problems		b. Non-Monitor Equipment Malfunctions	
c. Process Problems		c. Quality Assurance Calibration	
d. Other Known Causes		d. Other Known Causes	
e. Unknown Causes		e. Unknown Causes	
2. Total Duration of Excess Emissions		2. Total CMS Downtime	
3. [Total Duration of Excess Emissions] x (100%) / [Total Source Operating Time] [b]		3. [Total CMS Downtime] x (100%) / [Total source operating time]	

[a] For opacity, record all times in minutes. For gases, record all times in hours.

[b] For the reporting period: If the total duration of excess emissions is 1 percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report form and the excess emission report described in 40 CFR 60.7(c) shall be submitted.

Note: *On a separate page, describe any changes since last quarter in CMS, process or controls.*

I certify that the information contained in this report is true, accurate, and complete.

____
Name

____
Title

____ ____________________
Signature *Date*

Memorandum

Florida Department of Environmental Protection

TO: Clair Fancy, Chief – Bureau of Air Regulation

THROUGH: Al Linero, Administrator - New Source Review Section aaLinero 9/20

FROM: Jeff Koerner, Project Engineer - New Source Review Section JK

DATE: September 20, 2000

PROJECT: Peace River Station, L.L.C.
Three Nominal 170 MW Simple Cycle Peaking Combustion Turbines
Project No. 1050336-001-AC
Draft Permit No. PSD-FL-292

Attached is the public notice package to construct a new 510 MW electrical generating plant located approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The new plant will consist of three new General Electric Model PG7241(FA) simple cycle gas turbines with electrical generator sets, each capable of producing a nominal 170 MW of electrical power. Each unit will be fired primarily by natural gas with very low sulfur distillate oil as a backup fuel. Operation is restricted to 3390 hours during any consecutive 12 months with no more than 720 hours of very low sulfur oil firing. The draft permit includes the following BACT standards.

CO Emissions: Achieved by the efficient combustion of clean fuels

- Gas Firing, Normal: 8.2 ppmvd @ 15% O_2 based on a 3-hour average; annual test
- Distillate Oil Firing: 14.2 ppmvd @ 15% O_2 based on a 3-hour average; annual test

NOx Emissions: Achieved by dry low-NOx combustion for gas firing and water injection for oil firing

- Gas Firing, Normal: 9.0 ppmvd @ 15% O_2 based on a 3-hour average; initial test, new and clean
  10.0 ppmvd @ 15% O_2 based on a 3-hour average of CEMS data
- Distillate Oil Firing: 42.0 ppmvd @ 15% O_2 based on a 3-hour average; annual test and CEMS data

PM/PM_{10} and SO_2 Emissions: Achieved by the efficient combustion of clean fuels

- Particulate Matter: ≤ 9.0 lb/hour when firing gas and ≤ 17.0 lb/hr when firing oil, initial and renewal tests
- Visible Emissions: ≤ 10% opacity when firing natural gas or oil, annual test
- Fuel Specifications: Natural gas (primary fuel) and distillate oil containing ≤ 0.05% sulfur by weight (backup fuel)

VOC Emissions: Low VOC emissions do not trigger a BACT determination for this project (< 40 TPY)

Excess Emissions: Operation below 50% of base load shall not exceed 120 minutes per day. During periods of startup and shutdown, visible emissions are limited to 20% opacity for up to ten, 6-minute observation periods per day. NOx emissions must be recorded during startup, shutdown, and malfunction, but the permittee may exclude two 1-hour CEMS averages per day due to excess emissions resulting from these conditions.

Day #74 of the permitting time clock is October 26, 2000. I recommend your approval of the attached Intent to Issue package for this project.

CHF/AAL/jfk
Attachments

FLORIDA

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

P.E. CERTIFICATION STATEMENT

PERMITTEE

Macauley Whiting, Jr., President
Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, FL 32789

Project No.	1050336-001-AC
Draft Permit No.	PSD-FL-292
Facility ID No.	1050336
SIC No.	4911

PROJECT DESCRIPTION

The applicant proposes to construct a new 510 MW electrical generating plant (Peace River Station) located approximately one-quarter mile west of Ft. Meade in Polk County, Florida. The new plant will consist of three new General Electric Model PG7241(FA) simple cycle gas turbines with electrical generator sets, each capable of producing a nominal 170 MW of electrical power. Each unit will be fired primarily by natural gas with very low sulfur distillate oil as a backup fuel. Operation is restricted to 3390 hours during any consecutive 12 months with no more than 720 hours of very low sulfur oil firing. The Draft Permit includes the following BACT standards.

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NOx Emissions: Achieved by dry low-NOx combustion for gas firing and water injection for oil firing

- Gas Firing, Normal: 9.0 ppmvd @ 15% O_2 based on a 3-hour average; initial test and tuning
  10.0 ppmvd @ 15% O_2 based on a 3-hour average of CEMS data
- Distillate Oil Firing: 42.0 ppmvd @ 15% O_2 based on a 3-hour average; annual test and CEMS data

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I HEREBY CERTIFY *that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

Jeffery F. Koerner
9-20-00

Jeffery F. Koerner, P.E.
Registration Number: 49441

(Date)

DARM/BAR - New Source Review Section
Florida Department of Environmental Protection

"More Protection, Less Process"

Printed on recycled paper.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

P.E. CERTIFICATION STATEMENT

PERMITTEE

Macauley Whiting, Jr., President
Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
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Project No.	1050336-001-AC
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***I HEREBY CERTIFY** that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).*

Jeffery F. Koerner 9-20-00

Jeffery F. Koerner, P.E. (Date)
Registration Number: 49441

DARM/BAR - New Source Review Section
Florida Department of Environmental Protection

DECKER ENERGY
INTERNATIONAL

RECEIVED
JUN 12 2000
BUREAU OF AIR REGULATION

June 7, 2000

Administrator, New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Attention: Mr. A.A. Linero, P.E.

1050336-001-AC
PSD-FL-292

RE: PEACE RIVER STATION, L.L.C.
AIR PERMIT APPLICATION AND PREVENTION OF SIGNIFCANT DETERIORATION ANALYSIS
PEACE RIVER STATION POWER PROJECT, POLK COUNTY, FLORIDA

Dear Mr. Linero:

Peace River Station, L.L.C. is pleased to submit this application for a permit to license, construct, and operate an independent power production facility in Polk County, Florida. The application includes supportive information that the project is required to provide under the regulations for Prevention of Significant Deterioration (PSD) of air quality. The application processing fee of $7,500 is included with this transmittal.

We appreciate your timely review of this application and look forward towards working with you. If you have any questions, please contact me or Mr. Jon Pomerleau at (407) 628-8900.

Sincerely,

PEACE RIVER STATION, L.L.C.

Jon T. Pomerleau VP.
For Macauley Whiting, Jr

Macauley Whiting, Jr,
President

Cc: Jon T. Pomerleau
K.F.Kosky- Golder Associates
R.C.McCann- Golder Associates

CC: J. Koerner, BAR
SWD
Polk Co
EPA
NPS
C. Carlson

D:\

163 East Morse Blvd. • Suite 200 • Post Office Box 2397 • Winter Park, Florida 32790
(407) 628-8900 • Facsimile (407) 628-8535

Peace River Station, LLC

7243

DECKER ENERGY INTERNATIONAL, INC.
P O BOX 2397 PH 407-628-8900
WINTER PARK, FL 32790

63-751/631
BRANCH 00994

DATE June 8, 2000

PAY TO THE ORDER OF Florida Dept. of Environmental Protection $ 7500.00

Seven Thousand Five Hundred Exactly********************** DOLLARS

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FOR Air Permit/Peace River Sta.

MP

[redacted]

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JUN 12 2000

BUREAU OF AIR REGULATION

AIR PERMIT APPLICATION AND PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS FOR THE PEACE RIVER STATION, POLK COUNTY, FLORIDA

Prepared For:

Peace River Station, L.L.C.
163 East Morse Boulevard, Suite 200
Winter Park, Florida 32790

Prepared By:

Golder Associates Inc.
6241 NW 23rd Street, Suite 500
Gainesville, Florida 32653-1500

June 2000
9939562Y/F1

DISTRIBUTION:
7 Copies - Florida Department of Protection
2 Copies – Peace River Station, L.L.C.
2 Copies - Golder Associates Inc.

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PART A

AIR PERMIT APPLICATION

Department of Environmental Protection

Division of Air Resources Management

APPLICATION FOR AIR PERMIT - TITLE V SOURCE

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

Identification of Facility

1. Facility Owner/Company Name: **Peace River Station, L.L.C.**	
2. Site Name: **Peace River Station**	
3. Facility Identification Number: [X] Unknown	
4. Facility Location: **¼ mile west of Fort Meade** Street Address or Other Locator: **West County Road 630** City: **Fort Meade** County: **Polk** Zip Code:	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [ ] Yes [X] No

Application Contact

1. Name and Title of Application Contact: **Macauley Whiting, Jr., President**
2. Application Contact Mailing Address: Organization/Firm: **Peace River Station, L.L.C.** Street Address: **163 East Morse Boulevard, Suite 200** City: **Winter Park** State: **FL** Zip Code: **32789**
3. Application Contact Telephone Numbers: Telephone: (**407**) **628 - 8900** Fax: (**407**) **628 - 8535**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	June 12, 2000
2. Permit Number:	1050336-001-AC
3. PSD Number (if applicable):	PSD-FL-292
4. Siting Number (if applicable):	

Purpose of Application

Air Operation Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[ ] Initial Title V air operation permit for an existing facility which is classified as a Title V source.

[ ] Initial Title V air operation permit for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number:________________________________

[ ] Title V air operation permit revision to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number:________________________________

Operation permit number to be revised:________________________________

[ ] Title V air operation permit revision or administrative correction to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. (Also check Air Construction Permit Application below.)

Operation permit number to be revised/corrected:________________________

[ ] Title V air operation permit revision for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit number to be revised:________________________________

Reason for revision:____

Air Construction Permit Application

This Application for Air Permit is submitted to obtain: (Check one)

[X] Air construction permit to construct or modify one or more emissions units.

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Macauley Whiting, Jr., President

2. Owner/Authorized Representative or Responsible Official Mailing Address:
   Organization/Firm: **Peace River Station, L.L.C.**
   Street Address: **163 East Morse Boulevard, Suite 200**
   City: **Winter Park** State: **FL** Zip Code: **32789**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: **(407) 628 - 8900** Fax: **(407) 628 - 8535**

4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative(check here [ ], if so) or the responsible official (check here [ ], if so) of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

   Signature ______________________ Date 6-7-00

* Attach letter of authorization if not currently on file.

Professional Engineer Certification

1. Professional Engineer Name: **Kennard F. Kosky**
   Registration Number: **14996**

2. Professional Engineer Mailing Address:
   Organization/Firm: **Golder Associates Inc.**
   Street Address: **6241 NW 23rd Street, Suite 500**
   City: **Gainesville** State: **FL** Zip Code: **32653-1500**

3. Professional Engineer Telephone Numbers:
   Telephone: **(352) 336 - 5600** Fax: **(352) 336 - 6603**

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ], if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [X], if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ], if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature: [signature] Date: 5/31/2000

(seal)

* Attach any exception to certification statement.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type	Processing Fee
--	GE Frame 7FA Combustion Turbine	AC1A	
--	GE Frame 7FA Combustion Turbine	AC1A	
--	GE Frame 7FA Combustion Turbine	AC1A	
--	Unregulated Emissions	AC1A	

Application Processing Fee

Check one: [X] Attached - Amount: $: 7,500 [ ] Not Applicable

Construction/Modification Information

1. Description of Proposed Project or Alterations: **Construction of 3 170-MW GE Frame 7FA combustion turbines. See Attachment PSD-PRS.**
2. Projected or Actual Date of Commencement of Construction: **1 Dec 2000**
3. Projected Date of Completion of Construction: **1 Jun 2002**

Application Comment

See Attachment PSD-PRS

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17** East (km): **419.5** North (km): **3,069.7**			
2. Facility Latitude/Longitude: Latitude (DD/MM/SS): **27 / 45 / 4** Longitude (DD/MM/SS): **89 / 49 / 00**			
3. Governmental Facility Code: **0**	4. Facility Status Code: **C**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment (limit to 500 characters): **Project consists of three 174-MW dual-fuel, General Electric Frame 7FA combustion turbines that will use dry low-nitrogen oxide combustion technology when firing natural gas and water injection when firing distillate fuel oil. Each CT will operate up to 3,390 hours per year.**			

Facility Contact

1. Name and Title of Facility Contact: **Macauley Whiting, Jr., President**
2. Facility Contact Mailing Address: Organization/Firm: **Peace River Station, L.L.C.** Street Address: **163 East Morse Boulevard, Suite 200** City: **Winter Park** State: **FL** Zip Code: **32789**
3. Facility Contact Telephone Numbers: Telephone: (**407**) **628 - 8900** Fax: (**407**) **628 - 8535**

Facility Regulatory Classifications

Check all that apply:

1. [ ] Small Business Stationary Source?	[ ] Unknown
2. [X] Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	
3. [ ] Synthetic Minor Source of Pollutants Other than HAPs?	
4. [ ] Major Source of Hazardous Air Pollutants (HAPs)?	
5. [ ] Synthetic Minor Source of HAPs?	
6. [X] One or More Emissions Units Subject to NSPS?	
7. [ ] One or More Emission Units Subject to NESHAP?	
8. [X] Title V Source by EPA Designation?	
9. Facility Regulatory Classifications Comment (limit to 200 characters): **CTs are subject to NSPS Subpart GG. The oil storage tanks are subject to Subpart Kb.**	

List of Applicable Regulations

Not Applicable	

B. FACILITY POLLUTANTS

List of Pollutants Emitted

1. Pollutant Emitted	2. Pollutant Classif.	3. Requested Emissions Cap lb/hour	tons/year	4. Basis for Emissions Cap	5. Pollutant Comment
PM	**B**				**Particulate Matter-Total**
VOC	**B**				**Volatile Organic Compounds**
SO_2	**A**				**Sulfur Dioxide**
NO_x	**A**				**Nitrogen Oxides**
CO	**A**				**Carbon Monoxides**
PM_{10}	**B**				**Particulate Matter-PM_{10}**

C. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements

1. Area Map Showing Facility Location: [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
2. Facility Plot Plan: [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
3. Process Flow Diagram(s): [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested	
5. Fugitive Emissions Identification: [ ] Attached, Document ID: ______ [X] Not Applicable [ ] Waiver Requested	
6. Supplemental Information for Construction Permit Application: [X] Attached, Document ID: PSD-PRS [ ] Not Applicable	
7. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

8. List of Proposed Insignificant Activities: [ ] Attached, Document ID:________ [ ] Not Applicable	
9. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:________ [ ] Equipment/Activities On site but Not Required to be Individually Listed [ ] Not Applicable	
10. Alternative Methods of Operation: [ ] Attached, Document ID:________ [ ] Not Applicable	
11. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:________ [ ] Not Applicable	
12. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:________ [ ] Not Applicable	
13. Risk Management Plan Verification: [ ] Plan previously submitted to Chemical Emergency Preparedness and Prevention Office (CEPPO). Verification of submittal attached (Document ID:________) or previously submitted to DEP (Date and DEP Office:________________________) [ ] Plan to be submitted to CEPPO (Date required:____________________________) [ ] Not Applicable	
14. Compliance Report and Plan: [ ] Attached, Document ID:________ [ ] Not Applicable	
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:________ [ ] Not Applicable	

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-PRS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**	
2. Control Device or Method Code(s): **25**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**174** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**	
2. Control Device or Method Code(s): **28**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**183** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:			**1,614**	mmBtu/hr
2. Maximum Incineration Rate:		lb/hr		tons/day
3. Maximum Process or Throughput Rate:				
4. Maximum Production Rate:				
5. Requested Maximum Operating Schedule:				
		hours/day		days/week
		weeks/year	**3,390**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,790 MMBtu/hr (ISO-LHV) and 183 MW.**				

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment PRS-EU1-D for operational requirements	
See Attachment PSD-PRS for permitting requirements	

ATTACHMENT PRS-EU1-D

Applicable Requirements Listing

EMISSION UNIT ID: EU1

FDEP Rules:

Air Pollution Control-General Provisions:

62-204.800(7)(b)37. (State Only)	NSPS Subpart GG
62-204.800(7)(c) (State Only)	NSPS authority
62-204.800(7)(d)(State Only)	NSPS General Provisions
62-204.800(12) (State Only)	Acid Rain Program
62-204.800(13) (State Only)	Allowances
62-204.800(14) (State Only)	Acid Rain Program Monitoring
62-204.800(16) (State Only)	Excess Emissions (Potentially applicable over term of permit)

Stationary Sources-General:

62-210.650	Circumvention; EUs with control device
62-210.700(1)	Excess Emissions;
62-210.700(4)	Excess Emissions; poor maintenance
62-210.700(6)	Excess Emissions; notification

Acid Rain:

62-214.300	All Acid Rain Units (Applicability)
62-214.320(1)(a),(2)	All Acid Rain Units (Application Shield)
62-214.330(1)(a)1.	Compliance Options (if 214.430)
62-214.340	Exemptions (new units, retired units)
62-214.350(2);(3);(6)	All Acid Rain Units (Certification)
62-214.370	All Acid Rain Units (Revisions; correction; potentially applicable if a need arises)
62-214.430	All Acid Rain Units (Compliance Options-if required)

Stationary Sources-Emission Standards:

62-296.320(4)(b)(State Only)	CTs/Diesel Units

Stationary Sources-Emission Monitoring (where stack test is required):

62-297.310(1)	All Units (Test Runs-Mass Emission)
62-297.310(2)(b)	All Units (Operating Rate; other than CTs;no CT)
62-297.310(3)	All Units (Calculation of Emission)
62-297.310(4)(a)	All Units (Applicable Test Procedures;Sampling time)
62-297.310(4)(b)	All Units (Sample Volume)
62-297.310(4)(c)	All Units (Required Flow Rate Range-PM/H2SO4/F)
62-297.310(4)(d)	All Units (Calibration)
62-297.310(4)(e)	All Units (EPA Method 5-only)

62-297.310(6)(a)	All Units (Permanent Test Facilities-general)
62-297.310(6)(c)	All Units (Sampling Ports)
62-297.310(6)(d)	All Units (Work Platforms)
62-297.310(6)(e)	All Units (Access)
62-297.310(6)(f)	All Units (Electrical Power)
62-297.310(6)(g)	All Units (Equipment Support)
62-297.310(7)(a)1.	Applies mainly to CTs/Diesels
62-297.310(7)(a)2.	FFSG excess emissions
62-297.310(7)(a)3.	Permit Renewal Test Required
62-297.310(7)(a)4.a	Annual Test
62-297.310(7)(a)5.	PM exemption if <400 hrs/yr
62-297.310(7)(a)6.	PM FFSG semi annual test required if >200 hrs/yr
62-297.310(7)(a)7.	PM quarterly monitoring if >100 hrs/yr
62-297.310(7)(a)9.	FDEP Notification - 15 days
62-297.310(7)(c)	Waiver of Compliance Tests (Fuel Sampling)
62-297.310(8)	Test Reports

Federal Rules:

NSPS Subpart GG:

40 CFR 60.332(a)(1)	NO_x for Electric Utility CTs
40 CFR 60.332(a)(3)	NO_x for Electric Utility CTs
40 CFR 60.333	SO_2 limits
40 CFR 60.334	Monitoring of Operations (Custom Monitoring for Gas)
40 CFR 60.335	Test Methods

NSPS General Requirements:

40 CFR 60.7(a)(1)	Notification of Construction
40 CFR 60.7(a)(2)	Notification of Initial Start-Up
40 CFR 60.7(a)(3)	Notification of Actual Start-Up
40 CFR 60.7(a)(4)	Notification and Recordkeeping (Physical/Operational Cycle)
40 CFR 60.7(a)(5)	Notification of CEM Demonstration
40 CFR 60.7(b)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(c)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(d)	Notification and Recordkeeping (startup/shutdown/malfunction)
40 CFR 60.7(f)	Notification and Recordkeeping (maintain records-2 yrs)
40 CFR 60.8(a)	Performance Test Requirements
40 CFR 60.8(b)	Performance Test Notification
40 CFR 60.8(c)	Performance Tests (representative conditions)
40 CFR 60.8(e)	Provide Stack Sampling Facilities
40 CFR 60.8(f)	Test Runs
40 CFR 60.11(a)	Compliance (ref. S. 60.8 or Subpart; other than opacity)
40 CFR 60.11(b)	Compliance (opacity determined EPA Method 9)
40 CFR 60.11(c)	Compliance (opacity; excludes startup/shutdown/malfunction)
40 CFR 60.11(d)	Compliance (maintain air pollution control equip.)
40 CFR 60.11(e)(2)	Compliance (opacity; ref. S. 60.8)
40 CFR 60.12	Circumvention

40 CFR 60.13(a)	Monitoring (Appendix B; Appendix F)
40 CFR 60.13(c)	Monitoring (Opacity COMS)
40 CFR 60.13(d)(1)	Monitoring (CEMS; span, drift, etc.)
40 CFR 60.13(d)(2)	Monitoring (COMS; span, system check)
40 CFR 60.13(e)	Monitoring (frequency of operation)
40 CFR 60.13(f)	Monitoring (frequency of operation)
40 CFR 60.13(h)	Monitoring (COMS; data requirements)
Acid Rain-Permits:	
40 CFR 72.9(a)	Permit Requirements
40 CFR 72.9(b)	Monitoring Requirements
40 CFR 72.9(c)(1)	SO_2 Allowances-hold allowances
40 CFR 72.9(c)(2)	SO_2 Allowances-violation
40 CFR 72.9(c)(3)(iii)	SO_2 Allowances-Phase II Units (listed)
40 CFR 72.9(c)(4)	SO_2 Allowances-allowances held in ATS
40 CFR 72.9(c)(5)	SO_2 Allowances-no deduction for 72.9(c)(1)(i)
40 CFR 72.9(d)	NO_x Requirements
40 CFR 72.9(e)	Excess Emission Requirements
40 CFR 72.9(f)	Recordkeeping and Reporting
40 CFR 72.9(g)	Liability
40 CFR 72.20(a)	Designated Representative; required
40 CFR 72.20(b)	Designated Representative; legally binding
40 CFR 72.20(c)	Designated Representative; certification requirements
40 CFR 72.21	Submissions
40 CFR 72.22	Alternate Designated Representative
40 CFR 72.23	Changing representatives; owners
40 CFR 72.24	Certificate of representation
40 CFR 72.30(a)	Requirements to Apply (operate)
40 CFR 72.30(b)(2)	Requirements to Apply (Phase II-Complete)
40 CFR 72.30(c)	Requirements to Apply (reapply before expiration)
40 CFR 72.30(d)	Requirements to Apply (submittal requirements)
40 CFR 72.31	Information Requirements; Acid Rain Applications
40 CFR 72.32	Permit Application Shield
40 CFR 72.33(b)	Dispatch System ID;unit/system ID
40 CFR 72.33(c)	Dispatch System ID;ID requirements
40 CFR 72.33(d)	Dispatch System ID;ID change
40 CFR 72.40(a)	General; compliance plan
40 CFR 72.40(b)	General; multi-unit compliance options
40 CFR 72.40(c)	General; conditional approval
40 CFR 72.40(d)	General; termination of compliance options
40 CFR 72.51	Permit Shield
40 CFR 72.90	Annual Compliance Certification
Allowances:	
40 CFR 73.33(a),(c)	Authorized account representative
40 CFR 73.35(c)(1)	Compliance: ID of allowances by serial number

Monitoring Part 75:

40 CFR 75.4	Compliance Dates;
40 CFR 75.5	Prohibitions
40 CFR 75.10(a)(1)	Primary Measurement; SO_2;
40 CFR 75.10(a)(2)	Primary Measurement; NO_x;
40 CFR 75.10(a)(3)(iii)	Primary Measurement; CO_2; O_2 monitor
40 CFR 75.10(b)	Primary Measurement; Performance Requirements
40 CFR 75.10(c)	Primary Measurement; Heat Input; Appendix F
40 CFR 75.10(e)	Primary Measurement; Optional Backup Monitor
40 CFR 75.10(f)	Primary Measurement; Minimum Measurement
40 CFR 75.10(g)	Primary Measurement; Minimum Recording
40 CFR 75.11(d)	SO_2 Monitoring; Gas- and Oil-fired units
40 CFR 75.11(e)	SO_2 Monitoring; Gaseous firing
40 CFR 75.12(a)	NO_x Monitoring; Coal; Non-peaking oil/gas units
40 CFR 75.12(b)	NO_x Monitoring; Determination of NO_x emission rate; Appendix F
40 CFR 75.13(b)	CO_2 Monitoring; Appendix G
40 CFR 75.13(c)	CO_2 Monitoring; Appendix F
40 CFR 75.14(c)	Opacity Monitoring; Gas units; exemption
40 CFR 75.20(a)	Initial Certification Approval Process; Loss of Certification
40 CFR 75.20(b)	Recertification Procedures (if recertification necessary)
40 CFR 75.20(c)	Certification Procedures (if recertification necessary)
40 CFR 75.20(d)	Recertification Backup/portable monitor
40 CFR 75.20(f)	Alternate Monitoring system
40 CFR 75.21(a)	QA/QC; CEMS; Appendix B (Suspended 7/17/95-12/31/96)
40 CFR 75.21(c)	QA/QC; Calibration Gases
40 CFR 75.21(d)	QA/QC; Notification of RATA
40 CFR 75.21(e)	QA/QC; Audits
40 CFR 75.21(f)	QA/QC; CEMS (Effective 7/17/96-12/31/96)
40 CFR 75.22	Reference Methods
40 CFR 75.24	Out-of-Control Periods; CEMS
40 CFR 75.30(a)(3)	General Missing Data Procedures; NO_x
40 CFR 75.30(a)(4)	General Missing Data Procedures; SO_2
40 CFR 75.30(b)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(c)	General Missing Data Procedures; certified backup monitor
40 CFR 75.30(d)	General Missing Data Procedures; SO_2 (optional before 1/1/97)
40 CFR 75.30(e)	General Missing Data Procedures; bypass/multiple stacks
40 CFR 75.31	Initial Missing Data Procedures (new/re-certified CMS)
40 CFR 75.32	Monitoring Data Availability for Missing Data
40 CFR 75.33	Standard Missing Data Procedures
40 CFR 75.36	Missing Data for Heat Input
40 CFR 75.40	Alternate Monitoring Systems-General
40 CFR 75.41	Alternate Monitoring Systems-Precision Criteria
40 CFR 75.42	Alternate Monitoring Systems-Reliability Criteria
40 CFR 75.43	Alternate Monitoring Systems-Accessability Criteria
40 CFR 75.44	Alternate Monitoring Systems-Timeliness Criteria
40 CFR 75.45	Alternate Monitoring Systems-Daily QA
40 CFR 75.46	Alternate Monitoring Systems-Missing data
40 CFR 75.47	Alternate Monitoring Systems-Criteria for Class

40 CFR 75.48	Alternate Monitoring Systems-Petition
40 CFR 75.53	Monitoring Plan; revisions
40 CFR 75.54(a)	Recordkeeping-general
40 CFR 75.54(b)	Recordkeeping-operating parameter
40 CFR 75.54(c)	Recordkeeping-SO_2
40 CFR 75.54(d)	Recordkeeping- NO_x
40 CFR 75.54(e)	Recordkeeping-CO_2
40 CFR 75.54(f)	Recordkeeping-Opacity
40 CFR 75.55(c)	General Recordkeeping (Specific Situations)
40 CFR 75.55(e)	General Recordkeeping (Specific Situations)
40 CFR 75.56	Certification; QA/QC Provisions
40 CFR 75.60	Reporting Requirements-General
40 CFR 75.61	Reporting Requirements-Notification cert/recertification
40 CFR 75.62	Reporting Requirements-Monitoring Plan
40 CFR 75.63	Reporting Requirements-Certification/Recertification
40 CFR 75.64(a)	Reporting Requirements-Quarterly reports; submission
40 CFR 75.64(b)	Reporting Requirements-Quarterly reports; DR statement
40 CFR 75.64(c)	Rep. Req.; Quarterly reports; Compliance Certification
40 CFR 75.64(d)	Rep. Req.; Quarterly reports; Electronic format
40 CFR 75.66	Petitions to the Administrator (if required)
Appendix A-1	Installation and Measurement Locations
Appendix A-2.	Equipment Specifications
Appendix A-3.	Performance Specifications
Appendix A-4.	Data Handling and Acquisition Systems
Appendix A-5.	Calibration Gases
Appendix A-6.	Certification Tests and Procedures
Appendix A-7.	Calculations
Appendix B	QA/QC Procedures
Appendix C-1.	Missing Data; SO_2/ NO_x for controlled sources
Appendix C-2.	Missing Data; Load-Based Procedure; NO_x & flow
Appendix D	Optional SO_2; Oil-/gas-fired units
Appendix F	Conversion Procedures
Appendix H	Traceability Protocol

Acid Rain Program-Excess Emissions (these are future requirements):

40 CFR 77.3	Offset Plans (future)
40 CFR 77.5(b)	Deductions of Allowances (future)
40 CFR 77.6	Excess Emissions Penalties (SO_2 and NO_x;future)

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-PRS**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **21** feet
8. Exit Temperature: **1,097** °F	9. Actual Volumetric Flow Rate: **2,375,800** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **725,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **419.5** North (km): **3069.7**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,078°F and 2,443,200 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **14.1**	5. Maximum Annual Rate: **9,776**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, ISO conditions, 720 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.82**	5. Maximum Annual Rate: **5,947**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **920**
10. Segment Comment (limit to 200 characters): **Based on 920 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**

2. Total Percent Efficiency of Control:

3. Potential Emissions: **22** lb/hour **22.6** tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: **GE, 2000; Decker**

7. Emissions Method Code: **2**

8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-PRS; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing, all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: **22 lb/hr**

4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year

5. Method of Compliance (limit to 60 characters):

   Annual stack test; EPA Methods 5 or 17; if < 400 hours

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000, Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **106.9** lb/hour **37.2** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load;TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **10.4** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 2 grains S/100 cf - 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **352** lb/hour **215** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **352** lb/hour **122** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: NO_x

2. Total Percent Efficiency of Control:

3. Potential Emissions: 352 lb/hour 215 tons/year

4. Synthetically Limited? [X]

5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year

6. Emission Factor:
   Reference: GE, 2000; Decker

7. Emissions Method Code: 2

8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-PRS; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: OTHER

2. Future Effective Date of Allowable Emissions:

3. Requested Allowable Emissions and Units: 10 ppmvd

4. Equivalent Allowable Emissions: 71.9 lb/hour 117.4 tons/year

5. Method of Compliance (limit to 60 characters):

   CEM - 30 Day Rolling Average

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **72.6** lb/hour **25.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **35.9** lb/hour **58.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **4 ppmvd**	4. Equivalent Allowable Emissions: **8.1** lb/hour **2.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **2.0 ppmvd**	4. Equivalent Allowable Emissions: **4.2** lb/hour **6.9** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units -
Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **22 lb/hr**	4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): ***Maximum for oil firing.***	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:_______________ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-PRS [ ] Not Applicable
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-PRS [ ] Not Applicable
10. Supplemental Requirements Comment:

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number:
ID:

[ ] No ID
[X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-PRS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**	
2. Control Device or Method Code(s): **25**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**
2. Generator Nameplate Rating: **174** MW	
3. Incinerator Information: Dwell Temperature: °F Dwell Time: seconds Incinerator Afterburner Temperature: °F	

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**	
2. Control Device or Method Code(s): **28**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**183** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1. Maximum Heat Input Rate:		**1,614**	mmBtu/hr
2. Maximum Incineration Rate:	lb/hr		tons/day
3. Maximum Process or Throughput Rate:			
4. Maximum Production Rate:			
5. Requested Maximum Operating Schedule:			
	hours/day		days/week
	weeks/year	**3,390**	hours/year
6. Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,790 MMBtu/hr (ISO-LHV) and 183 MW.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment PRS-EU1-D for operational requirements	
See Attachment PSD-PRS for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-PRS**
2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

   Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**
6. Stack Height: **60** feet
7. Exit Diameter: **22** feet
8. Exit Temperature: **1,113** °F
9. Actual Volumetric Flow Rate: **2,375,800** acfm
10. Water Vapor: **8.7** %
11. Maximum Dry Standard Flow Rate: **725,000** dscfm
12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates:

    Zone: **17** East (km): **419.5** North (km): **3069.7**

14. Emission Point Comment (limit to 200 characters):

    Stack parameters for ISO operating condition firing natural gas; for oil 1,078°F and 2,443,200 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **14.1**	5. Maximum Annual Rate: **9,776**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, ISO conditions, 720 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.82**	5. Maximum Annual Rate: **5,947**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **920**
10. Segment Comment (limit to 200 characters): **Based on 920 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **22 lb/hr**	4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000, Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **106.9** lb/hour **37.2** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load;TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **10.4** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 2 grains S/100 cf - 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **352** lb/hour **215** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **352** lb/hour **122** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **352** lb/hour **215** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **71.9** lb/hour **117.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **72.6** lb/hour **25.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **35.9** lb/hour **58.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **4 ppmvd**	4. Equivalent Allowable Emissions: **8.1** lb/hour **2.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**
2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year
4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year
6. Emission Factor: Reference: **GE, 2000; Decker**
7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters):

   See Attachment PSD-PRS; Section 2.0; Appendix A.

9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters):

   Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**
2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **2.0 ppmvd**
4. Equivalent Allowable Emissions: **4.2** lb/hour **6.9** tons/year
5. Method of Compliance (limit to 60 characters):

   EPA Method 25A; high and low load

6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters):

   Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **22 lb/hr**	4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:_______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-PRS [ ] Not Applicable	
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-PRS [ ] Not Applicable	
10. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:_______ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:_______ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:_______ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:_______ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:_______ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:_______ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:_______ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:_______ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:_______ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:_______ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):
GE Frame 7FA Combustion Turbine

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[X]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit is a GE Frame 7FA combustion turbine operating in simple cycle mode. See Attachment PSD-PRS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Dry Low NO_x combustion - Natural gas firing**	
2. Control Device or Method Code(s): **25**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**174** MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method): **Water injection - distillate oil firing**	
2. Control Device or Method Code(s): **28**	

Emissions Unit Details

1. Package Unit: Manufacturer: **General Electric**	Model Number: **7FA**	
2. Generator Nameplate Rating:	**183** MW	
3. Incinerator Information:		
Dwell Temperature:		°F
Dwell Time:		seconds
Incinerator Afterburner Temperature:		°F

B. EMISSIONS UNIT CAPACITY INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Heat Input Rate:		**1,614**	mmBtu/hr
2.	Maximum Incineration Rate:	lb/hr		tons/day
3.	Maximum Process or Throughput Rate:			
4.	Maximum Production Rate:			
5.	Requested Maximum Operating Schedule:			
		hours/day		days/week
		weeks/year	**3,390**	hours/year
6.	Operating Capacity/Schedule Comment (limit to 200 characters): **Maximum heat input at ISO conditions and natural gas firing (LHV); maximum for oil firing is 1,790 MMBtu/hr (ISO-LHV) and 183 MW.**			

C. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

List of Applicable Regulations

See Attachment PRS-EU1-D for operational requirements	
See Attachment PSD-PRS for permitting requirements	

D. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram? **See Att. PSD-PRS**	2. Emission Point Type Code: **1**

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point):

Exhausts through a single stack.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **21** feet
8. Exit Temperature: **1,097** °F	9. Actual Volumetric Flow Rate: **2,375,800** acfm	10. Water Vapor: **8.7** %

11. Maximum Dry Standard Flow Rate: **725,000** dscfm	12. Nonstack Emission Point Height: feet

13. Emission Point UTM Coordinates:

Zone: **17** East (km): **419.5** North (km): **3069.7**

14. Emission Point Comment (limit to 200 characters):

Stack parameters for ISO operating condition firing natural gas; for oil 1,078°F and 2,443,200 ACFM.

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate: **14.1**	5. Maximum Annual Rate: **9,776**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Million Btu per SCC Unit = 131.8 (rounded to 132). Based on 7.1 lb/gal; LHV of 18,560 Btu/lb, ISO conditions, 720 hrs/yr operation.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **1.82**	5. Maximum Annual Rate: **5,947**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **920**
10. Segment Comment (limit to 200 characters): **Based on 920 Btu/cf (LHV); ISO conditions and 3,390 hrs/yr operation.**		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
PM			EL
SO_2			EL
NO_x	026	028	EL
CO			EL
VOC			EL
PM_{10}			EL

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing, all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **22 lb/hr**	4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Methods 5 or 17; if < 400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; all loads. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing - all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000, Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **0.05% Sulfur Oil**	4. Equivalent Allowable Emissions: **106.9** lb/hour **37.2** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load;TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **106.9** lb/hour **50.5** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Emission Factor: 2 grains S per 100 CF gas; 0.05% S oil lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions

Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **See Comment**	4. Equivalent Allowable Emissions: **10.4** lb/hour **17.0** tons/year
5. Method of Compliance (limit to 60 characters): **Fuel Sampling**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested allowable emissions and units: Pipeline Natural Gas. Gas firing, 2 grains S/100 cf - 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **352** lb/hour **215** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **352** lb/hour **122** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions is at 15% O_2-100% load. Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **NO_x**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **352** lb/hour **215** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 _____ to _____ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **71.9** lb/hour **117.4** tons/year
5. Method of Compliance (limit to 60 characters): **CEM - 30 Day Rolling Average**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Requested Allowable Emissions and Units is at 15% O_2-100% load. Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **20 ppmvd**	4. Equivalent Allowable Emissions: **72.6** lb/hour **25.0** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **72.6** lb/hour **70.8** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **10 ppmvd**	4. Equivalent Allowable Emissions: **35.9** lb/hour **58.1** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 10; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **4 ppmvd**	4. Equivalent Allowable Emissions: **8.1** lb/hour **2.8** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing; max @ 32°F; 100% load; TPY @ 59°F, 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **8.1** lb/hour **8.2** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 32°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **2.0 ppmvd**	4. Equivalent Allowable Emissions: **4.2** lb/hour **6.9** tons/year
5. Method of Compliance (limit to 60 characters): **EPA Method 25A; high and low load**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Additional requested allowable emissions and units: Gas firing; 32°F; 100% load; TPY @ 59°F, 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [**X**]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **22 lb/hr**	4. Equivalent Allowable Emissions: **22** lb/hour **7.9** tons/year
5. Method of Compliance (limit to 60 characters): **Annual stack test; EPA Method 5 or 17; if <400 hours**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Oil firing - all loads; 720 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

G. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units - Emissions-Limited and Preconstruction Review Pollutants Only)

Potential/Fugitive Emissions

1. Pollutant Emitted: **PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22** lb/hour **22.6** tons/year	4. Synthetically Limited? [X]
5. Range of Estimated Fugitive Emissions: [ ] 1 [ ] 2 [ ] 3 ______ to ______ tons/year	
6. Emission Factor: Reference: **GE, 2000; Decker**	7. Emissions Method Code: **2**
8. Calculation of Emissions (limit to 600 characters): **See Attachment PSD-PRS; Section 2.0; Appendix A.**	
9. Pollutant Potential/Fugitive Emissions Comment (limit to 200 characters): **Lb/hr based on oil firing; 100% load; 59°F. Tons/yr based on 2,670 hrs/yr gas firing and 720 hrs/yr oil firing; ISO conditions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Requested Allowable Emissions and Units: **11 lb/hr**	4. Equivalent Allowable Emissions: **11** lb/hour **18.6** tons/year
5. Method of Compliance (limit to 60 characters): **VE Test < 20% opacity**	
6. Allowable Emissions Comment (Desc. of Operating Method) (limit to 200 characters): **Gas firing; all loads; 3,390 hrs/yr. See Attachment PSD-PRS; Section 2.0; Appendix A.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **Annual VE Test EPA Method 9**	
5. Visible Emissions Comment (limit to 200 characters): **Maximum for oil firing.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 1 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number: Serial Number:	
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **NO_x CEM proposed to meet requirements of 40 CFR Part 75.**	

H. VISIBLE EMISSIONS INFORMATION
(Only Regulated Emissions Units Subject to a VE Limitation)

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: [X] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **6** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-201.700(1), Allowed for 2 hours (120 minutes) per 24 hours for start up, shutdown and malfunction.**	

I. CONTINUOUS MONITOR INFORMATION
(Only Regulated Emissions Units Subject to Continuous Monitoring)

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: **Not yet determined** Manufacturer: Model Number:	Serial Number:
5. Installation Date: **01 Jun 2002**	6. Performance Specification Test Date:
7. Continuous Monitor Comment (limit to 200 characters): **Parameter Code: WTF. Required by 40 CFR Part 60; subpart GG; 60.334.**	

J. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements

1. Process Flow Diagram [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
2. Fuel Analysis or Specification [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
3. Detailed Description of Control Equipment [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
4. Description of Stack Sampling Facilities [X] Attached, Document ID: PSD-PRS [ ] Not Applicable [ ] Waiver Requested	
5. Compliance Test Report [ ] Attached, Document ID:________ [ ] Previously submitted, Date:______________ [X] Not Applicable	
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
7. Operation and Maintenance Plan [ ] Attached, Document ID:________ [X] Not Applicable [ ] Waiver Requested	
8. Supplemental Information for Construction Permit Application [X] Attached, Document ID: PSD-PRS [ ] Not Applicable	
9. Other Information Required by Rule or Statute [X] Attached, Document ID: PSD-PRS [ ] Not Applicable	
10. Supplemental Requirements Comment:	

Additional Supplemental Requirements for Title V Air Operation Permit Applications

11. Alternative Methods of Operation [ ] Attached, Document ID:________ [ ] Not Applicable
12. Alternative Modes of Operation (Emissions Trading) [ ] Attached, Document ID:________ [ ] Not Applicable
13. Identification of Additional Applicable Requirements [ ] Attached, Document ID:________ [ ] Not Applicable
14. Compliance Assurance Monitoring Plan [ ] Attached, Document ID:________ [ ] Not Applicable
15. Acid Rain Part Application (Hard-copy Required) [ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a)) Attached, Document ID:________ [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) Attached, Document ID:________ [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.) Attached, Document ID:________ [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) Attached, Document ID:________ [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) Attached, Document ID:________ [ ] Phase NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) Attached, Document ID:________ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through J as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application.

A. GENERAL EMISSIONS UNIT INFORMATION
(All Emissions Units)

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in This Section: (Check one)

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Regulated or Unregulated Emissions Unit? (Check one)

[ ] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[X] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

3. Description of Emissions Unit Addressed in This Section (limit to 60 characters):

Unreg. Emissions Activities - 2 Tanks at 1.5 M gallons each

4. Emissions Unit Identification Number: [ ] No ID
ID: [X] ID Unknown

5. Emissions Unit Status Code:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C		**49**	[ ]

9. Emissions Unit Comment: (Limit to 500 Characters)

This emission unit information section addresses two 1.5 million gallon tanks as unregulated emission units. NSPS Subpart Kb recordkeeping requirements are applicable; there is no emission limiting or work practice standards. See Attachment PSD-PRS.

Emissions Unit Control Equipment

1. Control Equipment/Method Description (Limit to 200 characters per device or method):
2. Control Device or Method Code(s):

Emissions Unit Details

1. Package Unit: Manufacturer:	Model Number:	
2. Generator Nameplate Rating:	MW	
3. Incinerator Information: Dwell Temperature: Dwell Time: Incinerator Afterburner Temperature:		 °F seconds °F

E. SEGMENT (PROCESS/FUEL) INFORMATION
(All Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type) (limit to 500 characters): **No. 2 Distillate Oil/Diesel**		
2. Source Classification Code (SCC): **A2505030090**	3. SCC Units: **1,000 gallons used**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **29,340**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment (limit to 200 characters): **Annual rate combined for both tanks based on inputs to CTs; 18,560 Btu/lb (LHV); and 7.1 lb/gal at 59°F.**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type) (limit to 500 characters):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment (limit to 200 characters):		

F. EMISSIONS UNIT POLLUTANTS
(All Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			NS

PART B

REPORT

1.0 INTRODUCTION

Peace River Station, L.L.C. proposes to license, construct, and operate a nominal 525-megawatt (MW) power production facility, referred to as the Peace River Station (the "Project"), in the City of Fort Meade, Polk County, Florida (Figure 1-1). The site will be located on a 31.55-acre tract.. The Project consists of three 175-MW dual-fuel, General Electric Frame 7FA combustion turbines (CTs) that will use dry low-nitrogen oxide (NO_x) (DLN) combustion technology when operating on natural gas and water injection (for NO_x control) when operating on distillate fuel oil. The facility is designed for peaking service. The primary fuel for the combustion turbines will be natural gas with distillate fuel oil used as backup fuel. Fuel oil will contain a maximum sulfur content of 0.05 percent.

The permitting of the Project in Florida requires an air construction permit and prevention of significant deterioration (PSD) review approval. To assist in performing the necessary licensing activities, Peace River Station, L.L.C. has contracted Golder Associates Inc. (Golder) to perform the necessary air quality assessments for determining the Project's compliance with state and federal new source review (NSR) regulation, including PSD and nonattainment review requirements. The critical aspects of these assessments include the air quality impact analyses performed using an air dispersion model and the best available control technology (BACT) analyses performed to evaluate the selected emission control technology.

The proposed Project will be a new air pollution source that will result in increases in air emissions in Polk County. The U.S. Environmental Protection Agency (EPA) has implemented regulations requiring a PSD review. PSD regulations are promulgated under Volume 40 Code of Federal Regulations (CFR) Part 52.21 and implemented through delegation to the Florida Department of Environmental Protection (DEP). Florida's PSD regulations are codified in Rules 62-212.400, F.A.C. These regulations incorporate the EPA PSD regulations.

Based on the emissions from the proposed Project, a PSD review is required for each of the following regulated pollutants:

- Particulate matter (PM) as total suspended particulate matter (TSP),
- Particulate matter with aerodynamic diameter of 10 microns or less (PM_{10}),
- Nitrogen dioxide (NO_2),
- Sulfur dioxide (SO_2),
- Carbon monoxide (CO), and
- Sulfuric acid mist.

Polk County has been designated as an attainment area for all criteria pollutants [i.e., attainment: ozone (O_3), PM_{10}, SO_2, CO, and NO_2; unclassifiable: lead] and is classified as a PSD Class II area for PM_{10}, SO_2, and NO_2; therefore, the PSD review will follow regulations pertaining to such designations.

The air permit application is divided into seven major sections.

- Section 2.0 presents a description of the facility, including air emissions and stack parameters.
- Section 3.0 provides a review of the PSD and nonattainment requirements applicable to the proposed Project.
- Section 4.0 includes the control technology review with discussions on BACT.
- Section 5.0 discusses the ambient air monitoring analysis (pre-construction monitoring) required by PSD regulations.
- Section 6.0 presents a summary of the air modeling approach and results used in assessing compliance of the proposed Project with ambient air quality standards (AAQS), PSD increments, and good engineering practice (GEP) stack height regulations.
- Section 7.0 provides the additional impact analyses for soils, vegetation, and visibility.

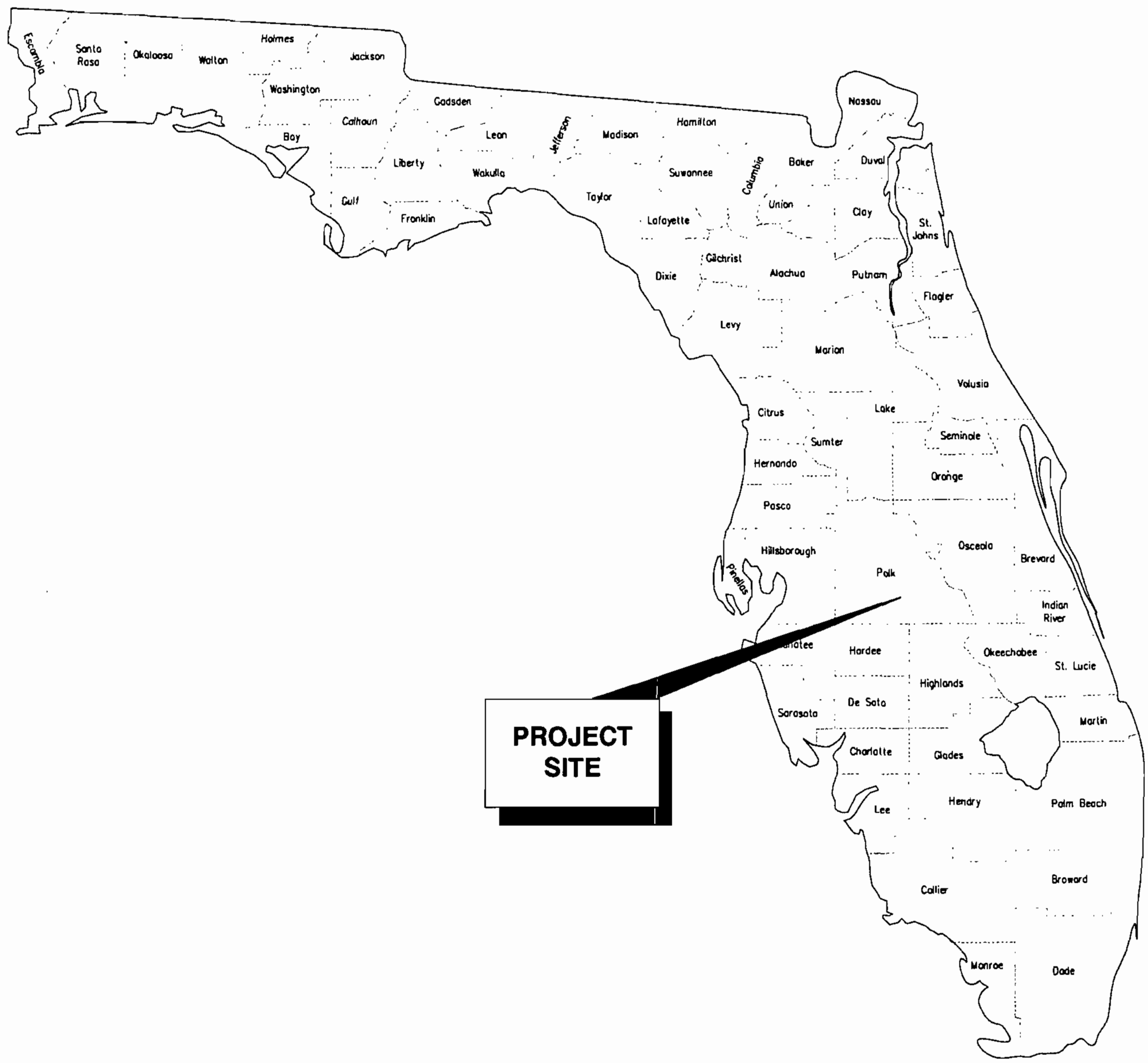


Figure 1-1. General Site Location

2.0 PROJECT DESCRIPTION

2.1 SITE DESCRIPTION

The Project site, shown in Figure 2-1, consists of about 31.55 acres that are currently agricultural. There is industrial, commercial, and residential development within a 3-kilometer (km) radius of the site; however, this development is located about 0.8 km (0.5 miles) to the east in the City of Fort Meade. The plant elevation will be approximately 130 feet above sea level. The terrain surrounding the site is flat.

The Project will connect to the electrical grid at the existing Florida Power Corporation (FPC) Fort Meade Substation located adjacent to and west of the southwest boundary of the site. The Project will likely connect to an existing natural gas pipeline lateral from the Florida Gas Transmission Company's (FGT) transmission pipeline or one of two proposed new pipelines to be located near the site. Natural gas will be transported to the site via a new pipeline lateral to be constructed to the site. Distillate fuel oil will be delivered by truck and stored in tanks located at the plant site.

Water for the NO_x control when firing oil will be supplied by the City of Fort Meade. Potable water and additional fire protection supply water will be served by the City of Fort Meade.

2.2 POWER PLANT

The proposed Project will consist of three General Electric Frame 7FA CTs and associated facilities. The annual maximum capacity factor of the plant will be 39 percent, which is equivalent to operating 3,390 hours per year at full load. Natural gas will be used as the primary fuel, and fuel oil will be used as a backup fuel. Fuel oil usage will be limited to the equivalent of 720 hours per year at full load.

Plant performance with General Electric 7FA combustion turbines was developed for natural gas and oil; at 50-, 75-, and 100-percent load; and at 32°F, 59°F, and 95°F turbine inlet temperatures. Combustion turbine performance is based on a performance envelope developed from General Electric.

The CTs will be capable of normal steady state operation from 50 to 100 percent of baseload. The efficiency of the CTs decreases at part load. As a result, the economic incentive is to dispatch the plant to keep the units operating as near baseload as possible.

Natural gas will be transported to the site via pipeline and fuel oil will be trucked to the site. The distillate fuel oil, which will have a maximum sulfur content of 0.05 percent, will be stored onsite in two aboveground storage tanks, each sized to hold approximately 35,714 barrels (1.5 million gallons).

Air emissions control will consist of using state-of-the-art dry low-NO_x burners in the CTs when firing natural gas. The General Electric Frame 7FA will be equipped with the General Electric dry low-NO_x (DLN- NO_x) combustion system that regulates the distribution of fuel delivery to a multi-nozzle, total premix combustor arrangement. The fuel flow distribution to each combustion system fuel nozzle is regulated to maintain unit load and optimum turbine emissions. Water injection will be used for NO_x control when firing distillate fuel oil. The SO_2 emissions will be controlled by the use of low-sulfur fuels. Good combustion practices and clean fuels will also minimize potential emissions of PM, CO, VOC, and other pollutants (e.g., trace metals). These engineering and environmental designs maximize control of air emissions while minimizing economic, environmental, and energy impacts (see Section 4.0 for the BACT evaluation).

2.3 PROPOSED SOURCE EMISSIONS AND STACK PARAMETERS

The estimated maximum hourly emissions and exhaust information representative of the proposed CT design operating at baseload conditions (100-percent load), 75-percent load and 50-percent load conditions are presented in Tables 2-1 and 2-2. The information is presented in these tables for one unit simple cycle operation based on natural gas combustion and fuel oil combustion. The data are presented for turbine inlet temperatures of 32°F, 59°F, and 95°F. These temperatures represent the range of ambient temperatures that the CTs are most likely to experience.

The performance calculations for the operating conditions are given in Appendix A.

The pollutant gaseous emission concentrations and PM_{10} emission rates for the proposed CTs at baseload conditions and ambient temperature of 59 °F are as follows:

Pollutant	Natural Gas	Distillate Oil
NO_x, ppmvd @ 15% O_2	9	42
CO, ppmvd	10	20
VOC as CH_4, ppmvd @ 15% O_2	2.0	2.8
SO_x as SO_2	Calculated Based on Fuel (2.0 grains S/100 SCF)	Calculated Based on Fuel (0.05% sulfur)
PM_{10} lb/hr (dry filterable)	11	22

The maximum short-term emission rates (lb/hr) generally occur at baseload, 32°F operation, where the CT has the greatest output and greatest fuel consumption.

Based on a turbine inlet temperature of 59°F, the emission rates used to calculate maximum potential annual emissions for the proposed facility for regulated air pollutants for one and three CTs are presented in Table 2-3. To produce the maximum annual emissions, the CTs are assumed to operate at baseload for 3,390 hours (39 percent capacity factor) firing natural gas for 2,670 hours and fuel oil for 720 hours. The potential emissions are based on the 59°F turbine inlet air condition since it represents a nominal average between the higher emission levels at the 32°F turbine inlet condition (winter) and the infrequent 95°F turbine inlet condition (summer). A summary of the maximum potential annual emissions for the Project is presented in Table 2-4 and the Project's emissions are compared to the PSD significant emission rates. As shown, the Project's emissions are major for NO_x and greater than the significant emission rates for SO_2, PM, PM_{10}, CO, and sulfuric acid mist.

Process flow diagrams of the turbine operating at turbine inlet temperature of 32°F, 59°F, and 95°F are presented in Figures 2-2 through 2-4, respectively for the CT.

Based on a review of the emission rates for natural gas and fuel oil combustion, the highest emission rates for the regulated pollutants generally occur when firing fuel oil. Combustion of natural gas and fuel oil result in slightly different exhaust flow gas rates and stack exit temperatures; however, the differences are minor.

As discussed in Section 6.0, the air modeling analyses that addressed compliance with ambient standards were based on modeling the CTs for the operating load and ambient temperature which produced the maximum impacts from the load impact analysis that was performed. Although the highest emission rates occur with low turbine inlet temperatures (i.e., 32°F) and baseload conditions, the lowest exhaust gas flow rates occur with a turbine inlet temperature of 95°F and 50 percent operating load. Since this low exhaust flow condition can result in potentially higher impacts due to lower plume rise (i.e., due to lower exit velocity and temperature), the load analysis included modeling the CTs for the following six scenarios designed to determine the maximum impacts for the Project:

- Base operating load for the turbine inlet temperatures of 32°F and 95°F;
- A 75-percent operating load for the turbine inlet temperatures of 32°F and 95°F; and
- A 50-percent operating load for the turbine inlet temperatures of 32°F and 95°F.

2.4 SITE LAYOUT, STRUCTURES, AND STACK SAMPLING FACILITIES

The plot plan of the proposed facility is presented in Figure 2-5. The dimensions of the buildings and structures are presented in Section 6.0. Stack sampling facilities will be constructed in accordance to Rule 62-297.310(6) F.A.C.

The plot plan shows facility property lines, major process equipment and structures, and all emission points. The entrance to the site will have security gates to control site access. The fenced property boundary is shown in the figure.

Table 2-1. Stack, Operating, and Emission Data for Simple Cycle Combustion Turbine
Natural Gas Firing

Parameter		Operating and Emission Data [a] for Ambient Temperarure			
		32 °F	59 °F	75 °F	95 °F
Stack Data (ft)					
Height		60	60	60	60
Diameter		21	21	21	21
100 Percent Load					
Operating Data					
Temperature (°F)		1,076	1,097	1,115	1,124
Velocity (ft/sec)		118.6	115.8	112.4	110.4
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	10.4	10.0	9.5	9.3
PM/PM10	lb/hr	11.0	11.0	11.0	11.0
NO_x	lb/hr	71.9	69.3	65.7	63.9
CO	lb/hr	35.9	34.3	32.4	31.4
VOC (as methane)	lb/hr	4.2	4.1	3.9	3.8
Sulfuric Acid Mist	lb/hr	2.39	2.30	2.19	2.13
Mercury	lb/hr	1.49E-06	1.43E-06	1.36E-06	1.32E-06
75 Percent Load					
Operating Data					
Temperature (°F)		1,164	1,179	1,180	1,180
Velocity (ft/sec)		100.1	96.7	94.6	91.7
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	8.6	8.1	7.8	7.3
PM/PM10	lb/hr	11.0	11.0	11.0	11.0
NO_x	lb/hr	59.3	55.9	53.7	50.6
CO	lb/hr	28.5	27.2	26.2	25.3
VOC (as methane)	lb/hr	3.4	3.2	3.1	3.1
Sulfuric Acid Mist	lb/hr	1.97	1.86	1.79	1.68
Mercury	lb/hr	1.23E-06	1.16E-06	1.11E-06	1.05E-06
50 Percent Load					
Operating Data					
Temperature (°F)		1,076	1,048	1,049	1,052
Velocity (ft/sec)		82.9	81.0	79.7	78.0
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	6.5	6.1	5.9	5.6
PM/PM10	lb/hr	11.0	11.0	11.0	11.0
NO_x	lb/hr	44.7	42.1	40.6	38.5
CO	lb/hr	25.2	25.1	24.3	23.6
VOC (as methane)	lb/hr	3.0	3.0	2.8	2.8
Sulfuric Acid Mist	lb/hr	1.49	1.40	1.35	1.28
Mercury	lb/hr	9.28E-07	8.72E-07	8.40E-07	7.97E-07

[a] Refer to Appendix A for detailed information. Data at 100% load for 95 °F are based on evaporative cooler on and operating at 95 percent efficiency.

[b] Other regulated pollutants are assumed to have negligible emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, MSW Organics, Metals and Acid Gases.

Basis for pollutant emission rates at 59 °F ambient temperature are:

SO_2 = 2.0 grain sulfur/ 100 cubic feet
PM/PM10 = dry filterables
NO_x = 10.0 ppmvd at 15% O_2
CO = 10.0 ppmvd
VOC = 2 ppmvd100 and 75% load; 2.1 ppmvd at 50% load
Sulfuric acid mist = 15% SO_2 emissions
Mercury = Gas: 0.0008 lb/10^{12} Btu.

Table 2-2. Stack, Operating, and Emission Data for the Simple Cycle Combustion Turbine
Distillate Fuel Oil Firing

Parameter		Operating and Emission Data [a] for Ambient Temperarure			
		32 °F	59 °F	75 °F	95 °F
Stack Data (ft)					
Height		60	60	60	60
Diameter		21	21	21	21
100 Percent Load					
Operating Data					
Temperature (°F)		1,054	1,078	1,101	1,111
Velocity (ft/sec)		121.7	119.1	116.0	114.0
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	106.9	103.2	98.9	96.2
PM/PM10	lb/hr	22.0	22.0	22.0	22.0
NO_x	lb/hr	352.1	340.1	326.0	316.9
CO	lb/hr	72.6	69.4	65.6	63.5
VOC (as methane)	lb/hr	8.1	7.8	7.5	7.3
Sulfuric Acid Mist	lb/hr	24.55	23.70	22.72	22.10
Mercury	lb/hr	1.23E-03	1.19E-03	1.14E-03	1.11E-03
75 Percent Load					
Operating Data					
Temperature (°F)		1,145	1,172	1,180	1,180
Velocity (ft/sec)		101.4	98.1	96.0	93.1
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	87.2	83.0	79.9	75.3
PM/PM10	lb/hr	22.0	22.0	22.0	22.0
NO_x	lb/hr	287.3	273.5	263.1	248.2
CO	lb/hr	56.9	53.8	51.6	50.0
VOC (as methane)	lb/hr	6.4	6.1	5.9	5.7
Sulfuric Acid Mist	lb/hr	20.03	19.06	18.35	17.30
Mercury	lb/hr	1.00E-03	9.56E-04	9.20E-04	8.67E-04
50 Percent Load					
Operating Data					
Temperature (°F)		1,040	1,018	1,020	1,025
Velocity (ft/sec)		83.6	81.9	80.6	78.9
Maximum Hourly Emissions per Unit [b]					
SO_2	lb/hr	64.9	61.3	59.1	56.2
PM/PM10	lb/hr	22.0	22.0	22.0	22.0
NO_x	lb/hr	213.9	201.8	194.8	185.2
CO	lb/hr	51.0	50.7	49.1	47.8
VOC (as methane)	lb/hr	5.6	5.6	5.5	5.4
Sulfuric Acid Mist	lb/hr	4.97	4.69	4.52	4.30
Mercury	lb/hr	7.47E-04	7.05E-04	6.80E-04	6.46E-04

[a] Refer to Appendix A for detailed information. Data at 100% load for 95 °F are based on evaporative cooler on and operating at 95 percent efficiency.

[b] Other regulated pollutants are assumed to have negligible and minor amounts of emissions. These pollutants include lead, reduced sulfur compounds, hydrogen sulfide, fluorides, MWC Organics, Metals and Acid Gases.

Basis for pollutant emission rates at 59 °F ambient temperature are:

SO_2 = 0.05% S in fuel oil
PM/PM10 = dry filterables
NO_x = 42 ppmvd at 15% O_2
CO = 20.1 ppmvd at 100 and 75% loads; 24.7 ppmvd at 50% load
VOC = 4 ppmvd at 100 and 75% loads; 4.7 ppmvd at 50% load
Sulfuric acid mist = 15% SO_2 emissions
Mercury = Oil: 0.626 lb/10^{12} Btu

Table 2-3 Summary of Maximum Potential Annual Emissions for the Simple Cycle Combustion Turbine Project

	Hourly Emissions (lb/hr)[a]						Maximum Emissions (tons/year)[b]	
Load:	100%	75%	50%	100%	75%	50%		
Pollutant / Fuel:	Gas	Gas	Gas	Oil	Oil	Oil	Case A	Case B
One Combustion Turbine- Simple Cycle								
SO2	10.0	8.11	6.10	103	83.0	61.3	17.0	50.5
PM/PM10	11.0	11.0	11.0	22.0	22.0	22.0	18.6	22.6
NOx	69.3	55.9	42.1	340	274	202	117	215
CO	34.3	27.2	25	69.4	53.8	50.7	58.1	70.8
VOC (as methane)	4.05	3.24	2.97	7.80	6.10	5.60	6.9	8.2
Sulfuric Acid Mist	2.30	1.86	1.40	23.70	19.06	4.69	3.9	11.6
Mercury	1.43E-06	1.16E-06	8.72E-07	1.19E-03	9.56E-04	7.05E-04	2.4E-06	4.3E-04
Lead	NEG	NEG	NEG	7.38E-03	5.93E-03	4.38E-03	NEG	2.7E-03
Fluorides	NEG	NEG	NEG	2.22E-02	1.79E-02	1.32E-02	NEG	8.0E-03
MWC Organics (as 2,3,7,8-TCDD)	3.64E-09	2.95E-09	2.22E-09	2.60E-07	2.09E-07	1.54E-07	6.2E-09	9.8E-08
MWC Metals (as Be and Cd)	NEG	NEG	NEG	2.44E-03	1.96E-03	1.45E-03	NEG	8.8E-04
MWC Acid Gases (as HCl)	NEG	NEG	NEG	1.44E-01	1.16E-01	1.60E-08	NEG	5.2E-02
Three Combustion Turbines- Simple Cycle								
SO2	30.1	24.3	18.3	310	249	184	51.0	152
PM/PM10	33.0	33.0	33.0	66.0	66.0	66.0	55.9	67.8
NOx	208	168	126	1,020	821	605	352	645
CO	103	82	75	208	161	152	174	212
VOC (as methane)	12.2	9.72	8.91	23.4	18.3	16.8	20.6	24.6
Sulfuric Acid Mist	6.91	5.59	4.20	71.1	57.2	14.1	11.7	34.8
Mercury	4.30E-06	3.48E-06	2.62E-06	3.56E-03	2.87E-03	2.12E-03	7.29E-06	1.29E-03
Lead	NEG	NEG	NEG	2.2E-02	1.8E-02	1.3E-02	NEG	8.0E-03
Fluorides	NEG	NEG	NEG	6.7E-02	5.4E-02	4.0E-02	NEG	2.4E-02
MWC Organics (as 2,3,7,8-TCDD)	1.09E-08	8.85E-09	6.65E-09	7.8E-07	6.3E-07	4.6E-07	1.9E-08	2.9E-07
MWC Metals (as Be and Cd)	NEG	NEG	NEG	7.3E-03	5.9E-03	4.3E-03	NEG	2.6E-03
MWC Acid Gases (as HCl)	NEG	NEG	NEG	4.3E-01	3.5E-01	4.8E-08	NEG	1.6E-01

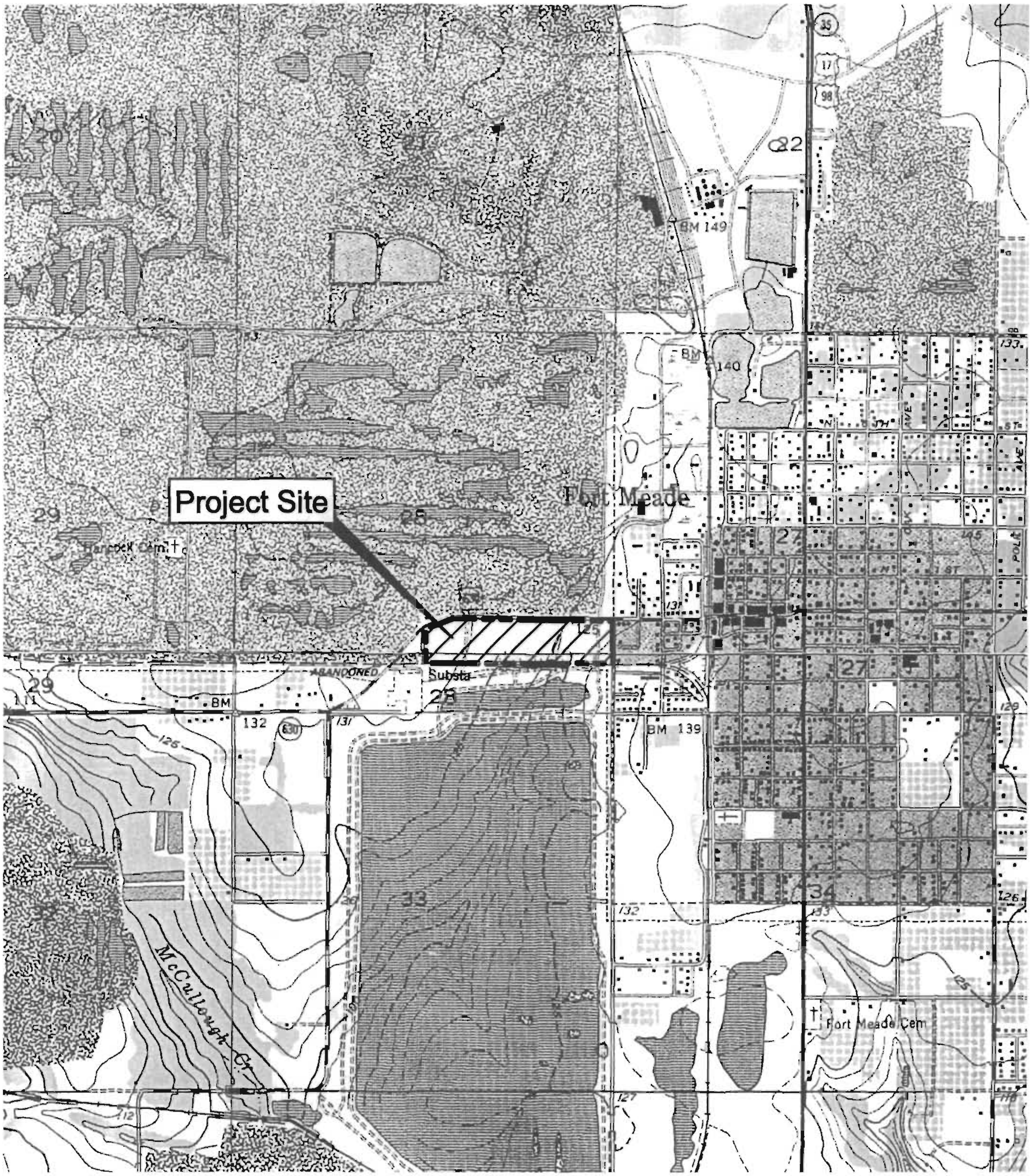
[a] Based on 59 °F ambient inlet air temperature. See Appendix A for details of emission factors used for each pollutant.

[b] Maximim emission cases:

Operation	Number of Hours for Operation: Case A	Case B
Natural gas- 100 % Load	3,390	2,670
Fuel oil- 100 % Load	0	720
Total hours	3,390	3,390

Table 2-4 Maximum Potential Annual Emissions for the Simple Cycle Combustion Turbine Project
Compared to the PSD Significant Emission Rates

Pollutant	Fuel	Load	Annual Emissions (tons/year) based on following hours of operation		Maximum Annual Emissions (tons/year)	PSD Significant Emission Rate (tons/year)	PSD Review Required?
	Gas	100% :	3,390	2,670			
	Oil	100% :	0	720			
SO2			51	152	152	40	Yes
PM			56	68	68	25	Yes
PM10			56	68	68	15	Yes
NOx			352	645	645	40	Yes
CO			174	212	212	100	Yes
VOC (as methane)			21	25	25	40	No
Sulfuric Acid Mist			12	35	35	7	Yes
Mercury			7.29E-06	1.29E-03	1.29E-03	0.1	No
Lead			NEG	7.97E-03	7.97E-03	0.6	No
Fluorides			NEG	2.40E-02	2.40E-02	3	No
MWC Organics (as 2,3,7,8-TCDD)			1.85E-08	2.95E-07	2.95E-07	3.50E-06	No
MWC Metals (as Be and Cd)			NEG	2.63E-03	2.63E-03	15	No
MWC Acid Gases (as HCl)			NEG	1.56E-01	1.56E-01	40	No



REFERENCE

USGS 7.5 Minute Topographic Quadrangles, Homeland & Bowling Green, Florida

0 500 1000 2000
SCALE

N

Golder Associates

Tampa, Florida

Site Location and Topographic Map

Client / Project	CAD BY: CDT	SCALE: 1"=2000'	Job No. 993-9562
	CHK BY: SP	DATE: 04/21/00	FIGURE 2-1
	REV BY: –	FILE No.: site-topo.dwg	

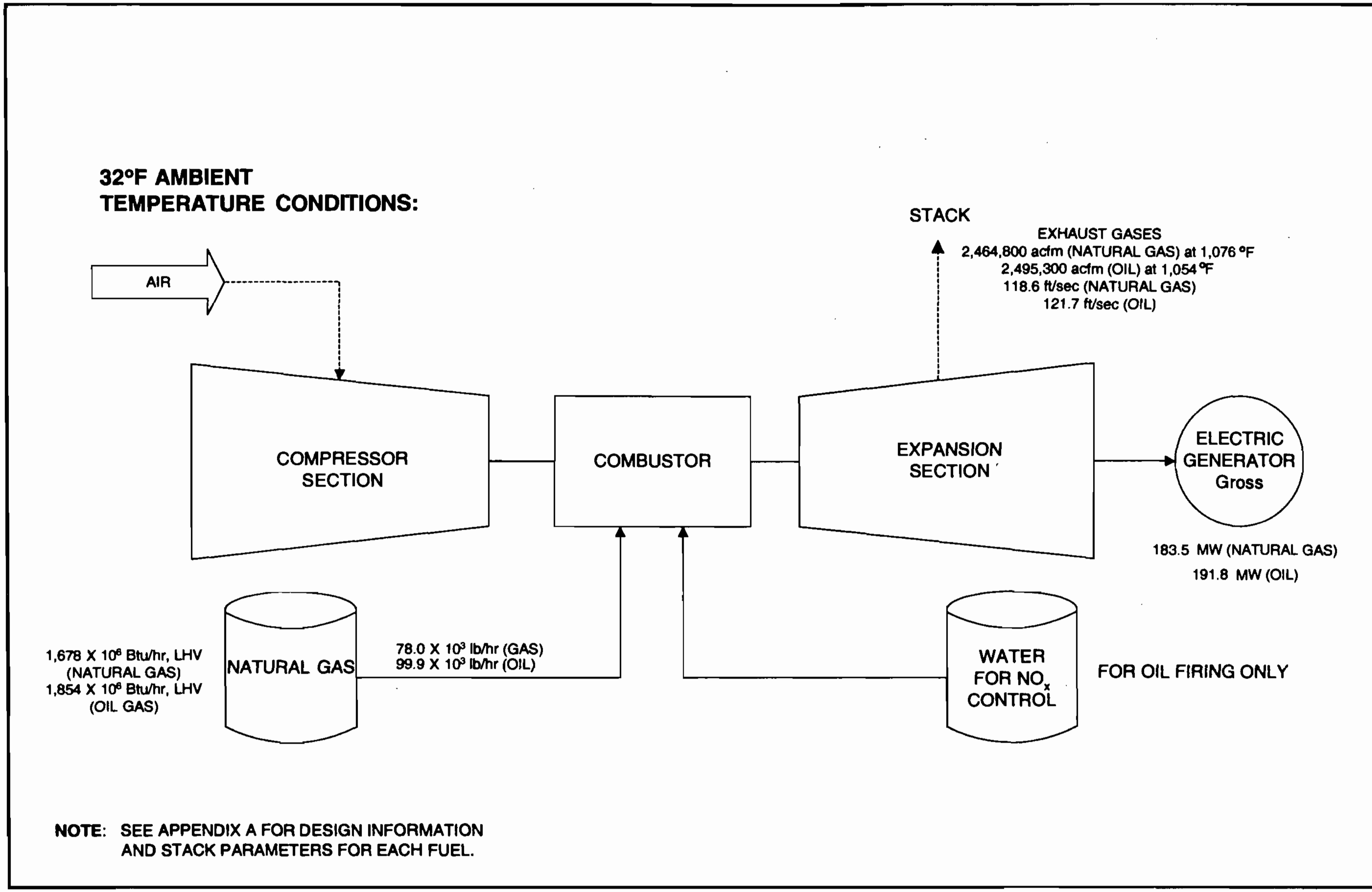


Figure 2-2
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Winter Design Conditions
Decker / Peace River Station

Process Flow Legend	
Solid/Liquid	——→
Gas	- - - - →
Steam	·········→

Project No. 9939562-0100

Filename: Peaceriver.VSD

Date: 5/17/00

Golder Associates

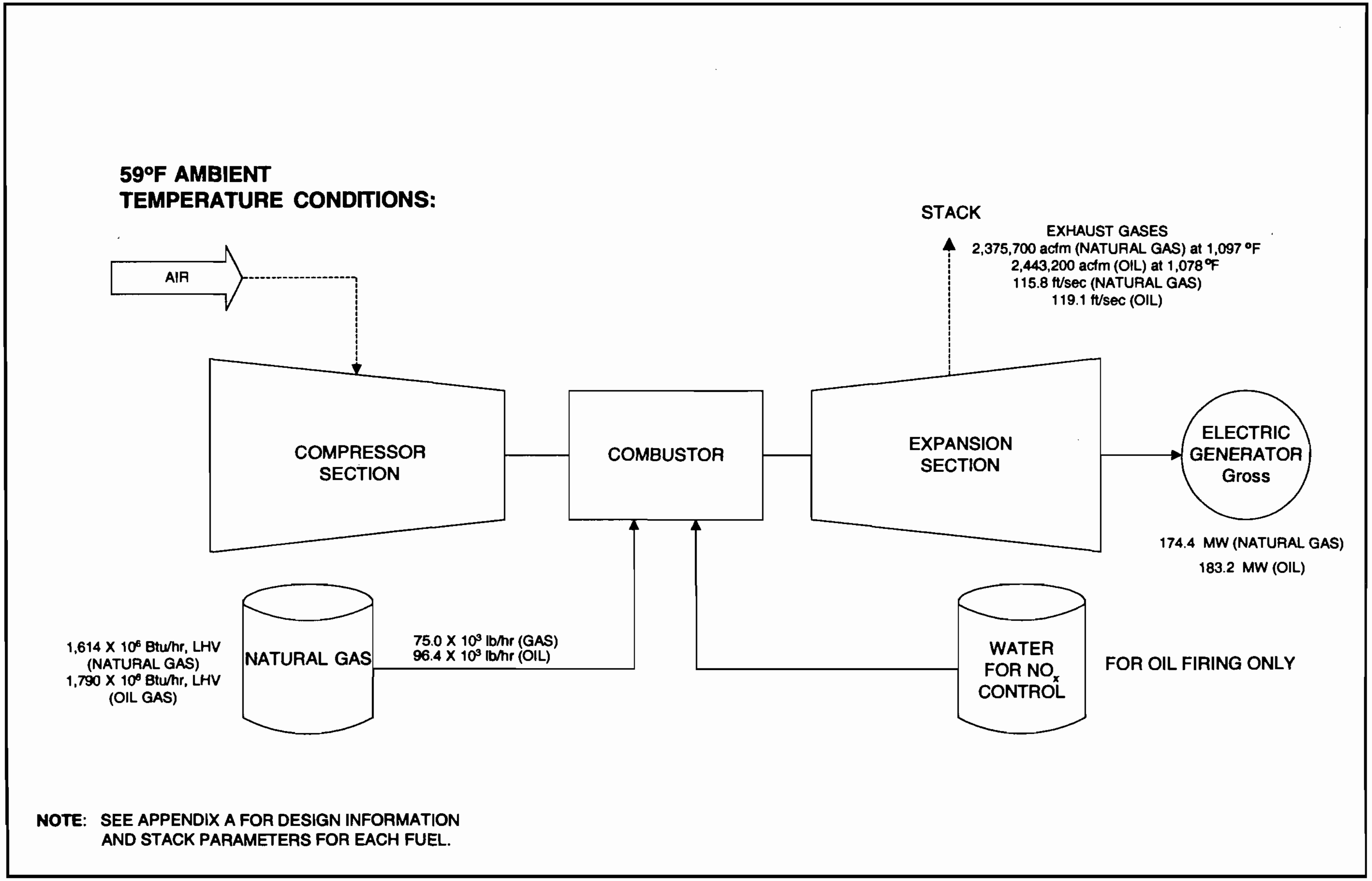
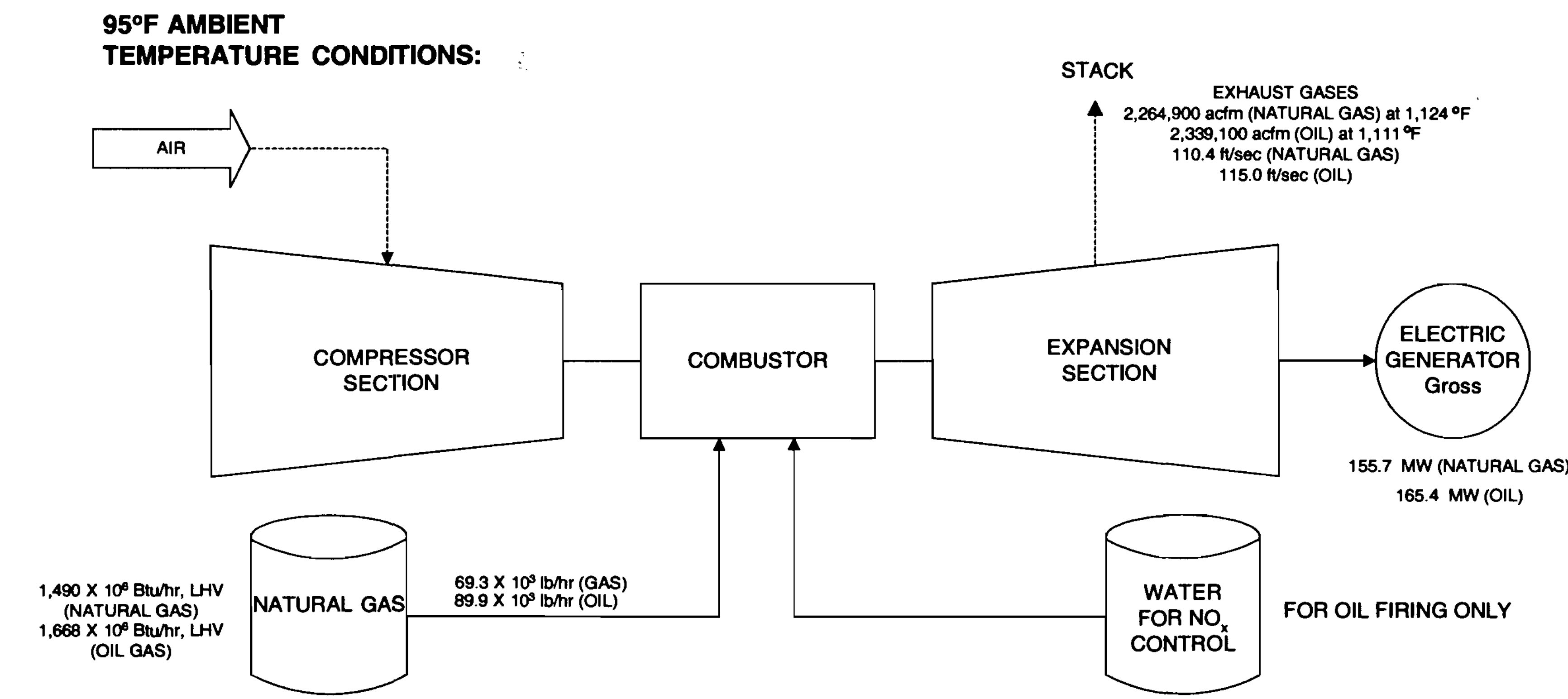


Figure 2-3
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Annual Design Conditions
Decker / Peace River Station

Process Flow Legend
Solid/Liquid ———→
Gas - - - - →
Steam ———→

Project No. 9939562-0100
Filename: Peaceriver.VSD
Date: 5/17/00

Golder Associates



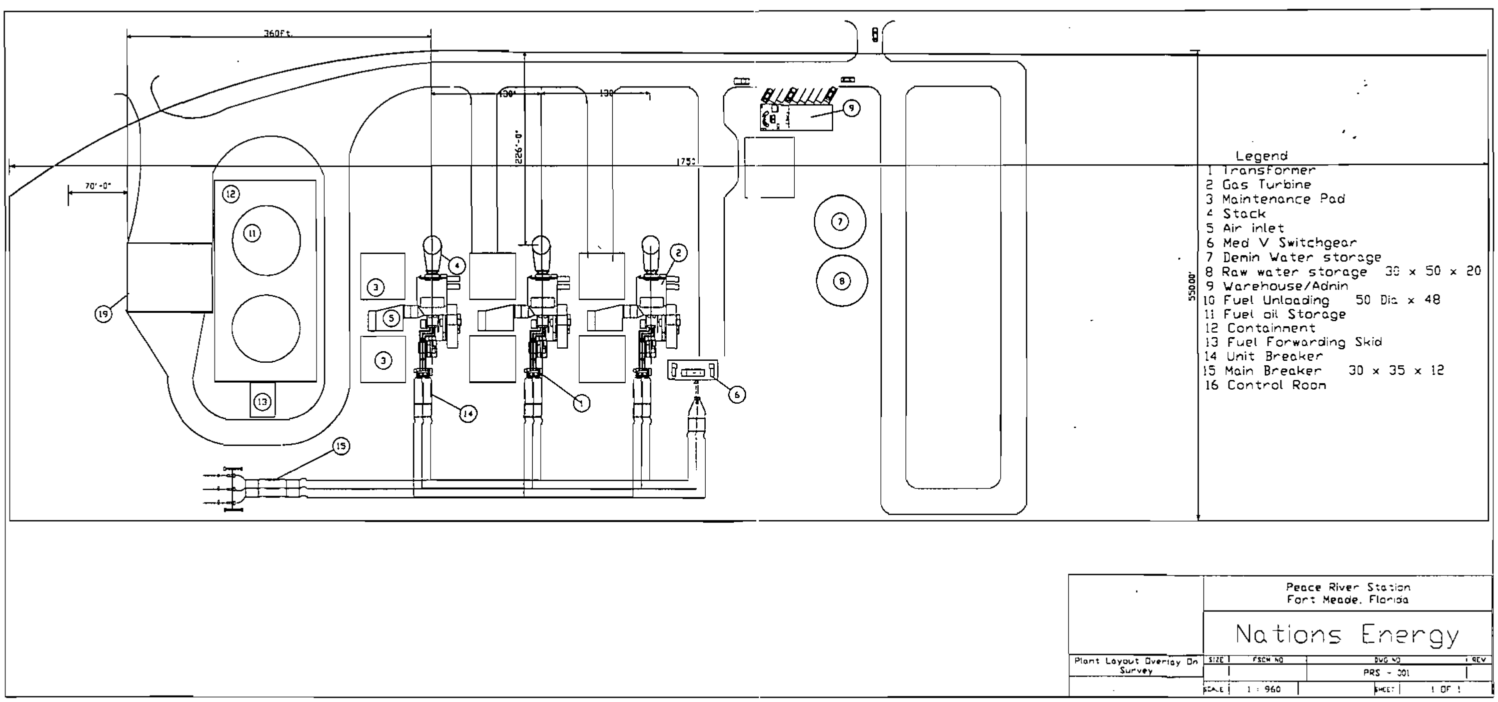
NOTE: SEE APPENDIX A FOR DESIGN INFORMATION AND STACK PARAMETERS FOR EACH FUEL.

Figure 2-4
Simplified Flow Diagram of Proposed "F" Class Combustion Turbine
Baseload, Summer Design Conditions
Decker / Peace River Station

Process Flow Legend
Solid/Liquid ⟶
Gas - - - -→
Steam ⟶

Project No. 9939562-0100
Filename: Peaceriver.VSD
Date: 5/17/00

Golder Associates


360Ft.
130'
130'
226'-0"
175'
70'-0"
550.00'
Legend
1 Transformer
2 Gas Turbine
3 Maintenance Pad
4 Stack
5 Air inlet
6 Med V Switchgear
7 Demin Water storage
8 Raw water storage 30 x 50 x 20
9 Warehouse/Admin
10 Fuel Unloading 50 Dia x 48
11 Fuel oil Storage
12 Containment
13 Fuel Forwarding Skid
14 Unit Breaker
15 Main Breaker 30 x 35 x 12
16 Control Room
Peace River Station
Fort Meade, Florida
Nations Energy
Plant Layout Overlay On Survey
SIZE
FSCM NO
DWG NO
REV
PRS - 301
SCALE 1 : 960
SHEET 1 OF 1

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the proposed Peace River Station. These regulations must be satisfied before the proposed Project can begin operation.

3.1 NATIONAL AND STATE AAQS

The existing applicable National and Florida Ambient Air Quality Standards (AAQS) are presented in Table 3-1. National primary AAQS were promulgated to protect the health of the general public, including the young, elderly, and those with respiratory ailments. National secondary AAQS were promulgated to protect the public welfare, including consideration of economic interests, vegetation, visibility, and other factors, with an adequate margin of safety from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

Florida has adopted EPA's primary and secondary AAQS in Chapter 62-204, F.A.C. In addition, Florida has additional AAQS for SO_2 of 60 and 260 $\mu g/m^3$ for the annual and 24-hour averaging periods, respectively, not to be exceeded more than once per year.

3.2 PSD REQUIREMENTS

3.2.1 GENERAL REQUIREMENTS

Under federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a pre-construction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by EPA; therefore, PSD approval authority has been granted to DEP.

A "major facility" is defined as any one of 28 named source categories that have the potential to emit 100 tons per year (TPY) or more or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

A "major modification" is defined under PSD regulations as a change at an existing major facility that increases emissions by greater than significant amounts. PSD significant emission rates are shown in Table 3-2.

EPA has promulgated as regulations certain increases above an air quality baseline concentration level of SO_2, PM_{10}, and NO_2 concentrations that would constitute significant deterioration. The EPA class designations and allowable PSD increments are presented in Table 3-1. The State of Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2 increments.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations by reference [Rule 62-212.400 F.A.C.]. Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility also must be reviewed with respect to GEP stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 CONTROL TECHNOLOGY REVIEW

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission-limiting standards be met, and that BACT be applied to control emissions from the source (Rule 62-212.410, F.A.C.). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in 52.21 (b)(12) and Rule 62-210.200(40), F.A.C., as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction of each pollutant subject to regulation under the Act which would be emitted by any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice, or operation and shall provide for compliance by means which achieve equivalent results.

BACT was promulgated within the framework of the PSD requirements in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the *PSD Workshop Manual* (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with new source performance standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and PSD Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, EPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the EPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program, including the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emissions limit that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), location differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified. EPA has issued a draft guidance document on the top-down approach entitled *Top-Down Best Available Control Technology Guidance Document* (EPA, 1990).

3.2.3 SOURCE IMPACT ANALYSIS

A source impact analysis must be performed for a proposed major source subject to PSD review for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (Revised). The source impact analysis for criteria pollutants to address compliance with AAQS and PSD Class II increments may be limited to the new or modified source if the net increase in impacts as a result of the new or modified source is above significance levels, as presented in Table 3-1.

The EPA has proposed significant impact levels (SILs) for Class I areas. The National Park Service (NPS) as the designated agency for oversight in air quality impacts to Class I areas has also recommended significant impact levels for PSD Class I areas. The EPA proposed Class I SILs are as follows:

Pollutant	Averaging Time	Proposed EPA PSD Class I Significant Impact Levels (μg/m³)
SO_2	3-hour	1
	24-hour	0.2
	Annual	0.1
PM_{10}	24-hour	0.3
	Annual	0.2
NO_2	Annual	0.1

[a] μg/m³ = micrograms per cubic meter.

Although these levels have not been officially promulgated as part of the PSD review process and may not be binding for states in performing PSD review, the proposed levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing NSR provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the proposed rules concerning the significant impact levels is appropriate in order to assist states in implementing the PSD permit process.

Various lengths of record for meteorological data can be used for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM(TSP) concentrations, or February 8, 1988, for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM(TSP) concentrations, and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM(TSP), and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO_2 and PM(TSP), and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM(TSP) has been set as December 27, 1977, for the entire State of Florida (Rule 62-275.700(1)(a), F.A.C.). The minor source baseline for NO_2

has been set as March 28, 1988 (Rule 62-275.700(3)(a), F.A.C). It should be noted that references to PM (TSP) are also applicable to PM_{10}.

3.2.4 AIR QUALITY MONITORING REQUIREMENTS

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(5)(f), F.A.C,, any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year generally is appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be used if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that Florida DEP may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2 (Rule 62-212.400-3, F.A.C.).

3.2.5 SOURCE INFORMATION/GOOD ENGINEERING PRACTICE STACK HEIGHT

Source information must be provided to adequately describe the proposed Project. The general type of information required for this Project is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by Florida DEP (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

   $$Hg = H + 1.5L$$

   where: Hg = GEP stack height,

   H = Height of the structure or nearby structure, and

   L = Lesser dimension (height or projected width) of nearby structure(s); or
3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 ADDITIONAL IMPACT ANALYSIS

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21(o); Rule 62-212.400(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.3 NONATTAINMENT RULES

Based on the current nonattainment provisions (Rule 62-212.500, F.A.C.), all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review. A new major facility is required to undergo this review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant. A major modification at a major facility is required to undergo review if it results in a significant net emission increase of 40 TPY or more of the nonattainment pollutant or if the modification is major (i.e., 100 TPY or more).

For major facilities or major modifications that locate in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The area of influence is defined as an area that is outside the boundary of a nonattainment area but within the locus of all points that are 50 km outside the boundary of the nonattainment area. Based on Rule 62-2.500(2)(c)2.a., F.A.C., all VOC sources that are located within an area of influence are exempt from the provisions of NSR for nonattainment areas. Sources that emit other nonattainment pollutants and are located within the area of influence are subject to nonattainment review unless the maximum allowable emissions from the proposed source do not have a significant impact within the nonattainment area.

3.4 EMISSION STANDARDS

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

The proposed Project will be subject to one or more NSPS. The CTs will be subject to 40 CFR Part 60, Subpart GG, and each fuel oil storage tank (2.8 million gallon capacity) will be subject to 40 CFR Part 60, Subpart Kb.

3.4.1.1 Combustion Turbine

The CTs will be subject to emission limitations covered under Subpart GG, which limits NO_x and SO_2 emissions from all stationary combustion turbines with a heat input at peak load equal to 10.7 gigajoules per hour (10 mmBtu/hr), based on the lower heating value of the fuel fired.

NO_x emissions are limited to 75 ppmvd corrected to 15 percent oxygen and heat rate while sulfur dioxide emissions are limited to using a fuel with a sulfur content of 0.8 percent. In addition to emission limitations, there are requirements for notification, record keeping, reporting, performance testing and monitoring. These are summarized below:

40 CFR 60.7 Notification and Record Keeping

(a)(1) Notification of the date of construction - 30 days after such date.

(a)(2) Notification of the date of initial start-up - no more than 60 days or less than 30 days prior to date.

(a)(3) Notification of actual date of initial start-up - within 15 days after such date.

(a)(5) Notification of date which demonstrates CEM - not less than 30 days prior to date.

60.7 (b) Maintain records of the start-up, shutdown, and malfunction quarterly.

(c) Excess emissions reports - by the 30th day following end of quarter. (required even if no excess emissions occur)

(d) Maintain file of all measurements for two years.

60.8 Performance Tests

(a) must be performed within 60 days after achieving maximum production rate but no later than 180 days after initial start-up.

(d) Notification of Performance tests at least 30 days prior to them occurring.

40 CFR Subpart GG

60.334 Monitoring of Operations

(a) continuous monitoring system required for water-to-fuel ratio to meet NSPS; system must be accurate within ±5 percent.

(b) Monitor sulfur and nitrogen content of fuel.

Oil - (1): each occasion that fuel is transferred to bulk storage tank.

Gas - (2): daily monitoring required

3.4.1.2 Fuel Oil Storage Tank

The applicable NSPS is 40 CFR Part 60, Subpart Kb--Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984). The storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb. There are no emission limiting or control requirements under Subpart Kb for the use of distillate fuel oil. The facility, however, must perform record keeping of the type of organic liquid in the tank.

3.4.2 FLORIDA RULES

The Florida DEP regulations for new stationary sources are covered in the F.A.C. The Florida DEP has adopted the EPA NSPS by reference in Rule 62-204.800(7); subsection (b)38 for stationary gas turbines and (b)15 for volatile organic liquid storage vessels. Therefore, the Project is required to meet the same emissions, performance testings, monitoring, reporting, and record keeping as those described in Section 3.4.1. DEP has authority for implementing NSPS requirements in Florida.

3.4.3 FLORIDA AIR PERMITTING REQUIREMENTS

The Florida DEP regulations require any new source to obtain an air permit prior to construction. Major new sources must meet the appropriate PSD and nonattainment requirements as discussed previously. Required permits and approvals for air pollution sources include NSR for nonattainment areas, PSD, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), Permit to Construct, and Permit to Operate. The requirements for construction permits and approvals are contained in Rules 62-4.030, 62-4.050, 62-4.052, 62-4.210, and 62-210.300(1), F.A.C. Specific emission standards are set forth in Chapter 62-296, F.A.C.

3.4.4 HAZARDOUS POLLUTANT REVIEW

The Florida DEP has published guidelines (DEP, 1995) to determine whether any emission of a potentially hazardous or toxic pollutant can pose a possible health risk to the public. Maximum concentrations for all regulated pollutants for which an ambient standard does not exist and all nonregulated hazardous pollutants can be compared to ambient reference concentrations (ARCs) for each applicable pollutant. If the maximum predicted concentrations for any hazardous pollutant is less than the corresponding ARC for each applicable averaging time, that emission is considered not to pose a significant health risk. The ARCs are not environmental standards but, rather, evaluation tools to determine if an apparent threat to the public health may exist. These levels are not used in permitting new sources.

3.4.5 LOCAL AIR REGULATIONS

Polk County does not have more stringent air regulations than those promulgated by the DEP.

3.5 SOURCE APPLICABILITY

3.5.1 AREA CLASSIFICATION

The Project site is located in Polk County, which has been designated by EPA and DEP as an attainment area for all criteria pollutants. Polk County and surrounding counties are designated as PSD Class II areas for SO_2, PM10, and NO_2. The nearest Class I area to the site is the Chassahowitzka National Wilderness Area (NWA) which is about 124 km (74 miles) from the site.

3.5.2 PSD REVIEW

3.5.2.1 Pollutant Applicability

The Project is considered to be a major facility because the emissions for one regulated pollutants is estimated to exceed 250 TPY; therefore, PSD review is required for any pollutant for which the emissions are considered major or exceed the PSD significant emission rates. As shown in Table 3-3, potential emissions from the proposed Project will be major for NO_x and greater than the significant emission rates for PM (TSP), PM_{10}, SO_2, CO, and sulfuric acid mist. Because the proposed Project impacts for these pollutants are predicted to be below the significant impact levels, a modeling analysis incorporating the impacts from other sources is not required. (Note: EPA has promulgated changes to the PSD Rules to eliminate hazardous air pollutants (HAPs) from PSD review. The pollutants, vinyl chloride, mercury, asbestos, and beryllium, are no longer evaluated in PSD review.)

As part of the PSD review, a PSD Class I increment analysis is required if the proposed Project's impacts are greater than the proposed EPA Class I significant impact levels. Because the nearest Class I areas to the plant site is about 124 km from the site, a PSD Class I increment-consumption analysis is required.

3.5.2.2 Emission Standards

The applicable NSPS for the CTs is 40 CFR Part 60, Subpart GG. The proposed emissions for the turbines will be well below the specified limits (see Section 4.0). The fuel oil storage tanks will each have a nominal storage capacity of 1.5 million gallons of distillate fuel oil.

Since each storage tank has a capacity greater than 40 cubic meters (m^3) [approximately gallons], the applicable NSPS is 40 CFR Part 60, Subpart Kb. Each storage tank will contain distillate fuel oil, a volatile organic liquid as defined in Subpart Kb, with a true vapor pressure of 0.022 pound per square inch (psi) at 100 F. Because the fuel oil is expected to have a maximum true vapor pressure of less than 3.5 kilopascals (kPa) or 0.51 psi, only the minor monitoring of operating requirements specified in 40 CFR 60 116b(a) and (b) will apply.

3.5.2.3 Ambient Monitoring

Based on the estimated pollutant emissions from the proposed plant (see Table 3-4), a pre-construction ambient monitoring analysis is required for PM_{10}, SO_2, NO_2, CO, and sulfuric acid mist. If the net increase in impact of other pollutants is less than the applicable *de minimis* monitoring concentration, then an exemption from the pre-construction ambient monitoring requirement is authorized by Rule 62-212.400(3)(e) F.A.C. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

If pre-construction monitoring data are required to be submitted, data collected at or near the Project site can be submitted, based on existing air quality data or the collection of onsite data.

Pre-construction monitoring data should not be required to be submitted for the Project because, as shown in Table 3-4, impacts are predicted to be below the applicable de minimis monitoring concentration (see Table 3-2) for all pollutants. For sulfuric acid mist, although the Project's emissions are greater than the significant emission rate, EPA has established no acceptable monitoring method for this pollutant. Therefore, an exemption from the preconstruction monitoring requirement for sulfuric acid is requested in accordance with the PSD regulations.

3.5.2.4 GEP Stack Height Analysis

The GEP stack height regulations allow any stack to be at least 65 m [213 feet (ft)] high. The CT stacks for the Project will be 60 ft. This stack height does not exceed the GEP stack height. However, as discussed in Section 6.0, Air Quality Modeling Approach, since the stack height is less than GEP, building downwash effects must be considered in the modeling analysis. As a result, the potential for downwash of the CTs' emissions caused by nearby structures are included in the modeling analysis.

3.5.3 NONATTAINMENT REVIEW

The Project site is located in Polk County, which is classified as an attainment area for all criteria pollutants. Therefore, nonattainment requirements are not applicable.

3.5.4 OTHER CLEAN AIR ACT REQUIREMENTS

The 1990 CAA Amendments established a program to reduce potential precursors of acidic deposition. The Acid Rain Program was delineated in Title IV of the CAA Amendments and required EPA to develop the program. EPA's final regulations were promulgated on January 11, 1993, and included permit provisions (40 CFR Part 72), allowance system (Part 73), continuous emission monitoring (Part 75), excess emission procedures (Part 77), and appeal procedures (Part 78).

EPA's Acid Rain Program applies to all existing and new utility units except those serving a generator less than 25 MW, existing simple cycle CTs, and certain non-utility facilities; units which fall under the program are referred to as affected units. The EPA regulations would be applicable to the proposed Project for the purposes for obtaining a permit and allowances, as well as emission monitoring. New units are required to obtain permits under the program by submitting a complete application 24 months before the later of January 1, 2000, or the date on which the unit begins serving an electric generator (greater than 25 MW).

The permit would provide SO_2 and NO_x emission limitations and the requirement to hold emission allowances. Emission limitations established in the Acid Rain Program are presumed to be less stringent than BACT or lowest achievable emission rate (LAER) for new units. An allowance is a market-based financial instrument that is equivalent to 1 ton of SO_2 emissions. Allowances can be sold, purchased, or traded. For the proposed Project, SO_2 allowances will be obtained from the market.

Continuous emission monitoring (CEM) for SO_2 and NO_x is required for gas-fired and oil-fired affected units. When an SO_2 CEM is selected to monitor SO_2 mass emissions, a flow monitor is also required. Alternately, SO_2 emissions may be determined using procedures established in Appendix D, 40 CFR Part 75 (flow proportional oil sampling or manual daily oil sampling). CO_2 emissions must also be determined either through a CEM (e.g., as a diluent for NO_x monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified (Part 75 Appendices A through I). The CEM requirements including QA/QC procedures are, in general, more stringent than those specified in the NSPS for Subpart GG. New units are required to meet the requirements by the later of January 1, 1995, or not later than 90 days after the unit commences commercial operation.

The EPA has, and is currently developing, emissions standards for HAPs for various industrial categories. These new National Emission Standards for Hazardous Air Pollutants (NESHAPs) that result from the 1990 CAA Amendments are based on the use of Maximum Achievable Control Technology (MACT). The adopted standards are contained in 40 CFR 63. New sources that emit more than 10 TPY of a single HAP or 25 TPY of total HAPs are required to apply MACT for the promulgated industrial category or to obtain a case-by-case MACT determination from the applicable regulatory authority after submitting a MACT analysis. EPA is currently developing NESHAP for stationary combustion turbines. The proposed NESHAP are anticipated in late 2000 with promulgation in early 2002. For the Project, emissions of HAPs will be less than 10 TPY of a single HAP and 25 TPY of all HAPs.

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significant Impact Levels

Pollutant	Averaging Time	AAQS ($\mu g/m^3$)			PSD Increments ($\mu g/m^3$)		Significant Impact Levels ($\mu g/m^3$)[b]
		Primary Standard	Secondary Standard	Florida	Class I	Class II	
Particulate Matter[c] (PM_{10})	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum	150	150	150	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum	365	NA	260	5	91	5
	3-Hour Maximum	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone[c]	8-Hour Maximum[d]	157	157	157	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Note: Particulate matter (PM_{10}) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
NA = Not applicable, i.e., no standard exists.

[a] Short-term maximum concentrations are not to be exceeded more than once per year.

[b] Maximum concentrations are not to be exceeded.

[c] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, PM2.5 standards were introduced with a 24-hour standard of 65 g/m^3 (3-year average of 98th percentile) and an annual standard of 15 g/m^3 (3-year average at community monitors). These standards have been stayed by a court case against EPA and implementation of these standards are many years away pending EPA appeal.

[d] 0.08 ppm; achieved when 3-year average of 99th percentile is 0.08 ppm or less. These have been stayed by a court case against EPA. EPA is appealing. The 1-hour standard of 0.12 ppm is still applicable. FDEP has not yet adopted the new standards.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50; 40 CFR 52.21.
Chapter 62-272, F.A.C.

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration[a] (μg/m3)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	10, 24-hour
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour
MWC Organics	NSPS	$3.5x10^{-6}$	NM
MWC Metals	NSPS	15	NM
MWC Acid Gases	NSPS	40	NM
MSW Landfill Gases	NSPS	50	NM

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
g/m^3 = micrograms per cubic meter.
MWC = Municipal waste combustor
MSW = Municipal solid waste

[a] Short-term concentrations are not to be exceeded.
[b] No *de minimis* concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.
[c] Any emission rate of these pollutants.

Sources: 40 CFR 52.21.
Rule 62-212.400

Table 3-3. Maximum Emissions Due to the Proposed Peace River Station Compared to the PSD Significant Emission Rates

Pollutant	Pollutant Emissions (TPY)		PSD Review
	Potential Emissions from Proposed Facility[a]	Significant Emission Rate	
Sulfur Dioxide	152	40	Yes
Particulate Matter [PM(TSP)]	68	25	Yes
Particulate Matter (PM_{10})	68	15	Yes
Nitrogen Dioxide	645	40	Yes
Carbon Monoxide	212	100	Yes
Volatile Organic Compounds	25	40	No
Sulfuric Acid Mist	35	7	Yes
Mercury	1.29E-03	0.1	Yes
Lead	7.97E-03	0.6	No
Total Fluorides	2.40E-02	3	No
Total Reduced Sulfur	NEG	10	No
Reduced Sulfur Compounds	NEG	10	No
Hydrogen Sulfide	NEG	10	No
MWC Organics (as 2,3,7,8-TCDD)	2.95E-07	$3.5x10^{-6}$	No
MWC Metals (as Be, Cd)	2.63E-03	15	No
MWC Acid Gaser (as HCl)	1.56E-01	40	No

Note: NEG = Negligible.

[a] Based on emissions from operating at baseload at 59°F; firing natural gas and distillate fuel oil for 2,670 and 720 hours per year per turbine for a total of three CTs, respectively (Refer to Table 2-4).

Table 3-4. Predicted Net Increase in Impacts Due to the Proposed Peace River Station Compared to PSD *De Minimis* Monitoring Concentrations

	Concentration (µg/m3)	
Pollutant	Predicted Increase in Impacts[a]	*De Minimis* Monitoring Concentration
Sulfur Dioxide	0.96	13, 24-hour
Particulate Matter (PM_{10})	0.28	10, 24-hour
Nitrogen Dioxide	0.23	14, annual
Carbon Monoxide	1.4	575, 8-hour

Note: NA = not applicable.
NM = no ambient measurement method.
TPY = tons per year.

[a] See Section 6.0 for air dispersion modeling results. These results are based on firing fuel oil and are higher than those for firing natural gas.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 APPLICABILITY

The PSD regulations require new major stationary sources to undergo a control technology review for each pollutant that may potentially be emitted above significant amounts. The control technology review requirements of the PSD regulations are applicable to emissions of NO_x, SO_2, CO, and PM/PM_{10} (see Section 3.0). The maximum potential annual emissions of these pollutants from the proposed GE 7FA CTs are summarized below (see Table 2-7):

Pollutant Emissions (TPY)

Pollutant	3 GE 7FA CTs
NO_x	644.7
SO_2	151.5
CO	212.4
PM/PM_{10}	67.8

[a] Maximum emissions based on firing natural gas for 2,670 hours and distillate fuel oil for 720 hours at baseload conditions and 59°F.

This section presents the applicable NSPS and the proposed BACT for these pollutants. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as EPA's current policy guidelines requiring a top-down approach. A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies [see 40 CFR 52.21(b)(12); and Rule 62-212.200(40), and Rule 62-214.410, F.A.C.]. The analysis must, by definition, be specific to the Project (i.e., case-by-case).

4.2 NEW SOURCE PERFORMANCE STANDARDS

The applicable NSPS for CTs are codified in 40 CFR 60, Subpart GG and summarized in Appendix B. The applicable NSPS emission limit for NO_x is 75 parts per million by volume dry (ppmvd) corrected for heat rate and 15 percent oxygen. For the CTs being considered for the Project, the NSPS emission limit for NO_x with the NSPS heat rate correction is 110.6 parts per million (ppm) on gas and 104.8 ppm on oil (corrected to 15 percent oxygen at a fuel-bound nitrogen content of 0.015 percent). The proposed NO_x emission limits for the Project will be much lower than the NSPS.

4.3 BEST AVAILABLE CONTROL TECHNOLOGY

4.3.1 PROPOSED BACT

In recent permitting actions, FDEP has established BACT for heavy-duty industrial gas turbines. These decisions have included the use of advanced dry low-NO_x combustors for limiting NO_x and CO emissions and clean fuels (natural gas and distillate oil) for control of other emissions, including SO_2. The BACT proposed for the CTs is consistent with these FDEP permits. The proposed Project will have two modes of operation (see Section 2.3) for which a BACT analysis has been performed. The results of the analysis have concluded the following controls as BACT for the Project.

1. Natural Gas Fired. The CTs will utilize state-of-the-art dry low-NO_x combustion technology which will achieve gas turbine exhaust NO_x levels of no greater than 10 ppmvd corrected to 15 percent O_2. CO emissions will be limited to 12 ppmvd at baseload.
2. Fuel Oil Fired. The CT will utilize water injection to achieve gas turbine exhaust NO_x levels of no greater than 42 ppmvd corrected to 15 percent O_2. CO emissions will be limited to 20 ppmvd at baseload.

4.3.2 NITROGEN OXIDES

4.3.2.1 Introduction

The BACT analysis was performed based on those available and feasible control technologies that can provide the maximum degree of emission reduction for emissions of NO_x. An evaluation of the available and feasible control technologies determined that DLN combustion and DLN with water injection, for gas and oil combustion respectively, could provide the maximum degree of emission reduction. Other available technologies such as $SCONO_x$™, NO_xOut, Thermal $DeNO_x$, NSCR, and XONON™ Combustion System were evaluated and determined to be technically infeasible or not commercially demonstrated for the Project.

Available technologies for controlling NO_x emissions from combustion turbines include combustion process modifications and post-combustion exhaust gas treatment systems. The BACT analysis for the Project was performed for the following alternatives:

1. Advanced dry low-NO_x combustors at an emission rate of 10 ppmvd corrected to 15 percent O_2 when firing gas and 42 ppmvd corrected to 15 percent O_2 when firing oil.
2. Selective catalytic reduction (SCR) and advanced dry low-NO_x combustors at an emission rate of approximately 3.5 ppmvd corrected to 15 percent O_2 when firing natural gas and 14.7 ppmvd corrected to 15 percent O_2 when firing oil.
3. SCONO$_x$™, using post combustion catalytic absorption to reduce emissions of NO_x.
4. XONON™, using catalytic combustion to reduce emission of NO_x.
5. Selective non-catalytic reduction (SNCR) which uses ammonia to reduce NO_x but no catalyst.

SCONO$_x$™, XONON™, and SNCR are either not demonstrated and feasable or currently available. Appendix B presents a discussion of NO_x control technologies and their feasibility for the Project.

Dry low-NO_x combustor technology has recently been offered and installed by manufacturers to reduce NO_x emissions by inhibiting thermal NO_x formation through premixing fuel and air prior to combustion and providing staged combustion to reduce flame temperatures. NO_x emissions from 25 ppmvd (corrected to 15-percent O_2) and less has been offered by manufacturers for advanced combustion turbines. Advanced in this context is the larger (over 150 MW) and more efficient (higher initial firing temperatures and lower heat rate) combustion turbines. This technology is truly pollution prevention since NO_x emissions are inhibited from forming.

SCR is a post-combustion process where NO_x in the gas stream is reacted with ammonia in the presence of a catalyst to form nitrogen and water. The reaction occurs typically between 600°F and 750°F, which has limited SCR application to combined cycle units where such temperatures occur in the HRSG. Exhausts from simple cycle operation reach up to 1,200°F, thus limiting SCR application for this mode of operation. With the higher cost ceramic catalyst, temperatures up to 1,050°F are possible. Such SCR systems are referred to as "hot" SCR. To accommodate "hot" SCR in the "F" Class gas turbine, some gas cooling would be required to maintain temperatures below 1,050°F. In-duct cooling using about 110,000 acfm of ambient air would maintain temperatures at below 1,050°F with turbine flow of about 2,600,000 acfm and up to 1,200°F. This could be accomplished with an electric powered fan rated at about 200 kW. While such modifications are theoretically possible, such gas cooling and its effectiveness has not been demonstrated on a "F" Class simple cycle gas turbine. SCR has been primarily installed and operated on combined cycle facilities using catalysts with temperature ranges from 600-750°F and generally achieving 9 ppmvd (corrected to 15-percent O_2) or less while burning only natural gas.

Applications of SCR with oil firing are limited. Where oil firing has been attempted, catalyst poisoning and ammonium salt formation has occurred. Ammonium salts (ammonium sulfate and ammonium bisulfate) are formed by the reaction of sulfur oxides in the gas stream and ammonia. These salts are highly acidic, and special precautions in materials and ammonia injection rates must be implemented to minimize their formation. Ammonia injected in the SCR system that does not react with NO_x is emitted directly and referred to as ammonia slip. In general, SCR manufacturers guarantee ammonia slip to be no more than 10 ppmvd; however, permitted limits in some applications have exceeded 25 ppmvd. While SCR is technically feasible for the Project, SCR has not been applied to a simple cycle advanced combustion turbine of the size proposed for this Project or to the amount of oil firing that may occur.

For simple cycle projects, the predominate BACT emission rate has been based on DLN use when firing natural gas and water injection when firing distillate oil. Recent Florida projects include the IPS Vandolah Project, the Constellation Oleander Project, the IPS Shady Hills Project, the Reliant Holopaw Project, and the Jacksonville Electric Authority (JEA) Peaking Project. BACT emission rates for projects in Region IV have also been based on DLN and water injection. The BACT emission rates in Region IV for simple cycle projects have ranged from 9 to 15 ppmvd corrected to 15-percent O_2 when firing natural gas and 42 ppmvd corrected to 15-percent O_2 when firing distillate oil.

As discussed in Section 2.1, the proposed CTs will be fired primarily with natural gas. Distillate oil will be used as backup fuel not to exceed 720 hours per year. Table 4-1 presents a summary of emissions with dry low-NO_x combustors and with dry low-NO_x combustors and SCR assuming 39 percent operating capacity at an ambient temperature of 59°F. The NO_x removed using SCR would be 140 TPY when firing oil and natural gas. The NO_x removed when firing oil is based on 720 hours per year. The NO_x removed when firing natural gas is based on 2,670 hours of operation.

<u>Technology Feasibility</u>–The proposed Project will use an advanced heavy-duty industrial gas turbine with advanced dry low-NO_x combustors. This type of machine advances the state-of-the-art for CTs by being more efficient and less polluting than previous CTs. Integral to the machine's design is dry low-NO_x combustors that prevent the formation of air pollutants within the combustion process, thereby eliminating the need for add-on controls that can have detrimental effects on the environment. An analogy of this technology is a more efficient automotive engine that gives better mileage and reduces pollutant formation without the need of a catalytic converter.

An advanced gas turbine is unique from an engineering perspective in two ways. First, the advanced machine is larger and has higher initial firing (i.e., combustion) temperatures than conventional turbines. This results in a larger, more thermally efficient machine. For example, the electrical generating capability of the proposed GE Frame 7 FA advanced machine is about 170 MW compared to the 70 MW to 120 MW conventional machines. The higher initial firing temperature (i.e., 2,600°F) results in about 20 percent more electrical energy produced for the same amount of fossil fuel used in conventional machines. This has the added advantage of producing lower air pollutant emissions (e.g., NO_x, PM, and CO) for each MW generated. While the increased firing temperature increases the thermal NO_x generated, this NO_x increase is controlled through combustor design.

The second unique attribute of the advanced machine is the use of dry low-NO_x combustors that will reduce NO_x emissions to 10 ppmvd when firing natural gas. Thermal NO_x formation is inhibited by using staged combustion techniques where the natural gas and combustion air are premixed prior to ignition. This level of control will result in NO_x emissions of about 0.04 lb/10^6 Btu, which is less than half of the emissions generated from conventional fossil fuel-fired steam generators.

Since the purpose of the Project is to produce electrical energy, and CT technology is rapidly advancing, it is appropriate to compare the proposed emissions on an equivalent generation basis to that of a conventional CT. The heat rate of the GE 7FA machines will be about 9,254 Btu/kWh (LHV, 59°F, natural gas). In contrast, the heat rate for a new conventional CT is about 11,000 Btu/kWh. Therefore, the amount of total NO_x from the advanced CT will be more than 10-percent lower than a conventional turbine for the same amount of generation.

Also, the amount of NO_x control achieved by the dry low-NO_x combustor on an advanced CT is considerably higher than that achieved by a conventional CT. Because of the higher initial firing temperatures, the advanced CT results in greater NO_x emission formation. Since the advanced machine has higher firing temperatures, the NO_x emissions without the use of dry low-NO_x combustion technology are much higher than a conventional CT (greater than 180 ppmvd vs. 150 ppmvd). This results in an overall greater NO_x reduction on the advanced CT.

Energy and Environmental Impacts –The maximum predicted NO_x impacts using the dry low-NO_x technology are all considerably below the NO_2 PSD Class II increment of 25 $\mu g/m^3$, annual average, and the AAQS of 100 $\mu g/m^3$, annual average. Indeed, the maximum annual impact for the Project is 0.047 $\mu g/m^3$, which is 5 percent of the significant impact level. While additional controls beyond dry low-NO_x combustors (i.e., SCR and SCR with water injection) would reduce emissions, the effect will not be significant and much less than 1 percent of the PSD increment and the AAQS for the Project.

The use of dry low-NO_x combustor technology is truly "pollution prevention". In contrast, use of SCR on the proposed Project will cause emissions of ammonia and ammonium salts, such as ammonium sulfate and bisulfate. Ammonia emissions associated with SCR are expected to be up to 10 ppm based on reported experience; previous permit conditions have specified this level. Indeed, ammonia emissions could be as high as 42.7 TPY/ per unit for the Project. Potential emissions of ammonium sulfate and bisulfate will increase emissions of PM_{10} up to 20.8 TPY/per unit.

The electrical energy required to run the SCR system and the back pressure from the turbine will reduce the available power from the Project. The back pressure is a result of the amount of catalyst needed for the reduction and the velocity of exhaust gasses significantly reducing the available power. This power, which would otherwise be available to the electrical system, will have to be replaced by other less efficient units. The replacement power will cause air pollutant emissions that would not have occurred without SCR. These "secondary" emissions, coupled with potential emissions of ammonia and ammonium salts, will reduce the net benefit of "hot" SCR. The net reduction in emissions with SCR when all criteria pollutants are considered, will be 74.1 TPY. In addition to criteria pollutants, additional secondary emissions of carbon dioxide would be emitted. Indeed, the emissions including CO_2 would be greater with SCR than that proposed using dry low-NO_x combustion technology.

The replacement of the SCR catalyst will create additional economic and environmental impacts since certain catalysts contain materials that are listed as hazardous chemical wastes under Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). In addition, SCR will require the construction and maintenance of storage vessels of anhydrous or aqueous ammonia for use in the reaction. Ammonia has potential health effects, and the construction of ammonia storage facilities triggers the application of at least three major standards: Clean Air Act (section 112), Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000, and OSHA 29 CFR 1910.119.

Economic Impacts–An assessment of economic impacts was performed by assuming a baseline case of advanced DLN combustor technology and water injection with the addition of SCR controls. DLN and water injection technology provided by General Electric is expected to achieve a NO_x exhaust concentration of 10 ppmvd and 42 ppmvd at 15 percent O_2 for gas and oil combustion in the turbine, respectively. SCR technology is expected to achieve NO_x concentrations of 3.5 ppmvd at 15 percent O_2 for natural gas firing and 14.7 ppmvd @15 percent O_2 for oil firing.

The cost impact analysis was conducted using the OAQPS factors. Emission reductions were calculated assuming base load operations (2,670 hours of gas-firing at baseload, and 720 hours of oil firing). Specific capital and annual operating costs for the SCR control system are summarized in Tables B-3 and B-4 of Appendix B.

Cost effectiveness for the application of SCR technology to achieve 3.5 ppmvd at 15 percent O_2 was determined to be $ 10,466 per ton of NO_x removed. The total capital costs of SCR for the proposed plant are $5,518,594 per CT. The total annualized cost of applying SCR with dry low-NOx combustion is $1,462,292. This cost effectiveness accounts only for the reduction of NO_x with SCR use and not the potential emissions from ammonia slip or other criteria pollutants that could result. The net control cost, considering maximum emission of ammonia slip, and additional PM and secondary emissions (from energy losses), is estimated at about $19,760 per ton.

4.3.2.2 Proposed BACT and Rationale

The proposed BACT for the Project is advanced dry low-NO_x combustion technology. The proposed NO_x emissions level using this technology is 10 ppmvd (corrected to 15 percent O_2) when firing natural gas under baseload conditions. NO_x from oil firing will be controlled using water injection (42 ppmvd corrected to 15 percent oxygen). This combination of the technology can achieve the maximum amount of emission reduction available, technically feasible and demonstrated for the Project. SCR is rejected based on the economic, environmental, and energy impacts. The proposed BACT is consistent with recent BACT decisions on other similar projects.

"Hot" SCR is rejected for the following reasons:

1. SCR was rejected based on technical, economic, environmental, and energy grounds. Table 4-1 summarizes these considerations which favor the dry low-NO_x pollution prevention technology.
2. Hot SCR has not been demonstrated on an "F" Class CT. Applications of this technology on much smaller turbines have not been sucessful.
3. The estimated incremental cost of SCR is approximately $10,466 per ton of NO_x removed and is similar to cost for other projects that have rejected SCR as being unreasonable. This is even more apparent if additional pollutant emissions due to SCR are considered.
4. Additional environmental impacts would result from SCR operation, including emissions of ammonia; from secondary emissions (to replace the lost generation); and from the generation of hazardous waste (i.e., spent catalyst replacement). While NO_x emissions would be reduced by about 140 TPY per unit with SCR, the net emissions reduction would not be as great. There are three additional factors that must be considered:
   a. Ammonia slip would occur, and it may be as high as 42.7 TPY per unit.

b. Additional particulate matter may be formed through the reaction of ammonia and sulfur oxides forming ammonium salts. As much as 20.8 TPY per unit additional particulate matter may be formed.

c. SCR will require energy for system operation and reduce the efficiency of the combustion turbine. This lost energy would have to be replaced since the proposed Project would be an efficient peaking power plant while operating. Any peaking power plants replacing this lost energy would be lower on the dispatch list and inevitably more polluting. Conservatively, this lost energy would result in the emissions of an additional 2.3 TPY of criteria pollutants. Additional emissions of carbon dioxide would also result.

d. The "net" cost effectiveness cold be a high as $19,760 per ton of pollutant removed.

5. The energy impacts of SCR will reduce potential electrical power generation by more than 2.0 million kilowatt hours (kWh) per year. This amount of energy is sufficient to provide the monthly electrical needs of 170 residential customers.

6. The proposed BACT (i.e., dry low-NOx combustion) provides the most cost effective control alternative, is pollution preventing, and results in low environmental impacts (less than the significant impact levels). Dry low-NOx combustion at the proposed emissions levels has been adopted previously in BACT determinations. Indeed, compared to conventional CTs, the proposed BACT will result in 10 to 15 percent less NOx emission from the same amount of generation.

Significant energy penalties occur with SCR. With SCR, the output of the CT may be reduced by about 0.50 percent over that of advanced low-NO_x combustors. This penalty is the result of the SCR pressure drop, which would be about 2.5 inches of water and would amount to about 1,773,648 kWh per year in potential lost generation. The energy required by the SCR equipment would be about 271,200 kWh per yr. Taken together, the total lost generation and energy requirements of SCR of 2,044,848 kWh per year could supply the monthly electrical needs of about 170 residential customers. To replace this lost energy, an additional 19.8 x 10^{10} British thermal units per year (Btu/yr) or about 20 million cubic feet per year (ft^3/yr) of natural gas would be required.

4.3.3 CARBON MONOXIDE

4.3.3.1 Introduction

Emissions of CO are dependent upon the combustion design, which is a result of the manufacturer's operating specifications, including the air-to-fuel ratio, staging of combustion, and the amount of water injected (i.e., for oil firing). The CTs proposed for the Project have designs to optimize combustion efficiency and minimize CO as well as NO_x emissions.

For the Project, the following alternatives were evaluated as BACT:

1. Combustion controls at 12 ppmvd when firing natural gas (at baseload) and 20 ppmvd when firing oil (at baseload); and
2. Oxidation catalyst at 90 percent removal; maximum annual CO emissions are 70.8 TPY per unit.

$SCONO_x$™ also provides CO removal; however, it was not evaluated because, as discussed in Appendix B, it is not commercially demonstrated on "F"-Class turbines.

4.3.3.2 Impact Analysis

Economic--The estimated annualized cost of a CO oxidation catalyst is $534,770 per unit, resulting in a cost effectiveness of nearly $8,400 per ton of CO removed. The cost effectiveness is based on 2,670 hours per year on natural gas and 720 hours per year of operation on oil. No costs are associated with combustion techniques since they are inherent in the design.

Environmental–Experience with similar projects indicate that the air quality impacts of both oxidation catalyst control and good combustion practice would be well below the significant impact levels for CO. Therefore, no significant environmental benefit would be realized by the installation of a CO catalyst. Indeed, there would be additional particulate and secondary emissions as a result of an oxidation catalyst. The particulate would result from the conversion of SO_2 to sulfates, and the secondary emissions would result from the heat rate reduction as described below. Moreover, the air quality impacts at the proposed CT emission rate are predicted to be much less than the PSD significant impact levels. The maximum predicted CO impacts are less than 0.2 percent of the applicable ambient air quality standards (see Section 6). There would also be no secondary benefits, such as acidic deposition, associated with reductions of reducing CO using an oxidation catalyst.

Energy--An energy penalty would result from the pressure drop across the catalyst bed. A pressure drop of about 2 inches water gauge would be expected. At a catalyst back pressure of about 2 inches, an energy penalty of about 1,182,432 kWh/yr would result at 100 percent load. This energy penalty is sufficient to supply the electrical needs of about 99 residential customers for a year. To replace this lost energy, about 1.1×10^{10} Btu/yr or about 11 million ft^3/yr of natural gas would be required.

4.3.3.3 Proposed BACT and Rationale

Combustion design is proposed as BACT, as there are adverse technical and economic consequences of using catalytic oxidation on CTs. The proposed BACT emission rates for CO will not exceed 12 ppmvd when firing natural gas and 20 ppmvd when firing distillate oil at baseload conditions. Catalytic oxidation is considered unreasonable for the following reasons:

1. Catalytic oxidation will not produce measurable reduction in the air quality impacts;
2. The economic impacts are significant (i.e., the capital cost is about $1.62 million per unit, with an annualized cost of $534,770 per year per unit); and
3. Recent projects in Florida have been authorized with BACT emission limits of 25 ppmvd on gas and 90 ppmvd on oil.

Combustion design is proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on CTs. Catalytic oxidation is considered unreasonable since it will not produce a measurable reduction in the air quality impacts. Indeed, recent BACT decisions for similar advanced CTs have set limits in the 30 ppmvd range and higher. Even the Northeast States for Coordinated Air Use Management (NESCAUM) has recognized a BACT level of 50 ppmvd for CO emissions. The cost of an oxidation catalyst would be significant and not be cost effective given the maximum proposed emission limits.

4.3.4 SO_2 AND H_2SO_4 POLLUTANT EMISSIONS

There are no technically feasible methods for controlling the emissions of SO_2 and sulfuric acid mist from CTs, other than the inherent quality of the fuel. The use of flue gas desulfurization (FGD) systems are not available, technically feasible, demonstrated or cost effective on CTs using natural gas and very low sulfur distillate oil. Clean fuels, natural gas, and distillate oil represent BACT for these pollutants. The use of natural gas and very low sulfur (0.05 percent) fuel oil will limit emissions of SO_2.

4.3.5 PM/PM_{10}, SO_2 AND OTHER REGULATED AND NONREGULATED POLLUTANT EMISSIONS

The PM/PM_{10} emissions from the CTs are a result of incomplete combustion and trace elements in the fuel. The design of the CT ensures that particulate emissions will be minimized by combustion controls and the use of clean fuels. A review of EPA's BACT/LAER Clearinghouse Documents did not reveal any post-combustion particulate control technologies being used on gas- or oil-fired CTs.

The maximum particulate emissions from the CT will be lower in concentration than that normally specified for fabric filter designs {i.e., the grain loading associated with the maximum particulate emissions [about 10 pounds per hour (lb/hr) when firing natural gas]} is less than 0.01 grain per standard cubic foot (gr/scf), which is a typical design specification for a baghouse. This further demonstrates that no further particulate controls are necessary for the proposed Project.

There are no technically feasible methods for controlling the emissions of these pollutants from CTs, other than the inherent quality of the fuel. Clean fuels, natural gas and distillate oil represent BACT for these pollutants. The use of natural gas and very low sulfur (0.05%) fuel oil will limit emissions of SO_2.

For the nonregulated pollutants, none of the control technologies evaluated for other pollutants (i.e., SCR) would reduce such emissions; thus, natural gas and distillate oil represent BACT because of their inherently low contaminant content.

Table 4-1. NO_x Emission Estimates (TPY) of BACT Alternative Technologies (per Unit)

Alternative BACT Control Technologies	Operating Mode[a]		Total
	Oil	Gas	
NO$_x$ Emission (TPY)			
DLN/water injection only	122.4	92.5	215
DLN/water injection with SCR	42.9	32.3	75.2
Reduction	(79.5)	(60.2)	(139.8)
Basis of Emissions (ppmvd)			
DLN/water injection only	42	10	
DLN/water injection with "Hot" SCR	14.7	3.5	
Hours of Operation	720	2,670	3,390

Note: DLN = Dry low-NO_x.
SCR = selective catalytic reduction.
TPY = tons per year.

[a] Emission rates were based on a "F" class combustion turbine operating at 100-percent capacity and firing natural gas for 2,670 hours and distillate fuel oil for 720 hours. Emission data are based on an ambient temperature of 59°F at maximum emission rates.

5.0 AMBIENT MONITORING ANALYSIS

The CAA requires that an air quality analysis be conducted for each criteria and noncriteria pollutant subject to regulation under the act before a major stationary source is constructed. Criteria pollutants are those pollutants for which AAQS have been established. Noncriteria pollutants are those pollutants that may be regulated by emission standards, but no AAQS have been established. This analysis may be performed by the use of modeling and/or by monitoring the air quality.

Based on the estimated emissions from the proposed Project (see Table 3-3), preconstruction ambient monitoring analyses for SO_2, PM_{10}, NO_2, CO, and sulfuric acid mist are required to be submitted as part of the application. A major source may waive the ambient monitoring analysis requirement if it can be demonstrated that the proposed source's maximum air quality impacts will not exceed the PSD *de minimis* concentration levels.

As shown in Table 3-4, the proposed Project's impacts are predicted to be below the applicable *de minimis* monitoring concentrations for all pollutants. For sulfuric acid mist, which is a noncriteria pollutant, although the Project's emissions are greater than the significant emission rate, EPA has established no acceptable monitoring method for this pollutant. Therefore, Peace River Station, L.L.C. requests an exemption from the preconstruction monitoring requirement for sulfuric acid in accordance with the PSD regulations.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 SIGNIFICANT IMPACT ANALYSIS APPROACH

The modeling approach followed EPA and DEP modeling guidelines for determining compliance with AAQS and PSD increments. For all applicable pollutants that have emission increases that will exceed the PSD significant emission rate due to the proposed Project, a significant impact analysis was performed. This analysis determines whether the Project alone will result in predicted impacts that will exceed the EPA significant impact levels in any areas beyond the Project's fenced property.

If the Project's impacts are above the significant impact levels, then a more detailed air modeling analysis that includes background sources is required. If the Project's impacts are below the significant impact levels, a more detailed air modeling analysis is not required.

Generally, if a new project also is within 200 km of a PSD Class I area, then a significant impact analysis is also performed for the PSD Class I area. EPA has proposed PSD Class I significant impact levels that have not been finalized as of this report (see Section 3.2.3).

Because the proposed Project site is approximately 124 km from the Chassahowitzka National Wilderness Area PSD Class I area, a significant impact modeling analysis has been performed. Air impact analyses were not performed for other PSD Class I areas since they are located more than 200 km from the Project.

6.2 PRECONSTRUCTION MONITORING ANALYSIS APPROACH

The modeling approach followed EPA and DEP modeling guidelines for evaluating a project's impacts relative to the *de minimis* monitoring levels to determine the need to submit ambient monitoring data prior to construction. Current DEP policies stipulate that the highest annual average and highest short-term concentrations are to be compared to the applicable *de minimis* monitoring levels.

6.3 AIR MODELING ANALYSIS APPROACH

6.3.1 GENERAL PROCEDURES

As stated in the previous sections, for each pollutant which is emitted above the significant emission rate, air modeling analyses are required to determine if the Project's impacts are predicted to be greater than the significant impact levels and *de minimis* monitoring levels. These analyses consider the Project's impacts alone. Air quality impacts are predicted using 5 years of meteorological data and selecting the highest predicted ground-level concentrations for comparison to the significant impact levels and *de minimis* monitoring levels.

If the Project's impacts are greater than the significant impact levels, the air modeling analyses must consider other nearby sources and background concentrations, and predict concentration for comparison to ambient standards. Because the Project's maximum impacts are predicted to be less than the significant impact levels, only the highest concentrations due to the Project's emissions were evaluated.

To develop the maximum short-term concentrations for the proposed Project, the modeling approach was divided into screening and refined phases to reduce the computation time required performing the modeling analysis. Concentrations are predicted for the screening phase using a coarse receptor grid and a 5-year meteorological data record. If the highest concentration is predicted at a receptor in an area where the receptor spacing is more than 100 m, then a refined analysis is performed. Modeling refinements are performed using a receptor spacing of 100 m with a receptor grid centered on the screening receptor at which the maximum concentration was predicted. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred.

More detailed descriptions of the model, along with the emission inventory, meteorological data, and receptor grids are presented in the following sections.

6.3.2 MODEL SELECTION

The selection of an air quality model to calculate air quality impacts for this Project was based on its applicability to simulate impacts in areas surrounding the Project as well as at the PSD Class I area of the Chassahowitzka NWA, located about 124 km from the Site. Two air quality dispersion models were selected and used in these analyses to address air quality impacts for the Project. These models were:

- The Industrial Source Complex Short Term (ISCST3) dispersion model, and
- The California Puff model (CALPUFF)

The Industrial Source Complex Short-term (ISCST3, Version 99155) dispersion model (EPA, 1999) was used to evaluate the pollutant impacts due to the Project in nearby areas surrounding the Site. This model is maintained by the EPA on its Internet website, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN). A listing of ISCST3 model features is presented in Table 6-1. The ISCST3 model is designed to calculate hourly concentrations based on hourly meteorological data (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The ISCST3 model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights. These areas are referred to as simple terrain. The model can also be applied in areas where the terrain exceeds the stack heights. These areas are referred to as complex terrain.

The Site is about 130 ft above mean sea level (msl). Around the immediate vicinity of the Site, the terrain is flat to gently rolling with elevations that range within 10 to 20 ft of the Site elevation.

Since the proposed stack heights for the CTs are proposed to be 60 ft, the surrounding terrain is below the proposed stack top heights. Therefore, the surrounding terrain can be considered as simple (i.e., less than stack top) with respect to the proposed stack heights. Due to the minimal amount of terrain elevation differences in the Project's vicinity, receptor elevations were not included in the analysis. As a result, the simple terrain option was used for the air modeling analysis which assumes that all receptors are at the same elevation as the stack base elevations for the CTs.

In this analysis, the EPA regulatory default options were used to predict all maximum impacts. The ISCST3 model can run in the rural or urban land use mode that affects stability dispersion coefficients, wind speed profiles, and mixing heights. Land use can be characterized based on a scheme recommended by EPA (Auer, 1978). If more than 50 percent land use within a 3-km radius around a project is classified as industrial or commercial, or high-density residential, then the urban option should be selected. Otherwise, the rural option is appropriate. Based on the land-use within a 3-km radius of the proposed Site (see Figure 1-1), the rural dispersion coefficients were used in the modeling analysis.

The ISCST3 model was used to provide maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times. To estimate impacts due to emissions from the CT stacks, an emission rate of 79.365 pounds per hour (lb/hr) or 10 grams per second (g/s) was initially used to produce relative concentrations as a function of the modeled emission rate (i.e., $\mu g/m^3$ per 10 g/s). These impacts are referred to as generic pollutant impacts. Maximum air quality impacts for specific pollutants were then determined by multiplying the maximum pollutant-specific emission rate in lb/hr (g/s) to the maximum predicted generic impact divided by 79.365 lb/hr (10 g/s).

At distances beyond 50 km from a source, the CALPUFF model, Version 5.0 (EPA, 1998), is recommended for use by the EPA and DEP. The CALPUFF model is a long-range transport model applicable for estimating the air quality impacts in areas that are more than 50 km from a source. The methods and assumptions used in the CALPUFF model were based on the latest recommendations for modeling analysis as presented in the Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts (EPA, 1998). This model is also maintained by the EPA on the SCRAM website.

As a result, the CALPUFF model was used to perform the significant impact analysis for the Project at the Class I area of the Chassahowitzka NWA. The CALPUFF model was also used to assess the Project's impact on regional haze at the Class I area (see Section 7.0). Based on discussions with DEP, the ISCST3 model was used to determine the "worst-case" operating load and ambient temperature that produced the Project's maximum impact at the Class I area. Based on that analysis, air quality impacts were then predicted with the CALPUFF model using the "worst-case" operating scenario to compare the Project's impacts to Class I significant impact levels and potential contribution to regional haze. A more detailed description of the assumptions and methods used for the CALPUFF model is presented in Appendix C.

6.3.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST3 model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Tampa International Airport and Ruskin, Florida, respectively. The 5-year period of meteorological data was from 1987 through 1991, which are the latest readily available data for these stations that are acceptable to the Florida DEP. The NWS station at Tampa is located approximately 77 km (48 miles) west-northwest of the proposed Site while the NWS station at Ruskin is located approximately 65 km (39 miles) west of the proposed Site.

These meteorological data are the most complete and representative of the region around the Project Site because both the Site and the weather stations are located in areas that experience similar weather conditions, such as frontal passages. In addition, these data have been approved for use by the Florida DEP in previous air permit applications to address air quality impacts for other proposed sources locating in Polk County and adjacent counties.

For the CALPUFF model, additional meteorological parameters are needed (e.g., precipitation, relative humidity) to predict air quality concentrations than that required for the ISCST3 model. More detailed descriptions of the assumptions and methods used for processing the meteorological data and establishing the model domain are presented in Appendix C.

6.3.4 EMISSION INVENTORY

A summary of the criteria pollutant emission rates, physical stack and stack operating parameters for the proposed CTs used in the air modeling analysis is presented in Tables 2-1 and 2-2. The emission and stack operating parameters presented for 32°F and 95°F ambient temperatures for both natural gas and distillate fuel oil were used in the modeling to determine the maximum air quality impacts for a range of possible operating conditions.

Six modeling scenarios per fuel type were considered:

1. base operating load for the ambient temperature of 32°F and 95°F;
2. 75 percent operating load for the ambient temperature of 32°F and 95°F; and
3. 50 percent operating load for the ambient temperature of 32°F and 95°F;

The proposed CTs will have a stack height of 60 feet and an inner stack diameter of 22 ft. Because the proposed CT stack heights are less than GEP, building downwash effects were included in the modeling analysis (see following section on building downwash).

6.3.5 RECEPTOR LOCATIONS

For predicting maximum concentrations in the vicinity of the plant, a polar receptor grid comprised of 136 grid receptors was used. These receptors included 52 receptors located on radials extending out from the proposed CTs' stack locations. Along each radial, receptors were located at the plant property and downwind distances of:

- 0.3 to 3.0 km at 100 meter spacing
- 3.0 to 6.0 km at 250 meter spacing;
- 6.0 to 10.0 km at 500 meter spacing; and
- 10.0 to 20.0 km at 1 km spacing.

The polar receptor grid was centered on the middle CT stack of the three proposed CT stacks.

Modeling refinements were performed for the worst-case loads for fuel oil only, by employing a polar receptor grid with a maximum spacing of 100 m along each radial and an angular spacing between radials of 0.25 to 2 degrees.

Since the terrain surrounding the proposed plant site varies little from the stack base elevation of 130 ft-msl, the terrain was assumed to be flat and receptor elevations were set equal to the stack base elevation.

To address impacts in the Chassahowitzka NWA, the following receptor locations were used:

Receptors at the PSD Class I Area of the Chassahowitzka National Wilderness Area

UTM Coordinates (m)	
East	**North**
340,300	3,165,700
340,300	3,167,700
340,300	3,169,800
340,700	3,171,900
342,000	3,174,000
343,000	3,176,200
343,700	3,178,300
342,400	3,180,600
341,100	3,183,400
339,000	3,183,400
336,500	3,183,400
334,000	3,183,400
331,500	3,183,400

Note: UTM Zone 17

These receptors have been used in previous PSD applications that addressed predicting impacts in the Chassahowitzka NWA. The Project's East and North UTM coordinates are 419.5 and 3,069.7 km, respectively, in Zone 17.

6.3.6 BUILDING DOWNWASH EFFECTS

A review of the dimensions of structures proposed for the Project was conducted to determine those structures that could produce building downwash effects. The only significant structures in the vicinity of the proposed CT stacks are the proposed CT air filter inlets, CT structures, and oil tanks. Because the heights of other structures, such as the administration building, are less than 20 ft and would not produce downwash effects for the Project's emissions, they were not considered in the analysis.

The height and widths of these structures are as follows:

Structure	Height (ft)	Width (ft)	Length (ft)
CT air inlet	47	36	36
CT structure	22	30	42
Fuel Oil Tanks (2)	48	80 (Dia)	Not applicable

Building dimensions for the project's structures were entered into the EPA's Building Profile Input Program (BPIP, Version 95086) for the purpose of obtaining direction-specific building heights and widths for all downwash-affected sources. The direction-specific building dimensions were then input to the ISCST3 model as the building height and width for each of 36 ten-degree wind sectors. A summary of the direction-specific building dimensions used in the modeling is presented in Appendix D.

6.4 SIGNIFICANT IMPACT ANALYSIS RESULTS

6.4.1 SITE VICINITY

The modeling analysis results for the proposed CTs alone in the vicinity of the plant are summarized in Tables 6-2 and 6-3. The maximum pollutant concentrations predicted in the screening analysis for three CTs firing natural gas and distillate fuel oil for the three CTs at the three operating loads and two ambient temperatures are presented in Tables 6-2. The maximum pollutant concentrations predicted in the refined analysis for three CTs firing distillate fuel oil are presented in Tables 6-3. Since the air impacts in the screening analysis showed that the Project's impacts firing natural gas were lower than those predicted for firing oil, the refined analysis was only performed for the Project firing oil.

As shown in the tables, the maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are all below the significant impact levels. Because the proposed source will not have a significant impact upon the air quality in the vicinity of the plant site, more detailed modeling analyses for determining compliance with the AAQS and allowable PSD Class II increments are not required.

The maximum predicted PM, SO_2, NO_x, and CO impacts due to the proposed CTs are also below the *de minimis* monitoring levels. Because the proposed source will not have predicted impacts greater than *de minimis* levels, preconstruction monitoring data are not required to be submitted as part of the PSD review.

A summary of the model results for the ISCST3 model is presented in Appendix E. The locations of the maximum predicted concentrations are also given in the summary. Model input files are also provided in Appendix E.

6.4.2 PSD CLASS I AREA

The modeling analysis results for the proposed CTs alone at the PSD Class I area of the Chassahowitzka NWA are summarized in Tables 6-4 and 6-5. The maximum pollutant concentrations predicted in the screening analysis for three CTs firing natural gas and distillate fuel oil at the three operating loads and two ambient temperatures are presented in Table 6-4.

As shown in Table 6-4, the "worst-case" operating load and ambient temperature that produced the Project's maximum for SO_2 and NO_2 impacts at the Class I area occurred for baseload operation with an ambient temperature of 32°F; for PM10, the "worst-case" operating load and ambient temperature was at 50 percent load and 95°F . As a result, air quality impacts for the Project were predicted at the Class I area with the CALPUFF model using these "worst-case" operating scenarios for the applicable pollutant. A summary of the overall maximum concentrations predicted at the Class I area due to the Project's emissions is given in Table 6-5 for comparison to the PSD Class I significant impact levels and increments. Results are provided both for the ISCST3 and CALPUFF models.

As shown in Table 6-5, the maximum PM, SO_2, and NO_2 impacts due to the Project are all below the significant impact levels. Because the Project will not have a significant impact upon the air quality at the Class I area, more detailed modeling analyses for determining compliance with the PSD Class I increments are not required. These maximum concentrations due to the Project are predicted to be less than 1 percent of the PSD Class I increments.

A summary of the model results for the ISCST3 and CALPUFF models is presented in Appendix E. The locations of the maximum predicted concentrations are also given in the summary. Model input files are also provided in Appendix E.

Table 6-1. Major Features of the ISCST3 Model

ISCST3 Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975; Bowers, et al., 1979).
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulman and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple emission sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume, area, and open pit sources
• Capability to calculate dry and wet deposition, including both gaseous and particulate precipitation scavenging for wet deposition
• Variation of wind speed with height (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average times
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm for ISCST3; a built-in algorithm for predicting concentrations in complex terrain
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing including setting wind speeds less than 1 m/s to 1 m/s.

Note: ISCST3 = Industrial Source Complex Short-Term.
Source: EPA, 1995.

Table 6-2. Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Firing Natural Gas and Distillate Fuel Oil by Operating Load and Inlet Ambient Temperature

		Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Averaging	Base Load		75% Load		50% Load	
Pollutant	Time	32°F	95°F	32°F	95°F	32°F	95°F
Natural Gas							
SO_2	Annual	0.0068	0.0065	0.0066	0.0061	0.0063	0.0057
	24-Hour	0.086	0.083	0.082	0.076	0.076	0.070
	3-Hour	0.398	0.357	0.336	0.338	0.421	0.366
PM10	Annual	0.0072	0.0078	0.0084	0.0092	0.0107	0.0113
	24-Hour	0.091	0.098	0.105	0.114	0.128	0.138
NO_x	Annual	0.047	0.045	0.045	0.042	0.044	0.040
CO	8-Hour	0.65	0.60	0.59	0.56	0.63	0.70
	1-Hour	2.8	2.6	2.6	2.4	2.7	2.8
Distillate Fuel Oil							
SO_2	Annual	0.068	0.065	0.066	0.061	0.062	0.058
	24-Hour	0.87	0.82	0.82	0.76	0.75	0.71
	3-Hour	4.1	3.7	3.4	3.5	4.2	3.7
PM10	Annual	0.0141	0.0149	0.0166	0.0179	0.0210	0.0229
	24-Hour	0.179	0.186	0.208	0.223	0.254	0.276
NO_x	Annual	0.23	0.21	0.22	0.20	0.20	0.19
CO	8-Hour	1.28	1.17	1.15	1.09	1.26	1.43
	1-Hour	5.5	5.0	5.0	4.8	5.5	5.6

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-3. Summary of Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Compared to the EPA Class II Significant Impact Levels, PSD Class II Increments, and AAQS

Pollutant	Averaging Time	Maximum Concentration (ug/m^3) Natural Gas	Maximum Concentration (ug/m^3) Fuel Oil (a)	EPA Class II Significant Impact Levels (ug/m^3)	PSD Class II Increments (ug/m^3)	AAQS (ug/m^3)
SO_2	Annual	0.0068	0.071	1	25	60
	24-Hour	0.086	0.96	5	91	260
	3-Hour	0.42	4.2	25	512	1,300
PM10	Annual	0.0113	0.234	1	17	50
	24-Hour	0.138	0.28	5	30	150
NO_x	Annual	0.047	0.23	1	25	100
CO	8-Hour	0.70	1.4	500	NA	10,000
	1-Hour	2.8	5.6	2,000	NA	40,000

NA= not applicable

(a) Refined modeling values

Table 6-4. Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Firing Natural Gas and Distillate Fuel Oil by Operating Load and Inlet Ambient Temperature at the PSD Class I Area of the Chassahowitzka NWA

Pollutant	Averaging Time	Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1) Base Load 32°F	Base Load 95°F	75% Load 32°F	75% Load 95°F	50% Load 32°F	50% Load 95°F
Natural Gas							
SO_2	Annual	0.00121	0.00113	0.00112	0.00103	0.00101	0.00089
	24-Hour	0.019	0.017	0.019	0.017	0.017	0.015
	3-Hour	0.122	0.111	0.108	0.096	0.091	0.080
PM10	Annual	0.0013	0.0013	0.0014	0.0015	0.0017	0.0018
	24-Hour	0.020	0.021	0.024	0.026	0.028	0.030
NO_x	Annual	0.00832	0.00778	0.00775	0.00708	0.00695	0.00614
Distillate Fuel Oil							
SO_2	Annual	0.0122	0.0114	0.0112	0.0104	0.0100	0.0090
	24-Hour	0.190	0.176	0.187	0.172	0.166	0.152
	3-Hour	1.23	1.14	1.08	0.97	0.90	0.81
PM10	Annual	0.003	0.003	0.003	0.003	0.003	0.004
	24-Hour	0.039	0.040	0.047	0.050	0.056	0.059
NO_x	Annual	0.040	0.037	0.037	0.034	0.033	0.030

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Table 6-5. Summary of Maximum Pollutant Concentrations Predicted for Three Simple-Cycle Combustion Turbines Compared to the EPA Class I Significant Impact Levels and PSD Class I Increments

Pollutant	Averaging Time	Maximum Concentration (ug/m^3)		EPA Class I Significant Impact Levels (ug/m^3)	PSD Class I Increments (ug/m^3)
		ISCST	CALPUFF		
Natural Gas					
SO_2	Annual	0.0012	0.0007	0.1	2
	24-Hour	0.019	0.012	0.2	5
	3-Hour	0.122	0.045	1.0	25
PM10	Annual	0.0018	0.0009	0.2	4
	24-Hour	0.030	0.017	0.3	8
NO_x	Annual	0.008	0.0009	0.1	2.5
Distillate Fuel Oil					
SO_2	Annual	0.012	0.007	0.1	2
	24-Hour	0.19	0.12	0.2	5
	3-Hour	1.23	0.46	1.0	25
PM10	Annual	0.004	0.002	0.2	4
	24-Hour	0.059	0.033	0.3	8
NO_x	Annual	0.040	0.004	0.1	2.5

7.0 ADDITIONAL IMPACT ANALYSIS

7.1 IMPACTS DUE TO DIRECT GROWTH

The Peace River Station Project is being constructed to meet current and projected electric demands. Additional growth as a direct result of the additional electric power provided by the Project is not expected.

Construction of the Project will occur over an 18-month period requiring an average of approximately 25 workers during that time. It is anticipated that many of these construction personnel will commute to the Site.

The Peace River Station will employ a total of 12 operational workers at Project build-out. The operational workforce will also include annual contracted maintenance workers to be hired for periodic routine services. The workforce needed to operate the proposed Project represents a small fraction of the population already present in the immediate area. Therefore, while there would be a small increase in vehicular traffic in the area, the effect on air quality levels would be minimal.

There are also expected to be no air quality impacts due to associated industrial/ commercial growth given the Site's location relative to the City of Fort Meade. The existing commercial infrastructure should be adequate to provide any support services that the Project might require.

7.2 IMPACT ON SOILS, VEGETATION, WILDLIFE, AND VISIBILITY IN THE PROJECT'S VICINITY

Because the Project's impacts on the local air quality are predicted to be less than the significant impact levels for PSD Class II areas, the Project's impacts on soils, vegetation, and wildlife in the Project's vicinity are also not expected to be significant. According to the modeling results presented in Section 6.0, the maximum air quality impacts due to the Project are predicted to be well below the PSD Class II significant impact levels, PSD Class II Increments, and AAQS. In addition, no visibility impairment in the Project's vicinity is expected due to the types and quantities of emissions proposed for the Project. The opacity of the proposed CT exhaust emissions will be 10 percent or less.

According to the USDA Polk County Soil Survey, soils in the vicinity of the Site are classified as Tavares fine sand, 0 to 5 percent slopes. Tavares fine sand is described as moderately well drained soils that formed in sandy marine sediments and are found on broad uplands and knolls within flatwoods (Polk County Soil Survey, USDA 1980). These soils can be described as strongly acid. The pollutants emitted by the Project that could cause potential impact to soils are SO_2 and NO_x. The primary effect of SO_2 and NO_x deposition and adsorption by soils is the resultant lowering of soil pH. Low soil pH will have an influence on most chemical and biological reactions in the soil including the level and availability of most plant nutrients in the soil. Based on the extremely low SO_2 and NO_2 impacts predicted for the Project and the ambient acidic nature of the soils, the Project's emissions will not have any significant adverse impact to soils at the Site or vicinity.

Although air pollution impacts to wildlife have been reported in the literature, many of the incidents involved acute exposures to pollutants, usually caused by unusual or highly concentrated releases or unique weather conditions. Generally, there are three ways pollutants may affect wildlife: through inhalation, through exposure with skin, and through ingestion (Newman 1980). Ingestion is the most common means and can occur through eating or drinking of high concentrations of pollutants. Bioaccumulation is the process of animals collecting and accumulating pollutant levels in their bodies over time. Other animals that prey on these animals would then be ingesting concentrated pollutants levels.

It is unlikely that the Project's emissions will cause injury or death to wildlife based on a review of the limited literature on air pollutant effects on wildlife. The Project's impacts are predicted to be very low and dispersed over a large area. Coupled with the mobility of wildlife, the potential for exposure of wildlife to the Project's impacts under weather conditions that lead to high concentrations is extremely unlikely.

The maximum concentrations of SO_2, PM_{10}, NO_2, and CO due to the Project's emissions are predicted to be at least an order of magnitude lower than the EPA Class II significant impact levels; therefore, no significant impacts associated with facility operations are expected. The maximum predicted concentrations are less than one percent of the AAQS. Since the AAQS are designed to protect the public welfare, including effects on soils, vegetation and wildlife, no detrimental effects on soils, vegetation or wildlife should occur in this area.

Visibility impairment in the Project's vicinity is not expected due to the types and quantities of emissions proposed for the Project. The opacity of the proposed CT exhaust emissions will be 10 percent or less.

7.3 IMPACTS UPON PSD CLASS I AREAS

7.3.1 IDENTIFICATION OF AQRVS AND METHODOLOGY

The Peace River Station is located about 124 km from the PSD Class I area of the Chassahowitzka NWA. Other PSD Class I areas are located more than 200 km from the Site. Because the proposed Project will be fired primarily with natural gas, a clean fuel, with low sulfur content distillate fuel oil as a backup fuel, it is expected that the Project's impacts for SO_2, NO_2, and PM_{10} will be minimal and not significantly affect or impair visibility or soils and vegetation at the Class I areas.

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed emissions from the Project. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.
>
> Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register 1978).

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the Chassahowitzka NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined by the U.S. Fish and Wildlife as:

Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass
Marsh Islands - cabbage palm and eastern red cedar
Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle
Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm
Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto
Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

The maximum pollutant concentrations due to the Project's emissions predicted at the PSD Class I area of the Chassahowitzka NWA are presented in Table 7-1. These results are based on using the CALPUFF model (see Section 6.0).

Similar to the evaluation performed in Section 7.2, a screening approach was used that compared the maximum ambient concentration of air pollutants of concern due to the Project's emissions at the PSD Class I area of the Chassahowitzka NWA with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species that can be used as indicators of effects.

7.3.2 IMPACTS TO SOILS

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification,
- Alteration in cation exchange,
- Loss of base cations, and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

According to the USDA Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the Chassahowitzka NWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacooche, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the NWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the NWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and therefore have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level concentrations of contaminants projected for the Chassahowitzka NWA from the proposed Project's emissions precludes any significant impact on soils.

7.3.3 IMPACTS TO VEGETATION

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants, such as fluoride, chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides, have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure. For purposes of this analysis, it was assumed that 100 percent of each air contaminant of concern is accessible to the plants.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

The concentrations of the pollutants, duration of exposure and frequency of exposures influence the response of vegetation and wildlife to atmospheric pollutants. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentration which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

7.3.3.1 SO_2

Sulfur is an essential plant nutrient usually taken up as sulfate ions by the roots from the soil solution. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, within the leaf, sulfite is oxidized to sulfate ions, which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they prove harmful.

SO_2 gas at elevated levels has long been known to cause injury to plants. Acute SO_2 injury usually develops within a few hours or days of exposure, and symptoms include marginal, flecked, and/or intercoastal necrotic areas that appear water-soaked and dullish green initially. This injury generally occurs to younger leaves. Chronic injury usually is evident by signs of chlorosis, bronzing, premature senescence, reduced growth, and possible tissue necrosis (EPA, 1982). Background levels of SO_2 in the Chassahowitzka NWA average 1.29 $\mu g/m^3$, with a 24-hour maximum average concentration of 14.5 $\mu g/m^3$. Observed SO_2 effect levels for several plant species and plant sensitivity groupings are presented in Tables 7-2 and 7-3, respectively.

Many studies have been conducted to determine the effects of high-concentration, short-term SO_2 exposure on natural community vegetation. Sensitive plants include ragweed, legumes, blackberry, southern pine, and red and black oak. These species are injured by exposure to 3-hour average SO_2 concentrations of 790 to 1,570 $\mu g/m^3$. Intermediate plants include locust and sweetgum. These species are injured by exposure to 3-hour average SO_2 concentrations of 1,570 to 2,100 $\mu g/m^3$. Resistant species (injured at concentrations above 2,100 $\mu g/m^3$ for 3 hours) include white oak and dogwood (EPA, 1982).

A study of native Floridian species (Woltz and Howe, 1981) demonstrated that cypress, slash pine, live oak, and mangrove exposed to 1,300 $\mu g/m^3$ SO_2 for 8 hours were not visibly damaged.

This finding support the levels cited by other researchers on the effects of SO_2 on vegetation. A corroborative study (McLaughlin and Lee, 1974) demonstrated that approximately 20 percent of a cross-section of plants ranging from sensitive to tolerant was visibly injured at 3-hour average SO_2 concentrations of 920 $\mu g/m^3$.

Jack pine seedlings exposed to SO_2 concentrations of 470 to 520 $\mu g/m^3$ for 24 hours demonstrated inhibition of foliar lipid synthesis; however, this inhibition was reversible (Malhotra and Kahn, 1978). Black oak exposed to 1,310 $\mu g/m^3$ SO_2 for 24 hours a day for 1 week demonstrated a 48 percent reduction in photosynthesis (Carlson, 1979).

Two lichen species indigenous to Florida exhibited signs of SO_2 damage in the form of decreased biomass gain and photosynthetic rate as well as membrane leakage when exposed to concentrations of 200 to 400 $\mu g/m^3$ for 6 hours/week for 10 weeks (Hart et al., 1988).

The maximum 24-hour average SO_2 concentration that is predicted for the Project at the Class I area is 0.072 $\mu g/m^3$. When added to the average background concentration of 1.29 $\mu g/m^3$, total SO_2 impact is 1.36 $\mu g/m^3$. When added to the maximum 24-hour average background concentration of 14.5 $\mu g/m^3$ at the NWA, the maximum worst-case total SO_2 concentration is 14.6 $\mu g/m^3$, which is much lower than those known to cause damage to test species. The maximum 24-hour average SO_2 concentrations predicted for the Project at the Class I area are only 4 to 7 percent of those that caused damage to the most sensitive lichens. The modeled annual incremental increase in SO_2 adds slightly to background levels of this gas and poses only a minimal threat to area vegetation.

7.3.3.2 PM_{10}

Although information pertaining to the effects of particulate matter on plants is scarce, some research results are available. In a study conducted by Mandoli and Dubey (1988), ten species of native Indian plants were exposed to levels of particulate matter that ranged from 210 to 366 μg/m^3 for an 8-hour averaging period. Damage in the form of a higher leaf area/dry weight ratio was observed at varying degrees for most plants tested. Concentrations of particulate matter lower than 163 μg/m^3 did not appear to be injurious to the tested plants.

By comparison of these published toxicity values for particulate matter exposure with modeled concentrations, the possibility of plant damage in the Chassahowitzka NWA can be determined. The maximum PM_{10} concentrations predicted by the Project in the Class I area are 0.074 and 0.037 μg/m^3 for 8- and 24-hour averaging times, respectively (see Table 7-1). The 24-hour average background PM_{10} concentration reported for Chassahowitzka NWA is 21.1 μg/m^3. The 8-hour average background was estimated by multiplying the 24-hour average concentration by three. This produced a conservative 8-hour average background concentration of 63.3 μg/m^3. When added to the maximum 8-hour average PM_{10} concentrations of 0.074 μg/m^3 predicted by the Project in the NWA, the maximum total 8-hour average concentration of 63.4 μg/m^3 is well below the lower threshold value that reportedly affects plant foliage. As a result, no effects to vegetative AQRVs are expected from the Project's emissions.

7.3.3.3 NO_2

NO_2 can injure plant tissue with symptoms usually appearing as irregular white to brown collapsed lesions between the leaf veins and near the margins. Conversely, non-injurious levels of NO_2 can be absorbed by plants, enzymatically transformed into ammonia, and incorporated into plant constituents such as amino acids (Matsumaru et al., 1979).

Plant damage can occur through either acute (short-term, high concentration) or chronic (long-term, relatively low concentration) exposure. For plants that have been determined to be more sensitive to NO_2 exposure than others, acute (1, 4, 8 hours) exposure caused 5 percent predicted foliar injury at concentrations ranging from 3,800 to 15,000 μg/m^3 (Heck and Tingey, 1979). Chronic exposure of selected plants (some considered NO_2-sensitive) to NO_2 concentrations of

2,000 to 4,000 µg/m^3 for 213 to 1,900 hours caused reductions in yield of up to 37 percent and some chlorosis (Zahn, 1975).

The 8-hour average NO_2 concentration for the Project in the Class I area is predicted to be 0.42 µg/m^3. This concentration is less than 0.01 percent of the levels that cause foliar injury in acute exposure scenarios. By comparison of published toxicity values for NO_2 exposure to long-term (annual averaging time) modeled concentrations, the possibility of plant damage in the Class I areas can be examined for chronic exposure situations. For a chronic exposure, the maximum annual average NO_2 concentration due to the Project in the Class I area is 0.0033 µg/m^3. This value is less than 0.001 percent of the levels that caused minimal yield loss and chlorosis in plant tissue. Average and maximum background 24-hour average concentrations of NO_2 reported in the Chassahowitzka NWA are 0.006 and 0.104 µg/m^3, respectively.

Although it has been shown that simultaneous exposure to SO_2 and NO_2 results in synergistic plant injury (Ashenden and Williams, 1980), the magnitude of this response is generally only 3 to 4 times greater than either gas alone and usually occurs at unnaturally high levels of each gas. Therefore, the concentrations within the wilderness areas are still far below the levels that potentially cause plant injury for either acute or chronic exposure.

7.3.3.4 CO

As with PM, information pertaining to the effects of CO on plants is scarce. The main effect of high concentrations of CO is the inhibition of cytochrome *c* oxidase, the terminal oxidase in the mitochondrial electron transfer chain. Inhibition of cytochrome *c* oxidase depletes the supply of ATP, the principal donor of free energy required for cell functions. However, this inhibition only occurs at extremely high concentrations of CO. Pollok et al. (1989) reported that acute exposure to $CO:O_2$ ratio of 25 (equivalent to an ambient CO concentration of 6.85×10^6 µg/m^3) resulted in stomatal closure in the leaves of the sunflower (*Helianthus annuus*). Naik et al. (1992)

reported cytochrome *c* oxidase inhibition in corn, sorghum, millet, and Guinea grass at $CO:O_2$ ratios of 2.5 (equivalent to an ambient CO concentration of 6.85×10^5 $\mu g/m^3$). These plants were considered the species most sensitive to CO-induced inhibition of cytochrome *c* oxidase.

By comparison of published effect values for CO exposure, the possibility of plant damage in the Class I areas can be determined. The maximum 1-hour average concentration due to the Project in the Class I area is 0.34 $\mu g/m^3$, which is less than 0.001 percent of the minimum value that caused inhibition in laboratory studies.

7.3.3.5 Sulfuric Acid Mist

Acidic precipitation or acid rain is coupled to SO_2 emissions mainly formed during the burning of fossil fuels. This pollutant is oxidized in the atmosphere and dissolves in rain forming sulfuric acid mist which falls as acidic precipitation (Ravera, 1989). Although concentration data are not available, sulfuric acid mist has been reported to yield necrotic spotting on the upper surfaces of leaves (Middleton et al, 1950).

No significant adverse effects on vegetation are expected from the Project's emissions because SO_2 concentrations, which lead directly to the formation of sulfuric acid mist concentrations, are predicted to be well below levels which have been documented as negatively affecting vegetation. During the last decade, much attention has been focused on acid rain. Acidic deposition is an ecosystem-level problem that affects vegetation because of some alterations of soil conditions such as increased leaching of essential base cations or elevated concentrations of aluminum in the soil water (Goldstein et al. 1985). Although effects of acid rain in eastern North America have been well published and publicized, detrimental effects of acid rain on Florida vegetation are lacking documentation.

7.3.3.6 Summary

In summary, the phytotoxic effects from the Peace River Station's emissions are minimal. It is important to note that the elements were conservatively modeled with the assumption that 100 percent was available for plant uptake. This is rarely the case in a natural ecosystem.

7.3.4 IMPACTS TO WILDLIFE

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National AAQS. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (e.g., particulate contamination) and acute effects (e.g., injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary ambient air quality standards. Physiological and behavioral effects have been observed in experimental animals at or below these standards. For impacts on wildlife, the lowest threshold values of SO_2, NO_2, and particulates which are reported to cause physiological changes are shown in Table 7-4. These values are up to orders of magnitude larger than maximum concentrations predicted for the Peace River Station for the Class I area. No effects on wildlife AQRVs from SO_2, NO_2, and particulates are expected. The proposed Project's contribution to cumulative impacts is negligible.

7.3.5 IMPACTS UPON VISIBILITY

7.3.5.1 General

Visibility is an AQRV for the Chassahowitzka NWA. Visibility can take the form of plume blight for nearby areas, or regional haze for long distances (e.g., distances beyond 50 km). Because the Chassahowitzka NWA is more than 50 km from the Peace River Station, the change in visibility is analyzed as regional haze. Current regional haze guidelines characterize a change in visibility by either of the following methods:

1. Change in the visual range, defined as the greatest distance that a large dark object can be seen, or
2. Change in the light-extinction coefficient (b_{ext}).

The b_{ext} is the attenuation of light per unit distance due to the scattering and absorption by gases and particles in the atmosphere. A change in the extinction coefficient produces a perceived visual change that is measured by a visibility index called the deciview. The deciview (dv) is defined as:

$$dv = 10 \ln (1 + b_{exts} / b_{extb})$$

where: b_{exts} is the extinction coefficient calculated for the source, and
b_{extb} is the background extinction coefficient

A similar index that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

7.3.5.2 IWAQM Recommendations

The CALPUFF air modeling analysis followed the recommendations contained in the IWAQM Phase 2 Summary Report (EPA, 1998). A detailed description of the methods and assumptions used in this is presented in Appendix C. Air quality impacts for the refined analyses were calculated as follows:

1. Obtain maximum 24-hour sulfate (SO_4) and nitrate (NO_3) impacts, in units of micrograms per cubic meter ($\mu g/m^3$).

2. Convert the SO_4 impact to ammonium sulfate $(NH_4)_2SO_4$ by the following formula:
$$(NH_4)_2SO_4\ (\mu g/m^3) = SO_4\ (\mu g/m^3) \times \text{molecular weight } (NH_4)_2SO_4 / \text{molecular weight } SO_4$$
$$(NH_4)_2SO_4\ (\mu g/m^3) = SO_4\ (\mu g/m^3) \times 132/96$$
$$= SO_4\ (\mu g/m^3) \times 1.375$$

3. Convert the NO_3 impact to ammonium nitrate (NH_4NO_3) by the following formula:
$$NH_4NO_3\ (\mu g/m3) = NO3\ (\mu g/m^3) \times \text{molecular weight } NH_4NO_3 / \text{molecular weight } NO_3$$
$$NH_4NO_3\ (\mu g/m^3) = NO_3\ (\mu g/m^3) \times 80/62$$
$$= NO_3\ (\mu g/m^3) \times 1.29$$

4. Compute b_{exts} (extinction coefficient calculated for the source) with the following formula:
$$b_{exts} = 3 \times NH_4NO_3 \times f(RH) + 3 \times (NH_4)_2SO_4 \times f(RH) + 3 \times PM_{10}$$

5. Compute b_{extb} (background extinction coefficient) using the background visual range (km) from the FLM with the following formula:
$$b_{extb} = 3.912 / \text{Visual range (km)}$$

6. Compute the change in extinction coefficients:

In terms of deciviews:
$$dv = 10 \ln (1 + b_{exts} / b_{extb})$$

In terms of percent change of visibility:
$$\Delta\% = (b_{exts} / b_{extb}) \times 100$$

Based on the predicted SO_4, NO_3, and PM_{10} concentrations, the Project's emissions are compared to a 5 percent change in light extinction of the background levels. This is equivalent to a change in deciview of 0.5.

7.3.5.3 Background Visual Ranges And Relative Humidity Factors

The background visual range is based on data representative of the top 20-percentile of visual range data measured at Chassahowitzka NWA. The background visual range for the Chassahowitzka NWA is 65 km and was provided by the FLM. The average relative humidity factor for each day during which the highest concentrations were predicted was computed by averaging the hourly relative humidity factor based on the hourly relative humidity for the 24-hour period. This factor was estimated by using data presented in the Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Draft Phase I Report (October 1999).

7.3.5.4 Regional Haze Analysis

The results of the Phase 2 refined analysis for regional haze are summarized in Tables 7-5 through 7-7. As shown in Table 7-5, the maximum pollutant impacts were predicted to occur on August 16, 1990 (Julian Day 228) for SO_4, July 4, 1990 (Julian Day 185) for NO_3, and May 16, 1990 (Julian Day 136) for PM_{10}. The calculated average relative humidity factors for these days are presented in Table 7-6. The maximum changes in visibility due to the Project for these days are summarized in Table 7-7. As shown in Table 7-7, the maximum change in visibility on July 4 is estimated to be 2.2 percent or 0.22 deciviews. This impact is below the FLM's screening criteria of 5 percent or 0.5 deciview change. As a result, this indicates that the Peace River Station would not have an adverse impact on the existing regional haze at the PSD Class I area of the Chassahowitzka NWA.

Table 7-1. Maximum Pollutant Concentrations Due to the Peace River Station Predicted at the PSD Class I Area of the Chassahowitzka National Wilderness Area

	Maximum Concentration [a] ($\mu g/m^3$)				
Pollutant	Annual	24-Hour	8-Hour	3-Hour	1-Hour
Sulfur Dioxide (SO_2)	0.0041	0.072	0.15	0.26	0.33
Nitrogen Dioxide (NO_2)	0.0033	0.16	0.42	0.67	0.84
Particulates (PM_{10})	0.0021	0.037	0.074	0.12	0.15
Carbon Monoxide (CO)	0.0060	0.089	0.16	0.27	0.34

[a] Based on maximum concentrations using the CALPUFF model.

Table 7-2. SO_2 Effects Levels for Various Plant Species

Plant Species	Observed Effect Level ($\mu g/m^3$)	Exposure (Time)	Reference
Sensitive to tolerant	920 (20 percent displayed visible injury)	3 hours	McLaughlin and Lee, 1974
Lichens	200-400	6 hr/wk for 10 weeks	Hart *et al.*, 1988
Cypress, slash pine, live oak, mangrove	1,300	8 hours	Woltz and Howe, 1981
Jack pine seedlings	470-520	24 hours	Malhotra and Kahn, 1978
Black oak	1,310	Continuously for 1 week	Carlson, 1979

Table 7-3. Sensitivity Groupings of Vegetation Based on Visible Injury at Different SO_2 Exposures[a]

Sensitivity Grouping	SO_2 Concentration		Plants
	1-Hour	3-Hour	
Sensitive	1,310 - 2,620 μG/m^3 (0.5 - 1.0 ppm)	790 - 1,570 μG/m^3 (0.3 - 0.6 ppm)	Ragweeds Legumes Blackberry Southern pines Red and black oaks White ash Sumacs
Intermediate	2,620 - 5,240 μG/m^3 (1.0 - 2.0 ppm)	1,570 - 2,100 μG/m^3 (0.6 - 0.8 ppm)	Maples Locust Sweetgum Cherry Elms Tuliptree Many crop and garden species
Resistant	>5,240 μG/m^3 (>2.0 ppm)	>2,100 μG/m^3 (>0.8 ppm)	White oaks Potato Upland cotton Corn Dogwood Peach

[a] Based on observations over a 20-year period of visible injury occurring on over 120 species growing in the vicinities of coal-fired power plants in the southeastern United States.

Source: EPA, 1982a.

Table 7-4. Examples of Reported Effects of Air Pollutants at Concentrations Below National Secondary Ambient Air Quality Standards

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Sulfur Dioxide[a]	Respiratory stress in guinea pigs	427 to 854	1 hour
	Respiratory stress in rats	267	7 hours/day; 5 day/week for 10 weeks
	Decreased abundance in deer mice	13 to 157	continually for 5 months
Nitrogen Dioxide[b,c]	Respiratory stress in mice	1,917	3 hours
	Respiratory stress in guinea pigs	96 to 958	8 hours/day for 122 days
Particulates[a]	Respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	Decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Source: [a]Newman and Schreiber, 1988.
[b]Gardner and Graham, 1976.
[c]Trzeciak et al., 1977.

Table 7-5. Maximum Pollutant Concentrations Predicted for the Peace River Station at the Chassahowitzka PSD Class I Area

Pollutant	Maximum Predicted Concentrations[a] (ug/m3)		
	May 16 (136)	July 4 (185)	August 16 (228)
SO_4	0.0197	0.0164	0.0430 [b]
NO_3	0.0281	0.0985 [b]	0.0411
PM_{10}	0.0366 [b]	0.0268	0.0362

[a] Predicted with CALPUFF model in the refined mode (Julian Day in parentheses)

[b] Highest concentration predicted for specific pollutant. Maximum concentrations for for SO_4 and NO_3 predicted for 100 % load at 32 °F; for PM10, maximum concentration predicted for 50% load, 95 °F.

Table 7-6. Computed Daily Average RH Factors for Days of Maximum Impacts Predicted for the Peace River Station at the PSD Class I Area of the Chassahowitzka NWA

Hour	May 16 (136)[a]		July 4 (185)[a]		August 16 (228)[a]	
Ending	RH(%)	f(RH)	RH(%)	f(RH)	RH(%)	f(RH)
0	87	3.8	90	4.7	87	3.8
1	87	3.8	82	3.0	90	4.7
2	90	4.7	85	3.4	94	8.4
3	94	8.4	87	3.8	94	8.4
4	97	15.1	90	4.7	94	8.4
5	93	7.0	87	3.8	94	8.4
6	93	7.0	93	7.0	94	8.4
7	90	4.7	85	3.4	88	4.0
8	82	3.0	74	2.1	82	3.0
9	69	1.9	69	1.9	77	2.4
10	57	1.3	67	1.7	68	1.8
11	52	1.3	61	1.5	59	1.4
12	47	1.2	55	1.3	52	1.3
13	42	1.1	52	1.3	52	1.3
14	37	1.1	42	1.1	49	1.2
15	37	1.1	46	1.2	49	1.2
16	39	1.1	52	1.3	47	1.2
17	42	1.1	61	1.5	50	1.2
18	52	1.3	67	1.7	74	2.1
19	55	1.3	72	2.0	82	3.0
20	56	1.3	72	2.0	74	2.1
21	62	1.5	74	2.1	77	2.4
22	67	1.7	79	2.6	85	3.4
23	76	2.3	82	3.0	85	3.4
Average		3.25		2.59		3.62

Note: RH = relative humidity; f(RH) = relative humidity factor

[a] Hourly relative humidity data for 1990 from the National Weather Service station at the Tampa International Airport in Tampa, Florida. Julian day in parenthesis.

Table 7-7. Summary of the Refined Regional Haze Analyses for the Peace River Station's Impacts Predicted at the PSD Class I Area of the Chassahowitzka NWA

Parameter	Units	Days of Maximum Concentrations Predicted for the Project		
		May 16 (136)	July 4 (185)	August 16 (228)
Maximum Predicted Concentration	ug/m^3			
SO_4		0.0197	0.0164	0.0430
NO_3		0.0281	0.0985	0.0411
PM10		0.0366	0.0268	0.0362
Computed Concentrations	ug/m^3			
$(NH_4)_2SO_4$		0.0271	0.0225	0.0591
NH_4NO_3		0.0362	0.1270	0.0530
Average Relative Humidity Factor [a]		3.25	2.59	3.62
Background Visual Range (Vr) [b]		65	65	65
Background Extinction Coefficient (bext)	km^{-1}	0.0602	0.0602	0.0602
Source Extinction Coefficients (bexts)	km^{-1}			
$(NH_4)_2SO_4$		0.000264	0.000175	0.000642
NH_4NO_3		0.000354	0.000986	0.000575
PM10		0.000110	0.000080	0.000109
Total bexts	km^{-1}	0.000728	0.001241	0.001326
Deciview Change		0.120	0.204	0.218
Percent Change (%)		1.20	2.04	2.18
Allowable Criteria (%)		5.0	5.0	5.0

[a] Computed from relative humidity data measured in 1990 at the National Weather Service station at the Tampa International Airport, Florida

[b] Provided by U.S. Fish and Wildlife Service

8.0 REFERENCES

Ashenden, T.W. and I.A.D. Williams. 1980. Growth Reductions on *Lolium multiflorum* Lam. and *Phleum pratense* L. as a Result of SO_2 and NO_2 pollution. Environ. Pollut. Ser. A. 21:131-139.

Carlson, R.W. 1979. Reduction in the Photosynthetic Rate of *Acer quercus* and *Fraxinus* Species Caused by Sulphur Dioxide and Ozone. Environ. Pollut. 18:159-170.

Hart, R., P.G. Webb, R.H. Biggs, and K.M. Portier. 1988. The Use of Lichen Fumigation Studies to Evaluate the Effects of New Emission Sources on Class I Areas. J. Air Poll. Cont. Assoc. 38:144-147.

Heck, W.W. and D.T. Tingey. 1979. Nitrogen Dioxide: Time-Concentration Model to Predict Acute Foliar Injury. EPA-600/3-79-057, U.S. Environmental Protection Agency, Corvallis, OR.

Malhotra, S.S. and A.A. Kahn. 1978. Effect of Sulfur Dioxide Fumigation on Lipid Biosynthesis in Pine Needles. Phytochemistry 17:241-244.

Mandoli, B.L. and P.S. Dubey. 1988. The Industrial Emission and Plant Response at Pithampur (M.P.). Int. J. Ecol. Environ. Sci. 14:75-79.

Matsumaru, T., T. Yoneyama, T. Totsuka, and K. Shiratori. 1979. Absorption of Atmospheric NO_2 by Plants and Soils. Soil Sci. Plant Nutr. 25:255-265.

McLaughlin, S.B. and N.T. Lee. 1974. Botanical Studies in the Vicinity of the Widows Creek Steam Plant. Review of Air Pollution Effects Studies, 1952-1972, and Results of 1973 Surveys. Internal Report I-EB-74-1, TVA.

Naik, R.M., A.R. Dhage, S.V. Munjal, P. Singh, B.B. Desai, S.L. Mehta, and M.S. Naik. 1992. Differential Carbon Monoxide Sensitivity of Cytochrome c Oxidase in the Leaves of C3 and C4 Plants. Plant Physiology 98:984-987.

Newman, J.R. 1981. Effects of Air Pollution on Animals at Concentrations at or Below Ambient Air Standards. Performed for Denver Air Quality Office, National Park Service, U.S. Department of the Interior. Denver, Colorado.

Newman, J.R. and R.K. Schreiber. 1988. Air Pollution and Wildlife Toxicology. Environmental Toxicology and Chemistry. 7:381-390.

Pollok, M., U. Hever, and M.S. Naik. 1989. Inhibition of stomatal opening in sunflower leaves by carbon monoxide and reversal of inhibition by light. Planta 178:223-230.

Porter, E.M. 1996. Air Quality and Air Quality Related Values in Chassahowitzka National Wildlife Refuge and Wilderness Area. Air Quality Branch, U.S. Fish and Wildlife Service, Denver, Colorado.

U.S. Department of Agriculture, Soil Conservation Service. 1981. Soil Survey of Pasco County, Florida.

U.S. Environmental Protection Agency (EPA). 1982. Air Quality Criteria for Particulate Matter and Sulfur Oxides. Vol. 3.

Woltz, S.S. and T.K. Howe. 1981. Effects of Coal Burning Emissions on Florida Agriculture. In: The Impact of Increased Coal Use in Florida. Interdisciplinary Center for Aeronomy and (other) Atmospheric Sciences. University of Florida, Gainesville, Florida.

Zahn, R. 1975. Gassing Experiments with NO_2 in Small Greenhouses. Staub Reinhalt. Luft 35:194-196.

APPENDIX A

EXPECTED PERFORMANCE AND EMISSION INFORMATION ON GE FRAME 7FA COMBUSTION TURBINE

(Note: SO_2 emissions based on 2 gr/100 cf of sulfur to account for odorant (mercaptans) in pipeline gas.)

Table A-1. Design Information and Stack Parameters
General Electric Frame 7FA Simple Cycle Unit, Dry Low NOx Combustor, Natural Gas, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	On	On	On
Ambient Relative Humidity (%)	80	60	75	95
Gross power output (MW)	183.53	174.41	162.46	155.72
Gross heat rate (Btu/kWh, LHV)	9,143	9,254	9,448	9,569
(Btu/kWh, HHV)	10,149	10,272	10,488	10,621
Heat Input (MMBtu/hr, LHV)- calculated	1,678	1,614	1,535	1,490
- provided	1,678	1,614	1,535	1,490
(MMBtu/hr, HHV) - calculated	1,863	1,792	1,704	1,654
(HHV/LHV)	1.11	1.11	1.11	1.11
Fuel heating value (Btu/lb, LHV)	21,511	21,511	21,511	21,511
(Btu/lb, HHV)	23,877	23,877	23,877	23,877
(HHV/LHV)	1.11	1.11	1.11	1.11
CT Exhaust Flow				
Mass Flow (lb/hr)	3,701,000	3,557,000	3,396,000	3,306,000
Temperature (°F)	1,096	1,117	1,135	1,144
Moisture (% Vol.)	7.93	8.65	9.93	10.71
Oxygen (% Vol.)	12.60	12.46	12.26	12.13
Molecular Weight - calculated	28.44	28.36	28.21	28.13
- provided	28.44	28.36	28.21	28.13
Volume Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,701,000	3,557,000	3,396,000	3,306,000
Temperature (°F)	1,096	1,117	1,135	1,144
Molecular weight	28.44	28.36	28.21	28.13
Volume flow (acfm)- calculated	2,463,574	2,406,262	2,335,408	2,293,500
- provided	2,496,900	2,412,600	2,341,500	2,299,400
	1.014	1.003	1.003	1.003
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,678	1,614	1,535	1,490
Heat content (Btu/lb, LHV)	21,511	21,511	21,511	21,511
Fuel usage (lb/hr)- calculated	78,007	75,031	71,359	69,267
- provided	78,000	75,000	71,400	69,300
Heat content (Btu/cf, LHV)- assumed	920	920	920	920
Fuel density (lb/ft^3)	0.0428	0.0428	0.0428	0.0428
Fuel usage (cf/hr)- calculated	1,823,913	1,754,348	1,668,478	1,619,565
(cf/yr)	6,183,070,000	5,947,240,000	5,656,140,000	5,490,330,000
Stack and Exit Gas Conditions				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	2,496,900	2,406,262	2,335,408	2,293,500
Temperature (°F) (-20 oF from CT exhaust)	1,076	1,097	1,115	1,124
Exit gas volume flow (acfm)	2,464,806	2,375,745	2,306,123	2,264,903
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	118.6	115.8	112.4	110.4
Velocity (ft/sec)- provided	118.9	116.1	112.7	110.6
Velocity (m/sec)- from calculated value	36.15	35.29	34.25	33.64

Source: General Electric, 1999; Decker Energy International, 2000.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2

Table A-2. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7FA Simple Cycle Unit, Dry Low NOx Combustor, Natural Gas, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Particulate from CT = Emission rate (lb/hr) from CT manufacturer (dry filterables)				
Basis, lb/hr - provided (a) (b)	11.0	11.0	11.0	11.0
(TPY)	18.6	18.6	18.6	18.6
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x *sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100*				
Fuel use (cf/hr)	1,823,913	1,754,348	1,668,478	1,619,565
Sulfur content (grains/ 100 cf) - assumed (b)	2	2	2	2
lb SO_2/lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	10.4	10.0	9.5	9.3
(lb/hr)- provided (0.5 gr/100 cf)	2.8	2.7	2.6	2.5
(TPY)	17.7	17.0	16.2	15.7
[Ratio lb/hr provided/calculated]	0.269	0.269	0.273	0.270
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a) (b)	10.0	10.0	10.0	10.0
Moisture (%)	7.93	8.65	9.93	10.71
Oxygen (%)	12.60	12.46	12.26	12.13
Volume Flow (acfm)	2,496,900	2,412,600	2,341,500	2,299,400
Temperature (°F)	1,096	1,117	1,135	1,144
Emission rate (lb/hr)- calculated	68.2	65.0	61.7	60.0
(lb/hr)- provided	71.9	69.3	65.7	63.9
(TPY)	121.9	117.4	111.4	108.4
[Ratio lb/hr provided/calculated]	1.054	1.066	1.065	1.066
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	10.0	10.0	10.0	10.0
Basis, ppmvd @ 15% O2- calcul-ted	8.2	8.1	8.1	8.1
- provided (a) (b)	8.2	8.1	8.1	8.1
Moisture (%)	7.93	8.65	9.93	10.71
Oxygen (%)	12.60	12.46	12.26	12.13
Volume Flow (acfm)	2,496,900	2,412,600	2,341,500	2,299,400
Temperature (°F)	1,096	1,117	1,135	1,144
Emission rate (lb/hr)- calculated from given ppmvd	34.2	32.1	30.5	29.6
(lb/hr)- provided	35.9	34.3	32.4	31.4
(TPY)	60.8	58.1	54.9	53.2
[Ratio lb/hr provided/calculated]	1.050	1.069	1.064	1.061
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	2.0	2.0	2.2	2.2
Basis, ppmvd @ 15% O2- calculated	1.6	1.6	1.8	1.8
- provided (a) (b)	1.6	1.6	1.8	1.8
Moisture (%)	7.93	8.65	9.93	10.71
Oxygen (%)	12.60	12.46	12.26	12.13
Volume Flow (acfm)	2,496,900	2,412,600	2,341,500	2,299,400
Temperature (°F)	1,096	1,117	1,135	1,144
Emission rate (lb/hr)- calculated	3.8	3.7	3.8	3.7
(lb/hr)- provided	4.2	4.1	3.9	3.8
(TPY)	7.1	6.9	6.6	6.4
[Ratio lb/hr provided/calculated]	1.087	1.105	1.038	1.032
Lead (lb/hr) = NA				
Emission Rate Basis	NA	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA	NA
(TPY)	NA	NA	NA	NA
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	8.00E-04	8.00E-04	8.00E-04	8.00E-04
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	1.49E-06	1.43E-06	1.36E-06	1.32E-06
(TPY)	2.53E-06	2.43E-06	2.31E-06	2.24E-06
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4/MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	10.4	10.0	9.5	9.3
lb H_2SO_4/lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	15	15	15	15
Emission Rate (lb/hr)	2.39	2.30	2.19	2.13
(TPY)	4.06	3.90	3.71	3.60

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPRI, 1994
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-3. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7FA Simple Cycle Unit, Dry Low NOx Combustor, Natural Gas, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	2.24E-09	2.15E-09	2.04E-09	1.98E-09
(TPY)	3.79E-09	3.64E-09	3.47E-09	3.36E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12).
Emission factors for metals are questionable and not used.

Note: No emission factors for hydrogen chloride (HCl) from natural gas-firing.

Table A-4. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7FA Simple Cycle Unit, Dry Low NOx Combustor, Natural Gas, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	1.49E-03	1.43E-03	1.36E-03	1.32E-03
(TPY)	2.53E-03	2.43E-03	2.31E-03	2.24E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	34	34	34	34
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	6.33E-02	6.09E-02	5.79E-02	5.62E-02
(TPY)	1.07E-01	1.03E-01	9.82E-02	9.53E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	10	10	10	10
Heat Input Rate (MMBtu/hr)	1,863	1,792	1,704	1,654
Emission Rate (lb/hr)	1.86E-02	1.79E-02	1.70E-02	1.65E-02
(TPY)	3.16E-02	3.04E-02	2.89E-02	2.80E-02

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12).
Emission factors for metals are questionable and not used.

Table A-5. Design Information and Stack Parameters
General Electric Frame 7 FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	Off	Off	Off
Ambient Relative Humidity (%)	80	60	87	55
Gross power output (MW)	137.66	126.23	120.69	110.63
Gross heat rate (Btu/kWh, LHV)	10,046	10,346	10,382	10,676
(Btu/kWh, HHV)	11,152	11,484	11,524	11,850
Heat Input (MMBtu/hr, LHV)- calculated	1,383	1,306	1,253	1,181
- provided	1,383	1,306	1,253	1,181
(MMBtu/hr, HHV) - calculated	1,535	1,450	1,391	1,311
(HHV/LHV)	1.11	1.11	1.11	1.11
Fuel heating value (Btu/lb, LHV)	21,511	21,511	21,511	21,511
(Btu/lb, HHV)	23,877	23,877	23,877	23,877
(HHV/LHV)	1.11	1.11	1.11	1.11
CT Exhaust Flow				
Mass Flow (lb/hr)	2,950,000	2,817,000	2,740,000	2,653,000
Temperature (°F)	1,184	1,199	1,200	1,200
Moisture (% Vol.)	8.18	8.60	9.94	10.22
Oxygen (% Vol.)	12.33	12.33	12.17	12.31
Molecular Weight - calculated	28.42	28.37	28.22	28.18
- provided	28.42	28.37	28.22	28.18
Volume Flow (acfm)= [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	2,950,000	2,817,000	2,740,000	2,653,000
Temperature (°F)	1,184	1,199	1,200	1,200
Molecular weight	28.42	28.37	28.22	28.18
Volume flow (acfm)- calculated	2,075,685	2,003,743	1,960,901	1,901,303
- provided	2,081,100	2,009,300	1,966,100	1,906,500
	1.003	1.003	1.003	1.003
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,383	1,306	1,253	1,181
Heat content (Btu/lb, LHV)	21,511	21,511	21,511	21,511
Fuel usage (lb/hr)- calculated	64,293	60,713	58,249	54,902
- provided	64,300	60,700	58,200	54,900
Heat content (Btu/cf, LHV)	920	920	920	920
Fuel density (lb/ft^3)	0.0428	0.0428	0.0428	0.0428
Fuel usage (cf/hr)- calculated	1,503,261	1,419,565	1,361,957	1,283,696
<u>Stack and Exit Gas Conditions</u>				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	2,081,100	2,009,300	1,966,100	1,906,500
Temperature (°F) (-20 oF from CT exhaust)	1,164	1,179	1,180	1,180
Exit gas volume flow (acfm)	2,055,782	1,985,077	1,942,412	1,883,530
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	100.1	96.7	94.6	91.7
Velocity (ft/sec)- provided	100.1	96.7	94.6	91.7
Velocity (m/sec)- from calculated value	30.52	29.47	28.84	27.96

Source: General Electric, 1999; Decker Energy International, 2000.
Note: Universal gas constant= 1,545 ft-lb(force)/°R; atmospheric pressure= 2,116.8 lb(force)/ft^2

Table A-6. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7 FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Particulate from CT = Emission rate (lb/hr) from CT manufacturer (dry filterables)				
Basis, lb/hr - provided (a) (b)	11.0	11.0	11.0	11.0
(TPY)	18.6	18.6	18.6	18.6
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2 /lb S) /100				
Fuel use (cf/hr)	1,503,261	1,419,565	1,361,957	1,283,696
Sulfur content (grains/ 100 cf) - assumed (b)	2	2	2	2
lb SO_2 /lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	8.6	8.1	7.8	7.3
(lb/hr)- provided (0.5 gr/100 cf)	2.30	2.20	2.10	2.00
(TPY)	14.6	13.7	13.2	12.4
[Ratio lb/hr provided/calculated]	0.268	0.271	0.270	0.273
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a) (b)	10.0	10.0	10.0	10.0
Moisture (%)	8.18	8.60	9.94	10.22
Oxygen (%)	12.33	12.33	12.17	12.31
Volume Flow (acfm)	2,081,100	2,009,300	1,966,100	1,906,500
Temperature (°F)	1,184	1,199	1,200	1,200
Emission rate (lb/hr)- calculated	55.6	52.5	50.5	47.5
(lb/hr)- provided	59.3	55.9	53.7	50.6
(TPY)	100.5	94.8	91.1	85.8
[Ratio lb/hr provided/calculated]	1.066	1.065	1.065	1.066
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	10.0	10.0	10.0	10.0
Basis, ppmvd @ 15% O2- calculated	7.9	8.0	8.0	8.2
- provided (a) (b)	7.9	8.0	8.0	8.2
Moisture (%)	8.18	8.60	9.94	10.22
Oxygen (%)	12.33	12.33	12.17	12.31
Volume Flow (acfm)	2,081,100	2,009,300	1,966,100	1,906,500
Temperature (°F)	1,184	1,199	1,200	1,200
Emission rate (lb/hr)- calculated from given ppmvd	26.7	25.6	24.6	23.8
(lb/hr)- provided	28.5	27.2	26.2	25.3
(TPY)	48.4	46.1	44.4	42.9
[Ratio lb/hr provided/calculated]	1.069	1.063	1.066	1.065
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	2.1	2.0	2.0	2.1
Basis, ppmvd @ 15% O2- calculated	1.6	1.6	1.6	1.8
- provided (a) (b)	1.6	1.6	1.6	1.8
Moisture (%)	8.18	8.60	9.94	10.22
Oxygen (%)	12.33	12.33	12.17	12.31
Volume Flow (acfm)	2,081,100	2,009,300	1,966,100	1,906,500
Temperature (°F)	1,184	1,199	1,200	1,200
Emission rate (lb/hr)- calculated	3.1	3.0	2.8	2.9
(lb/hr)- provided	3.4	3.2	3.1	3.1
(TPY)	5.7	5.5	5.3	5.3
[Ratio lb/hr provided/calculated]	1.076	1.094	1.091	1.071
Lead (lb/hr) = NA				
Emission Rate Basis	NA	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA	NA
(TPY)	NA	NA	NA	NA
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	8.00E-04	8.00E-04	8.00E-04	8.00E-04
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	1.23E-06	1.16E-06	1.11E-06	1.05E-06
(TPY)	2.08E-06	1.97E-06	1.89E-06	1.78E-06
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4 /MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	8.6	8.1	7.8	7.3
lb H_2SO_4 /lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	15	15	15	15
Emission Rate (lb/hr)	1.97	1.86	1.79	1.68
(TPY)	3.34	3.16	3.03	2.86

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPRI, 1994
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-7. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7 FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	1.84E-09	1.74E-09	1.67E-09	1.57E-09
(TPY)	3.12E-09	2.95E-09	2.83E-09	2.67E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12).
Emission factors for metals are questionable and not used.

Note: No emission factors for hydrogen chloride (HCl) from natural gas-firing.

Table A-8. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7 FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	1.23E-03	1.16E-03	1.11E-03	1.05E-03
(TPY)	2.08E-03	1.97E-03	1.89E-03	1.78E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	34	34	34	34
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	5.22E-02	4.93E-02	4.73E-02	4.46E-02
(TPY)	8.85E-02	8.35E-02	8.02E-02	7.55E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	10	10	10	10
Heat Input Rate (MMBtu/hr)	1,535	1,450	1,391	1,311
Emission Rate (lb/hr)	1.54E-02	1.45E-02	1.39E-02	1.31E-02
(TPY)	2.60E-02	2.46E-02	2.36E-02	2.22E-02

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12).
Emission factors for metals are questionable and not used.

Table A-9. Design Information and Stack Parameters
General Electric Frame 7FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	Off	Off	Off
Ambient Relative Humidity (%)	80	60	87	55
Gross power output (MW)	91.78	85.49	80.46	73.76
Gross heat rate (Btu/kWh, LHV)	11,386	11,487	11,758	12,175
(Btu/kWh, HHV)	12,638	12,751	13,051	13,515
Heat Input (MMBtu/hr, LHV)- calculated	1,045	982	946	898
- provided	1,045	982	946	898
(MMBtu/hr, HHV) - calculated	1,160	1,090	1,050	997
(HHV/LHV)	1.11	1.11	1.11	1.11
Fuel heating value (Btu/lb, LHV)	21,511	21,511	21,511	21,511
(Btu/lb, HHV)	23,877	23,877	23,877	23,877
(HHV/LHV)	1.11	1.11	1.11	1.11
CT Exhaust Flow				
Mass Flow (lb/hr)	2,586,000	2,570,000	2,515,000	2,452,000
Temperature (°F)	1,096	1,068	1,069	1,072
Moisture (% Vol.)	7.14	7.28	8.64	8.97
Oxygen (% Vol.)	13.49	13.79	13.61	13.70
Molecular Weight - calculated	28.49	28.46	28.30	28.26
- provided	28.49	28.46	28.30	28.26
Volume Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	2,586,000	2,570,000	2,515,000	2,452,000
Temperature (°F)	1,096	1,068	1,069	1,072
Molecular weight	28.49	28.46	28.30	28.26
Volume flow (acfm)- calculated	1,718,154	1,678,706	1,652,949	1,617,205
- provided	1,722,900	1,683,400	1,657,000	1,621,300
	1.003	1.003	1.002	1.003
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,045	982	946	898
Heat content (Btu/lb, LHV)	21,511	21,511	21,511	21,511
Fuel usage (lb/hr)- calculated	48,580	45,651	43,977	41,746
- provided	48,600	45,700	44,000	41,700
Heat content (Btu/cf, LHV)	920	920	920	920
Fuel density (lb/ft^3)	0.0428	0.0428	0.0428	0.0428
Fuel usage (cf/hr)- calculated	1,135,870	1,067,391	1,028,261	976,087
Stack and Exit Gas Conditions				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2/4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	1,722,900	1,683,400	1,657,000	1,621,300
Temperature (°F) (-20 oF from CT exhaust)	1,076	1,048	1,049	1,052
Exit gas volume flow (acfm)	1,700,755	1,661,366	1,635,326	1,600,134
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	82.9	81.0	79.7	78.0
Velocity (ft/sec)- provided	82.9	81.0	79.7	78.0
Velocity (m/sec)- calculated (from provided value)	25.27	24.69	24.30	23.78

Source: General Electric, 1999; Decker Energy International, 2000.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2

Table A-10. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Particulate (lb/hr) = Emission rate (lb/hr) from manufacturer (dry filterables)				
Basis, lb/hr (a)	11.0	11.0	11.0	11.0
(TPY)	18.6	18.6	18.6	18.6
Sulfur Dioxide (lb/hr) = Natural gas (cf/hr) x sulfur content(gr/100 cf) x 1 lb/7000 gr x (lb SO_2/lb S) /100				
Fuel use (cf/hr)	1,135,870	1,067,391	1,028,261	976,087
Sulfur content (0.5 grains/ 100 cf) - assumed (b)	2	2	2	2
lb SO_2/lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	6.5	6.1	5.9	5.6
(lb/hr)- provided (0.5 gr/100 cf)	1.8	1.6	1.6	1.5
(TPY)	11.0	10.3	10.0	9.5
[Ratio lb/hr provided/calculated]	0.277	0.262	0.272	0.269
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a)	10.0	10.0	10.0	10.0
Moisture (%)	7.14	7.28	8.64	8.97
Oxygen (%)	13.49	13.79	13.61	13.70
Volume Flow (acfm)	1,722,900	1,683,400	1,657,000	1,621,300
Temperature (°F)	1,096	1,068	1,069	1,072
Emission rate (lb/hr)- calculated	42.0	39.4	38.0	36.1
(lb/hr)- provided	44.7	42.1	40.6	38.5
(TPY)	75.8	71.3	68.9	65.3
[Ratio lb/hr provided/calculated]	1.066	1.067	1.068	1.067
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	10.0	10.0	9.9	10.0
Basis, ppmvd @ 15% O2- calculated	9.2	9.8	9.8	10.1
- provided (a)	9.2	9.8	9.8	10.1
Moisture (%)	7.14	7.28	8.64	8.97
Oxygen (%)	13.49	13.79	13.61	13.70
Volume Flow (acfm)	1,722,900	1,683,400	1,657,000	1,621,300
Temperature (°F)	1,096	1,068	1,069	1,072
Emission rate (lb/hr)- calculated from given ppmvd	23.6	23.5	22.6	22.2
(lb/hr)- provided	25.2	25.1	24.3	23.6
(TPY)	42.7	42.5	41.2	40.1
[Ratio lb/hr provided/calculated]	1.070	1.069	1.073	1.064
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	2.0	2.1	2.1	2.1
Basis, ppmvd @ 15% O2- calculated	1.9	2.0	2.0	2.2
- provided (a)	1.9	2.0	2.0	2.16
Moisture (%)	7.14	7.28	8.64	8.97
Oxygen (%)	13.49	13.79	13.61	13.70
Volume Flow (acfm)	1,722,900	1,683,400	1,657,000	1,621,300
Temperature (°F)	1,096	1,068	1,069	1,072
Emission rate (lb/hr)- calculated	2.8	2.8	2.7	2.7
(lb/hr)- provided	3.0	3.0	2.8	2.8
(TPY)	5.0	5.0	4.8	4.8
[Ratio lb/hr provided/calculated]	1.076	1.069	1.057	1.045
Lead (lb/hr) = NA				
Emission Rate Basis	NA	NA	NA	NA
Emission rate (lb/hr)	NA	NA	NA	NA
(TPY)	NA	NA	NA	NA
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	8.00E-04	8.00E-04	8.00E-04	8.00E-04
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	9.28E-07	8.72E-07	8.40E-07	7.97E-07
(TPY)	1.57E-06	1.48E-06	1.42E-06	1.35E-06
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4/MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	6.5	6.1	5.9	5.6
lb H_2SO_4/lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	15	15	15	15
Emission Rate (lb/hr)	1.49	1.40	1.35	1.28
(TPY)	2.53	2.37	2.29	2.17

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPRI, 1994
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-11. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	1.20E-06	1.20E-06	1.20E-06	1.20E-06
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	1.39E-09	1.31E-09	1.26E-09	1.20E-09
(TPY)	2.36E-09	2.22E-09	2.14E-09	2.03E-09
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12) .
Emission factors for metals are questionable and not used .

Note: No emission factors for hydrogen chloride (HCl) from natural gas-firing.

Table A-12. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7FA, Simple Cycle, Dry Low NOx Combustor, Natural Gas, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	3,390	3,390	3,390	3,390
Antimony (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0.8	0.8	0.8	0.8
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	9.28E-04	8.72E-04	8.40E-04	7.97E-04
(TPY)	1.57E-03	1.48E-03	1.42E-03	1.35E-03
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	34	34	34	34
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	3.94E-02	3.71E-02	3.57E-02	3.39E-02
(TPY)	6.68E-02	6.28E-02	6.05E-02	5.74E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0	0	0	0
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
(TPY)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	10	10	10	10
Heat Input Rate (MMBtu/hr)	1,160	1,090	1,050	997
Emission Rate (lb/hr)	1.16E-02	1.09E-02	1.05E-02	9.97E-03
(TPY)	1.97E-02	1.85E-02	1.78E-02	1.69E-02

Source: Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12).
Emission factors for metals are questionable and not used.

Table A-13. Design Information and Stack Parameters
General Electric Frame 7 FA, Simple Cycle Unit, Water Injection, Oil firing, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	On	On	On
Ambient Relative Humidity (%)	80	60	87	55
Gross power output (MW)	191.82	183.16	172.24	165.43
Gross heat rate (Btu/kWh, LHV)	9,665	9,773	9,963	10,083
(Btu/kWh, HHV)	10,245	10,359	10,560	10,688
Heat Input (MMBtu/hr, LHV)- calculated	1,854	1,790	1,716	1,668
- provided	1,854	1,790	1,716	1,668
(MMBtu/hr, HHV) - calculated	1,965	1,897	1,819	1,768
(HHV/LHV)	1.06	1.06	1.06	1.06
Fuel heating value (Btu/lb, LHV)	18,560	18,560	18,560	18,560
(Btu/lb, HHV)	19,674	19,674	19,674	19,674
(HHV/LHV)	1.06	1.06	1.06	1.06
CT Exhaust Flow				
Mass Flow (lb/hr)	3,837,000	3,688,000	3,523,000	3,429,000
Temperature (°F)	1,074	1,098	1,121	1,131
Moisture (% Vol.)	10.42	11.14	12.44	13.18
Oxygen (% Vol.)	11.27	11.10	10.84	10.72
Molecular Weight - calculated	28.40	28.32	28.18	28.09
- provided	28.39	28.31	28.17	28.09
Volume Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,837,000	3,688,000	3,523,000	3,429,000
Temperature (°F)	1,074	1,098	1,121	1,131
Molecular weight	28.40	28.32	28.18	28.09
Volume flow (acfm)- calculated	2,521,379	2,468,089	2,404,748	2,362,513
- provided	2,528,300	2,475,000	2,411,400	2,368,900
	1.003	1.003	1.003	1.003
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,854	1,790	1,716	1,668
Heat content (Btu/lb, LHV)	18,560	18,560	18,560	18,560
Fuel usage (lb/hr)- calculated	99,892	96,444	92,457	89,871
- provided	99,900	96,400	92,500	89,900
Fuel density (lb/gal)	7.1	7.1	7.1	7.1
Fuel usage (gal/hr)- from provided	14,070	13,577	13,028	12,662
(gal/yr)	10,130,000	9,780,000	9,380,000	9,120,000
Stack and Exit Gas Conditions				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	2,528,300	2,475,000	2,411,400	2,368,900
Temperature (°F) (-20 oF from CT exhaust)	1,054	1,078	1,101	1,111
Exit gas volume flow (acfm)	2,495,337	2,443,228	2,380,895	2,339,121
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	121.7	119.1	116.0	114.0
Velocity (ft/sec)- provided	121.7	119.1	116.0	114.0
Velocity (m/sec)- calculated (from provided value)	37.1	36.3	35.4	34.7

Source: General Electric, 1999; Decker Energy International, 2000.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²

Table A-14. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7 FA, Simple Cycle Unit, Water Injection, Oil firing, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Particulate from CT = Emission rate (lb/hr) from CT manufacturer (dry filterables)				
Basis, lb/hr - provided (a) (b)	22.0	22.0	22.0	22.0
(TPY)	7.9	7.9	7.9	7.9
Sulfur Dioxide (lb/hr) = Fuel Oil (lb/hr) x sulfur content(gr/100 cf) x (lb SO_2 /lb S) /100				
Fuel use (lb/hr)	99,900	96,400	92,500	89,900
Fuel Sulfur content	0.05%	0.05%	0.05%	0.05%
lb SO_2 /lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	99.9	96.4	92.5	89.9
(lb/hr)- provided	106.9	103.2	98.9	96.2
(TPY)	38.5	37.2	35.6	34.6
[Ratio lb/hr provided/calculated]	1.070	1.071	1.069	1.070
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a)	42	42	42	42
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	2,528,300	2,475,000	2,411,400	2,368,900
Temperature (°F)	1,074	1,098	1,121	1,131
Emission rate (lb/hr)- calculated	330.6	319.5	306.3	297.6
(lb/hr)- provided	352.1	340.1	326.0	316.9
(TPY)	126.8	122.4	117.4	114.1
[Ratio lb/hr provided/calculated]	1.065	1.064	1.064	1.065
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	20.0	20.1	20.1	20.0
Basis, ppmvd @ 15% O2- calculated	14.2	14.1	13.9	13.8
- provided (a)	14.2	14.1	13.9	13.8
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	2,528,300	2,475,000	2,411,400	2,368,900
Temperature (°F)	1,074	1,098	1,121	1,131
Emission rate (lb/hr)- calculated from given ppmvd	68.0	65.3	61.7	59.5
(lb/hr)- provided	72.6	69.4	65.6	63.5
(TPY)	26.1	25.0	23.6	22.9
[Ratio lb/hr provided/calculated]	1.067	1.063	1.063	1.067
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	3.9	4.0	4.0	4.1
Basis, ppmvd @ 15% O2- calculated	2.8	2.8	2.8	2.8
- provided (a)	2.8	2.8	2.8	2.8
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	2,528,300	2,475,000	2,411,400	2,368,900
Temperature (°F)	1,074	1,098	1,121	1,131
Emission rate (lb/hr)- calculated	7.7	7.4	7.1	6.9
(lb/hr)- provided	8.1	7.8	7.5	7.3
(TPY)	2.9	2.8	2.7	2.6
[Ratio lb/hr provided/calculated]	1.056	1.053	1.056	1.058
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	10.8	10.8	10.8	10.8
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	2.12E-02	2.05E-02	1.96E-02	1.91E-02
(TPY)	7.64E-03	7.38E-03	7.07E-03	6.87E-03
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	6.26E-01	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	1.23E-03	1.19E-03	1.14E-03	1.11E-03
(TPY)	4.43E-04	4.28E-04	4.10E-04	3.98E-04
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4 /MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	106.9	103.2	98.9	96.2
lb H_2SO_4 /lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	15	15	15	15
Emission Rate (lb/hr)	24.55	23.70	22.72	22.10
(TPY)	8.84	8.53	8.18	7.95

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPA, 1998 (AP-42, Draft, Table 3.1-6)
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-15. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7 FA, Simple Cycle Unit, Water Injection, Oil firing, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	7.47E-07	7.21E-07	6.91E-07	6.72E-07
(TPY)	2.69E-07	2.60E-07	2.49E-07	2.42E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	0.331	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	6.50E-04	6.28E-04	6.02E-04	5.85E-04
(TPY)	2.34E-04	2.26E-04	2.17E-04	2.11E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	6.39E-02	6.17E-02	5.92E-02	5.75E-02
(TPY)	2.30E-02	2.22E-02	2.13E-02	2.07E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	211	211	211	211
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	4.15E-01	4.00E-01	3.84E-01	3.73E-01
(TPY)	1.49E-01	1.44E-01	1.38E-01	1.34E-01

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-6)
(b) Golder Associates, 1998
(c) Chlorine content of 4 ppm assumed based on ASTM D 2880.

Table A-16. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7 FA, Simple Cycle Unit, Water Injection, Oil firing, 100 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	7.91	7.91	7.91	7.91
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	1.55E-02	1.50E-02	1.44E-02	1.40E-02
(TPY)	5.60E-03	5.40E-03	5.18E-03	5.03E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	1.1	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	2.16E-03	2.09E-03	2.00E-03	1.94E-03
(TPY)	7.78E-04	7.51E-04	7.20E-04	7.00E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	6.37E-03	6.15E-03	5.89E-03	5.73E-03
(TPY)	2.29E-03	2.21E-03	2.12E-03	2.06E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	1.33E-02	1.28E-02	1.23E-02	1.20E-02
(TPY)	4.78E-03	4.62E-03	4.43E-03	4.30E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	20	20	20	20
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	3.93E-02	3.79E-02	3.64E-02	3.54E-02
(TPY)	1.41E-02	1.37E-02	1.31E-02	1.27E-02
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	37	37	37	37
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	7.27E-02	7.02E-02	6.73E-02	6.54E-02
(TPY)	2.62E-02	2.53E-02	2.42E-02	2.36E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	432	432	432	432
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	8.49E-01	8.20E-01	7.86E-01	7.64E-01
(TPY)	3.06E-01	2.95E-01	2.83E-01	2.75E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	1.70E-01	1.64E-01	1.57E-01	1.53E-01
(TPY)	6.11E-02	5.89E-02	5.65E-02	5.49E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	300	300	300	300
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	5.90E-01	5.69E-01	5.46E-01	5.30E-01
(TPY)	2.12E-01	2.05E-01	1.96E-01	1.91E-01
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	23	23	23	23
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	4.52E-02	4.36E-02	4.18E-02	4.07E-02
(TPY)	1.63E-02	1.57E-02	1.51E-02	1.46E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	237	237	237	237
Heat Input Rate (MMBtu/hr)	1,965	1,897	1,819	1,768
Emission Rate (lb/hr)	4.66E-01	4.50E-01	4.31E-01	4.19E-01
(TPY)	1.68E-01	1.62E-01	1.55E-01	1.51E-01

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-5 and 3.1-6)
(b) Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12)
(c) EPA, 1996 (AP-42, Table 3.1-4)

Table A-17. Design Information and Stack Parameters
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	Off	Off	Off
Ambient Relative Humidity (%)	80	60	87	55
Gross power output (MW)	142.15	133.53	126.09	115.89
Gross heat rate (Btu/kWh, LHV)	10,636	10,784	10,992	11,278
(Btu/kWh, HHV)	11,275	11,431	11,652	11,955
Heat Input (MMBtu/hr, LHV)- calculated	1,512	1,440	1,386	1,307
- provided	1,512	1,440	1,386	1,307
(MMBtu/hr, HHV) - calculated	1,603	1,526	1,469	1,385
(HHV/LHV)	1.06	1.06	1.06	1.06
Fuel heating value (Btu/lb, LHV)	18,560	18,560	18,560	18,560
(Btu/lb, HHV)	19,674	19,674	19,674	19,674
(HHV/LHV)	1.06	1.06	1.06	1.06
CT Exhaust Flow				
Mass Flow (lb/hr)	3,018,000	2,886,000	2,776,000	2,689,000
Temperature (°F)	1,165	1,192	1,200	1,200
Moisture (% Vol.)	10.77	11.28	12.60	12.78
Oxygen (% Vol.)	10.92	10.81	10.63	10.80
Molecular Weight - calculated	28.38	28.32	28.17	28.14
- provided	28.37	28.32	28.17	28.13
Volume Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,018,000	2,886,000	2,776,000	2,689,000
Temperature (°F)	1,165	1,192	1,200	1,200
Molecular weight	28.38	28.32	28.17	28.14
Volume flow (acfm)- calculated	2,102,228	2,047,643	1,989,896	1,929,903
- provided	2,108,000	2,038,700	1,995,300	1,935,100
	1.003	0.996	1.003	1.003
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,512	1,440	1,386	1,307
Heat content (Btu/lb, LHV)	18,560	18,560	18,560	18,560
Fuel usage (lb/hr)- calculated	81,466	77,586	74,677	70,420
- provided	81,500	77,600	74,700	70,400

Stack and Exit Gas Conditions				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	2,108,000	2,038,700	1,995,300	1,935,100
Temperature (°F) (-20 oF from CT exhaust)	1,145	1,172	1,180	1,180
Exit gas volume flow (acfm)	2,082,055	2,014,018	1,971,260	1,911,786
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	101.4	98.1	96.0	93.1
Velocity (ft/sec)- provided	101.4	98.1	96.0	93.1
Velocity (m/sec)- calculated (from provided value)	30.9	29.9	29.3	28.4

Source: General Electric, 1999; Decker Energy International, 2000.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²

Table A-18. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Particulate from CT = Emission rate (lb/hr) from CT manufacturer (dry filterables)				
Basis, lb/hr - provided (a) (b)	22.0	22.0	22.0	22.0
(TPY)	7.9	7.9	7.9	7.9
Sulfur Dioxide (lb/hr) = Fuel Oil (lb/hr) x sulfur content(gr/100 cf) x (lb SO_2 /lb S) /100				
Fuel use (lb/hr)	81,500	77,600	74,700	70,400
Fuel Sulfur content	0.05%	0.05%	0.05%	0.05%
lb SO_2 /lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	81.5	77.6	74.7	70.4
(lb/hr)- provided	87.2	83.0	79.9	75.3
(TPY)	31.4	29.9	28.8	27.1
[Ratio lb/hr provided/calculated]	1.070	1.070	1.070	1.070
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a)	42	42	42	42
Moisture (%)	10.77	11.28	12.60	12.78
Oxygen (%)	10.92	10.81	10.63	10.80
Volume Flow (acfm)	2,108,000	2,038,700	1,995,300	1,935,100
Temperature (°F)	1,165	1,192	1,200	1,200
Emission rate (lb/hr)- calculated	269.9	256.9	247.1	233.1
(lb/hr)- provided	287.3	273.5	263.1	248.2
(TPY)	103.4	98.5	94.7	89.4
[Ratio lb/hr provided/calculated]	1.064	1.065	1.065	1.065
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	20.1	20.1	20.0	20.1
Basis, ppmvd @ 15% O2- calculated	13.7	13.6	13.5	13.9
- provided (a)	13.7	13.6	13.5	13.9
Moisture (%)	10.77	11.28	12.60	12.78
Oxygen (%)	10.92	10.81	10.63	10.80
Volume Flow (acfm)	2,108,000	2,038,700	1,995,300	1,935,100
Temperature (°F)	1,165	1,192	1,200	1,200
Emission rate (lb/hr)- calculated from given ppmvd	53.6	50.6	48.3	47.0
(lb/hr)- provided	56.9	53.8	51.6	50.0
(TPY)	20.5	19.4	18.6	18.0
[Ratio lb/hr provided/calculated]	1.062	1.063	1.067	1.065
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	4.0	4.0	4.0	4.0
Basis, ppmvd @ 15% O2- calculated	2.7	2.7	2.7	2.8
- provided (a)	2.7	2.7	2.7	2.8
Moisture (%)	10.77	11.28	12.60	12.78
Oxygen (%)	10.92	10.81	10.63	10.80
Volume Flow (acfm)	2,108,000	2,038,700	1,995,300	1,935,100
Temperature (°F)	1,165	1,192	1,200	1,200
Emission rate (lb/hr)- calculated	6.0	5.7	5.5	5.4
(lb/hr)- provided	6.4	6.1	5.9	5.7
(TPY)	2.3	2.2	2.1	2.1
[Ratio lb/hr provided/calculated]	1.060	1.062	1.068	1.054
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	10.8	10.8	10.8	10.8
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.73E-02	1.65E-02	1.59E-02	1.50E-02
(TPY)	6.23E-03	5.93E-03	5.71E-03	5.39E-03
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	6.26E-01	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.00E-03	9.56E-04	9.20E-04	8.67E-04
(TPY)	3.61E-04	3.44E-04	3.31E-04	3.12E-04
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4 /MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	87.2	83.0	79.9	75.3
lb H_2SO_4 /lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	15	15	15	15
Emission Rate (lb/hr)	20.03	19.06	18.35	17.30
(TPY)	7.21	6.86	6.61	6.23

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPA, 1998 (AP-42, Draft, Table 3.1-6)
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-19. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	6.09E-07	5.80E-07	5.58E-07	5.26E-07
(TPY)	2.19E-07	2.09E-07	2.01E-07	1.90E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	0.331	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	5.31E-04	5.05E-04	4.86E-04	4.59E-04
(TPY)	1.91E-04	1.82E-04	1.75E-04	1.65E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	5.22E-02	4.97E-02	4.78E-02	4.51E-02
(TPY)	1.88E-02	1.79E-02	1.72E-02	1.62E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c) , lb/10^{12} Btu	211	211	211	211
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	3.38E-01	3.22E-01	3.10E-01	2.92E-01
(TPY)	1.22E-01	1.16E-01	1.12E-01	1.05E-01

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-6)
(b) Golder Associates, 1998
(c) Chlorine content of 4 ppm assumed based on ASTM D 2880.

Table A-20. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 75 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	7.91	7.91	7.91	7.91
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.27E-02	1.21E-02	1.16E-02	1.10E-02
(TPY)	4.56E-03	4.35E-03	4.18E-03	3.95E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	1.1	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.76E-03	1.68E-03	1.62E-03	1.52E-03
(TPY)	6.35E-04	6.04E-04	5.82E-04	5.49E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	5.19E-03	4.95E-03	4.76E-03	4.49E-03
(TPY)	1.87E-03	1.78E-03	1.71E-03	1.62E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.08E-02	1.03E-02	9.93E-03	9.37E-03
(TPY)	3.90E-03	3.71E-03	3.58E-03	3.37E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	20	20	20	20
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	3.21E-02	3.05E-02	2.94E-02	2.77E-02
(TPY)	1.15E-02	1.10E-02	1.06E-02	9.98E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	37	37	37	37
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	5.93E-02	5.65E-02	5.44E-02	5.13E-02
(TPY)	2.13E-02	2.03E-02	1.96E-02	1.85E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	432	432	432	432
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	6.92E-01	6.59E-01	6.35E-01	5.99E-01
(TPY)	2.49E-01	2.37E-01	2.28E-01	2.15E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	1.38E-01	1.32E-01	1.27E-01	1.20E-01
(TPY)	4.98E-02	4.74E-02	4.56E-02	4.30E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	300	300	300	300
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	4.81E-01	4.58E-01	4.41E-01	4.16E-01
(TPY)	1.73E-01	1.65E-01	1.59E-01	1.50E-01
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	23	23	23	23
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	3.69E-02	3.51E-02	3.38E-02	3.19E-02
(TPY)	1.33E-02	1.26E-02	1.22E-02	1.15E-02
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	237	237	237	237
Heat Input Rate (MMBtu/hr)	1,603	1,526	1,469	1,385
Emission Rate (lb/hr)	3.80E-01	3.62E-01	3.48E-01	3.28E-01
(TPY)	1.37E-01	1.30E-01	1.25E-01	1.18E-01

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-5 and 3.1-6)
(b) Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12)
(c) EPA, 1996 (AP-42, Table 3.1-4)

Table A-21. Design Information and Stack Parameters
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Combustion Turbine Performance				
Evaporative cooler status/ efficiency (%)	Off	Off	Off	Off
Ambient Relative Humidity (%)	80	60	87	55
Gross power output (MW)	93.51	87.62	82.61	75.90
Gross heat rate (Btu/kWh, LHV)	12,042	12,132	12,408	12,833
(Btu/kWh, HHV)	12,764	12,860	13,152	13,603
Heat Input (MMBtu/hr, LHV)- calculated	1,126	1,063	1,025	974
- provided	1,126	1,063	1,025	974
(MMBtu/hr, HHV) - calculated	1,194	1,127	1,087	1,032
(HHV/LHV)	1.06	1.06	1.06	1.06
Fuel heating value (Btu/lb, LHV)	18,560	18,560	18,560	18,560
(Btu/lb, HHV)	19,674	19,674	19,674	19,674
(HHV/LHV)	1.06	1.06	1.06	1.06
CT Exhaust Flow				
Mass Flow (lb/hr)	2,668,000	2,647,000	2,589,000	2,523,000
Temperature (°F)	1,060	1,038	1,040	1,045
Moisture (% Vol.)	10.42	11.14	12.44	13.18
Oxygen (% Vol.)	11.27	11.10	10.84	10.72
Molecular Weight - calculated	28.40	28.32	28.18	28.09
- provided	28.39	28.31	28.17	28.09
Volume Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F) + 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	2,668,000	2,647,000	2,589,000	2,523,000
Temperature (°F)	1,060	1,038	1,040	1,045
Molecular weight	28.40	28.32	28.18	28.09
Volume flow (acfm)- calculated	1,737,202	1,703,210	1,676,673	1,644,335
- provided	1,737,800	1,701,300	1,675,100	1,640,200
	1.000	0.999	0.999	0.997
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,126	1,063	1,025	974
Heat content (Btu/lb, LHV)	18,560	18,560	18,560	18,560
Fuel usage (lb/hr)- calculated	60,668	57,274	55,226	52,478
- provided	60,700	57,300	55,200	52,500
Stack and Exit Gas Condition				
Stack height (ft)	60	60	60	60
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2/4) x 3.14159] / 60 sec/min				
Volume flow (acfm)- from CT	1,737,800	1,701,300	1,675,100	1,640,200
Temperature (°F) (-20 oF from CT exhaust)	1,040	1,018	1,020	1,025
Exit gas volume flow (acfm)	1,714,934	1,678,586	1,652,765	1,618,403
Diameter (ft)	21.0	21.0	21.0	21.0
Velocity (ft/sec)- calculated	83.6	81.9	80.6	78.9
Velocity (ft/sec)- provided	83.6	81.9	80.6	78.9
Velocity (m/sec)- calculated (from provided value)	25.5	25.0	24.6	24.1

Source: General Electric, 1999.
Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2

Table A-22. Maximum Emissions for Criteria and Other Regulated Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Particulate from CT = Emission rate (lb/hr) from CT manufacturer (dry filterables)				
Basis, lb/hr - provided (a)	22.0	22.0	22.0	22.0
(TPY)	7.9	7.9	7.9	7.9
Sulfur Dioxide (lb/hr) = Fuel Oil (lb/hr) x sulfur content(gr/100 cf) x (lb SO_2 /lb S)/100				
Fuel use (lb/hr)	60,700	57,300	55,200	52,500
Fuel Sulfur content	0.05%	0.05%	0.05%	0.05%
lb SO_2 /lb S (64/32)	2	2	2	2
Emission rate (lb/hr)- calculated	60.7	57.3	55.2	52.5
(lb/hr)- provided	64.9	61.3	59.1	56.2
(TPY)	23.4	22.1	21.3	20.2
[Ratio lb/hr provided/calculated]	1.069	1.070	1.071	1.070
Nitrogen Oxides (lb/hr) = NOx(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 5.9 x 1,000,000 (adj. for ppm)]				
Basis, ppmvd @15% O_2 (a)	42	42	42	42
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	1,737,800	1,701,300	1,675,100	1,640,200
Temperature (°F)	1,060	1,038	1,040	1,045
Emission rate (lb/hr)- calculated	229.4	228.4	224.3	217.8
(lb/hr)- provided	213.9	201.8	194.8	185.2
(TPY)	77.0	72.6	70.1	66.7
[Ratio lb/hr provided/calculated]	0.933	0.883	0.869	0.850
Carbon Monoxide (lb/hr) = CO(ppm) x {[20.9 x (1 - Moisture(%)/100)] - Oxygen(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd- calculated	23.3	24.7	25.1	25.8
Basis, ppmvd @ 15% O2- calculated	16.5	17.3	17.4	17.8
- provided (a)	16.5	17.3	17.4	17.8
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	1,737,800	1,701,300	1,675,100	1,640,200
Temperature (°F)	1,060	1,038	1,040	1,045
Emission rate (lb/hr)- calculated from given ppmvd	54.8	57.3	56.6	56.2
(lb/hr)- provided	51.0	50.7	49.1	47.8
(TPY)	18.4	18.3	17.7	17.2
[Ratio lb/hr provided/calculated]	0.930	0.885	0.868	0.851
VOCs (lb/hr) = VOC(ppm) x [1 - Moisture(%)/ 100] x 2116.8 lb/ft2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd (as CH_4)- calculated	4.5	4.7	4.9	5.1
Basis, ppmvd @ 15% O2- calculated	3.2	3.3	3.4	3.5
- provided (a)	3.2	3.3	3.4	3.5
Moisture (%)	10.42	11.14	12.44	13.18
Oxygen (%)	11.27	11.10	10.84	10.72
Volume Flow (acfm)	1,737,800	1,701,300	1,675,100	1,640,200
Temperature (°F)	1,060	1,038	1,040	1,045
Emission rate (lb/hr)- calculated	6.1	6.2	6.3	6.3
(lb/hr)- provided	5.6	5.6	5.5	5.4
(TPY)	2.0	2.0	2.0	1.9
[Ratio lb/hr provided/calculated]	0.921	0.897	0.871	0.855
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	10.8	10.8	10.8	10.8
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	1.29E-02	1.22E-02	1.17E-02	1.12E-02
(TPY)	4.64E-03	4.38E-03	4.22E-03	4.01E-03
Mercury (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis, lb/10^{12} Btu (c)	6.26E-01	6.26E-01	6.26E-01	6.26E-01
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	7.47E-04	7.05E-04	6.80E-04	6.46E-04
(TPY)	2.69E-04	2.54E-04	2.45E-04	2.33E-04
Sulfuric Acid Mist = SO2 emission rate (lb/hr) x conversion rate of SO2 to H_2SO_4 (%) x MW H_2SO_4 /MW SO_2 (98/64)				
SO2 emission rate (lb/hr)	64.9	61.3	59.1	56.2
lb H_2SO_4 /lb SO_2 (98/64)	1.53	1.53	1.53	1.53
Conversion to H_2SO_4 (%) (b)	5	5	5	5
Emission Rate (lb/hr)	4.97	4.69	4.52	4.30
(TPY)	1.79	1.69	1.63	1.55

Source: (a) General Electric 1999; (b) Decker Energy International, 2000; (c) EPA 1998 (AP-42, Draft, Table 3.1-6)
Note: ppmvd = parts per million, volume dry; O2 = oxygen.

Table A-23. Maximum Emissions for Other Regulated PSD Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
2,3,7,8 TCDD Equivalents (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	3.80E-04	3.80E-04	3.80E-04	3.80E-04
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	4.54E-07	4.28E-07	4.13E-07	3.92E-07
(TPY)	1.63E-07	1.54E-07	1.49E-07	1.41E-07
Beryllium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a) , lb/10^{12} Btu	0.331	0.331	0.331	0.331
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	3.95E-04	3.73E-04	3.60E-04	3.42E-04
(TPY)	1.42E-04	1.34E-04	1.29E-04	1.23E-04
Fluoride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	32.54	32.54	32.54	32.54
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	3.88E-02	3.67E-02	3.54E-02	3.36E-02
(TPY)	1.40E-02	1.32E-02	1.27E-02	1.21E-02
Hydrogen Chloride (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c) , lb/10^{12} Btu	211	211	211	211
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	2.52E-01	2.38E-01	2.29E-01	2.18E-01
(TPY)	1.79E-08	1.60E-08	1.48E-08	1.34E-08

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-6)
(b) Golder Associates, 1998
(c) Chlorine content of 4 ppm assumed based on ASTM D 2880.

Table A-24. Maximum Emissions for Hazardous Air Pollutants
General Electric Frame 7FA, Simple Cycle Unit, Water Injection, Oil firing, 50 % Load

Parameter	Ambient/Compressor Inlet Temperature 32 °F	59 °F	75 °F	95 °F
Hours of Operation	720	720	720	720
Arsenic (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	7.91	7.91	7.91	7.91
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	9.44E-03	8.91E-03	8.59E-03	8.17E-03
(TPY)	3.40E-03	3.21E-03	3.09E-03	2.94E-03
Benzene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	1.1	1.1	1.1	1.1
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	1.31E-03	1.24E-03	1.20E-03	1.14E-03
(TPY)	4.73E-04	4.46E-04	4.30E-04	4.09E-04
Cadmium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	3.24	3.24	3.24	3.24
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	3.87E-03	3.65E-03	3.52E-03	3.35E-03
(TPY)	1.39E-03	1.31E-03	1.27E-03	1.20E-03
Chromium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	6.76	6.76	6.76	6.76
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	8.07E-03	7.62E-03	7.34E-03	6.98E-03
(TPY)	2.90E-03	2.74E-03	2.64E-03	2.51E-03
Formaldehyde (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (b), lb/10^{12} Btu	20	20	20	20
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	2.39E-02	2.25E-02	2.17E-02	2.06E-02
(TPY)	8.59E-03	8.11E-03	7.82E-03	7.43E-03
Cobalt (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	37	37	37	37
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	4.42E-02	4.17E-02	4.02E-02	3.82E-02
(TPY)	1.59E-02	1.50E-02	1.45E-02	1.38E-02
Manganese (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	432	432	432	432
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	5.16E-01	4.87E-01	4.69E-01	4.46E-01
(TPY)	1.86E-01	1.75E-01	1.69E-01	1.61E-01
Nickel (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	86.3	86.3	86.3	86.3
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	1.03E-01	9.72E-02	9.38E-02	8.91E-02
(TPY)	3.71E-02	3.50E-02	3.38E-02	3.21E-02
Phosphorous (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (c), lb/10^{12} Btu	300	300	300	300
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	3.58E-01	3.38E-01	3.26E-01	3.10E-01
(TPY)	1.29E-01	1.22E-01	1.17E-01	1.12E-01
Selenium (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	23	23	23	23
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	2.75E-02	2.59E-02	2.50E-02	2.37E-02
(TPY)	9.88E-03	9.33E-03	9.00E-03	8.55E-03
Toluene (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Basis (a), lb/10^{12} Btu	237	237	237	237
Heat Input Rate (MMBtu/hr)	1,194	1,127	1,087	1,032
Emission Rate (lb/hr)	2.83E-01	2.67E-01	2.58E-01	2.45E-01
(TPY)	1.02E-01	9.61E-02	9.27E-02	8.81E-02

Sources: (a) EPA 1998 (AP-42, Draft, Table 3.1-5 and 3.1-6)
(b) Electric Power Research Institute (EPRI), Electric Utility Trace Substances Report, 1994 (Table B-12)
(c) EPA, 1996 (AP-42, Table 3.1-4)

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY FOR THE PROPOSED COMBUSTION TURBINES

B.1 NEW SOURCE PERFORMANCE STANDARDS

BACT is a case-by-case emission limitation for each applicable pollutant, based on the maximum degree of emission reduction after taking into account the energy, environmental, and economic impacts, and other costs. The BACT cannot be any less stringent than any applicable new source performance standards (NSPS) and consideration must be given to the applicable NSPS in the determination of BACT [Rule 62-212.400(6) F.A.C.]. This requirement also applies for any applicable National Emission Standard for Hazardous Air Pollutants promulgated under 40 CFR Part 61. For combustion turbines the applicable NSPS is 40 CFR Part 60, Subpart GG Standards of Performance for Stationary Gas Turbines.

B.1.1 SUBPART GG

The NSPS regulations (40 CFR, Subpart GG) applicable to gas turbines apply to:

1. Electric utility stationary gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr [40 CFR 60.332 (b)];
2. Stationary gas turbines with a heat input at peak load between 10 and 100 x 10^6 Btu/hr [40 CFR 60.332 (c)]; or
3. Stationary gas turbines with a manufacturer's rate base load at ISO conditions of 30 MW or less [40 CFR 60.332 (d)].

The electric utility stationary gas turbine provisions apply to stationary gas turbines constructed for the purpose of supplying more than one-third of their potential electric output capacity for sale to any utility power distribution system [40 CFR 60.331 (q)]. The requirements for electric utility stationary gas turbines are applicable to the turbines proposed for the Project and are the most stringent provision of the NSPS. These requirements are summarized in Table B-1 and were considered in the BACT analysis.

As noted from Table B-1, the NSPS NO_x emission limit can be adjusted upward to allow for fuel-bound nitrogen (FBN). For a fuel-bound nitrogen concentration of 0.015 percent or less, no increase in the NSPS is provided; for a fuel-bound nitrogen concentration of 0.03 percent, the NSPS is increased by 0.0012 percent or 12 parts per million (ppm). The NSPS NO_x emission limit adjustment is not affected by natural gas combustion.

B.2 BEST AVAILABLE CONTROL TECHNOLOGY

The "top-down" analysis for determining BACT, as provided for in EPA's Draft 1990 New Source Review Workshop Manual, is used by the FDEP in determining BACT under Rule 62-212.400(5)(c) F.A.C. The procedure involves 5 steps: identification of control technologies, elimination of technically infeasible control technologies, a ranking of the control technologies, an evaluation of the effective control technologies and the selection of BACT.

The identification of control technologies is developed from the information obtained from BACT/LAER Information System (BLIS) database maintained at EPA's National Computer Center located at Research Triangle Park, North Carolina. While these data are comprehensive it is often not up to date with the most recent BACT/LAER decisions and separate contact with state agencies is required. LAER is distinctly different from BACT in that there is no consideration of economic, energy, or environmental impacts; if a control technology has previously been installed, it must be required as LAER. LAER is defined as follows:

> Lowest achievable emission rate means, for any source, the more stringent rate of emissions based on the following: (i) The most stringent emissions limitation which is contained in the implementation plan of any State of such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or (ii) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance (40 CFR 51, Appendix S.II, A.18).

The elimination of infeasible technologies is based on those engineering aspects that would preclude a technology's use due to physical, chemical or other engineering consideration. Control technologies that are technically feasible are ranked by control effectiveness, with determination of the environmental, economic and energy costs and benefits of the control technologies. This information forms the basis for the case-by-case consideration of environmental, energy and economic impacts. The "top" feasible control alterable is selected unless it can be rejected based on economic, environmental or energy considerations. This section of Appendix B presents information related to the proposed BACT emission limitation.

B.2.1 NITROGEN OXIDES

NO_x emissions from combustion of fossil fuels consist of thermal NO_x and fuel-bound NO_x. Thermal NO_x is formed from the reaction of oxygen and nitrogen in the combustion air at combustion temperatures. Formation of thermal NO_x depends on the flame temperature, residence time, combustion pressure, and air-to-fuel ratios in the primary combustion zone. The design and operation of the combustion chamber dictates these conditions. Fuel-bound NO_x is created by the oxidation of volatilized nitrogen in the fuel. Nitrogen content in the fuel is the primary factor in its formation.

<u>Identification of NO_x Control Technologies</u>

Table B-2 presents a listing of the lowest achievable emission rates/best available control technology (LAER/BACT) decisions made by state environmental agencies and EPA regional offices for gas turbines. This table was developed from the information obtained from BACT/LAER Information System (BLIS) database maintained at EPA's National Computer Center located at Research Triangle Park, North Carolina.

Historically, the most stringent NO_x controls for CTs established as LAER/BACT by state agencies were combustion controls with selective catalytic reduction (SCR) and combustion controls alone. SCR is a post-combustion control, while advanced dry low-NO_x combustors minimize the formation of NO_x in the combustion process. When SCR has been employed, wet injection and dry low-NO_x combustion technology are used initially to reduce NO_x emissions.

Wet injection was the first combustion technology introduced for combustion turbines (pre-1980's) and was the primary method of reducing NO_x emissions from CTs prior to the 1990's. Indeed, this method of control was first mandated by the NSPS to reduce NO_x levels to 75 parts per million by volume, dry (ppmvd) (corrected to 15 percent O_2 and heat rate).

Development of improved wet injection combustors reduced NO_x concentrations to 25 ppmvd (corrected to 15 percent O_2) when burning natural gas.
The dry low-NO_x combustion technology has been developed and made available since the early 1990's for gas turbines to achieve emission levels of 25 ppmvd corrected to 15 percent O_2. More recently, however, CT manufacturers have developed dry low-NO_x combustors that can reduce NO_x concentrations to 10 ppmvd (corrected to 15 percent O_2) or less when firing natural gas.

SCR has been installed or permitted in over 100 projects. The majority of these projects (more than 90 percent) were initially cogeneration facilities with capacities of 50 MW or less. Many of these projects that have installed SCR have been in the Southern California NO_2 nonattainment area where SCR was initially required not as BACT but as LAER, a more stringent requirement. As noted previously, there are distinct regulatory and policy differences between LAER and BACT. As discussed in Section 3.0, BACT involves an evaluation of the economic, environmental, and energy impacts of alternative control technologies. In contrast, LAER only considers the technical aspects of control.

More recently, projects with SCR have been installed throughout the US including the states of Vermont, Massachusetts, Connecticut, New Jersey, New York, Rhode Island, Virginia, and Florida. A majority of these projects are also cogeneration facilities or independent power producers. The size of these projects ranges from 22 MW to over 500 MW. While almost all of the facilities have distillate oil as backup fuel, distillate oil generally is restricted by permit to 1,000 hours or less per CT.

Reported and permitted NO_x removal efficiencies of SCR range from 40 to 80 percent of NO_x in the exhaust gas stream. The most common emission limiting standards associated with SCR are 9 ppmvd corrected to 15 percent O_2 or less for natural gas firing.

Other available control technologies that have become available for controlling NO_x emissions from combustion turbines for include SCONO$_x$™ and XONON™. SCONO$_x$™ is an add-on control using absorption and chemical conversion to remove NO_x formed from combustion, while XONON™ is a catalytic combustion system integral to the turbine. Other potential technologies used in combustion process for NO_x removal include: NO_xOUT, Thermal DeNO_x, and NSCR.

Technology Descriptions and Feasibility

Wet Injection

The injection of water or steam in the combustion zone of CTs reduces the flame temperature with a corresponding decrease of NO_x emissions. The amount of NO_x reduction possible depends on the combustor design and the water-to-fuel ratio employed. An increase in the water-to-fuel ratio will cause a concomitant decrease in NO_x emissions until flame instability occurs. At this point, operation of the CT becomes inefficient and unreliable, and significant increases in products of incomplete combustion results (i.e., CO and VOC emissions). In "F" Class turbines using wet injection with gas firing, the NO_x emission rates in the 30 ppm have been demonstrated. However, wet injection is no longer offered for gas firing in "F" Class turbines. Wet injection is the only current feasible means of reducing NO_x emissions in the combustion process when firing oil.

Dry Low-NO_x Combustor

In the past several years, CT manufacturers have offered and installed machines with dry low-NO_x combustors. These combustors, which are offered on conventional machines manufactured by General Electric (GE), Siemens/Westinghouse, and ABB, can achieve NO_x concentrations of 25 ppmvd or less when firing natural gas. GE and Siemens/Westinghouse have offered dry low-NO_x combustors on advanced heavy-duty industrial machines. Thermal NO_x formation is inhibited by using combustion techniques where the natural gas and combustion air are premixed before ignition. For the CT being considered for the Project, the combustion chamber design includes the use of dry low-NO_x combustor technology. The NO_x emission level when firing natural gas at baseload conditions is 10 ppmvd (corrected to 15 percent O_2), a level which is guaranteed by the selected vendor (GE) for the Project.

Selective Catalytic Reduction (SCR)

Selective Catalytic Reduction (SCR) uses ammonia (NH_3) to react with NO_x in the gas stream in the presence of a catalyst. NH_3, which is diluted with air to about 5 percent by volume, is introduced into the gas stream at reaction temperatures between 600°F and 750°F. The reactions are as follows:

$$4NH_3 + 4NO + O_2 = 4N_2 + 6H_2O$$

$$4NH_3 + 2NO_2 + O_2 = 3N_2 + 6H_2O$$

SCR operating experience, as applied to gas turbines, consists primarily of baseload natural-gas-fired installations either of cogeneration or combined-cycle configuration. Exhaust gas temperatures of simple-cycle CTs generally are in the range of 1,000°F to 1,200°F, which exceeds the optimum range for SCR with base metal catalysts. All current SCR applications have the catalyst placed in the HRSG to achieve proper reaction conditions. This allows a relatively constant temperature for the reaction of NH_3 and NO_x on the catalyst surface.

The use of SCR has been primarily limited to combined-cycle facilities that burn natural gas with small amounts of fuel oil. Traditional metal SCR catalysts were contaminated by sulfur-containing fuels. For most fuel-oil-burning facilities, catalyst operation was discontinued, or the exhaust bypasses the SCR system. This was due to the formation of ammonium salts (ammonium sulfate and bisulfate) resulting from the reaction of NH_3 and sulfur combustion products. Ammonium bisulfate can be corrosive and could cause damage to the HRSG surfaces that follow the catalyst, as well as to the stack. Corrosion protection for these areas would be required with concomitant cost and technical requirements. Ammonium sulfate is emitted as particulate matter. While the formation of ammonium salts is primarily associated with oil firing, sulfur combustion products from natural gas also could form small amounts of ammonium salts. Ceramic and specially designed catalysts have been designed to overcome the problems with base-metal catalysts. The sulfur in No. 2 distillate oil has also been reduced from 0.5 percent available in the early 1990's to 0.05 percent. In addition, HRSG designs can accommodate the impacts of the formation of ammonium salts.

For simple-cycle combustion turbines, SCR has had limited applications. Zeolite and specially designed high temperature catalysts, which are reported to be capable of withstanding temperature ranges up to 1,050°F, have become commercially available. Their initial application with SCR has primarily been limited to applications on internal combustion engines. The initial optimum performance of an SCR system using a zeolite catalyst is reported to range from about 800°F to 900°F. Recently, SCR vendors have offered high temperature catalysts for simple-cycle applications up to 1,050°F. At temperatures of 1,100°F and above, the high-temperature catalyst will be irreparably damaged.

In the 1990s there are four simple-cycle combustion turbine projects that have installed SCR with operating experience. These projects are:

- Redding Municipal Power – 3 GE Frame 5 CTs fired with natural gas. The CTs are operated as a peaking facility.
- SoCal Gas Company – 4 Solar Centaur CTs (4MW equivalent each) fired with natural gas. The CTs are operated in intermediate cycling duty.
- UnoCal Brea Research Center – a single 4 MW CT firing natural gas. The CT operates in intermediate to base load duty.
- Puerto Rico Electric Power Authority (Cambalache Facility) – 3 ABB Type 11 N (83 MW each) firing No. 2 distillate oil.

The SCRs for all these CTs were designed to operate at temperatures less than 1,000°F. Many of the smaller CTs have exhaust temperatures less than 1,000°F. The Cambalache Facility had a once through steam generator in the ductwork leading to SCR used for power augmentation that reduced the catalyst temperature to less than 1,000°F. Experience on these systems has shown significant catalyst deactivation occurs with peaking and intermediate cycling duty while firing natural gas. Under these conditions catalyst deactivation has occurred after operating from 350 to 4,000 hours. For intermediate-base load duty and firing natural gas, catalyst deactivation improved but still occurred after 8,000 hour of operation and well less the catalyst guarantee. When firing distillate oil, catalyst deactivation occurred after 600 hours. Due to the problems with oil firing, the SCR system for the Cambalache Facility has been removed.

The "F" Class turbines have higher exhaust temperatures and would require exhaust temperature reduction for the technology to be feasible. There are no current applications of SCR on "F" Class combustion turbines. The experience with SCR on simple-cycle turbines suggests the technology is available from vendors but has not been demonstrated as technically feasible.

SCONO$_x$™ Process

SCONO$_x$™ is a NO_x and CO control system exclusively offered by Goal Line Environmental Technologies (GLET). GLET is a partnership formed by Sunlaw Energy Corporation and Advanced Catalyst Systems, Inc. In 1998, ABB acquired the exclusive license for the technology in the United States for control applications larger than 100 MW.

The SCONO$_x$™ system employs a single catalyst to simultaneously oxidize CO to CO_2 and NO to NO_2. NO_2 formed by the oxidation of NO is subsequently absorbed onto the catalyst surface through the use of a potassium carbonate absorber coating. The SCONO$_x$™ oxidation/absorption cycle reactions are:

$$CO + \tfrac{1}{2} O_2 \rightarrow CO_2 \qquad (1)$$

$$NO + \tfrac{1}{2} O_2 \rightarrow NO_2 \qquad (2)$$

$$2NO_2 + K_2CO_3 \rightarrow CO_2 + KNO_2 + KNO_3 \qquad (3)$$

CO_2 produced by reaction (1) and (2) is released to the atmosphere as part of the CT/HRSG exhaust gas stream.

As shown in Reaction (3), the potassium carbonate catalyst coating reacts with NO_2 to form potassium nitrites and nitrates. Prior to saturation of the potassium carbonate coating, the catalyst must be regenerated. This regeneration is accomplished by passing a dilute hydrogen-reducing gas across the surface of the catalyst in the absence of O_2. Hydrogen in the reducing gas reacts with the nitrites and nitrates to form water and elemental nitrogen. CO_2 in the regeneration gas reacts with potassium nitrites and nitrates to form potassium carbonate; this compound is the catalyst absorber coating present on the surface of the catalyst at the start of the oxidation/absorption cycle. The SCONO$_x$™ regeneration cycle reaction is:

$$KNO_2 + KNO_3 + 4\,H_2 + CO_2 \Rightarrow K_2CO_3 + 4\,H_2O_{(g)} + N_2 \quad (4)$$

Water vapor and elemental nitrogen are released to the atmosphere as part of the CT/HRSG exhaust stream. Following regeneration, the SCONO$_x$™ catalyst has a fresh coating of potassium carbonate, allowing the oxidation/absorption cycle to begin again. There is no net gain or loss of potassium carbonate after both the oxidation/absorption and regeneration cycles have been completed.

Since the regeneration cycle must take place in an oxygen-free environment, the section of catalyst undergoing regeneration is isolated from the exhaust gas stream using a set of louvers. Each catalyst section is equipped with a set of upstream and downstream louvers. During the regeneration cycle, these louvers close and valves open allowing fresh regeneration gas to enter and spent regeneration gas to exit the catalyst section being regenerated. At any given time, 75 percent of the catalyst sections will be in the oxidation/absorption cycle, while 25 percent will be in regeneration mode. A regeneration cycle is typically set to last for 3 to 5 minutes.

Regeneration gas is produced by reacting natural gas with O_2 present in ambient air. The SCONO$_x$™ system uses a gas generator produced by Surface Combustion. This unit uses a two-stage process to produce hydrogen and carbon dioxide. In the first stage, natural gas and ambient air are reacted across a partial oxidation catalyst at 1,900°F to form CO and hydrogen. Steam is added and the gas mixture is then passed across a low temperature shift catalyst, forming CO_2 and additional hydrogen. The resulting gas stream is diluted to less than 4 percent hydrogen using steam or another inert gas. The regeneration gas reactions are:

$$CH_4 + \tfrac{1}{2}\,O_2 + 1.88\,N_2 \Rightarrow CO + 2\,H_2 + 1.88\,N_2 \quad (5)$$

$$CO + 2\,H_2 + H_2O + 1.88\,N2_2 \Rightarrow CO_2 + 3\,H_2 + 1.88\,N_2 \quad (6)$$

The SCONO$_x$™ operates at a temperature range of 300 to 700°F and, therefore, must be installed in the appropriate temperature section of a HRSG. For SCONO$_x$™ systems installed in locations of the HRSG above 500°F, a separate regeneration gas generator is not required. Instead, regeneration gas is produced by introducing natural gas directly across the $SCONO_x$™ catalyst that reforms the natural gas.

The $SCONO_x$™ system catalyst is subject to reduced performance and deactivation due to exposure to sulfur oxides. For this reason, an additional catalytic oxidation/absorption system ($SCONO_x$™) to remove sulfur compounds is installed upstream of the $SCONO_x$™ catalyst. During regeneration of the $SCONO_x$™ catalyst, either hydrogen sulfide or SO_2 is released to the atmosphere as part of the CT/HRSG exhaust gas stream. The absorption portion of the $SCONO_x$™ process is proprietary. $SCONO_x$™ oxidation/absorption and regeneration reactions are:

$$CO + \frac{1}{2} O_2 \Rightarrow CO_2 \tag{7}$$

$$SO_2 + \frac{1}{2} O_2 \Rightarrow SO_3 \tag{8}$$

$$SO_3 + \text{SORBER} \Rightarrow [SO_3 + \text{SORBER}] \tag{9}$$

$$[SO_3 + \text{SORBER}] + 4\,H_2 \Rightarrow H_2S + 3\,H_2O \tag{10}$$

Utility materials needed for the operation of the $SCONO_x$™ control system include ambient air, natural gas, water, steam, and electricity. The primary utility material is natural gas used for regeneration gas production. Steam is used as the carrier/dilution gas for the re-generation gas. Electricity is required to operate the computer control system, control valves, and louver actuators.

Commercial experience to date with the $SCONO_x$™ control system is limited to one small combined-cycle (CC) power plant located in Los Angeles. This power plant, owned by GLET partner Sunlaw Energy Corporation, utilizes a GE LM2500 turbine (30 MW size) equipped with water injection to control NO_x emissions to approximately 25 ppmvd. The $SCONO_x$™ control system was installed at the Sunlaw Energy facility in December 1996 and has achieved a NO_x exhaust concentration of 3.5 ppmv resulting in an approximate 85 percent NO_x removal efficiency.

The SCONO$_x$™ control technology is not considered to be technically feasible because it has not been commercially demonstrated on large CTs. The CTs planned for the Project, GE Frame 7F units, each have a nominal generating capacity of 174 MW which are approximately seven times larger than the nominal 25-MW GE LM2500 utilized at the Sunlaw Energy Corporation Los Angeles facility. Technical problems associated with scale-up of the SCONO$_x$™ technology given the large differences in machine flow rates are unknown. Additional concerns with the SCONO$_x$™ control technology include process complexity (multiple catalytic oxidation / absorption / regeneration systems), reliance on only one supplier, and the relatively brief operating history of the technology.

XONON™ Catalytic Combustor

Catalytic combustors are being develop for low emission applications on turbines where the catalyst is internal to the combustion system. The XONON™ Combustion System is a catalytic combustion system developed by Catalytica Combustion Systems, Inc. that can achieve low emission levels of NO$_x$, CO and VOCs. The XONON™ system combusts the fuel over a catalyst, reducing the temperature of combustion and providing for more complete combustion of the fuel. The system is referred to as "flameless combustion" where temperature are below those where limited NO$_x$ formation occurs. However, the exhaust temperatures from a combustion turbine standpoint are still sufficient for the expansion of the gases through the turbine for power generation. Emission levels of NO$_x$ at less than 2 ppm have been reported for the 1.5 MW Kawasaki gas turbine located at Sun Valley Power. Recently, this technology has been proposed for a 750 MW combined-cycle facility. This facility, the Pastoria Energy Facility, is a project proposed by affiliates of Enron Corporation, which has a 15 percent interest in Catalytica Combustion Systems, Inc. Commercial operation is scheduled for the summer of 2003. Catalytica is currently working in collaboration with several gas turbine manufacturers including General Electric, Pratt & Whitney, Rolls Royce Allison and Solar.

NO$_x$OUT Process

The NO$_x$OUT process originated from the initial research by the Electric Power Research Institute (EPRI) in 1976 on the use of urea to reduce NO$_x$. EPRI licensed the proprietary process to Fuel Tech, Inc., for commercialization. In the NO$_x$OUT process, aqueous urea is injected into the flue gas stream ideally within a temperature range of 1,600°F to 1,900°F. In the presence of oxygen, the following reaction results:

$$CO(NH_2)_2 + 2NO + \frac{1}{2} O_2 \Rightarrow 2N_2 + CO_2 + 2H_2O$$

The amount of urea required is most cost-effective when the treatment rate is 0.5 to 2 moles of urea per mole of NO_x. In addition to the original EPRI urea patents, Fuel Tech claims to have a number of proprietary catalysts capable of expanding the effective temperature range of the reaction to between 1,600°F and 1,950°F. Advantages of the system are as follows:

1. Low capital and operating costs as a result of use of urea injection, and
2. The proprietary catalysts used are nontoxic and nonhazardous, thus eliminating potential disposal problems.

Disadvantages of the system are as follows:

1. Formation of ammonia from excess urea treatment rates and/or improper use of reagent catalysts, and
2. Sulfur trioxide (SO_3), if present, will react with ammonia created from the urea to form ammonium bisulfate, potentially plugging the cold end equipment downstream.

Commercial application of the NO_xOUT system is limited and the NO_xOUT system has not been demonstrated on any combustion turbine/HRSG unit.

The NO_xOUT process is not technically feasible for the proposed Project because of the high application temperature of 1,600°F to 1,950°F. The maximum exhaust gas temperature of the project CT is about 1,100°F. Raising the exhaust temperature the required amount essentially would require installation of a heater. This would be economically prohibitive and would result in an increase in fuel consumption, an increase in the volume of gases that must be treated by the control system, and an increase in uncontrolled air emissions, including NO_x.

Thermal DeNO$_x$

Thermal DeNO$_x$ is Exxon Research and Engineering Company's patented process for NO$_x$ reduction. The process is a high temperature selective noncatalytic reduction (SNCR) of NO$_x$ using ammonia as the reducing agent. Thermal DeNO$_x$ requires the exhaust gas temperature to be above 1,800°F. However, use of ammonia plus hydrogen lowers the temperature requirement to about 1,000°F. For some applications, this must be achieved by additional firing in the exhaust stream before ammonia injection.

The only known commercial applications of Thermal DeNO$_x$ are on heavy industrial boilers, large furnaces, and incinerators that consistently produce exhaust gas temperatures above 1,800°F. There are no known applications on or experience with CTs. Temperatures of 1,800°F require alloy materials constructed with very large piping and components since the exhaust gas volume would be increased by several times. As with the NO$_x$OUT process, high capital, operating, and maintenance costs are expected because of material requirements, an additional duct burner system, and fuel consumption. Uncontrolled emissions would increase because of the additional fuel burning.

Thus, the Thermal DeNO$_x$ process will not be considered for the proposed Project since its high application temperature makes it technically infeasible. The maximum exhaust gas temperature of the Project combustion turbine is typically 1,100°F; the cost to raise the exhaust gas to such a high temperature is prohibitively expensive.

Nonselective Catalytic Reduction

Certain manufacturers, such as Engelhard, market a nonselective catalytic reduction system (NSCR) for NO$_x$ control on reciprocating engines. The NSCR process requires a low oxygen content in the exhaust gas stream and high temperature (700°F to 1,400°F) in order to be effective. CTs have the required temperature but also have high oxygen levels (greater than 12 percent) and, therefore, cannot use the NSCR process. As a result, NSCR is not a technically feasible add-on NO$_x$ control device for CTs.

Technology Demonstration and Feasibility

The combustion technologies of dry low-NO combustors and wet injection are available, demonstrated and technically feasible for combustion turbines in simple-cycle configuration. The advanced dry low-NO_x combustion technology alone can achieve 10 ppm (corrected to 15 percent O_2 dry conditions) when firing natural gas and water injection is capable of achieving a NO_x emission level of 42 ppm when firing natural gas (corrected to 15 percent O_2 dry conditions). Wet injection cannot achieve emission rates lower than 42 ppm when firing natural gas in an "F" Class machine and is not offered by the preferred vendor (i.e., GE). Injection of larger amounts of water than recommended by the manufacture will potential damage the machine.

The technical evaluation of post-combustion gas controls that include NO_xOUT, Thermal DeNO_x, and NSCR, and indicate that these processes have not been applied to either simple-cycle or combined-cycle combustion turbines and are technically infeasible for the Project because of process constraints (e.g., temperature). SCONO$_x$™ is potentially feasible for combined-cycle turbines but is infeasible for simple-cycle operation. There is currently no commercially demonstrated application of SCONO$_x$™ in a large combined-cycle unit (i.e., 170 MW). While the XONON™ catalytic combustion system can be applied to both simple-cycle and combined-cycle, application to a large combined-cycle unit has also not been demonstrated. For these reasons, the SCONO$_x$™ and XONON™ are still considered in the commercial demonstration stage. SCR is commercially available, technically feasible and demonstrated for combined-cycle units. While high-temperature "hot" SCR is feasible, it has not been demonstrated on simple-cycle "F" class turbines in peaking service.

For simple-cycle operation, dry low-NO_x combustion technology and water injection in combination with SCR are available from vendors but the technical feasibility of SCR is questionable.

Below is a summary of the technical availability, demonstration and feasibility for the proposed Project.

Simple-cycle:

Technology	Status
Selective Catalytic Reduction	Available, Not Demonstrated and Potentially Feasible
Dry Low-NO_x Combustors	Available, Demonstrated and Feasible for Gas Firing
Wet Injection	Available, Demonstrated and Feasible for Oil Firing
SCO NO_x	Not Available or Feasible
XOXON™	Not Yet Demonstrated, Potentially Feasible
Thermal De NO_x	Not Available or Feasible
NO_x Out	Not Available or Feasible
NSCR	Not Available or Feasible

SCR Cost Estimates

Tables B-3 and B-4 present the total capital and annualized cost for SCR applied to simple-cycle operation, respectively. The costs were developed using the EPA Cost Control Manual (EPA, 1990 & 1993). Vendor based estimates were used for the SCR system. Standard EPA recommended cost factors were used. A capital recovery period of 15 years was used for the capital costs.

Comparison of Economic, Environmental, and Energy Impacts

Table B-5 presents a comparison of the economic, environmental, and energy impacts associated with the top control alternatives for the simple-cycle unit. Table B-6 presents the potential emissions resulting from the formation of ammonium salts (i.e., particulate matter), ammonia slip and secondary emissions. The latter results from generation lost due to the back pressure of the SCR system.

B.2.2 CARBON MONOXIDE

Identification of CO Control Technologies

CO emissions are a result of incomplete or partial combustion of fossil fuel. Combustion design and catalytic oxidation are the control alternatives that are viable for the Project. Table B-7 presents a listing of LAER/BACT decisions for CO emissions from combustion turbines. Combustion design is the more common control technique used in CTs. Sufficient time, temperature, and turbulence is required within the combustion zone to maximize combustion efficiency and minimize the emissions of CO. Combustion efficiency is dependent upon combustor design. For the CTs being evaluated, CO emissions will not exceed 12 ppmvd, corrected to 15 percent O_2, dry conditions when firing natural gas under full load conditions and 20 ppmvd, corrected to 15 percent O_2, dry conditions when firing distillate oil under full load conditions.

Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to use LAER technology and typically have CO limits in the 10 ppm range (corrected to dry conditions) and less.

Technology Description

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst, such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required.

For CTs, the oxidation catalyst can be located directly after the CT. Catalyst size depends upon the exhaust flow, temperature, and desired efficiency. The existing oxidation catalyst applications primarily have been limited to smaller cogeneration facilities burning natural gas. Oxidation catalysts have not been used on fuel-oil-fired CTs. The use of sulfur-containing fuels in an oxidation catalyst system would result in an increase of SO_3 emissions and concomitant corrosive effects to the stack. In addition, trace metals in the fuel could result in catalyst poisoning during prolonged periods of operation.

During simple-cycle operation the units likely will require numerous startups and experience variations in exhaust conditions that will influence catalyst life and performance. Very little technical data exist to demonstrate the effect of such cycling.

Oxidation Catalyst Costs

Tables B-8 and B-9 present the capital and annualized cost for an oxidation catalyst applied to simple-cycle operation. The maximum CO impacts are less than 0.1 percent of the applicable ambient air quality standards. There would also be no secondary benefits, such as reducing acidic deposition, to reducing CO.

Comparison of Economic, Environmental, and Energy Impacts

Table B-10 presents a comparison of the economic, environmental, and energy impacts associated with the top control alternatives for the combined-cycle unit. Table B-11 presents the potential emissions resulting from the formation of ammonium salts (i.e., particulate matter), ammonia slip and secondary emissions. The latter results from generation lost due to the back pressure of the oxidation catalyst.

Table B-1. Federal NSPS for Electric Utility Stationary Gas Turbines

Pollutant	Emission Limitation[a]
Nitrogen Oxides[b]	0.0075 percent by volume (75 ppm) at 15 percent O_2 on a dry basis adjusted for heat rate and fuel nitrogen

[a] Applicable to electric utility gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr.

[b] Standard is multiplied by 14.4/Y; where Y is the manufacturer's rated heat rate in kilojoules per watt at rated load or actual measured heat rate based on the lower heating value of fuel measured at actual peak load; Y cannot be greater than 14.4. Standard is adjusted upward (additive) by the percent of nitrogen in the fuel:

Fuel-Bound Nitrogen (percent by weight)	Allowed Increase NO_x Percent by Volume
$N \leq 0.015$	0
$0.015 < N \leq 0.1$	0.04(N)
$0.1 < N \leq 0.25$	0.004+0.0067(N-0.1)
$N > 0.25$	0.005

where: N = the nitrogen content of the fuel (percent by weight).

Source: 40 CFR 60 Subpart GG.

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Table 6-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NO_x) Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit Process Description	Capacity (size)	NO_x Emission Limit	Control Method	Basis
KISSIMMEE UTILITIES AUTHORITY	FL	PSD-FL-254	12/16/99	TURBINE, COMBUSTION	250.00 MW	9.0000 PPMVD	GE DLNOX 2.6	BACT-PSD
DUKE ENERGY NEW SOMYRNA BEACH POWER CO LP	FL	PSD-FL-257	10/15/99	TURBINE-GAS, COMBINED CYCLE	500.00 MW (2 UNITS)	9.0000 PPM @ 15% O2	DLN GE DLN2.6 BURNERS	BACT-PSD
TAMPA ELECTRIC COMPANY (TEC)	FL	PSD-FL-263	10/15/99	TURBINE, COMBUSTION, SIMPLE CYCLE	165.00 MW	10.5000 PPM @ 15% O2	DLN GE DLN2.6	BACT-PSD
OLEANDER POWER PROJECT	FL	PSD-FL-258	10/2/99	TURBINE-GAS, COMBINED CYCLE	190.00 MW	9.0000 PPM @ 15% O2	DLN 2.6 GE ADVANCED DRY LOW NOX BURNERS	BACT-PSD
PDC EL PASO MILFORD LLC	CT	105-0068	4/16/99	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLERS	1.97 MMCF/H	2.0000 PPMV @ 15% O2 GAS	SCR WITH AMMONIA INJECTION	LAER
PDC EL PASO MILFORD LLC	CT	105-0069	4/16/99	TURBINE, COMBUSTION, ABB GT-24B, #2 WITH 2 CHILLERS	1.97 MMCF/H	2.0000 PPMV @ 15% O2 GAS	SCR WITH AMMONIA INJECTION	LAER
ALABAMA POWER COMPANY - THEODORE COGENERATION	AL	503-8073	3/16/99	TURBINE, WITH DUCT BURNER	170.00 MW	0.0130 LB/MMBTU	DLN COMBUSTOR IN CT, LNB IN DUCT BURNER, SCR	BACT-PSD
WYANDOTTE ENERGY	MI	279-98	2/8/99	TURBINE, COMBINED CYCLE, POWER PLANT	500.00 MW	4.5000 PPM	SCR	BACT
MOBILE ENERGY LLC	AL	503-8066	1/5/99	TURBINE, GAS, COMBINED CYCLE	168.00 MW	0.0190 LB/MMBTU	SCR & DLN COMBUSTORS DURING GAS FIRING STEAM/WATER INJECTION DURING OIL FIRING	BACT-PSD
COLORADO SPRINGS UTILITIES	CO	0410010	1/4/99	TURBINE, COMBINE, NATURAL GAS FIRED	30.00 MW EACH	15.0000 PPMVD ABOVE 70% LOAD	POLLUTION PREVENTION BUILT INTO EQUIPMENT	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P	GA	4-11-149-0004-P-01-0	12/18/98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160.00 MW EA	15.0000 PPMVD @ 15% O2	USING 15% EXCESS AIR, NOX EMISSION IS BECAUSE OF NATURAL GAS	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P	GA	4-11-149-0004-P-01-0	12/18/98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160.00 MW EA	42.0000 PPMVD @ 15% O2	USING 15% EXCESS AIR NOX EMISSION IS BECAUSE OF FUEL OIL	BACT-PSD
WESTBROOK POWER LLC	ME	A-763-71-A-N	12/4/98	TURBINE, COMBINED CYCLE, TWO	528.00 MW TOTAL	2.5000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX BURNERS	LAER
GORHAM ENERGY LIMITED PARTNERSHIP	ME	A-735	12/4/98	TURBINE, COMBINED CYCLE	900.00 MW TOTAL	2.5000 PPM @ 15% O2 (NAT G)	SELECTIVE CATALYTIC REDUCTION EMISSION IS FROM EACH 300 MW SYSTEM	LAER
SANTA ROSA ENERGY LLC	FL	PSD-FL 253	12/4/98	TURBINE, COMBUSTION, NATURAL GAS	241.00 MW	9.8000 PPM @ 15% O2 DB ON	DRY LOW NOX BURNER	BACT-PSD
LSP - COTTAGE GROVE, L.P.	MN	16300087-001	11/10/98	GENERATOR, COMBUSTION TURBINE & DUCT BURNER	1988.00 MMBTU/H (CTG)	4.5000 PPMDV @ 15% O2 (NG)	SELECTIVE CATALYTIC REDUCTION (SCR) WITH A NOX CEM AND A NOX PEM	BACT-PSD
CHAMPION INTERNATL CORP & CHAMP CLEAN ENERGY	ME	A-23-71-N-A	9/14/98	TURBINE, COMBINED CYCLE, NATURAL GAS	175.00 MW	9.0000 PPMVD @ 15% O2 GAS	DRY LOW NOX BURNER 1 OPTION IS CONSIDERED FOR OIL AND IS SELECTED	BACT-OTHER
ALABAMA POWER PLANT BARRY	AL	503-1001	8/7/98	TURBINES, COMBUSTION, NATURAL GAS	510.00 MW(TOTAL)	0.0130 LB/MMBTU	NATURAL GAS, CT-DLN COMBUSTORS, DUCTBURNER, LOW NOX BURNER, COMBINED STACK SCR	BACT-PSD
TNP TECHN. LLC (FORMERLY TX-NM POWER CO)	NM	PSD-NM-90-M2	8/7/98	GAS TURBINES	375.00 MMBTU/H	15.0000 PPM	WATER INJECTION FOLLOWED BY SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
CASCO BAY ENERGY CO	ME	A-728	7/13/98	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170.00 MW EACH	3.5000 PPM @15% O2	SELECTIVE CATALYTIC REDUCTION	BACT-PSD
CITY OF LAKELAND ELECTRIC AND WATER UTILITIES	FL	PSD-FL-245	7/10/98	TURBINE, COMBUSTION, GAS FIRED W/ FUEL OIL ALSO	2174.00 MMBTU/H	25.0000 PPM @ 15% O2	DRY LOW NOX BURNERS FOR SIMPLE CYCLE. SCR WHEN COMBINED CYCLE	BACT-PSD
COLORADO SPRINGS UTILITIES-NIXON POWER PLANT	CO	98EP132	6/30/98	SIMPLE CYCLE TURBINE, NATURAL GAS	1122.00 MM BTU/HR	25.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTION	BACT-PSD
BRIDGEPORT ENERGY, LLC	CT	0150190 & 0150191	6/29/98	TURBINES, COMBUSTION MODEL V84 3A, 2 SIEMENS	260.00 MW/HRSG PER TURBINE	6.0000 PPM NAT GAS	DRY LOW NOX BURNER WITH SCR	BACT-PSD
CITY OF TALLAHASSEE UTILITY SERVICES	FL	PSD-FL-239	5/29/98	TURBINE, COMBINED CYCLE, MULTIPLE FUELS	1165.00 MMBTU/H	0.0000 SEE P2 DESCRIPTION	DLN BURNERS VERSION 2.6 BY GE	BACT-OTHER
GENERAL ELECTRIC PLASTICS	AL	207-0008-X016	5/27/98	COMBINED CYCLE (TURBINE AND DUCT BURNER)	0.00	0.0700 LBS/MMBTU COMBINED	DRY LOW NOX BURNER ON TURBINE AND LOW NOX BURNER ON DUCT BURNER	BACT-PSD
RUMFORD POWER ASSOCIATES	ME	A-724-71-A-N	5/1/98	TURBINE GENERATOR, COMBUSTION, NATURAL GAS	1906.00 MMBTU/H	3.5000 PPM @ 15% O2	SCR AMMONIA INJECTION SYSTEM AND CATALYTIC REACTOR TO REDUCE NOX	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	A-718-71-A-N	3/31/98	GAS TURBINES, COGEN, W/DUCT BURNERS	675.00 MMBTU/H TURBINE	6.0000 PPM @ 15% O2 NG	LOW NOX BURNERS LOW NOX COMBUSTORS SCR DURING GAS FIRING ONLY.	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	A-718-71-A-N	3/31/98	GAS TURBINES, COGEN W/DUCT BURNERS	675.00 MMBTU/H TURBINE	42.0000 PPM @ 15% O2 NG OIL	LOW NOX COMBUSTORS, LOW NOX BURNERS WATER INJECTION DURING OIL FIRING	BACT-PSD
STAR ENTERPRISE	DE	APC-97/0503-CONST.(LAER)(NSPS)	3/30/98	TURBINES, COMBINED CYCLE, 2	426.60 MMBTU/H	16.0000 PPM @ 15% O2 SYN GAS	NITROGEN INJECTION WHILE FIRING SYNGAS AND STEAM INJECTION WHILE FIRING LSDF	LAER
STAR ENTERPRISE	DE	APC-97/0503-CONST.(LAER)(NSPS)	3/30/98	TURBINES, COMBINED CYCLE, 2	426.60 MMBTU/H	42.0000 PPM @ 15% O2 DIESEL	NITROGEN INJECTION WHILE FIRING SYNGAS AND STEAM INJECTION WHILE FIRING LSDF	LAER
SOUTHERN NATURAL GAS	AL	412-0013-X001 AND -X002	3/6/98	2-9160 HP GE MODEL MS5002C NATURAL GAS TURBINES	9160.00 HP	53.0000 LB/HR		BACT-PSD
SOUTHERN NATURAL GAS	AL	206-0021-X001 AND -X002	3/2/98	9160 HP GE MODEL MS5002C NATURAL GAS FIRED TURBINE	9160.00 HP	53.0000 LB/HR		BACT-PSD
TWO ELK GENERATION PARTNERS, LIMITED PARTNERSHIP	WY	CT-1352	2/27/98	TURBINE, STATIONARY	33.30 MW	25.0000 PPM @ 15% O2	DRY LOW NOX BURNERS	BACT-PSD
AIR LIQUIDE AMERICA CORPORATION	LA	PSD-LA-622	2/13/98	TURBINE GAS, GE, 7ME 7	966.00 MMBTU/H	9.0000 PPMV	DRY LOW NOX TO LIMIT NOX EMISSION TO 9PPMV	BACT-PSD
TIVERTON POWER ASSOCIATES	RI	RI-PSD-5	2/13/98	COMBUSTION TURBINE, NATURAL GAS	265.00 MW	3.5000 PPM @ 15% O2	SCR	LAER
MILLENNIUM POWER PARTNER, LP	MA	130921	2/2/98	TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501G	2534.00 MMBTU/H	0.0130 LB/MMBTU	DRY LOW-NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROLS	BACT-PSD
BASF CORPORATION	LA	PSD-LA-613	12/30/97	TURBINE, COGEN UNIT 2, GE FRAME 6	42.40 MW	5.0000 PPMV NAT. GAS	STEAM INJECTION AND SCR TO LIMIT NOX TO 5 PPM FOR NATURAL GAS AND 25 PPM FOR WASTE GAS (10% H2)	BACT-PSD
ALABAMA POWER COMPANY	AL	108-0018-X001 AND -X002	12/17/97	COMBUSTION TURBINE W/ DUCT BURNER (COMBINED CYCLE)	100.00 MW	15.0000 PPM	DRY LOW NOX BURNERS	BACT-PSD
BUCKNELL UNIVERSITY	PA	60-4001A	11/26/97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5.00 MW	25.0000 PPMV@15%O2	SOLONOX BURNER, LOW NOX BURNER	BACT-OTHER
DIGHTON POWER ASSOCIATE, LP	MA	4B96096	10/6/97	TURBINE, COMBUSTION, ABB GT11N2	1327.00 MMBTU/H	17.1200 LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL	BACT-PSD
NORTHERN CALIFORNIA POWER AGENCY	CA	N-583-1-1	10/2/97	GE FRAME 5 GAS TURBINE	325.00 MMBTU/HR	25.0000 PPMVD @ 15% O2	DRY LOW NOX BURNERS	LAER
QUESTAR PIPELINE CORP. - RK SPRINGS COMPRESSOR COM	WY	MD-333	9/25/97	TURBINE COMPRESSOR ENGINE, NATURAL GAS FIRED, 2EA	1001.00 HP	2.8000 G/B-HP-H		BACT-PSD
BERKSHIRE POWER DEVELOPMENT, INC.	MA	1-X-95-093	9/22/97	ENGINES, CHILLER, NATURAL GAS-FIRED, TWO	23.40 MMBTU/H	0.7000 LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL	BACT-PSD
BERKSHIRE POWER DEVELOPMENT, INC.	MA	1-X-95-093	9/22/97	TURBINE, COMBUSTION, ABB GT24	1792.00 MMBTU/H	20.3000 LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL	BACT-PSD
UNIVERSITY OF MEDICINE & DENTISTRY OF NEW JERSEY	NJ	087427/28/29 (3)	6/26/97	COMBUSTION TURBINE COGENERATION UNITS, 3	56.00 MMBTU/H	0.1670 LB/MMBTU NAT GAS		RACT
LORDSBURG L.P.	NM	PSD-NM-1973	6/18/97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN	100.00 MW	74.4000 LBS/HR	DRY LOW-NOX TECHNOLOGY WHICH ADOPTS STAGED OR SCHEDULED COMBUSTION	BACT-PSD
SOUTHERN CALIFORNIA GAS COMPANY	CA	S-1792-5-3	5/14/97	VARIABLE LOAD NATURAL GAS FIRED TURBINE COMPRESSOR	50.10 MMBTU/HR	25.0000 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	LAER
COLO. POWER PARTNERS- BRUSH COGEN FAC	CO	95MR933	3/27/97	COGEN TURBINES W/ DUCT BURNERS & BOILERS	365.00 MM BTU/HR	42.0000 PPM @ 15% O2	LOW NOX COMBUSTION RETROFIT AND WATER INJECTION	BACT-PSD
MEAD COATED BOARD, INC.	AL	211-0004	3/12/97	COMBINED CYCLE TURBINE (25 MW)	568.00 MMBTU/HR	25.0000 PPMVD@ 15% O2 (GAS)	F O OIL SULFUR CONTENT <=0.05% BY WT DLN NOX FIRING GAS WITH WATER INJECTION FIRING OIL	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	PSD-LA-560 (M-2)	3/7/97	TURBINE/HSRG, GAS COGENERATION	450.00 MM BTU/HR	9.0000 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONSTRUCTION	BACT-PSD
QUINCY SOYBEAN COMPANY OF ARKANSAS	AR	800-AOP-R0	3/4/97	BOILER, COGENERATION/WASTE HEAT RECOVERY	64.00 MMBTU/H	25.0000 PPM @ 15% O2	LOW NOX COMBUSTORS	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	PSD-NM-622-M-2	2/15/97	COMBUSTION TURBINE, NATURAL GAS	100.00 MW	0.0000 SEE FACILITY NOTES	DRY LOW NOX COMBUSTION	BACT-PSD
CALRESOURCES LLC	CA	S-1543-5-3 AND 6-3	1/10/97	SOLAR MODEL 1100 SATURN GAS TURBINE	13.60 MMBTU/HR	49.0000 PPMVD @15% O2	NO CONTROL	LAER
TEMPO PLASTICS	CA	S-995-3-0	12/31/96	GAS TURBINE COGENERATION UNIT	0.00	0.1090 LB/MMBTU	LOW-NOX COMBUSTOR	LAER
SOUTHERN NATURAL GAS COMPANY	MS	1300-00031	12/17/96	TURBINE, NATURAL GAS-FIRED	9160.00 HORSEPOWER	110.0000 PPMV @ 15% O2 DRY	PROPER TURBINE DESIGN AND OPERATION	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE CO/CUNNINGHAM STATION	NM	PSD-NM-622-M-1	11/6/96	COMBUSTION TURBINE, NATURAL GAS	100.00 MW	15.0000 PPM; SEE FAC. NOTES	DRY LOW NOX COMBUSTION	BACT-PSD
ECOELECTRICA, L.P.	PR	PR-0102	10/1/96	TURBINES, COMBINED-CYCLE COGENERATION	461.00 MW	73.0000 LB/HR	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
ECOELECTRICA, L.P.	PR	PR-0102	10/1/96	TURBINES, COMBINED-CYCLE COGENERATION	461.00 MW	60.0000 LB/HR	STEAM/WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
TOYOTA MOTOR CORPORATION SVCS OF N A	IN	CP-051-5391-00027	8/9/96	PLANTWIDE COMBUSTION UNITS	1680.00 MMBTU/HR	0.1300 LB/MMBTU	FUEL SPEC: USE OF NATURAL GAS AS FUEL	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	09-328-009	7/31/96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILER	153.00 MW	4.0000 PPM @ 15% O2	DRY LNB WITH SCR, WATER INJECTION FOR OIL FIRING OIL FIRING LIMITS SET TO 8.4 PPM @15% O2	LAER
WESTPLAINS ENERGY	CO	95PB013	6/14/96	SIMPLE CYCLE TURBINE, NATURAL GAS	218.50 MW	15.0000 PPM @ 15% O2 (@>75%)	DLN NOX, COMMITMENT TO UPGRADE THE DLN TO NEW VERSIONS EMITTING LOWER NOX AS THEY BECOME AVAILABLE	BACT-PSD
PUBLIC SERVICE OF COLO.-FORT ST VRAIN	CO	94WE609	5/1/96	COMBINED CYCLE TURBINES (2), NATURAL	471.00 MW	15.0000 PPMVD, SMPL CY	DRY LOW NOX COMBUSTION SYSTEMS FOR TURBINES AND DUCT BURNERS	BACT-PSD
CAROLINA POWER & LIGHT	NC	1812	4/11/96	COMBUSTION TURBINE, 4 EACH	1907.60 MMBTU/HR	512.3000 LB/HR	WATER INJECTION, FUEL SPEC 0.05% N FUEL OIL	BACT-PSD
CAROLINA POWER & LIGHT	NC	1812	4/11/96	COMBUSTION TURBINE, 4 EACH	1907.60 MMBTU/HR	158.0000 LB/HR	WATER INJECTION	BACT-PSD
MID-GEORGIA COGEN	GA	4911-078-11753	4/3/96	COMBUSTION TURBINE (2), NATURAL GAS	116.00 MW	9.0000 PPMVD	DRY LOW NOX BURNER WITH SCR	BACT-PSD
MID-GEORGIA COGEN.	GA	4911-078-11753	4/3/96	COMBUSTION TURBINE (2), FUEL OIL	116.00 MW	20.0000 PPMVD	WATER INJECTION WITH SCR	BACT-PSD
GEORGIA GULF CORPORATION	LA	PSD-LA-592	3/26/96	GENERATOR, NATURAL GAS FIRED TURBINE	1123.00 MM BTU/HR	25.0000 PPMV-CORR. TO 15%O2	CONTROL NOX USING STEAM INJECTION	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	PA-89-258A / PSD-FL-214	1/1/96	COMBINED CYCLE COMBUSTION TURBINE	140.00 MW	15.0000 PPM @ 15% O2	DRY LNB STAGED COMBUSTION	BACT-PSD
MINNESOTA METHANE	AZ	95-0241	11/12/95	ENGINES, COGENERATION (4)	600.00 KW	99.0000 TPY	AIR/FUEL CONTROLLER ADJUSTED TO OBTAIN LOW NOX	BACT
KEY WEST CITY ELECTRIC SYSTEM	FL	AC44-245399 / PSD-FL-210	9/28/95	TURBINE, EXISTING CT RELOCATION TO A NEW PLANT	23.00 MW	75.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
UNION CARBIDE CORPORATION	LA	PSD-LA-590	9/22/95	GENERATOR, GAS TURBINE	1312.00 MM BTU/HR	25.0000 PPMV CORR. TO 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	PR-0100	7/31/95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EACH	248.00 MW	35.0000 LB/HR AS NO2	STEAM INJECTION PLUS SCR SYSTEM USE OF NO 2 F O NITROGEN CONTENT NOT TO EXCEED 0.10% BY WEIGHT	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	0795-0023	7/27/95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49.10 MW	42.0000 PPM BY VOL 1 HR AVG	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	BACT-PSD
HIGGINSVILLE MUNICIPAL POWER FACILITY	MO	0795-0023	7/27/95	ADD OF A DUAL FUEL FIRED TWIN-PAC TURBINE	49.10 MW	75.0000 PPM BY VOL 1 HR AVG	CONTROLS TO REGULATE THE FUEL CONSUMPTION AND THE RATIO OF WATER TO FUEL BEING FIRED IN THE TURBINES	BACT-PSD
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P	NY	2-6101-00185/00002-9	6/6/95	TURBINE, OIL FIRED	210.00 MW	10.0000 PPM @ 15% O2	SCR	LAER
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P	NY	2-6101-00185/00002-9	6/6/95	TURBINE, NATURAL GAS FIRED	240.00 MW	3.5000 PPM @ 15% O2	SCR	LAER
PANDA-KATHLEEN, L.P.	FL	AC53-251898/PSD-FL-215	6/1/95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115MW)	75.00 MW	15.0000 PPM @ 15% O2	DRY LOW NOX BURNER	BACT-PSD
PROCTOR AND GAMBLE PAPER PRODUCTS CO (CHARMIN)	PA	66-0001	5/31/95	TURBINE, NATURAL GAS	580.00 MMBTU/HR	55.0000 PPM @ 15% O2	STEAM INJECTION	RACT
HOFFMAN-LA ROCHE, NUTLEY COGEN FACILITY	NJ	SEE FACILITY NOTES	5/4/95	TURBINE, GM LM500	66.60 MMBTU/H	0.3400 LB/MMBTU		RACT
GAINESVILLE REGIONAL UTILITIES	FL	PSD-FL-212	4/11/95	SIMPLE CYCLE COMBUSTION TURBINE, GAS NO 2 OIL B-UP	74.00 MW	15.0000 PPM AT 15% OXYGEN	DRY LOW NOX BURNERS GE FRAME UNIT CAN ANNULAR COMBUSTORS	BACT-PSD
GAINESVILLE REGIONAL UTILITIES	FL	PSD-FL-212	4/11/95	OIL FIRED COMBUSTION TURBINE	74.00 MW	42.0000 PPM AT 15% OXYGEN	WATER INJECTION	BACT-PSD
ALGONQUIN GAS TRANSMISSION COMPANY	NJ	LOG # 94-0079	3/31/95	TURBINES COMBUSTION, TWO SOLAR CENTAUR	3.10 MW EACH	0.0000 NOT APPLICABLE	GOOD COMBUSTION PRACTICE	RACT
ALGONQUIN GAS TRANSMISSION COMPANY	NJ	LOG # 94-0079	3/31/95	TURBINES COMBUSTION, TWO SOLAR CENTAUR	3.10 MW EACH	43.3800 LB/H		BACT
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	PSD-LA-560 (M-1)	3/2/95	TURBINE/HRSG, GAS COGENERATION	150.00 MM BTU/HR	9.0000 PPMV	DRY LOW NOX BURNER/COMBUSTION DESIGN AND CONTROL	LAER
LSP-COTTAGE GROVE, L.P.	MN	16300087-001	3/1/95	COMBUSTION TURBINE/GENERATOR	1970.00 MMBTU/HR	4.5000 PPM @ 15% O2 GAS	SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO	MO	0795-015	2/26/95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	58.77 MW	360.0000 TPY	WATER INJECTION	BACT-PSD
MARATHON OIL CO - INDIAN BASIN N G PLAN	NM	PSD-NM-295-M-2	1/11/95	TURBINES, NATURAL GAS (2)	5500.00 HP	7.1000 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY DRY LOW NOX	BACT-PSD
KAMINE/BESICORP SYRACUSE LP	NY	313201 2010 00001-0007	12/10/94	SIEMENS V84 3 GAS TURBINE (EP #00001)	650.00 MMBTU/HR	25.0000 PPM	WATER INJECTION	BACT
INDECK-OSWEGO ENERGY CENTER	NY	351200 0211 00001	10/6/94	GE FRAME 6 GAS TURBINE	533.00 LB/MMBTU	42.0000 PPM, 75.00 LB/HR	STEAM INJECTION	BACT
SEPCO	CA	10883	10/5/94	TURBINE, GAS COMBINED CYCLE GE MODEL 7	720.00 MMBTU/H	2.6000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX COMBUSTION	BACT
FULTON COGEN PLANT	NY	350400 0221 00001	9/15/94	GE LM5000 GAS TURBINE	500.00 MMBTU/HR	56.0000 PPM, 65 LB/HR	WATER INJECTION	BACT
CAROLINA POWER AND LIGHT	SC	0820-0020	5/31/94	STATIONARY GAS TURBINE	1520.00 MMBTU/H	42.0000 PPMDV @ 15% O2	WATER INJECTION	BACT-PSD
CAROLINA POWER AND LIGHT	SC	0820-0033	5/31/94	STATIONARY GAS TURBINE	1520.00 MMBTU/H	25.0000 PPMDV @ 15% O2	WATER INJECTION	BACT-PSD
SACRAMENTO POWER AUTHORITY CAMPBELL SOUP	CA	11456	5/19/94	TURBINE GAS COMBINE CYCLE SIEMENS V84.2	1257.00 MMBTU/H	3.0000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX COMBUSTION	BACT
BEAR MOUNTAIN LIMITED	CA	S-2044-1-2	5/19/94	TURBINE, GE, COGENERATION 48 MW	48.00 MW	3.6000 PPMVD @ 15% O2	STEAM INJECTION AND SELECTIVE CATALYTIC REDUCTION	BACT-OTHER

BEST AVAILABLE COPY

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NO_x) Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit/Process Description	Capacity (size)	NO_x Emission Limit	Control Method	Basis
SACRAMENTO COGENERATION AUTHORITY P&G	CA	11436	5/19/94	TURBINE, SIMPLE CYCLE LM6000 GAS	421.40 MMBTU/H	5.0000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND WATER INJECTION	BACT
SACRAMENTO COGENERATION AUTHORITY P&G	CA	11436	5/19/94	TURBINE, GAS, COMBINED CYCLE LM6000	421.40 MMBTU/H	5.0000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND WATER INJECTION	BACT
SACRAMENTO COGENERATION AUTHORITY P&G	CA	11436	5/19/94	TURBINE, GAS, COMBINED CYCLE LM6000	421.40 MMBTU/H	5.0000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND WATER INJECTION	BACT
SACRAMENTO POWER AUTHORITY CAMPBELL SCUP	CA	11456	5/19/94	TURBINE, GAS, COMBINED CYCLE, SIEMENS V84 2	1257.00 MMBTU/H	3.0000 PPMVD @ 15% O2	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX COMBUSTION	BACT
HERMISTON GENERATING CO	OR	20-0113	7/7/94	TURBINES, NATURAL GAS (2)	1696.00 MMBTU/H	4.5000 PPM @ 15% O2	SCR	BACT-PSD
MUDDY RIVER LP	NV	A0113	6/10/94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140.00 MEGAWATT	302.0000 LB/HR	LOW NOX BURNER	BACT-PSD
CSW NEVADA, INC	NV	A0116	6/10/94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140.00 MEGAWATT	275.0000 LB/HR	DRY LOW NOX COMBUSTOR	BACT-PSD
PORTLAND GENERAL ELECTRIC CO	OR	25-0031	5/31/94	TURBINES, NATURAL GAS (2)	1720.00 MMBTU	4.5000 PPM @ 15% O2	SCR	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO	MO	0594-005	5/17/94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1345.00 MMBTU/HR	25.2000 PPM BY VOL 1 HR AVG	LOW NOX BURNERS, AND WATER INJECTION	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO	MO	0594-005	5/17/94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1345.00 MMBTU/HR	1135.0000 TPY	LOW NOX BURNERS, AND WATER INJECTION	BACT-PSD
GEORGIA POWER COMPANY, ROBINS TURBINE PROJECT	GA	4911-076-11344	5/13/94	TURBINE, COMBUSTION, NATURAL GAS	80.00 MW	25.0000 PPM	WATER INJECTION, FUEL SPEC. NATURAL GAS	BACT-PSD
WEST CAMPUS COGENERATION COMPANY	TX	23962/PSD-TX-837	5/2/94	GAS TURBINES	75.30 MW (TOTAL POWER)	220.0000 TPY	INTERNAL COMBUSTION CONTROLS	BACT-PSD
FLEETWOOD COGENERATION ASSOCIATES	PA	06-328-001	4/22/94	NG TURBINE (GE LM6000) WITH WASTE HEAT BOILER	360.00 MMBTU/HR	21.5000 LB/HR	SCR WITH LOW NOX COMBUSTORS	BACT-OTHER
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	PSD-FL-195	2/25/94	TURBINE, NATURAL GAS (2)	1510.00 MMBTU/H	12.0000 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	PSD-FL-195	2/25/94	TURBINE, FUEL OIL (2)	1730.00 MMBTU/H	12.0000 PPMVD @ 15% O2	WATER INJECTION	BACT-PSD
INTERNATIONAL PAPER	LA	PSD-LA-93(M-3)	2/24/94	TURBINE/HRSG, GAS COGEN	338.00 MM BTU/HR TURBINE	25.0000 PPMV 15% O2 TURBINE	DRY LOW NOX COMBUSTOR, COMBUSTION CONTROL	BACT
TECO POLK POWER STATION	FL	PSD-FL-194	2/24/94	TURBINE, SYNGAS (COAL GASIFICATION)	1755.00 MMBTU/H	25.0000 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
TECO POLK POWER STATION	FL	PSD-FL-194	2/24/94	TURBINE, FUEL OIL	1765.00 MMBTU/H	42.0000 PPMVD @ 15% O2	WET INJECTION	BACT-PSD
KAMINE/BESICORP CARTHAGE LP	NY	226001 0285 00001	1/18/94	GE FRAME 6 GAS TURBINE	491.00 BTU/HR	42.0000 PPM, 74.6 LB/HR	STEAM INJECTION	BACT
SUNLAW COGEN (FEDERAL COLD STORAGE COGENERATION)	CA	RECLAIM 55711	1/15/94	TURBINE, NATURAL GAS FIRED, COMBINED CYCLE AND COG	28.00 MW	156617.2000 LB/YR	WATER INJECTION AND SCONOX (MOD 2) CATALYST SYSTEM IS INSTALLED AFTER THE HRSG	BACT-OTHER
ORANGE COGENERATION LP	FL	PSD-FL-206	12/30/93	TURBINE, NATURAL GAS, 2	368.30 MMBTU/H	15.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
PROJECT ORANGE ASSOCIATES	NY	311500 2015 00001	12/1/93	GE LM-5000 GAS TURBINE	350.00 MMBTU/HR	25.0000 PPM, 47 LB/HR	STEAM INJECTION, FUEL SPEC. NATURAL GAS ONLY	BACT
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	PSD-NM-340M2	10/28/93	TURBINE, GAS-FIRED	11259.00 HP	42.0000 PPM @ 15% O2	SOLONOX COMBUSTOR, DRY LOW NOX TECHNOLOGY	BACT-PSD
CROCKETT COGENERATION - C&H SUGAR	CA	S-201	10/5/93	TRUBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA)	240.00 MW	3.2000 PPMVD @ 15% O2	DRY LOW-NOX COMBUSTERS AND A MITSUBISHI HEAVY INDUSTRIES AMERICAN SELECTIVE CATALYTIC REDUCTION CATALYST.	BACT-OTHER
FLORIDA GAS TRANSMISSION	FL	FL-PSD-202	9/27/93	TURBINE, GAS	131.59 MMBTU/H	25.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	71975	9/15/93	TURBINE, COMBUSTION, SIEMENS MODEL V84 2, 3	10.20 X109 SCF/YR NAT GAS	131.0000 LB/HR(GAS), 309 OIL	DRY LOW NOX COMBUSTOR, DESIGN, WATER INJECTION	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	503-3028-X003	8/5/93	TURBINE, NATURAL GAS	12600.00 BHP	3.5800 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY LOW NOX COMBUSTION	BACT-PSD
CARSON ENERGY GROUP & CENTRAL VALLEY FINANCING AUT	CA	11012	7/23/93	TURBINE, GAS, COMBINED CYCLE, GE LM6000	450.00 MMBTU/H	5.0000 PPMVD @ 15% O2	SCR AND WATER INJECTION ALSO HAS CARBON ABSORPTION SYSTEM IN DIGESTER TO REMOVE ORGANSILOXANES	BACT
CARSON ENERGY GROUP & CENTRAL VALLEY FINANCING AUT	CA	11012	7/23/93	TURBINE, GAS, SIMPLE CYCLE, GE LM6000	450.00 MMBTU/H	5.0000 PPMVD @ 15% O2	SELECTIVE CATAYLTIC REDUCTION AND WATER INJECTION	BACT
LOCKPORT COGEN FACILITY	NY	292600 0416 00001-00007	7/16/93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	123.90 MMBTU/HR	42.0000 PPM	STEAM INJECTION	BACT
ANITEC COGEN PLANT	NY	030200 0631	7/7/93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #0007	451.00 MMBTU/HR	25.0000 PPM, 41 LB/HR	NO CONTROLS	BACT-OTHER
BANK OF AMERICA LOS ANGELES DATA CENTER	CA	A/N 272850	6/23/93	TURBINE, DIESEL & GENERATOR (SEE NOTES)	0.00	165.0000 PPM @ 15% O2	FUEL SPEC. LOW NOX DIESEL FUEL (SEE NOTES)	BACT-OTHER
NEWARK BAY COGENERATION PARTNERSHIP, LP	NJ	01-92-5231 TO 01-92-5261	6/9/93	TURBINES, COMBUSTION NATURAL GAS-FIRED (2)	617.00 MMBTU/HR (EACH)	5.3000 PPMDV	SCR	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP, LP	NJ	91-92-5231 TO 01-92-5261	6/9/93	TURBINES, COMBUSTION KEROSENE-FIRED (2)	640.00 MMBTU/H (EACH)	16.0000 PPMDV	SCR	BACT-PSD
TIGER BAY LP	FL	PSD-FL-190	5/17/93	TURBINE, GAS	1614.40 MMBTU/H	15.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
TIGER BAY LP	FL	PSD-FL-190	5/17/93	TURBINE, OIL	1649.90 MMBTU/H	42.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
INDECK ENERGY COMPANY	NY	563200 0099	5/12/93	GE FRAME 6 GAS TURBINE EP #00001	491.00 MMBTU/HR	32.0000 PPM	STEAM INJECTION	BACT
PHOENIX POWER PARTNERS	CO	92WE1257	5/11/93	TURBINE (NATURAL GAS)	311.00 MMBTU/HR	22.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTION	BACT-OTHER
LILCO SHOREHAM	NY	472200 5376	5/10/93	(3) GE FRAME 7 TURBINES (EP #S 00007-9)	850.00 MMBTU/HR	35.0000 PPM +FBN & HEAT RATE	WATER INJECTION	BACT
TRIGEN MITCHEL FIELD	NY	282089 4163 00004	4/16/93	GE FRAME 6 GAS TURBINE	424.70 MMBTU/HR	60.0000 PPM, 90 LB/HR	STEAM INJECTION	BACT
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-182	4/7/93	TURBINE, NATURAL GAS	869.00 MMBTU/H	15.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-182	4/7/93	TURBINE, NATURAL GAS	362.00 MMBTU/H	15.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-182	4/7/93	TURBINE, FUEL OIL	928.00 MMBTU/H	42.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-182	4/7/93	TURBINE, FUEL OIL	371.00 MMBTU/H	42.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
EAST KENTUCKY POWER COOPERATIVE	KY	C-93-045	3/24/93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1492.00 MMBTU/H (EACH)	42.0000 PPM @ 15% O2 (OIL)	WATER INJECTION	SEE NOTES
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	104-0003-X026	1/11/93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURNER	40.00 MW	0.0800 LB/MMBTU (GAS)	LOW NOX BURNERS (ON THE DUCT BURNER) STEAM INJECTION INTO THE TURBINE	BACT-PSD
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	92-016-C (PSD)	12/17/92	TURBINE, COMBUSTION	58.00 MW	65.0000 PPM @ 15% O2	COMBUSTION CONTROLS	BACT-OTHER
OKLAHOMA MUNICIPAL POWER AUTHORITY	OK	92-016-C (PSD)	12/17/92	TURBINE, COMBUSTION	58.00 MW	25.0000 PPM @ 15% O2	COMBUSTION CONTROLS	BACT-OTHER
AUBURNDALE POWER PARTNERS, LP	FL	PSD-FL-185	12/14/92	TURBINE, GAS	1214.00 MMBTU/H	15.0000 PPMVD @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	PSD-FL-185	12/14/92	TURBINE, OIL	1170.00 MMBTU/H	42.0000 PPMVD @ 15% O2	STEAM INJECTION	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	7-3556-00040-00002-9	11/24/92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW)	2133.00 MMBTU/HR (EACH)	4.5000 PPM	SCR AND DRY LOW NOX	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	6-2320-00015/00001-0	11/9/92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00 MMBTU/HR	55.0000 PPM	DRY LOW NOX OR SCR	BACT-OTHER
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	6-2320-00015/00001-0	11/9/92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW)	650.00 MMBTU/HR	9.0000 PPM	DRY LOW NOX OR SCR	BACT-OTHER
KAMINE/BESICORP CORNING L.P.	NY	8-4638-00022/01-0	11/5/92	TURBINE, COMBUSTION (79 MW)	653.00 MMBTU/HR	9.0000 PPM	DRY LOW NOX OR SCR	BACT-OTHER
GRAYS FERRY CO GENERATION PARTNERSHIP	PA	92181 TO 92184	11/4/92	TURBINE (NATURAL GAS & OIL)	1150.00 MMBTU	9.0000 PPMVD (NAT. GAS)*	DRY LOW NOX BURNER, COMBUSTION CONTROL	BACT-OTHER
GOAL LINE, LP ICEFLOE	CA	911504	11/5/92	TURBINE, COMBUSTION (NATURAL GAS) (42.4 MW)	386.00 MMBTU/HR	5.0000 PPMVD @ 15% OXYGEN	WATER INJECTION & SCR W/AUTOMATIC AMMONIA INJECT.	BACT-OTHER
BEAR ISLAND PAPER COMPANY, L.P	VA	50840	10/30/92	TURBINE, COMBUSTION GAS	474.00 X10(6) BTU/HR N. GAS	9.0000 PPM	SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P	VA	50840	10/30/92	TURBINE, COMBUSTION GAS	464.00 X10(6) BTU/HR #2 OIL	15.0000 PPM	SCR	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	50840	10/30/92	TURBINE, COMBUSTION GAS (TOTAL)	0.00	69.7000 TPY	SCR	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINE FACILITY, GAS	1301.13 X10(7) SCF/Y NAT GAS	245.0000 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR) W/WATER INJEC	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINE FACILITY, GAS	7.44 X10(7) GPY FUEL OIL	245.0000 TOTAL TPY	SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINES (2) (EACH WITH A SF)	1.51 X10(9) BTU/HR N GAS	9.0000 PPMDV/UNIT @ 15% O2	SCR WITH WATER INJECTION	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40805	9/25/92	TURBINES (2) (EACH WITH A SF)	1.36 X10(9) BTU/H #2 OIL	66.0000 LBS/HR/UNIT	WATER INJECTION AND SCR	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	A533	9/18/92	COMBUSTION TURBINE ELECTRIC POWER GENERATION	600.00 MW (8 UNITS 75 EACH)	38.6000 TPY (EACH TURBINE)	LOW NOX COMBUSTOR	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	414401 0212 00001	9/10/92	GE FRAME 6 GAS TURBINE	498.00 MMBTU/HR	42.0000 PPM, 76.6 LB/HR	WATER INJECTION	BACT
NORTHERN STATES POWER COMPANY	SD	NONE	9/2/92	TURBINE, SIMPLE CYCLE, 4 EACH	129.00 MW	26.0000 PPM @ 15% O2 GAS	WATER INJECTION FOR GAS & DISTILLATION	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	1-4722-00926/00001-9	9/1/92	TURBINE, COMBUSTION GAS (150 MW)	1146.00 MMBTU/HR (GAS)*	42.0000 PPM	WATER INJECTOR	BACT-OTHER
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	1-4722-00926/00001-9	9/1/92	TURBINE, COMBUSTION GAS (150 MW)	1146.00 MMBTU/HR (GAS)*	9.0000 PPM	DRY LOW NOX	BACT-OTHER
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	1-4722-00926/00001-9	9/1/92	GENERATOR, EMERGENCY (NATURAL GAS)	3.50 MMBTU/HR	1.3000 LB/MMBTU	LEAN BURN ENGINE	BACT-OTHER
WEPCO, PARIS SITE	WI	91-RV-043	3/29/92	TURBINES, COMBUSTION (4)	0.00	65.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
WEPCO, PARIS SITE	WI	91-RV-043	3/29/92	TURBINES, COMBUSTION (4)	0.00	25.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
FLORIDA POWER CORPORATION	FL	FL-PSD-180	8/17/92	TURBINE, OIL	1029.00 MMBTU/H	42.0000 PPMVD @ 15% O2	WET INJECTION	BACT-PSD
FLORIDA POWER CORPORATION	FL	FL-PSD-180	8/17/92	TURBINE, OIL	1866.00 MMBTU/H	42.0000 PPMVD @ 15% O2	WET INJECTION	BACT-PSD
NORTHWEST PIPELINE COMPANY	WA	92-4	6/13/92	TURBINE, GAS-FIRED	12100.00 HP	196.0000 PPM @ 15% O2	ADVANCED DRY LOW NOX COMBUSTOR (BY 07/01/95)	BACT-PSD
CNG TRANSMISSION	OH	01-3870	5/12/92	TURBINE (NATURAL GAS) (3)	5500.00 HP (EACH)	1.6000 G/HP-HR*	LOW NOX COMBUSTION	BACT-OTHER
SARANAC ENERGY COMPANY	NY	5-0942-00106/00001-9	7/31/92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1123.00 MMBTU/HR (EACH)	9.0000 PPM	SCR	BACT-OTHER
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	4911-073-10941	7/28/92	TURBINE, GAS FIRED (2 EACH)	1817.00 M BTU/HR	25.0000 PPM @ 15% O2	MAXIMUM WATER INJECTION	BACT-PSD
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	4911-073-10941	7/28/92	TURBINE, OIL FIRED (2 EACH)	1840.00 M BTU/HR	25.3000 PPMVD, FUEL N ALLOW	MAXIMUM WATER INJECTION	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	HI 90-05	7/28/92	TURBINE, COMBINED-CYCLE COMBUSTION	28.00 MW	42.5000 LB/HR	WATER INJECTION	BACT-OTHER
INDECK-YERKES ENERGY SERVICES	NY	146400 0133	6/24/92	GE FRAME 6 GAS TURBINE (EP #00001)	432.20 MMBTU/HR	42.0000 PPM, 74 LB/HR	STEAM INJECTION	BACT
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00074/00002-9	6/18/92	COMBUSTION TURBINES (2) (252 MW)	1173.00 MMBTU/HR (EACH)	9.0000 PPM GAS	STEAM INJECTION AND SCR	BACT-OTHER
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00074/00002-9	6/18/92	COMBUSTION TURBINE (79 MW)	1173.00 MMBTU/HR	25.0000 PPM GAS	STEAM INJECTION	BACT-OTHER
TENASKA WASHINGTON PARTNERS, L.P.	WA	91-04	5/29/92	COGENERATION PLANT, COMBINED CYCLE	1.65 MMBTU/HR	7.0000 PPM @ 15% O2 (GAS)	STAGED LOW NOX DUCT BURNERS, STEAM INJECTION, SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
NORTHWEST PIPELINE CORPORATION	CO	91LP792(1-2) MOD. #1	5/29/92	TURBINE, SOLAR TAURUS	45.00 MMBTU/HR	95.0000 PPMVD (UNTIL 11/95)	DRY LOW NOX COMBUSTOR (BY 11/01/95)	BACT-PSD
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO	RI	RI-PSD-4	4/13/92	TURBINE, GAS AND DUCT BURNER	1360.00 MMBTU/H EACH	9.0000 PPM @ 15% O2, GAS	SCR	BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	C-92-005	3/10/92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1500.00 MM BTU/HR (EACH)	42.0000 PPM @ 15% O2, N. GAS	WATER INJECTION	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION	1175.00 MMBTU/H NAT. GAS	9.0000 PPM @ 15% O2	SCR, STEAM INJECTION	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION	1117.00 MMBTU/H NO2 FUEL OIL	15.0000 PPM @ 15% O2	SCR, STEAM INJ	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION, 2	0.00	191.1000 TPY/UNIT		BACT-PSD
THERMO INDUSTRIES, LTD	CO	90WE667(1-5)	2/18/92	TURBINE, GAS FIRED, 5 EACH	246.00 MMBTU/H	25.0000 PPM @ 15% O2	DRY LOW NOX TECH	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	4911-051-8529	2/12/92	TURBINES, 8	1002.00 MMBTU/H, NAT GAS	25.0000 PPM @ 15% O2	MAX WATER INJECTION	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO	GA	4911-051-8529	2/12/92	TURBINES, 8	972.00 MMBTU/H, #2 OIL	0.0000 SEE NOTES	MAX WATER INJECTION	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	HI-90-04	2/12/92	TURBINE, FUEL OIL #2	20.00 MW	42.5000 LB/HR	COMBUSTOR WATER INJECTOR, WATER INJECTION	BACT-PSD
LINDEN COGENERATION TECHNOLOGY	NJ		1/21/92	TURBINE, NATURAL GAS FIRED	50.00 X E12 BTU/YR	33.5000 LB/HR	STEAM INJECTION AND SCR	BACT-PSD
ALYESKA PIPELINE SERVICE COMPANY	AK	9136-AA012	1/17/92	SOLAR CENTAUR, 3	800.00 KW	150.0000 PPMVD @ 15% O2	LOW NOX BURNERS	NSPS
KAMINE BESICORP NATURAL DAM LP	NY	404089 0305 00009	12/31/91	GE FRAME 6 GAS TURBINE	500.00 MMBTU/HR	42.0000 PPM, 80.1 LB/HR	STEAM INJECTION	BACT
DUKE POWER CO LINCOLN COMBUSTION TURBINE STATION	NC	7171	12/20/91	TURBINE, COMBUSTION	1313.00 MM BTU/HR	113.0000 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	BACT-PSD
DUKE POWER CO LINCOLN COMBUSTION TURBINE STATION	NC	7171	12/20/91	TURBINE, COMBUSTION	1247.00 MM BTU/HR	257.0000 LB/HR	MULTINOZZLE COMBUSTOR, MAXIMUM WATER INJECTION	BACT-PSD
MAUI ELECTRIC COMPANY, LTD	HI	HI-90-02	12/3/91	TURBINE, FUEL OIL #2	28.00 MW	42.0000 PPM	WATER INJECTION	BACT-PSD

BEST AVAILABLE COPY

Table B-2. Summary of Best Available Control Technology (BACT) Determinations for Nitrogen Oxide (NO_x) Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit/Process Description	Capacity (size)	NO_x Emission Limit	Control Method	Basis
KALAMAZOO POWER LIMITED	MI	1234-90	12/3/91	TURBINE, GAS-FIRED, 2 W/ WASTE HEAT BOILERS	1503.40 MMBTU/H	15.0000 PPMV	DRY LOW NOX TURBINES	BACT-PSD
LAKE COGEN LIMITED	FL	PSD-FL-176	11/20/91	TURBINE, GAS, 2 EACH	12.00 MW	25.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
LAKE COGEN LIMITED	FL	PSD-FL-176	11/20/91	TURBINE, OIL, 2 EACH	12.00 MW	42.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	PSD-FL-173	11/5/91	TURBINE, GAS, 4 EACH	35.00 MW	12.0000 PPM @ 15% O2	WET INJECTION	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	PSD-FL-173	11/5/91	TURBINE, OIL, 4 EACH	35.00 MW	65.0000 PPM @ 15% O2	WET INJECTION	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	2046009-011	10/29/91	TURBINE, GAS-FIRED	57.94 MMBTU/H	5.0000 PPMVD @ 15% O2	HIGH TEMPERATURE SELECTIVE CATALYTIC REDUCTION	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	2046009-011	10/29/91	TURBINE, GAS FIRED, SOLAR MODEL H	3500.00 HP	5.0000 PPM @ 15% O2	HIGH TEMP SELECT. CAT. REDUCTION	BACT-PSD
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	5500.00 HP	14.4000 PPM @ 15% O2	LEAN BURN	NSPS
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	5500.00 HP	42.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	5500.00 HP	95.1000 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	NSPS
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	3500.00 HP	42.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
FLORIDA POWER GENERATION	FL	PSD-FL-167	10/16/91	TURBINE, OIL, 6 EACH	92.90 MW	42.0000 PPM @ 15% O2	WET INJECTION	BACT-PSD
EL PASO NATURAL GAS	AZ		10/15/91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12000.00 HP	225.0000 PPM @ 15% O2	LEAN BURN	BACT-PSD
EL PASO NATURAL GAS	AZ		10/15/91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12000.00 HP	42.0000 PPM @ 15% O2	DRY LOW NOX COMBUSTOR	BACT-PSD
NUGGET OIL CO	CA	4131003	10/8/91	GENERATOR, STEAM, GAS FIRED	62.50 MMBTU/H	0.0430 LB/MMBTU	LOW NOX BURNER AND FLUE GAS RECIRCULATION*	BACT-PSD
EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT	WA	91-02	9/26/91	TURBINES, COMBINED CYCLE COGEN. GE FRAME 6	123.00 MW	7.0000 PPMDV @15%O2 NG	STEAM INJECTION AND SCR	BACT-PSD
CAROLINA POWER AND LIGHT CO	SC	0820-0033-CA TO CC	9/23/91	TURBINE, I.C.	80.00 MW	292.0000 LB/H	WATER INJECTION	BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	PSD-LA-569	8/5/91	TURBINE, GAS, 2	39.10 MMBTU/H	40.0000 PPM @ 15% O2	H2O INJECT 0.67 LB/LB	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO	RI	1126-1127	7/31/91	TURBINE, GAS, 2	49.00 MMBTU/H	100.0000 PPM @ 15% O2	LOW NOX COMBUSTION	BACT-OTHER
CHARLES LARSEN POWER PLANT	FL	PSD-FL-166	7/25/91	TURBINE, GAS, 1 EACH	85.00 MW	25.0000 PPM @ 15% O2	WET INJECTION	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	PSD-FL-166	7/25/91	TURBINE, OIL, 1 EACH	80.00 MW	12.0000 PPM @ 15% O2	WET INJECTION	BACT-PSD
SUMAS ENERGY INC	WA		6/25/91	TURBINE, NATURAL GAS	88.00 MW	6.0000 PPM @ 15% O2	SCR	BACT-PSD
SAGUARO POWER COMPANY	NV	A393	6/17/91	COMBUSTION TURBINE GENERATOR	34.50 MW	16.9000 PPH (WINTER)	SELECTIVE CATALYTIC REDUCTION (SCR)	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, GAS, 4 EACH	400.00 MW	25.0000 PPM @ 15% O2	LOW NOX COMBUSTORS	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, CG, 1 EACH	400.00 MW	12.0000 PPM @ 15% O2	LOW NOX COMBUSTORS	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, OIL, 2 EACH	400.00 MW	65.0000 PPM @ 15% O2	LOW NOX COMBUSTORS	BACT-PSD
GRANITE ROAD LIMITED	CA	4216001	5/6/91	TURBINE, GAS, ELECTRIC GENERATION	460.90 MMBTU/H	1.5000 PPMVD @ 15% O2	SCR, STEAM INJECTION	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	25-328-001	5/3/91	TURBINES, GAS, 2	36.60 KW EACH	25.0000 PPM @ 15% O2	STEAM INJECTION/+SCR IN 1997	OTHER
LAKEWOOD COGENERATION, L.P.	NJ	SEVERAL, SEE NOTES	4/1/91	TURBINES (NATURAL GAS) (2)	1190.00 MMBTU/HR (EACH)	0.0200 LB/MMBTU	SCR, DRY LOW NOX BURNER	BACT-OTHER
LAKEWOOD COGENERATION, L.P.	NJ	SEVERAL, SEE NOTES	4/1/91	TURBINES (#2 FUEL OIL) (2)	1190.00 MMBTU/HR (EACH)	0.0520 LB/MMBTU	SCR AND WATER INJECTION	BACT-OTHER
CIMARRON CHEMICAL	CO	90WE438	3/25/91	TURBINE #1, GE FRAME 6	33.00 MW	25.0000 PPM @ 15% O2	WATER INJECTION	OTHER
CIMARRON CHEMICAL	CO	90WE438	3/25/91	TURBINE #2, GE FRAME 6	33.00 MW	9.0000 PPM @ 15% O2	SCR	OTHER
SEMINOLE FERTILIZER CORPORATION	FL	PSD-FL-157	3/17/91	TURBINE, GAS	26.00 MW	9.0000 PPM @ 15% O2	SCR	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-145	3/14/91	TURBINE, GAS, 4 EACH	240.00 MW	42.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-145	3/14/91	TURBINE, OIL, 4 EACH	0.00	65.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	A391	1/17/91	COMBINED-CYCLE POWER GENERATION	85.00 MW POWER OUTPUT	41.2600 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	A360	1/17/91	COMBINED-CYCLE POWER GENERATION	85.00 MW TOTAL OUTPUT	41.2600 LBS/HR	SELECTIVE CATALYTIC SYSTEM ON ONE UNIT	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ		11/1/90	TURBINE, KEROSENE FIRED	585.00 MMBTU/HR	0.0630 LB/MMBTU	STEAM INJECTION AND SCR	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ		11/1/90	TURBINE, NATURAL GAS FIRED	585.00 MMBTU/HR	0.0330 LB/MMBTU	STEAM INJECTION AND SCR	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	282400 3705 00001	5/5/90	GE LM2500 GAS TURBINE	214.90 MMBTU/HR	75.0000 PPM + FBN CORRECTION	WATER INJECTION	BACT
PEPCO - CHALK POINT PLANT	MD		6/25/90	TURBINE, 105 MW OIL FIRED ELECTRIC	105.00 MW	25.0000 PPM @ 15% O2	DRY PREMIX BURNER	BACT-PSD
PEPCO - CHALK POINT PLANT	MD		6/25/90	TURBINE, 84 MW OIL FIRED ELECTRIC	84.00 MW	55.0000 PPM @ 15% O2	QUIET COMBUSTION AND WATER INJECTION	BACT-PSD
PEPCO - CHALK POINT PLANT	MD		4/25/90	TURBINE, 105 MW NATURAL GAS FIRED ELECTRIC	105.00 MW	77.0000 PPM @ 15% O2	DRY PREMIX AND WATER INJECTION	BACT-PSD
PEPCO - CHALK POINT PLANT	MD		4/25/90	TURBINE, 84 MW NATURAL GAS FIRED ELECTRIC	84.00 MW	25.0000 PPM @ 15% O2	QUIET COMBUSTION AND WATER INJECTION	BACT-PSD
PACIFIC GAS TRANSMISSION COMPANY	OR	16-0026	6/19/90	TURBINE GAS, COMPRESSOR STATION	110.00 MMBTU/HR	199.0000 PPM @ 15% O2	LOW NOX BURNER DESIGN	NSPS
PEPCO - STATION A	MD		5/31/90	TURBINE, 124 MW OIL FIRED	125.00 MW	77.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
PEPCO - STATION A	MD		5/31/90	TURBINE, 124 MW NATURAL GAS FIRED	125.00 MW	42.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
PEDRICKTOWN COGENERATION LIMITED PARTNERSHIP	NJ		2/23/90	TURBINE, NATURAL GAS FIRED	1000.00 MMBTU/HR	0.0440 LB/MMBTU	STEAM INJECTION AND SCR	BACT-PSD
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	0560-0029	12/11/89	INTERNAL COMBUSTION TURBINE	110.00 MEGAWATTS	308.0000 LBS/HR	WATER INJECTION	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	MBR-89-COM-002	11/30/89	TURBINE, 38 MW OIL FIRED	412.00 MMBTU/HR	40.0000 PPM @ 15% O2	WATER INJECTION	BACT-OTHER
PEABODY MUNICIPAL LIGHT PLANT	MA	MBR-89-COM-002	11/30/89	TURBINE, 38 MW NATURAL FAS FIRED	412.00 MMBTU/HR	25.0000 PPM @ 15% O2	WATER INJECTION	BACT-OTHER
PACIFIC GAS TRANSMITION	OR	16-0026	11/2/89	TURBINE, NAT. GAS	14600.00 HP	12.0000 PPM @ 15% O2	LOW NOX BURNERS	BACT-PSD
SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	MD		10/1/89	TURBINE, OIL FIRED ELECTRIC	90.00 MW	400.0000 LB/HR	WATER INJECTION	BACT-PSD
SOUTHERN MARYLAND ELECTRIC COOPERATIVE (SMECO)	MD		10/1/89	TURBINE, NATURAL GAS FIRED ELECTRIC	90.00 MW	199.0000 LB/HR	WATER INJECTION	BACT-PSD
KINGSBURG ENERGY SYSTEMS	CA	3060230101	9/25/89	TURBINE, NATURAL GAS FIRED, DUCT BURNER	34.50 MW	6.0000 PPM @ 15% O2	SCR, STEAM INJECTION	BACT-PSD
MEGAN-RACINE ASSOCIATES, INC	NY	402201 0295 00001	9/5/89	GE LM5000-N COMBINED CYCLE GAS TURBINE	401.00 LB/MMBTU	42.0000 PPMDV @ 15% O2	WATER INJECTION	BACT
UNOCAL	CA	A/N 168274 AND 168295	7/18/89	TURBINE, GAS (SEE NOTES)	0.00	9.0000 PPM @ 15% O2	SELECTIVE CATALYTIC REDUCTION (SCR), WATER INJECTN	BACT-OTHER
KERN FRONT LIMITED	CA	S-1120-1-7	11/4/86	TURBINE, GAS, GENERAL ELECTRIC LM-2500	25.00 MW	46.9600 LB/D	WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION	BACT-OTHER
TOYOTA MOTOR MANUFACTURING U.S.A. INC.	KY	C-86-117	7/17/86	COMBUSTION, NATURAL GAS	0.00	0.1000 LB/MMBTU		BACT-PSD
UNION ELECTRIC CO	MO	0579-014 TO 0579-015	5/6/79	CONSTRUCTION OF A NEW OIL FIRED COMBUSTION TURBINE	622.00 MM BTU/HR	3242.0000 TPY	WATER INJECTION FOR NOX EMISSIONS	BACT-PSD
PILGRIM ENERGY CENTER	NY	472800 2054		(2) WESTINGHOUSE W501D5 TURBINES (EP #5 00001&2)	1400.00 MMBTU/HR	4.5000 PPM, 21.6 LB/HR	STEAM INJECTION FOLLOWED BY SCR	BACT
LEDERLE LABORATORIES	NY	392400 0095		(2) GAS TURBINES (EP #5 00101&102)	110.00 MMBTU/HR	42.0000 PPM, 18 LB/HR	STEAM INJECTION	BACT-PSD
BRUSH COGENERATION PARTNERSHIP	CO	91MR9M1		TURBINE	350.00 MMBTU/H	25.0000 PPM @ 15% O2	DRY LOW NOX BURNER	BACT-PSD
COLORADO POWER PARTNERSHIP	CO	91MR930.1-2		TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00 MMBTU/H EACH TURBINE	42.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
MILAGRO, WILLIAMS FIELD SERVICE	NM	PSD-NM-859-M-4		TURBINE/COGEN, NATURAL GAS (2)	900.00 MMCF/DAY	9.0000 PPM @ 15% O2	DRY LOW NOX (GENERAL ELECTRIC MODEL PG6541B)	BACT-PSD
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD			TURBINE, 140 MW OIL FIRED ELECTRIC	140.00 MW	65.0000 PPM @ 15% O2	WATER INJECTION	BACT-PSD
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD			TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00 MW	15.0000 PPM @ 15% O2	DRY BURN LOW NOX BURNERS	BACT-PSD

Source: EPA's RBLC Fourth Quarter 1999 Update

Table B-3. Capital Cost for Selective Catalytic Reduction for General Electric Frame 7 Simple Cycle Combustion Turbine

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
SCR Associated Equipment	$2,835,000	Vendor Estimate
Ammonia Storage Tank	$126,000	$35 per 1,000 lb mass flow developed from vendor quotes
Flue Gas Ductwork	$61,370	Vatavauk,1990
Instrumentation	$50,000	Additional NO_x Monitor and System
Taxes	$170,100	6% of SCR Associated Equipment and Catalyst
Freight	$141,750	5% of SCR Associated Equipment
Total Direct Capital Costs (TDCC)	$3,384,220	
Direct Installation Costs		
Foundation and supports	$270,738	8% of TDCC ; OAQPS Cost Control Manual
Handling & Erection	$473,791	14% of TDCC ; OAQPS Cost Control Manual
Electrical	$135,369	4% of TDCC ; OAQPS Cost Control Manual
Piping	$67,684	2% of TDCC ; OAQPS Cost Control Manual
Insulation for ductwork	$33,842	1% of TDCC ; OAQPS Cost Control Manual
Painting	$33,842	1% of TDCC ; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$15,000	Engineering Estimate
Total Direct Installation Costs (TDIC)	$1,035,266	
Total Capital Costs (TCC)	$4,419,486	Sum of TDCC, TDIC and RCC
Indirect Costs		
Engineering	$338,422	10% of TDCC; OAQPS Cost Control Manual
PSM/RMP Plan	$50,000	Engineering Estimate
Construction and Field Expense	$169,211	5% of TDCC; OAQPS Cost Control Manual
Contractor Fees	$338,422	10% of TDCC; OAQPS Cost Control Manual
Start-up	$67,684	2% of TDCC; OAQPS Cost Control Manual
Performance Tests	$33,842	1% of TDCC; OAQPS Cost Control Manual
Contingencies	$101,527	3% of TDCC; OAQPS Cost Control Manual
Total Indirect Capital Cost (TInCC)	$1,099,108	
Total Direct, Indirect and Capital Costs (TDICC)	$5,518,594	Sum of TCC and TInCC

Mass Flow of Combustion Turbine

3,600,000 lb/hr "F"

Table B-4. Annualized Cost for Selective Catalytic Reduction for General Electric Frame 7 Simple Cycle Operation

Cost Component	Costs	Basis of Cost Component
Direct Annual Costs		
Operating Personnel	$18,720	24 hours/week at $15/hr
Supervision	$2,808	15% of Operating Personnel;OAQPS Cost Control Manual
Ammonia	$60,856	$300 per ton for Aqueous NH_3
PSM/RMP Update	$15,000	Engineering Estimate
Inventory Cost	$40,663	Capital Recovery (10.98%) for 1/3 catalyst
Catalyst Cost	$370,333	3 years catalyst life; Based on Vendor Budget Estimate
Contingency	$15,251	3% of Direct Annual Costs
Total Direct Annual Costs (TDAC)	$523,631	
Energy Costs		
Electrical	$10,848	80kW/h for SCR @ $0.04/kWh times Capacity Factor
MW Loss and Heat Rate Penalty	$162,069	0.3% of MW output; EPA, 1993 (Page 6-20); 2" w.g. pressure drop
Total Energy Costs (TEC)	$172,917	
Indirect Annual Costs		
Overhead	$49,430	60% of Operating/Supervision Labor and Ammonia
Property Taxes	$55,186	1% of Total Capital Costs
Insurance	$55,186	1% of Total Capital Costs
Annualized Total Direct Capital	$605,942	10.98% Capital Recovery Factor of 7% over 15 years times sum of TDICC
Total Indirect Annual Costs (TIAC)	$765,744	
Total Annualized Costs	$1,462,292	Sum of TDAC, TEC and TIAC
Cost Effectiveness	$10,466	NO_x Reduction Only
	$19,760	Net Emission Reduction

Table B-5. Comparison of Alternative BACT Control Technologies for NO_x on the Simple-cycle Unit

	Alternative BACT Control Technologies	
	DLN/WI Only	DLN/WI with SCR
Technical Assessment	Feasible	Feasible for gas
Economic Impact[a]		
Capital Costs	included	$5,518,594
Annualized Costs	included	$1,462,292
Cost Effectiveness		
NO_x Removed (per ton of NO_x)	NA	$10,466
NO_x Removed (per ton of total pollutants)	NA	$19,760
Environmental Impact[b]		
Total NO_x (TPY)	215	75.2
NO_x Reduction (TPY)	NA	(139.8)
Ammonia Emissions (TPY)	0	42.6
PM Emissions (TPY)	0	20.8
Secondary Emissions (TPY)	0	2.3
Net Emission Reduction (TPY)	NA	(74.1)
Energy Impacts[c]		
Energy Use (kWh/yr)	0	2,044,848
Energy Use (mmBtu/yr) at 10,000 Btu/kWh	0	19,804
Energy Use (mmcf/yr) at 1,000 Btu/cf for natural gas	0	20

[a] See Tables B-3 and B-4 for detailed development of capital costs (including recurring costs) and annualized costs.

[b] See emission data presented in Table B-6.

[c] Energy impacts are estimated due to the lost energy from heat rate penalty and electrical usage for the SCR operation at 3,390 hours per year. Lost energy is based on 0.3 percent of 174.4 MW. SCR electrical usage is based on 0.080 MWh per SCR system.

Table B-6. Maximum Potential Incremental Emissions (TPY) with Selective Catalytic Reduction
Simple Cycle Operation

Pollutants		Incremental Emissions (tons/year) of SCR		
		Primary	Secondary	Total
Particulate		20.83	0.07	20.90
Sulfur Dioxide			0.03	0.03
Nitrogen Oxides		-139.72	1.32	-138.40
Carbon Monoxide			0.79	0.79
Volatile Organic Compounds			0.05	0.05
Ammonia		42.62		
	Total:	-76.27	2.26	-74.00
Carbon Dioxide (additional from gas firing)			1,254.28	1,254.28

Basis:

Lost Energy (mmBtu/year)	19,804

Secondary Emissions (lb/mmBtu): Assumes natural gas firing in NO_x controlled steam unit.

Particulate	0.0072
Sulfur Dioxide	0.0027
Nitrogen Oxides w/LNB	0.1333
Carbon Monoxide	0.0800
Volatile Organic Compounds	0.0052

Reference: Table 1.4-1 and 1.4-2, AP-42, Version 2/98

BEST AVAILABLE COPY

Table B-7. Summary of Best Availble Control Technology (BACT) Determinations for CO Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit Process Description	Capacity (size)	CO Emission Limit	Control Method	Basis
KISSIMMEE UTILITIES AUTHORITY	FL	PSD-FL-254	12/16/99	TURBINE, COMBUSTION	250.00 MW	12.0000 PPM	GOOD COMBUSTION	BACT-PSD
DUKE ENERGY NEW SOMYRNA BEACH POWER CO. LP	FL	PSD-FL-257	10/15/99	TURBINE-GAS, COMBINED CYCLE	500.00 MW (2 UNITS)	12.0000 PPM	GOOD COMBUSTION	BACT-PSD
OLEANDER POWER PROJECT	FL	PSD-FL-258	10/1/99	TURBINE-GAS, COMBINED CYCLE	190.00 MW	12.0000 PPM @ 15% O2	GOOD COMBUSTION	BACT-PSD
PDC EL PASO MILFORD LLC	CT	105-0066	4/16/99	TURBINE, COMBUSTION, ABB GT-24, #1 WITH 2 CHILLE	1.97 MMCF/H	13.0000 LB/H NAT GAS	OXIDATION CATALYST	BACT-PSD
PDC EL PASO MILFORD LLC	CT	105-0069	4/16/99	TURBINE, COMBUSTION, ABB GT-24E #2 WITH 2 CHILL	1.97 MMCF/H	13.0000 LB/H NAT GAS	OXIDATION CATALYST	BACT-PSD
ALABAMA POWER COMPANY - THEODORE COGENERATION	AL	503-8075	3/16/99	TURBINE, WITH DUCT BURNER	170.00 MW	0.0860 LB/MMBTU	EFFICIENT COMBUSTION	BACT-PSD
WYANDOTTE ENERGY	MI	279-98	2/5/99	TURBINE, COMBINED CYCLE, POWER PLANT	500.00 MW	3.0000 PPM	CATALYTIC OXIDIZER	LAER
MOBILE ENERGY LLC	AL	503-8066	1/5/99	TURBINE, GAS, COMBINED CYCLE	168.00 MW	0.0400 LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P.	GA	4-11-149-0004-P-01-0	12/18/98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160.00 MW EA	15.0000 PPMVD @ 15% O2	USING 15% EXCESS AIR. CO EMISSION IS BECAUSE OF NATURAL GAS.	BACT-PSD
TENUSKA GEORGIA PARTNERS, L.P.	GA	4-11-149-0004-P-01-0	12/18/98	TURBINE, COMBUSTION, SIMPLE CYCLE, 6	160.00 MW EA	33.0000 PPMVD	CO EMISSION IS BECAUSE OF FUEL OIL. WHEN OUTPUT ISBELOW 123 MW LIMIT IS 33 PPMVD AND ABOVE 123 MW	BACT-PSD
WESTBROOK POWER LLC	ME	A-743-71-A-N	12/4/98	TURBINE, COMBINED CYCLE, TWO	528.00 MW TOTAL	15.0000 PPM @15% O2	USING 15 % EXCESS AIR.	BACT-PSD
GORHAM ENERGY LIMITED PARTNERSHIP	ME	A-735	12/4/98	TURBINE, COMBINED CYCLE	900.00 MW TOTAL	5.0000 PPM @ 15% O2 (NAT G)	0.05% SULFUR DISTILLATE OIL #2 IS USED. EMISSION IS FROM EACH 300 MW SYSTEM.	BACT-PSD
SANTA ROSA ENERGY LLC	FL	PSD-FL 253	12/4/98	TURBINE, COMBUSTION, NATURAL GAS	241.00 MW	0.0000	DRY LOW NOX BURNER GOOD COMBUSTION PRACTICE	BACT-PSD
CHAMPION INTERNATL CORP. & CHAMP. CLEAN ENERGY	ME	A-22-71-N-A	9/14/98	TURBINE, COMBINED CYCLE, NATURAL GAS	175.00 MW	9.0000 PPMVD @15% O2 GAS		BACT-OTHE
ALABAMA POWER PLANT BARRY	AL	503-1001	8/7/98	TURBINES, COMBUSTION, NATURAL GAS	510.00 MW(TOTAL)	0.0570 LB/MMBTU	EFFICIENT COMBUSTION	BACT-PSD
TNP TECHN, LLC (FORMERLY TX-NM POWER CO.)	NM	PSD-NM-90-M2	8/7/98	GAS TURBINES	375.00 MMBTU/H	18.0000 PPM	GOOD COMBUSTION PRACTICES	BACT-PSD
CASCO RAY ENERGY CO	ME	A-728	7/13/98	TURBINE, COMBINED CYCLE, NATURAL GAS, TWO	170.00 MW EACH	20.0000 PPM @ 15% O2	15% EXCESS AIR	BACT-PSD
CITY OF LAKELAND ELECTRIC AND WATER UTILITIES	FL	PSD-FL-245	7/10/98	TURBINE, COMBUSTION, GAS FIRED W/ FUEL OIL ALSO	2174.00 MMBTU/H	25.0000 PPM	GOOD COMBUSTION WITH DRY LOW NOX BURNERS OXIDATION CATALYST MAY BE USED	BACT-PSD
COLORADO SPRINGS UTILITIES-NIXON POWER PLANT	CO	94EP132	6/30/98	SIMPLE CYCLE TURBINE, NATURAL GAS	1122.00 MM BTU/HR	0.8000 ORE	CATALYTIC OXIDATION	BACT-PSD
BRIDGEPORT ENERGY, LLC	CT	0150190 & 0150191	6/29/98	TURBINES, COMBUSTION MODEL V84.3A, 2 SIEMES	260.00 MW/HRSG PER TURBINE	10.0000 PPM GAS & OIL	PRE-MIX FUEL FAIR TO OPTIMIZE EFFICIENCY ACTUAL EMISSIONS EXPECTED BETWEEN 5-7PPM	BACT-PSD
ENCOGEN HAWAII, L.P.	HI	0243-01-C	6/8/98	TURBINES, COMBUSTION, 2 EA	23.00 MW	57.5000 PPMVD @ 15% O2	GOOD COMBUSTION DESIGN AND OPERATION.	BACT-PSD
CITY OF TALLAHASSEE UTILITY SERVICES	FL	PSD-FL-239	5/29/98	TURBINE, COMBINED CYCLE, MULTIPLE FUELS	1468.00 MMBTU/H	0.0000 SEE P2 DESCRIPTION	GOOD COMBUSTION OF CLEAN FUELS	BACT-OTHE
GENERAL ELECTRIC PLASTICS	AL	207-0008-X016	5/27/98	COMBINED CYCLE (TURBINE AND DUCT BURNER)	0.00	0.0800 LBS/MMBTU	PROPER COMBUSTION	BACT-PSD
RUMFORD POWER ASSOCIATES	ME	A-724-71-A-N	5/1/98	TURBINE GENERATOR, COMBUSTION, NATURAL GAS	1906.00 MMBTU/H	15.0000 PPM @ 15% O2	GE DRY LOW-NOX COMBUSTOR DESIGN. GOOD COMBUSTION CONTROL	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	A-718-71-A-N	3/31/98	GAS TURBINES, COGEN, W/DUCT BURNERS	673.00 MMBTU/H TURBINE	74.2100 LB/H NG	CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES.	BACT-PSD
ANDROSCOGGIN ENERGY LIMITED	ME	A-718-71-A-N	3/31/98	GAS TURBINES, COGEN, W/DUCT BURNERS	675.00 MMBTU/H TURBINE	43.7300 LB/H NG OIL	CATALYTIC OXIDATION, GOOD COMBUSTION PRACTICES.	BACT-PSD
TWO ELK GENERATION PARTNERS, LIMITED PARTNERSHIP	WY	CT-1352	2/27/98	TURBINE, STATIONARY	33.30 MW	25.0000 PPM @ 15% O2		OTHER
TIVERTON POWER ASSOCIATES	RI	RI-PSD-5	2/13/98	COMBUSTION TURBINE, NATURAL GAS	265.00 MW	12.0000 PPM @ 15% O2	GOOD COMBUSTION	BACT-PSD
AIR LIQUIDE AMERICA CORPORATION	LA	PSD-LA-622	2/13/98	TURBINE GAS, GE, 7ME 7	966.00 MMBTU/H	25.0000 PPMV	GOOD EQUIPMENT DESIGN, PROPER COMBUSTION TECHNIQUE AND MIN. 2% EXCESS O2	BACT-PSD
MILLENNIUM POWER PARTNER, LP	MA	130921	2/2/98	TURBINE, COMBUSTION, WESTINGHOUSE MODEL 501	2534.00 MMBTU/H	0.0700 LB/MMBTU	DRY LOW NOX COMBUSTION TECHNOLOGY IN CONJUNCTION WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
MAUI ELECTRIC COMPANY	HI	0067-01-C	1/6/98	TURBINE, COMBUSTION, 2 EA	20.00 MW	44.0000 PPMVD @ 15% O2	GOOD COMBUSTION DESIGN AND OPERATION.	BACT-PSD
BASF CORPORATION	LA	PSD-LA-613	12/30/97	DUCT BURNER, COGEN UNIT NO. 2	0.49 MMLB/H STEAM	83.9300 LB/HR	GOOD DESIGN, PROPER OPERATING PRACTICES, 2% EXCESS O2	BACT-PSD
BASF CORPORATION	LA	PSD-LA-613	12/30/97	TURBINE, COGEN UNIT 2, GE FRAME 6	42.40 MW	63.9300 LB/MMBTU	GOOD DESIGN, PROPER COMBUSTION TECHNIQUES, 2% EXCESS O2	BACT-PSD
BUCKNELL UNIVERSITY	PA	60-0001A	11/26/97	NG FIRED TURBINE, SOLAR TAURUS T-7300S	5.00 MW	50.0000 PPMV@15%O2	GOOD COMBUSTION	BACT-OTHE
DIGHTON POWER ASSOCIATE, LP	MA	4B96096	10/6/97	TURBINE, COMBUSTION, ABB GT11N2	1327.00 MMBTU/H	5.9700 LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
BERKSHIRE POWER DEVELOPMENT, INC.	MA	1-X-95-093	9/22/97	TURBINE, COMBUSTION, ABB GT24	1792.00 MMBTU/H	14.3000 LB/H	DRY LOW NOX COMBUSTION TECHNOLOGY WITH SCR ADD-ON NOX CONTROL.	BACT-PSD
UNIVERSITY OF MEDICINE & DENTISTRY OF NEW JERSEY	NJ	087427/28/29 (3)	6/26/97	COMBUSTION TURBINE COGENERATION UNITS, 3	56.00 MMBTU/H	75.0000 PPMVD NAT. GAS		RACT
LORDSBURG L.P.	NM	PSD-NM-1975	6/18/97	TURBINE, NATURAL GAS-FIRED, ELEC. GEN.	100.00 MW	27.0000 LBS/HR	DRY LOW-NOX TECHNOLOGY BY MAINTAINING PROPER AIR- FUEL RATIO.	BACT-PSD
COLO. POWER PARTNERS- BRUSH COGEN FAC	CO	91MR933	3/27/97	COGEN TURBINES W/ DUCT BURNERS & BOILERS	385.00 MM BTU/HR	35.0000 PPM @ 15% O2	GOOD COMBUSTION	BACT-PSD
MEAD COATED BOARD, INC.	AL	211-0004	3/12/97	COMBINED CYCLE TURBINE (25 MW)	568.00 MMBTU/HR	28.0000 PPMVD@15% O2 (GAS)	PROPER DESIGN AND GOOD COMBUSTION PRACTICES	BACT-PSD
FORMOSA PLASTICS CORPORATION, BATON ROUGE PLANT	LA	PSD-LA-560 (M-2)	3/7/97	TURBINE/HSRG, GAS COGENERATION	450.00 MM BTU/HR	70.0000 LB/HR	COMBUSTION DESIGN AND CONSTRUCTION.	BACT-PSD
SOUTHWESTERN PUBLIC SERVICE COMPANY/CUNNINGHAM STA	NM	PSD-NM-622-M-2	2/15/97	COMBUSTION TURBINE, NATURAL GAS	100.00 MW	0.0000 SEE FACILITY NOTES	GOOD COMBUSTION PRACTICES	BACT-PSD
ECOELECTRICA, L.P.	PR	PR-0102	10/1/96	TURBINES, COMBINED-CYCLE COGENERATION	461.00 MW	100.0000 PPMDV AT MIN. LOAD	COMBUSTION CONTROLS.	BACT-PSD
ECOELECTRICA, L.P.	PR	PR-0102	10/1/96	TURBINES, COMBINED-CYCLE COGENERATION	461.00 MW	33.0000 PPMDV	COMBUSTION CONTROLS.	BACT-PSD
BLUE MOUNTAIN POWER, LP	PA	06-328-009	7/31/96	COMBUSTION TURBINE WITH HEAT RECOVERY BOILE	153.00 MW	3.1000 PPM @ 15% O2	OXIDATION CATALYST 15 PPM @ 15% O2 WHEN FIRING NO. 2 OIL AT 75% NO LIMIT SET TO 22.1 PP	OTHER
COMMONWEALTH CHESAPEAKE CORPORATION	VA	40898	5/21/96	3 COMBUSTION TURBINES (OIL-FIRED)	3000.00 HRS/YR	96.0000 TPY	GOOD COMBUSTION OPERATING PRACTICES	BACT/NSPS
PORTSIDE ENERGY CORP.	IN	CP 127 5260	5/13/96	TURBINE, NATURAL GAS-FIRED	63.00 MEGAWATT	40.0000 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 40 PPMVD AT 15% OXYGEN.	BACT-PSD
PORTSIDE ENERGY CORP.	IN	CP 127 5260	5/13/96	TURBINE, NATURAL GAS-FIRED	63.00 MEGAWATT	12.0000 LBS/HR	GOOD COMBUSTION AND EMISSIONS NOT TO EXCEED 10 PPMVD AT 15% OXYGEN.	BACT-PSD
PUBLIC SERVICE OF COLO.-FORT ST VRAIN	CO	94WE609	5/1/96	COMBINED CYCLE TURBINES (2), NATURAL	471.00 MW	15.0000 PPMVD, SMPL CY	GOOD COMBUSTION CONTROL PRACTICES. COMMITMENT TO A PATTERN OF OPERATION (LOAD VARIATIONS, ET	BACT-PSD
GENERAL ELECTRIC GAS TURBINES	SC	1200-0094	4/19/96	I.C. TURBINE	2700.00 MMBTU/HR	27169.0000 LB/HR	GOOD COMBUSTION PRACTICES TO MINIMIZE EMISSIONS	BACT-PSD
CAROLINA POWER & LIGHT	NC	1812	4/11/96	COMBUSTION TURBINE, 4 EACH	1907.60 MMBTU/HR	81.0000 LB/HR	COMBUSTION CONTROL	BACT-PSD
CAROLINA POWER & LIGHT	NC	1812	4/11/96	COMBUSTION TURBINE, 4 EACH	1907.60 MMBTU/HR	80.0000 LB/HR	COMBUSTION CONTROL	BACT-PSD
SOUTH MISSISSIPPI ELECTRIC POWER ASSOC.	MS	1360-00035	4/9/96	COMBUSTION TURBINE, COMBINED CYCLE	1299.00 MMBTU/HR NAT GAS	26.3000 PPM @ 15% O2 GAS	GOOD COMBUSTION CONTROLS	BACT-PSD
MID-GEORGIA COGEN.	GA	4911-076-11753	4/3/96	COMBUSTION TURBINE (2), NATURAL GAS	116.00 MW	10.0000 PPMVD	COMPLETE COMBUSTION	BACT-PSD
MID-GEORGIA COGEN.	GA	4911-076-11753	4/3/96	COMBUSTION TURBINE (2), FUEL OIL	116.00 MW	30.0000 PPMVD	COMPLETE COMBUSTION	BACT-PSD
GEORGIA GULF CORPORATION	LA	PSD-LA-592	3/26/96	GENERATOR, NATURAL GAS FIRED TURBINE	1123.00 MM BTU/HR	972.4000 TPY CAP FOR 3 TURB.	GOOD COMBUSTION PRACTICE AND PROPER OPERATION	BACT-PSD
SEMINOLE HARDEE UNIT 3	FL	PA-89-258A / PSD-FL-214	1/1/96	COMBINED CYCLE COMBUSTION TURBINE	140.00 MW	20.0000 PPM (NAT. GAS)	DRY LNB GOOD COMBUSTION PRACTICES	BACT-PSD
MINNESOTA METHANE	AZ	95-0241	11/12/95	ENGINES, COGENERATION (4)	800.00 KW	99.9000 TPY	AIR/FUEL CONTROLLER	BACT
KEY WEST CITY ELECTRIC SYSTEM	FL	AC44-245099 / PSD-FL-210	9/28/95	TURBINE, EXISTING CT RELOCATION TO A NEW PLAN	23.00 MW	20.0000 PPM @ 15% O2 FULL LD	GOOD COMBUSTION	BACT-PSD
UNION CARBIDE CORPORATION	LA	PSD-LA-590	9/22/95	DUCT BURNER	710.00 MM BTU/HR	198.6000 LB/HR COMMON VENT	NO ADD-ON CONTROL GOOD COMBUSTION PRACTICE	BACT-PSD
UNION CARBIDE CORPORATION	LA	PSD-LA-590	9/22/95	GENERATOR, GAS TURBINE	1313.00 MM BTU/HR	198.6000 LB/HR	NO ADD-ON CONTROL GOOD COMBUSTION PRACTICE	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	PR-0100	7/31/95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EA	248.00 MW	104.0000 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	BACT-PSD
PUERTO RICO ELECTRIC POWER AUTHORITY (PREPA)	PR	PR-0100	7/31/95	COMBUSTION TURBINES (3), 83 MW SIMPLE-CYCLE EA	248.00 MW	20.0000 LB/HR	MAINTAIN EACH TURBINE IN GOOD WORKING ORDER AND IMPLEMENT GOOD COMBUSTION PRACTICES.	BACT-PSD
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	2-6101-00185/00002-9	6/6/95	TURBINE, OIL FIRED	240.00 MW	3.0000 PPM @ 15% O2		LAER
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	2-6101-00185/00002-9	6/6/95	GENERATOR, 3000 KW EMERGENCY	7000.00 KW	0.2500 LB/MMBTU		LAER
BROOKLYN NAVY YARD COGENERATION PARTNERS L.P.	NY	2-6101-00185/00002-9	6/6/95	TURBINE, NATURAL GAS FIRED	240.00 MW	4.0000 PPM @ 15% O2		LAER
PANDA-KATHLEEN, L.P.	FL	AC53-251898/PSD-FL-216	6/1/95	COMBINED CYCLE COMBUSTION TURBINE (TOTAL 115	75.00 MW	25.0000 PPM @ 15% O2	COMBUSTION CONTROLS STANDARD ONLY APPLIES IF GE CT IS SELECTED. THE ABB CT WAS LESS	BACT-PSD
ALGONQUIN GAS TRANSMISSION COMPANY	NJ	LOG# 94-0079	3/31/95	TURBINES COMBUSTION, TWO SOLAR CENTAUR	3.10 MW EACH	15.2000 LB/H		BACT
FORMOSA PLASTICS CORPORATION, LOUISIANA	LA	PSD-LA-560 (M-1)	3/2/95	TURBINE/HRSG, GAS COGENERATION	450.00 MM BTU/HR	25.8000 LB/HR	PROPER OPERATION	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	0395-015	2/28/95	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	88.77 MW	427.5000 TPY	GOOD COMBUSTION CONTROL	BACT-PSD
MARATHON OIL CO. - INDIAN BASIN N.G. PLAN	NM	PSD-NM-195-M-2	1/31/95	TURBINES, NATURAL GAS (2)	5900.00 HP	13.2000 LBS/HR	LEAN-PREMIXED COMBUSTION TECHNOLOGY.	BACT-PSD
KAMINE BESICORP SYRACUSE LP	NY	313201 2010/00001-00007	12/10/94	SIEMENS V64.3 GAS TURBINE (EP #00001)	650.00 MMBTU/HR	9.5000 PPM	NO CONTROLS	BACT-OTHE
INDECK-OSWEGO ENERGY CENTER	NY	351200 0211 00001	10/6/94	DUCT BURNER	30.00 MMBTU/HR	0.1280 LB/MMBTU, 3.84 LB/HR	NO CONTROLS	BACT-OTHE
INDECK-OSWEGO ENERGY CENTER	NY	351200 0211 00001	10/6/94	GE FRAME 6 GAS TURBINE	533.00 LB/MMBTU	10.0000 PPM, 10.00 LB/HR	NO CONTROLS	BACT-OTHE
FULTON COGEN PLANT	NY	350400 0221 00001	9/15/94	GE LM5000 GAS TURBINE	500.00 MMBTU/HR	107.0000 PPM, 120 LB/HR	NO CONTROLS	BACT-OTHE
CAROLINA POWER AND LIGHT	SC	0820-0033	8/31/94	STATIONARY GAS TURBINE	1520.00 MMBTU/H	414.0000 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	BACT-PSD
CAROLINA POWER AND LIGHT	SC	0820-0033	8/31/94	STATIONARY GAS TURBINE	1520.00 MMBTU/H	702.0000 LB/H	PROPER OPERATION TO ACHIEVE GOOD COMBUSTION	BACT-PSD
BEAR MOUNTAIN LIMITED	CA	S-2049-1-2	8/19/94	TURBINE, GE, COGENERATION, 45 MW	48.00 MW	252.6000 LB/D	OXIDATION CATALYST	BACT-OTHE
HERMISTON GENERATING CO.	OR	30-0113	7/7/94	TURBINES, NATURAL GAS (2)	1696.00 MMBTU/H	15.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
MUDDY RIVER L.P.	NV	A0113	6/10/94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140.00 MEGAWATT	77.0000 LB/HR	FUEL SPEC: NATURAL GAS	BACT-PSD
CSW NEVADA, INC.	NV	A0116	6/10/94	COMBUSTION TURBINE, DIESEL & NATURAL GAS	140.00 MEGAWATT	83.0000 LB/HR	FUEL SPEC: NATURAL GAS	BACT-PSD
PORTLAND GENERAL ELECTRIC CO.	OR	25-0001	5/31/94	TURBINES, NATURAL GAS (2)	1720.00 MMBTU	15.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	0594-035	5/17/94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1343.00 MMBTU/HR	120.0000 TPY	NONE	BACT-PSD
EMPIRE DISTRICT ELECTRIC CO.	MO	0594-035	5/17/94	INSTALL TWO NEW SIMPLE-CYCLE TURBINES	1343.00 MMBTU/HR	1290.0000 TPY	NONE	BACT-PSD

BEST AVAILABLE COPY

Table B-7. Summary of Best Availble Control Technology (BACT) Determinations for CO Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit Process Description	Capacity (size)	CO Emission Limit	Control Method	Basis
WEST CAMPUS COGENERATION COMPANY	TX	22962 PSD-TX-817	5/2/94	GAS TURBINES	75.30 MW (TOTAL POWER)	300.0000 TPY	INTERNAL COMBUSTION CONTROLS	BACT
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	PSD-FL-195	2/25/94	TURBINE, NATURAL GAS (2)	1510.00 MMBTU/H	25.0000 PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
FLORIDA POWER CORPORATION POLK COUNTY SITE	FL	PSD-FL-195	2/25/94	TURBINE, FUEL OIL (2)	1730.00 MMBTU/H	30.0000 PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
INTERNATIONAL PAPER	LA	PSD-LA-93(M-3)	2/24/94	TURBINE HRSG, GAS COGEN	338.00 MM BTU/HR TURBINE	165.9000 LB/HR	COMBUSTION CONTROL	BACT
TECO POLK POWER STATION	FL	PSD-FL-194	2/24/94	TURBINE, SYNGAS (COAL GASIFICATION)	1755.00 MMBTU/H	25.0000 PPMVD	GOOD COMBUSTION	BACT-PSD
TECO POLK POWER STATION	FL	PSD-FL-194	2/24/94	TURBINE, FUEL OIL	1765.00 MMBTU/H	40.0000 PPMVD	GOOD COMBUSTION	BACT-PSD
KAMINE/BESICORP CARTHAGE L.P.	NY	226001 7255 0000?	1/18/94	GE FRAME 6 GAS TURBINE	491.00 BTU/HR	10.0000 PPM, 11.0 LB/HR	NO CONTROLS	BACT-OTHE
ORANGE COGENERATION LP	FL	PSD-FL-206	12/30/93	TURBINE, NATURAL GAS, 2	368.50 MMBTU/H	30.0000 PPMVD	GOOD COMBUSTION	BACT-PSD
PROJECT ORANGE ASSOCIATES	NY	311500 2715 00001	12/1/93	STACK (TURBINE AND DUCT BURNER)	715.00 MMBTU/HR	106.4000 LB/HR TEMP > 20F	OXIDATION CATALYST	BACT
PROJECT ORANGE ASSOCIATES	NY	311500 2715 00001	12/1/93	GE LM-5000 GAS TURBINE	550.00 MMBTU/HR	92.0000 LB/HR TEMP > 20F	NO CONTROLS	BACT-OTHE
WILLIAMS FIELD SERVICES CO. - EL CEDRO COMPRESSOR	NM	PSD-NM-540M2	10/29/93	TURBINE, GAS-FIRED	11257.00 HP	50.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CROCKETT COGENERATION - C&H SUGAR	CA	5-201	10/5/93	TURBINE, GAS, GENERAL ELECTRIC MODEL PG7221(FA)	240.00 MW	5.9000 PPMVD @ 15% O2	ENGELHARD OXIDATION CATALYST	BACT-OTHE
PATOWMACK POWER PARTNERS, LIMITED PARTNERSHIP	VA	71975	9/15/93	TURBINE, COMBUSTION, SIEMENS MODEL V84.2, 3	10.20 X10(9) SCF/YR NAT GAS	26.0000 LB/HR	GOOD COMBUSTION OPERATING PRACTICES	BACT-PSD
FLORIDA GAS TRANSMISSION COMPANY	AL	503-3023-X003	8/5/93	TURBINE, NATURAL GAS	12600.00 BHP	0.4200 GM/HP HR	AIR-TO-FUEL RATIO CONTROL, DRY COMBUSTION CONTROLS	BACT-PSD
LOCKPORT COGEN FACILITY	NY	292600 0446 00001-00007	7/14/93	(3) DUCT BURNER (EP #S 00001-00003)	94.10 MMBTU/HR	0.1000 LB/MMBTU, 9.4 LB/HR	NO CONTROLS	BACT-OTHE
LOCKPORT COGEN FACILITY	NY	292600 0446 00001-00007	7/14/93	(6) GE FRAME 6 TURBINES (EP #S 00001-00006)	423.90 MMBTU/HR	10.0000 PPM	NO CONTROLS	BACT-OTHE
ANITEC COGEN PLANT	NY	030200 0451	7/7/93	DUCT BURNER EP #00001	70.00 MMBTU/HR	0.0350 LB/MMBTU, 2.5 LB/HR	NO CONTROLS	BACT-OTHE
ANITEC COGEN PLANT	NY	030200 0451	7/7/93	GE LM5000 COMBINED CYCLE GAS TURBINE EP #00001	451.00 MMBTU/HR	36.0000 PPM, 33 LB/HR	BAFFLE CHAMBER	SEE NOTE #
NEWARK BAY COGENERATION PARTNERSHIP, L.P	NJ	01-92-5231 TO 01-92-5261	6/9/93	TURBINES, COMBUSTION, NATURAL GAS-FIRED (2)	617.00 MMBTU/HR (EACH)	1.8000 PPMDV	OXIDATION CATALYST	OTHER
NEWARK BAY COGENERATION PARTNERSHIP, L.P.	NJ	01-92-5231 TO 01-92-5261	6/9/93	TURBINES, COMBUSTION, KEROSENE-FIRED (2)	640.00 MMBTU/H (EACH)	2.6000 PPMDV	OXIDATION CATALYST	OTHER
PSI ENERGY, INC. WABASH RIVER STATION	IN	CP 167 2610	5/27/93	COMBINED CYCLE SYNGAS TURBINE	1775.00 MMBTU/HR	15.0000 LESS THAN PPM	OPERATION PRACTICES AND GOOD COMBUSTION, COMBINED CYCLE SYNGAS TURBINE	BACT-PSD
TIGER BAY LP	FL	PSD-FL-190	5/17/93	DUCT BURNER, GAS	100.00 MMBTU/H	10.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
TIGER BAY LP	FL	PSD-FL-190	5/17/93	TURBINE, GAS	1614.80 MMBTU/H	49.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
TIGER BAY LP	FL	PSD-FL-190	5/17/93	TURBINE, OIL	1549.90 MMBTU/H	98.4000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
INDECK ENERGY COMPANY	NY	563200 0099	5/12/93	DUCT BURNER EP #00001	100.00 MMBTU/HR	0.1400 LB/MMBTU, 12.0 LB/HR	NO CONTROLS	BACT-OTHE
INDECK ENERGY COMPANY	NY	563200 0099	5/12/93	GE FRAME 6 GAS TURBINE EP #00001	491.00 MMBTU/HR	40.0000 PPM	NO CONTROLS	BACT-OTHE
PHOENIX POWER PARTNERS	CO	92WE1357	5/11/93	GENERATOR, STEAM, W/ DUCT BURNER	50.00 MMBTU/HR	91.1500 TPY	FUEL SPEC: NATURAL GAS COMBUSTION	OTHER
LILCO SHOREHAM	NY	472200 5578	5/10/93	(3) GE FRAME 7 TURBINES (EP #S 00007-9)	850.00 MMBTU/HR	10.0000 PPM, 19.7 LB/HR	NO CONTROLS	BACT-OTHE
TRIGEN MITCHEL FIELD	NY	282089 4153 00004	4/16/93	GE FRAME 6 GAS TURBINE	424.70 MMBTU/HR	10.0000 PPM, 10.0 LB/HR	NO CONTROLS	BACT-OTHE
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-152	4/7/93	TURBINE, NATURAL GAS	869.00 MMBTU/H	54.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSO
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-152	4/7/93	TURBINE, NATURAL GAS	367.00 MMBTU/H	40.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-152	4/7/93	TURBINE, FUEL OIL	928.00 MMBTU/H	65.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
KISSIMMEE UTILITY AUTHORITY	FL	FL-PSD-152	4/7/93	TURBINE, FUEL OIL	371.00 MMBTU/H	76.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
EAST KENTUCKY POWER COOPERATIVE	KY	C-93-045	3/24/93	TURBINES (5), #2 FUEL OIL AND NAT. GAS FIRED	1492.00 MMBTU/H (EACH)	75.0000 LBS/H (EACH)	PROPER COMBUSTION TECHNIQUES	BACT-OTHE
INTERNATIONAL PAPER CO. RIVERDALE MILL	AL	104-0005-X026	1/11/93	TURBINE, STATIONARY (GAS-FIRED) WITH DUCT BURN	40.00 MW	22.1000 LB/HR	DESIGN	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	PSD-FL-185	12/14/92	TURBINE, GAS	1214.00 MMBTU/H	15.0000 PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
AUBURNDALE POWER PARTNERS, LP	FL	PSD-FL-185	12/14/92	TURBINE, OIL	1170.00 MMBTU/H	25.0000 PPMVD	GOOD COMBUSTION PRACTICES	BACT-PSD
SITHE/INDEPENDENCE POWER PARTNERS	NY	7-3556-00040-00007-9	11/24/92	TURBINES, COMBUSTION (4) (NATURAL GAS) (1012 MW	2133.00 MMBTU/HR (EACH)	13.0000 PPM	COMBUSTION CONTROLS	BACT-OTHE
KAMINE/BESICORP BEAVER FALLS COGENERATION FACILITY	NY	6-2320-00018/00001-0	11/9/92	TURBINE, COMBUSTION (NAT. GAS & OIL FUEL) (79MW	650.00 MMBTU/HR	9.5000 PPM	COMBUSTION CONTROLS	BACT-OTHE
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	92181 TC 92184	11/4/92	TURBINE (NATURAL GAS & OIL)	1150.00 MMBTU	0.0055 LB/MMBTU (GAS)*	COMBUSTION	BACT-OTHE
GRAYS FERRY CO. GENERATION PARTNERSHIP	PA	92181 TC 92184	11/4/92	GENERATOR, STEAM	450.00 MMBTU	0.0055 LB/MMBTU (NAT GAS)*	COMBUSTION	BACT-OTHE
BEAR ISLAND PAPER COMPANY, L.P.	VA	51840	10/30/92	TURBINE, COMBUSTION GAS	474.00 X10(6) BTU/HR N. GAS	11.0000 LBS/HR	GOOD COMBUSTION	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	51840	10/30/92	TURBINE, COMBUSTION GAS	468.00 X10(6) BTU/HR #2 OIL	11.0000 LBS/HR	GOOD COMBUSTION	BACT-PSD
BEAR ISLAND PAPER COMPANY, L.P.	VA	51840	10/30/92	TURBINE, COMBUSTION GAS (TOTAL)	0.00	48.2000 TPY	GOOD COMBUSTION	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINE FACILITY, GAS	1331.10 X10(7) SCF/Y NAT GAS	249.9000 TOTAL TPY	GOOD COMBUSTION PRACTICES	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINE FACILITY, GAS	7.44 X10(7) GPY FUEL OIL	249.9000 TOTAL TPY	GOOD COMBUSTION PRACTICES	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINES (2) [EACH WITH A SF]	1.51 X10(9) BTU/HR N GAS	57.0000 LBS/HR/UNIT	GOOD COMBUSTION PRACTICES	BACT-PSD
GORDONSVILLE ENERGY L.P.	VA	REGISTRATION # 40808	9/25/92	TURBINES (2) [EACH WITH A SF]	1.36 X10(9) BTU/H #2 OIL	65.0000 LBS/HR/UNIT	GOOD COMBUSTION PRACTICES	BACT-PSD
NEVADA POWER COMPANY, HARRY ALLEN PEAKING PLANT	NV	A533	9/18/92	COMBUSTION TURBINE ELECTRIC POWER GENERATI	600.00 MW (8 UNITS 75 EACH)	152.5000 TPY (EACH TURBINE)	PRECISION CONTROL FOR THE LOW NOX COMBUSTOR	BACT-PSD
KAMINE SOUTH GLENS FALLS COGEN CO	NY	414401 2212 00001	9/10/92	GE FRAME 6 GAS TURBINE	498.00 MMBTU/HR	9.0000 PPM, 11.0 LB/HR	NO CONTROLS	BACT-OTHE
NORTHERN STATES POWER COMPANY	SD	NONE	9/2/92	TURBINE, SIMPLE CYCLE, 4 EACH	129.00 MW	50.0000 PPM FOR GAS	GOOD COMBUSTION TECHNIQUES	BACT-PSD
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	1-4722-00926/00001-9	9/1/92	GENERATOR, EMERGENCY (NATURAL GAS)	1.50 MMBTU/HR	6.5000 LB/MMBTU	COMBUSTION CONTROL	BACT-OTHE
PASNY/HOLTSVILLE COMBINED CYCLE PLANT	NY	1-4722-00926/00001-9	9/1/92	TURBINE, COMBUSTION GAS (150 MW)	1146.00 MMBTU/HR (GAS)*	8.5000 PPM	COMBUSTION CONTROL	BACT-OTHE
WEPCU, PARIS SITE	WI	91-RV-043	8/29/92	TURBINES, COMBUSTION (4)	0.00	25.0000 LBS/HR (SEE NOTES)		BACT-PSD
FLORIDA POWER CORPORATION	FL	FL-PSD-180	8/17/92	TURBINE, OIL	1029.00 MMBTU/H	54.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
FLORIDA POWER CORPORATION	FL	FL-PSD-180	8/17/92	TURBINE, OIL	1866.00 MMBTU/H	79.0000 LB/H	GOOD COMBUSTION PRACTICES	BACT-PSD
CNG TRANSMISSION	OH	01-3670	8/12/92	TURBINE (NATURAL GAS) (3)	5500.00 HP (EACH)	0.0150 G/HP-HR	FUEL SPEC: USE OF NATURAL GAS	OTHER
SARANAC ENERGY COMPANY	NY	5-0942-00106/00001-9	7/31/92	BURNERS, DUCT (2)	553.00 MMBTU/HR EACH	0.0600 LB/MMBTU	OXIDATION CATALYST	BACT-OTHE
SARANAC ENERGY COMPANY	NY	5-0942-00106/00001-9	7/31/92	TURBINES, COMBUSTION (2) (NATURAL GAS)	1123.00 MMBTU/HR (EACH)	3.0000 PPM	OXIDATION CATALYST	BACT-OTHE
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	4911-073-10941	7/28/92	TURBINE, GAS FIRED (2 EACH)	1817.00 M BTU/HR	25.0000 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	BACT-PSD
HARTWELL ENERGY LIMITED PARTNERSHIP	GA	4911-073-10941	7/28/92	TURBINE, OIL FIRED (2 EACH)	1840.00 M BTU/HR	25.0000 PPMVD @ FULL LOAD	FUEL SPEC: CLEAN BURNING FUELS	BACT-PSD
MAUI ELECTRIC COMPANY, LTD./MAALAEA GENERATING STA	HI	HI 90-05	7/28/92	TURBINE, COMBINED-CYCLE COMBUSTION	28.00 MW	26.9000 LB/HR	COMBUSTION TECHNOLOGY/DESIGN	BACT-OTHE
INDECK-YERKES ENERGY SERVICES	NY	146400 0133	6/24/92	DUCT BURNER (EP #00001)	20.00 MMBTU/HR	0.0400 LB/MMBTU, 0.8 LB/HR	NO CONTROLS	BACT-OTHE
INDECK-YERKES ENERGY SERVICES	NY	146400 0133	6/24/92	GE FRAME 5 GAS TURBINE (EP #00001)	432.20 MMBTU/HR	10.0000 PPM, 10 LB/HR	NO CONTROLS	BACT-OTHE
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00078/00002-9	6/18/92	DUCT BURNERS (2)	206.00 MMBTU/HR (EACH)	0.0730 LB/MMBTU GAS, 100%	COMBUSTION CONTROLS	BACT-OTHE
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00078/00002-9	6/18/92	DUCT BURNER	123.00 MMBTU/HR	0.0720 LB/MMBTU GAS (100%)	COMBUSTION CONTROL	BACT-OTHE
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00078/00002-9	6/18/92	COMBUSTION TURBINES (2) (252 MW)	1173.00 MMBTU/HR (EACH)	10.0000 PPM	COMBUSTION CONTROLS	BACT-OTHE
SELKIRK COGENERATION PARTNERS, L.P.	NY	4-0122-00078/00002-9	6/18/92	COMBUSTION TURBINE (79 MW)	1173.00 MMBTU/HR	25.0000 PPM	COMBUSTION CONTROL	BACT-OTHE
TENASKA WASHINGTON PARTNERS, L.P.	WA	PL-04	5/29/92	COGENERATION PLANT, COMBINED CYCLE	1.83 MMBTU/HR	20.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
NORTHWEST PIPELINE CORPORATION	CO	91LP792 (1-2) MOD. #1	5/29/92	BURNERS, DUCT, COEN	29.00 MMBTU/HR PER BURNER	4.0000 LB/HR		OTHER
NARRAGANSETT ELECTRIC/NEW ENGLAND POWER CO.	RI	RI-PSD-4	4/13/92	TURBINE, GAS AND DUCT BURNER	1760.00 MMBTU/H EACH	11.0000 PPM @ 15% O2 GAS		BACT-PSD
KENTUCKY UTILITIES COMPANY	KY	C-92-005	3/10/92	TURBINE, #2 FUEL OIL/NATURAL GAS (8)	1500.00 MM BTU/HR (EACH)	75.0000 LB/HR (EACH)	COMBUSTION CONTROL	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION	1175.00 MMBTU/H NAT. GAS	62.0000 LB/H/UNIT	FURNACE DESIGN	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION	1117.00 MMBTU/H NO2 FUEL OIL	62.0000 LB/H/UNIT	FURNACE DESIGN	BACT-PSD
BERMUDA HUNDRED ENERGY LIMITED PARTNERSHIP	VA	51020	3/3/92	TURBINE, COMBUSTION, 2	0.00	229.3000 T/YR/UNIT		BACT-PSD
THERMO INDUSTRIES, LTD.	CO	9 WE667(1-5)	2/19/92	TURBINE, GAS FIRED, 5 EACH	246.00 MMBTU/H	25.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	4911-051-8529	2/12/92	TURBINES, 8	1032.00 MMBTU/H, NAT GAS	9.0000 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSD
SAVANNAH ELECTRIC AND POWER CO.	GA	4911-051-8529	2/12/92	TURBINES, 8	972.00 MMBTU/H, #2 OIL	9.0000 PPM @ 15% O2	FUEL SPEC: LOW SULFUR FUEL OIL	BACT-PSO
HAWAII ELECTRIC LIGHT CO., INC.	HI	HI-90-04	2/12/92	TURBINE, FUEL OIL #2	20.00 MW	26.8000 LB/HR @ 100% PEAKLD	COMBUSTION DESIGN	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	HI-90-04	2/12/92	TURBINE, FUEL OIL #2	20.00 MW	56.4000 LB/H @ 75-<100% PKLD	COMBUSTION DESIGN	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	HI-90-04	2/12/92	TURBINE, FUEL OIL #2	20.00 MW	181.0000 LB/H @ 50-<75% PKLD	COMBUSTION DESIGN	BACT-PSD
HAWAII ELECTRIC LIGHT CO., INC.	HI	HI-90-04	2/12/92	TURBINE, FUEL OIL #2	20.00 MW	475.6000 LB/H @ 25-<50% PKLD	COMBUSTION DESIGN	BACT-PSD
KAMINE/BESICORP NATURAL DAM LP	NY	414089 0325 00001	12/31/91	GE FRAME 6 GAS TURBINE	500.00 MMBTU/HR	0.0200 LB/MMBTU, 10 LB/HR	NO CONTROLS	BACT-OTHE
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	7171	12/20/91	TURBINE, COMBUSTION	1313.00 MM BTU/HR	59.0000 LB/HR	COMBUSTION CONTROL	BACT-PSD

BEST AVAILABLE COPY

Table B-7. Summary of Best Avalible Control Technology (BACT) Determinations for CO Emissions for Combustion Turbines

Facility Name	State	Permit Number	Permit Issue Date	Unit/Process Description	Capacity (size)	CO Emission Limit	Control Method	Basis
DUKE POWER CO. LINCOLN COMBUSTION TURBINE STATION	NC	7171	12/20/91	TURBINE, COMBUSTION	1247.00 MM BTU/HR	60.0000 LB/HR	COMBUSTION CONTROL	BACT-PSD
MAUI ELECTRIC COMPANY, LTD.	HI	HI-90-02	12/3/91	TURBINE, FUEL OIL #2	28.00 MW	0.0000 SEE NOTES	GOOD COMBUSTION PRACTICES	BACT-PSD
KALAMAZOO POWER LIMITED	MI	1234-91	12/3/91	TURBINE, GAS-FIRED, 2, W/ WASTE HEAT BOILERS	1528.90 MMBTU/H	20.0000 PPMV	DRY LOW NOX TURBINES	BACT-PSD
LAKE COGEN LIMITED	FL	PSD-FL-176	11/20/91	DUCT BURNER, GAS	150.00 MMBTU/H	0.2000 LB/MMBTU	NOT REQUIRED	BACT-PSD
LAKE COGEN LIMITED	FL	PSD-FL-176	11/20/91	TURBINE, GAS, 2 EACH	42.00 MW	42.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
LAKE COGEN LIMITED	FL	PSD-FL-176	11/20/91	TURBINE, OIL, 2 EACH	42.00 MW	78.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	PSD-FL-173	11/5/91	TURBINE, GAS, 4 EACH	35.00 MW	10.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
ORLANDO UTILITIES COMMISSION	FL	PSD-FL-173	11/5/91	TURBINE, OIL, 4 EACH	35.00 MW	10.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	2046009-011	10/29/91	TURBINE, GAS-FIRED	47.64 MMBTU/H	7.7400 PPM @ 15% O2	HIGH TEMPERATURE OXIDATION CATALYST	BACT-PSD
SOUTHERN CALIFORNIA GAS	CA	2046009-011	10/29/91	TURBINE, GAS FIRED, SOLAR MODEL H	5500.00 HP	7.7400 PPM @ 15% O2	HIGH TEMP OXIDATION CATALYST	BACT-PSD
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	5500.00 HP	10.5000 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	BACT-PSD
EL PASO NATURAL GAS	AZ		10/25/91	TURBINE, GAS, SOLAR CENTAUR H	5500.00 HP	10.5000 PPM @ 15% O2	FUEL SPEC: LEAN FUEL MIX	BACT-PSD
FLORIDA POWER GENERATION	FL	PSD-FL-167	10/18/91	TURBINE, OIL, 6 EACH	92.90 MW	54.0000 LB/H	COMBUSTION CONTROL	BACT-PSD
EL PASO NATURAL GAS	AZ		10/18/91	TURBINE, NAT. GAS TRANSM., GE FRAME 3	12000.00 HP	60.0000 PPM @ 15% O2	LEAN BURN	BACT-PSD
EEX POWER SYSTEMS, ENCOGEN NW COGENERATION PROJECT	WA	91-02	9/26/91	TURBINES, COMBINED CYCLE COGEN, GE FRAME 6	123.00 MW	10.0000 PPMDV @ 15% O2		BACT-PSD
CAROLINA POWER AND LIGHT CO.	SC	0820-0033-CA TO CC	9/23/91	TURBINE, I.C.	90.00 MW	60.0000 LB/H		BACT-PSD
ENRON LOUISIANA ENERGY COMPANY	LA	PSD-LA-569	8/5/91	TURBINE, GAS, 2	39.10 MMBTU/H	60.0000 PPM @ 15% O2	BASE CASE, NO ADDITIONAL CONTROLS	BACT-PSD
ALGONQUIN GAS TRANSMISSION CO.	RI	1126-1127	7/31/91	TURBINE, GAS, 2	49.00 MMBTU/H	0.1140 LB/MMBTU	GOOD COMBUSTION PRACTICES	BACT-OTHE
CHARLES LARSEN POWER PLANT	FL	PSD-FL-166	7/25/91	TURBINE, GAS, 1 EACH	50.00 MW	25.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
CHARLES LARSEN POWER PLANT	FL	PSD-FL-166	7/25/91	TURBINE, OIL, 1 EACH	50.00 MW	25.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
SUMAS ENERGY INC.	WA		6/25/91	TURBINE, NATURAL GAS	88.00 MW	6.0000 PPM @ 15% O2	CO CATALYST	BACT-PSD
SAGUARO POWER COMPANY	NV	A393	6/17/91	COMBUSTION TURBINE GENERATOR	34.50 MW	9.0000 PPH	CONVERTER (CATALYTIC)	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, GAS, 4 EACH	400.00 MW	30.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, CG, 4 EACH	400.00 MW	33.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-146	6/5/91	TURBINE, OIL, 2 EACH	400.00 MW	33.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
NORTHERN CONSOLIDATED POWER	PA	25-326-001	5/3/91	TURBINES, GAS, 2	34.60 KW EACH	110.0000 T/YR	OXIDATION CATALYST	OTHER
LAKEWOOD COGENERATION, L.P.	NJ	SEVERAL; SEE NOTES	4/1/91	TURBINES (NATURAL GAS) (2)	1190.00 MMBTU/HR (EACH)	0.0260 LB/MMBTU	TURBINE DESIGN	BACT-OTHE
LAKEWOOD COGENERATION, L.P.	NJ	SEVERAL; SEE NOTES	4/1/91	TURBINES (#2 FUEL OIL) (2)	1190.00 MMBTU/HR (EACH)	0.0600 LB/MMBTU	TURBINE DESIGN	BACT-OTHE
CIMARRON CHEMICAL	CO	90WE438	3/25/91	TURBINE #2, GE FRAME 6	33.00 MW	250.0000 T/YR, LESS THAN	CO CATALYST	OTHER
FLORIDA POWER AND LIGHT	FL	PSD-FL-145	3/14/91	TURBINE, GAS, 4 EACH	243.00 MW	30.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
FLORIDA POWER AND LIGHT	FL	PSD-FL-145	3/14/91	TURBINE, OIL, 4 EACH	0.00	33.0000 PPM @ 15% O2	COMBUSTION CONTROL	BACT-PSD
NEVADA COGENERATION ASSOCIATES #2	NV	A391	1/17/91	COMBINED-CYCLE POWER GENERATION	85.00 MW POWER OUTPUT	39.9800 LBS/HR	CATALYTIC CONVERTER	BACT-PSD
NEVADA COGENERATION ASSOCIATES #1	NV	A360	1/17/91	COMBINED-CYCLE POWER GENERATION	85.00 MW TOTAL OUTPUT	39.9800 LBS/HR	CATALYTIC CONVERTER	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ		11/1/90	TURBINE, KEROSENE FIRED	585.00 MMBTU/HR	0.0630 LB/MMBTU	CATALYTIC OXIDATION	BACT-PSD
NEWARK BAY COGENERATION PARTNERSHIP	NJ		11/1/90	TURBINE, NATURAL GAS FIRED	585.00 MMBTU/HR	0.0055 LB/MMBTU	CATALYTIC OXIDATION	BACT-PSD
TBG COGEN COGENERATION PLANT	NY	282400 5725 00001	8/5/90	GE LM2500 GAS TURBINE	214.90 MMBTU/HR	0.1810 LB/MMBTU	CATALYTIC OXIDIZER	BACT
SC ELECTRIC AND GAS COMPANY - HAGOOD STATION	SC	0560-0029	12/11/89	INTERNAL COMBUSTION TURBINE	110.00 MEGAWATTS	23.0000 LBS/HR	GOOD COMBUSTION PRACTICES	BACT-PSD
PEABODY MUNICIPAL LIGHT PLANT	MA	MBR-89-COM-032	11/30/89	TURBINE, 38 MW NATURAL FAS FIRED	412.00 MMBTU/HR	40.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-OTHE
MEGAN-RACINE ASSOCIATES, INC	NY	402201 0295 00001	8/5/89	GE LM5000-N COMBINED CYCLE GAS TURBINE	491.00 LB/MMBTU	0.0260 LB/MMBTU, 11 LB/HR	NO CONTROLS	BACT-OTHE
UNOCAL	CA	A/N 165294 AND 165295	7/18/89	TURBINE, GAS (SEE NOTES)	0.00	10.0000 PPM @ 15% O2	OXIDATION CATALYST	BACT-OTHE
KERN FRONT LIMITED	CA	S-1120-1-7	11/4/86	TURBINE, GAS, GENERAL ELECTRIC LM-2500	25.00 MW	669.1900 LB/D	OXIDATION CATALYST	BACT-OTHE
TOYOTA MOTOR MANUFACTURING U.S.A. INC.	KY	C-86-117	7/17/86	COMBUSTION, NATURAL GAS	0.00	0.0333 LB/MMBTU		BACT-PSD
UNION ELECTRIC CO	MO	0579-014 TO 0579-015	5/6/79	CONSTRUCTION OF A NEW OIL FIRED COMBUSTION	622.00 MM BTU/HR	463.0000 TPY		BACT-PSD
MILAGRO, WILLIAMS FIELD SERVICE	NM	PSD-NM-859-M-4		TURBINE/COGEN, NATURAL GAS (2)	900.00 MMCF/DAY	27.6000 PPM @ 15% O2		BACT-PSD
PILGRIM ENERGY CENTER	NY	472800 2054		(2) DUCT BURNER (EP #S 00001&2)	214.10 MMBTU/HR	0.1080 LB/MMBTU, 17.5 LB/HR		BACT-OTHE
PILGRIM ENERGY CENTER	NY	472800 2054		(2) WESTINGHOUSE W501D5 TURBINES (EP #S 00001&2)	1400.00 MMBTU/HR	10.0000 PPM, 29.0 LB/HR		BACT-OTHE
LEDERLE LABORATORIES	NY	392400 0095		(2) GAS TURBINES (EP #S 00101&102)	110.00 MMBTU/HR	48.0000 PPM, 12.6 LB/HR		BACT-OTHE
BALTIMORE GAS & ELECTRIC - PERRYMAN PLANT	MD			TURBINE, 140 MW NATURAL GAS FIRED ELECTRIC	140.00 MW	20.0000 PPM @ 15% O2	GOOD COMBUSTION PRACTICES	BACT-PSD
COLORADO POWER PARTNERSHIP	CO	91MR933-1-2		TURBINES, 2 NAT GAS & 2 DUCT BURNERS	385.00 MMBTU/H EACH TURBIN	22.4000 PPM @ 15% O2		BACT-PSD

Table B-8. Direct and Indirect Capital Costs for CO Catalyst, General Electric Frame 7 Simple Cycle Combustion Turbine

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
CO Associated Equipment	$780,000	Vendor Quote
Flue Gas Ductwork	$61,370	Vatavauk,1990
Instrumentation	$78,000	10% of CO Associated Equipment
Sales Tax	$46,800	6% of CO Associated Equipment
Freight	$39,000	5% of CO Associated Equipment
Total Direct Capital Costs (TDCC)	$1,005,170	
Direct Installation Costs		
Foundation and supports	$80,414	8% of TDCC; OAQPS Cost Control Manual
Handling & Erection	$140,724	14% of TDCC; OAQPS Cost Control Manual
Electrical	$40,207	4% of TDCC; OAQPS Cost Control Manual
Piping	$20,103	2% of TDCC; OAQPS Cost Control Manual
Insulation for ductwork	$10,052	1% of TDCC; OAQPS Cost Control Manual
Painting	$10,052	1% of TDCC; OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$0	
Total Direct Installation Costs (TDIC)	$306,551	
Total Capital Costs	$1,311,721	Sum of TDCC, TDIC and RCC
Indirect Costs		
Engineering	$100,517	10% of TDCC; OAQPS Cost Control Manual
Construction and Field Expense	$50,258	5% of TDCC; OAQPS Cost Control Manual
Contractor Fees	$100,517	10% of TDCC; OAQPS Cost Control Manual
Start-up	$20,103	2% of TDCC; OAQPS Cost Control Manual
Performance Tests	$10,052	1% of TDCC; OAQPS Cost Control Manual
Contingencies	$30,155	3% of TDCC; OAQPS Cost Control Manual
Total Indirect Capital Cost (TInDC)	$311,603	
Total Direct, Indirect and Capital Costs (TDICC)	$1,623,323	Sum of TCC and TInCC

Mass Flow of Combustion Turbine

3,600,000 lb/hr "F"

Table B-9. Annualized Cost for CO Catalyst, General Electric Frame F Simple Cycle Combustion Turbine

Cost Component	Cost		Basis of Cost Estimate
Direct Annual Costs			
Operating Personnel	$6,240		8 hours/week at $15/hr
Supervision	$936		15% of Operating Personnel;OAQPS Cost Control Manual
Catalyst Replacement	$200,000	3	year catalyst life; base on Vendor Budget Quote
Inventory Cost	$21,960		Capital Recovery (10.98%) for 1/3 catalyst
Contingency	$6,874	3%	of Direct Annual Costs
Total Direct Annual Costs (TDAC)	$236,010		
Energy Costs			
Heat Rate Penalty	$83,747		0.2% of MW output; EPA, 1993 (Page 6-20) and $3/mmBtu addl fuel costs
Total Energy Costs (TDEC)	$83,747		
Indirect Annual Costs			
Overhead	$4,306	60%	of Operating/Supervision Labor
Property Taxes	$16,233	1%	of Total Capital Costs
Insurance	$16,233	1%	of Total Capital Costs
Annualized Total Direct Capital	$178,241	10.98%	Capital Recovery Factor of 7% over 15 yrs times sum of TDICC
Total Indirect Annual Costs	$215,013		
Total Annualized Costs	$534,770		Sum of TDAC, TEC and TIAC
Cost Effectiveness	$8,396		Simple CycleCombustion Turbine
	$12,869		Net Emission Reduction

Table B-10. Comparison of Alternative BACT Control Technologies for CO on Simple-cycle Unit

	Alternative BACT Control Technologies	
	DLN Only	DLN/WI with OC
Technical Assessment	Feasible	Available, Feasible and Demonstrated
Economic Impact[a]		
Capital Costs	included	$1,623,323
Annualized Costs	included	$534,770
Cost Effectiveness		
CO Removed (per ton of CO)	NA	$8,396
CO Removed (per ton of total pollutants)	NA	$12,869
Environmental Impact[b]		
Total CO (TPY)	70.8	7.1
CO Reduction (TPY)	NA	(63.7)
PM Emissions (TPY)	0	20.8
Secondary Emissions (TPY)	0	1.3
Net Emission Reduction (TPY)	NA	(41.6)
Energy Impacts[c]		
Energy Use (kWh/yr)	0	1,182,432
Energy Use (mmBtu/yr) at 10,000 Btu/kWh	0	11,452
Energy Use (mmcf/yr) at 1,000 Btu/cf for natural gas	0	11

[a] See Tables B-8 and B-9 for detailed development of capital costs (including recurring costs) and annualized costs.

[b] See emission data presented in Table B-11.

[c] Energy impacts are estimated due to the lost energy from heat rate penalty for 3,390 hours per year. Lost energy is based on 0.2 percent of 174.4 MW.

Table B-11. Maximum Potential Incremental Emissions (TPY) with an Oxidation Catalyst for Simple Cycle Unit

Pollutants		Incremental Emissions (tons/year) of SCR		
		Primary	Secondary	Total
Particulate		20.83	0.04	20.87
Sulfur Dioxide			0.02	0.02
Nitrogen Oxides			0.76	0.76
Carbon Monoxide		-63.70	0.46	-63.24
Volatile Organic Compounds			0.03	0.03
	Total:	-42.86	1.31	-41.56
Carbon Dioxide (additional from gas firing)			725.28	725.28

Basis:

Lost Energy (mmBtu/year)	11,452

Secondary Emissions (lb/mmBtu): Assumes natural gas firing in NOx controlled steam unit.

Particulate	0.0072
Sulfur Dioxide	0.0027
Nitrogen Oxides w/LNB	0.1333
Carbon Monoxide	0.0800
Volatile Organic Compounds	0.0052

Reference: Table 1.4-1 and 1.4-2, AP-42, Version 2/98

ENGELHARD

Golder Assoc.
Westinghouse 501D and GE 7FA - Simple and Combined Cycle
CAMET® CO Oxidation Catalyst System
VNX™ / ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB99639
December 13, 1999

ENGELHARD CORPORATION
CAMET® CO OXIDATION SYSTEMS
NOxCAT SCR NOx ABATEMENT CATALYST SYSTEMS

Scope of Supply: The equipment supplied is installed by others in accordance with the Engelhard design and installation instructions.

- Engelhard CAMET® CO Oxidation Catalyst Modules;
- Engelhard NOxCAT VNX™ (combined cycle) and ZNX™ (simple cycle) SCR catalyst in modules;
- Internal support structures for catalyst modules (frame); includes all hardware and gaskets for catalyst module installation;
- Ambient Air injection cooling system components (simple cycle);
- Ammonia Injection Grid (AIG);
- AIG manifold with flow control valves ;
- NH_3/Air dilution skid: 28% Aqueous Ammonia
  - Pre-piped & wired (including all valves and fittings)   Two (2) dilution air fans, one for back-up purposes
  - Panel mounted system controls for:
    - Blowers (on/off/flow indicators)   Air/ammonia flow indicator and controller
    - System pressure indicators   Main power disconnect switch

Excluded from Scope of Supply:
Ammonia storage and pumping
Any internally insulated reactor ductwork to house catalysts
Any transitions to and from reactor
Structural support
Any monorails and hoists for handling modules
Any interconnecting field piping or wiring
Electrical grounding equipment
Utilities
Foundations
All Monitors
All other items not specifically listed in Scope of Supply

BUDGET PRICES: See Performance Data

WARRANTY AND GUARANTEE:

Mechanical Warranty:	One year of operation* or 1.5 years after catalyst delivery, whichever occurs first.
Performance Guarantee:	Simple cycle - 9,000 hours of operation* or 3.5 years after catalyst delivery, whichever occurs first. Catalyst warranty is prorated over the guaranteed life
Performance Guarantee:	Combined cycle – 3 yearrs of operation* or 3.5 years after catalyst delivery, whichever occurs first. Catalyst warranty is prorated over the guaranteed life

DOCUMENT / MATERIAL DELIVERY SCHEDULE
Drawings / Documentation - 10 weeks after notice to proceed and Engelhard receipt of all engineering specifications and details
Operating manuals
Material Delivery   20 - 24 weeks after approval and release for fabrication

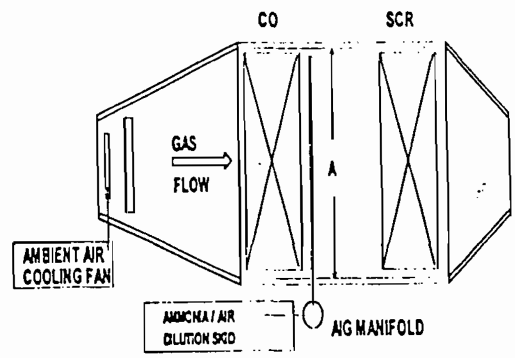
SYSTEM DESIGN BASIS:

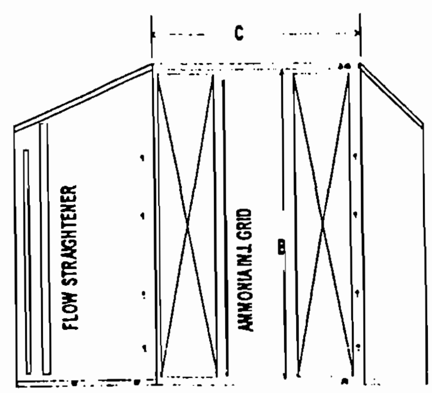
Gas Flow from:	Westinghouse 501D and GE 7FA Combustion Turbines
Gas Flow:	Assumed Horizontal
Fuel:	Natural Gas and Oil
Gas Flow Rate (At catalyst face):	See Performance data
Temperature (At catalyst face):	See Performance data
CO Concentration (At catalyst face):	See Performance data
CO Reduction:	See Performance data
CO Pressure Drop:	See Performance data
NOx Concentration (At catalyst face):	See Performance data
NOx Reduction:	See Performance data
NH3 Slip:	9 and 5 ppmvd@15%O_2
Pressure Drop through SCR	Nom. 4"WG

ENGELHARD

Golder Assoc.
Westinghouse 501D and GE 7FA - Simple and Combined Cycle
CAMET® CO Oxidation Catalyst System
VNX™ / ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB99639
December 13, 1999

<u>Dimensions / Sketch:</u> Simple Cycle
CO and SCR - w/ ambient cooling
Required Cross Sectional Area
Inside Liner Width x Inside Liner Height
(A x B) sq. ft.
Reactor Depth (C) 15'-0"





ENGELHARD

Golder Assoc.
Westinghouse 501D and GE 7FA - Simple and Combined Cycle
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VNX™ / ZNX™ SCR Catalyst System
Engelhard Budgetary Proposal EPB99639
December 13, 1999

GE 7FA – Simple Cycle

ASSUMED AMBIENT		59	59
GIVEN TURBINE EXHAUST TEMPERATURE, F		1,100	1,100
GIVEN TURBINE EXHAUST FLOW, lb/hr		3,900,000	4,080,000
ASSUMED TURBINE EXHAUST GAS ANALYSIS, % VOL.	N2	75.23	71.63
	O2	12.61	11.04
	CO2	3.63	5.20
	H2O	7.60	11.20
	Ar	0.93	0.93
AMBIENT AIR FLOW, lb/hr		332,949	348,316
TOTAL FLOW - TURBINE EXHAUST + AMBIENT - lb/hr		4,232,949	4,428,316
AMBIENT + EXHAUST GAS ANALYSIS, % VOL.	N2	75.70	72.37
	O2	13.09	11.64
	CO2	3.35	4.80
	H2O	7.01	10.33
	Ar	0.86	0.86
CALCULATED AIR + GAS MOL. WT.		28.48	28.32
GIVEN: TURBINE CO, ppmvd		9.0	20.0
CALC.: TURBINE CO, lb/hr		31.9	71.7
GIVEN: TURBINE NOx, ppmvd @ 15% O_2		9.0	42.0
CALC.: TURBINE NOx, lb/hr		64.5	355.2
CALC.: CO, ppmvd @ 15% O2 - AT CATALYST FACE		7.1	13.6
CALC.: NOx, ppmvd @ 15% O2 - AT CATALYST FACE		8.8	41.0
FLUE GAS TEMP. @ SCR CATALYST, F		1,025	1,025
DESIGN REQUIREMENTS			
CO CATALYST	CO CONVERSION, %	90%	90%
SCR CATALYST	NOx OUT, ppmvd @ 15% O2	3.5	ADVISE
	NH3 SLIP, ppmvd @ 15% O2	9	12
SCR PRESSURE DROP, 4.0"WG – Nom.			
GUARANTEED PERFORMANCE DATA			
CO CONVERSION - % Min.		90.0%	90.0%
CO OUT, ppmvd @ 15% O2		0.7	1.4
CO OUT, lb/hr		3.2	7.2
CO PRESSURE DROP		2.2	2.4
SCR CATALYST	NOx CONVERSION, % - Min.	61.1%	61.1%
	NOx OUT, lb/hr – Max.	25.1	138.1
	NOx OUT, ppmvd@15%O2 – Max.	3.4	16.0
EXPECTED AQUEOUS NH3 (28% SOL.) FLOW, lb/hr		139	424
NH3 SLIP, ppmvd@15%O2 – Max.		9	12
SCR PRESSURE DROP, "WG - Max.		4.2	4.4
REQUIRED CROSS SECTION - INSIDE LINER - A x B, sq ft		**1650.0**	
CO SYSTEM		**$843,000**	
REPLACEMENT CO CATALYST MODULES		**$643,000**	
SCR SYSTEM		**$2,835,000**	
REPLACEMENT SCR CATALYST MODULES		**$1,479,000**	

APPENDIX C

SUMMARY OF THE CALPUFF MODEL DESCRIPTION AND ASSUMPTIONS USED IN THE PSD CLASS I MODELING ANALYSES

C.0 SUMMARY OF CALPUFF MODEL DESRIPTION AND ASSUMPTIONS USED IN THE PSD CLASS I MODELING ANALYSES

C.1 INTRODUCTION

As part of the new source review requirements under Prevention of Significant Deterioration (PSD) regulations, new sources are required to address air quality impacts at PSD Class I areas. As part of the PSD analysis report submitted to the Florida Department of Environmental Protection (DEP), the air quality impacts due to the potential emissions of the Peace River Station Project are required to be addressed at the PSD Class I area of the Chassahowitzka National Wildlife Area (NWA). The Chassahowitzka NWA is located approximately 124 km north-northwest of the Project site and is the nearest Class I area to the Project. Other PSD Class I areas are located more than 200 km from the Project.

The evaluation of air quality impacts are not only concerned with determining compliance with PSD Class I increments but also assessing a source's impact on Air Quality Related Values (AQRVs), such as regional haze. Further, compliance with PSD Class I increments can be evaluated by determining if the source's impacts are less than the proposed U.S. Environmental Protection Agency (EPA) Class I significant impact levels. The significant impact levels are threshold levels that are used to determine the type of air impact analyses needed for the project. If the new source's impacts are predicted to be less than significant, then the source's impacts are assumed not to have a significant adverse affect on air quality and additional modeling with other sources is not required. However, if the source's impacts are predicted to be greater than the significant impact levels, additional modeling with other sources is required to demonstrate compliance with Class I increments.

Currently there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and Federal Land Managers (FLM) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM) Phase 1 Report: Interim Recommendations for Modeling Long Range Transport and Impacts on Regional Visibility* (EPA, 1993), referred to as the Phase 1 report; and
- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the Phase 2 report.

The recommended modeling approaches from these documents are as follows:

- Phase 1 report: screening analysis (Level 1)
- Phase 2 report: screening analysis
- Phase 2 report: refined analysis

For the Project, air quality analyses were performed that assess the Project's impacts in the PSD Class I area of the Chassahowitzka NWA using the refined approach from the Phase 2 report for:

- Significant impact analysis; and
- Regional haze analysis.

The refined analysis approach was used instead of the screening analysis approach since the air quality impacts are based on generally more realistic assumptions, include more detailed meteorological data, and are estimated at locations at the Class I area.

C.2 GENERAL AIR MODELING APPROACH

The general modeling approach was based on using the Industrial Source Complex Short-term model (ISCST3, Version 99155) and the long-range transport model, California Puff model (CALPUFF, Version 5.0). The ISCST3 model is applicable for estimating the air quality impacts in areas that are within 50 km from a source. At distances beyond 50 km, the ISCST3 model is considered to overpredict air quality impacts because it is a steady-state model. At those distances, the CALPUFF model is recommended for use. Recently, the FLM have requested that air quality impacts, such as for regional haze, for a source located more than 50 km from a Class I area be predicted using the CALPUFF model. The Florida DEP has also recommended that the CALPUFF model be used to assess if the source has a significant impact at a Class I area located beyond 50 km from the source. As a result, a significant impact and regional haze analyses were performed using the CALPUFF model to assess the Project's impacts at the Chassahowitzka NWA.

The methods and assumptions used in the CALPUFF model were based on the latest recommendations for a screening analysis as presented in the *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998).

Based on discussions with DEP, the ISCST3 model can be used to determine the "worst-case" operating load and ambient temperature that produces a source's maximum impact at a Class I area. Based on that analysis, air quality impacts can then be predicted with the CALPUFF model using the "worst-case" operating scenario to compare the source's impacts to Class I significant impact levels and potential contribution to regional haze. For this Project, the ISCST3 model was used to determine the "worst-case" operating scenario that was then considered in the CALPUFF model. The methods and assumptions used in the ISCST3 were based on those presented in Section 6.0 of the PSD report.

A regional haze analysis was performed to determine the affect that the Project's emissions will have on background regional haze levels at the Chassahowitzka NWA. In the regional haze analysis, the change in visual range, as calculated by a deciview change, was estimated for the Project in accordance with the IWAQM recommendations. Based on those recommendations, the CALPUFF model is used to predict the maximum 24-hour average sulfate (SO_4), nitrate (NO_3), and fine particulate (PM_{10}) concentrations as well as ammonium sulfate ($(NH_4)_2SO_4$) and ammonium nitrate (NH_4NO_3) concentrations. The change in visibility due to a source, estimated as a percentage, is then calculated based on the change from background data.

The following sections present the methods and assumptions used to assess the refined significant impact and regional haze analyses performed for the Project. The results of these analyses are presented in Sections 6.0 and 7.0 of the PSD report.

C.3 MODEL SELECTION AND SETTINGS

The California Puff (CALPUFF, version 5.0) air modeling system was used to model to assess the Project's impacts at the PSD Class I area for comparison to the PSD Class I significant impact levels and to the regional haze visibility criteria. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALPUFF meteorological and geophysical data preprocessor (CALMET, Version 5), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces a three-dimensional field of wind and temperature and a two-dimensional field of other meteorological parameters. CALMET was designed to process raw meteorological, terrain and land-use databases to be used in the air modeling analysis. The CALPUFF modeling system uses a number of FORTRAN preprocessor programs that extract data from large databases and converts the data into formats suitable for input to CALMET. The processed data produced from CALMET was input to CALPUFF to assess the pollutant specific impact. Both CALMET and CALPUFF were used in a manner that is recommended by the IWAQM Phase 2 Report (EPA, 1998).

C.3.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing a Phase 2 refined modeling analyses that are presented in Table C-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table C-2.

C.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the Project's emission, stack, and operating data as well as building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIP), Version 95086, and were included in the CALPUFF model input. The PSD Analysis Report presents a listing of the Project's emissions and structures included in the analysis.

C.4 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted in an array of 13 discrete receptors located at the CNWR area. These receptors are the same as those used in the PSD Class I analysis performed for the PSD Analysis Report.

C.5 METEOROLOGICAL DATA

C.5.1 REFINED ANALYSIS

CALMET was used to develop the gridded parameter fields required for the refined modeling analyses. The follow sections discuss the specific data used and processed in the CALMET model.

C.5.2 CALMET SETTINGS

The CALMET settings contained in Table C-3 were used for the refined modeling analysis. With the exception of hourly precipitation data files, all input data files needed for CALMET were developed by the FDEP staff.

C.5.3 MODELING DOMAIN

A rectangular modeling domain extending 250 km in the east-west (x) direction and 280 km in the north-south (y) direction was used for the refined modeling analysis. The extent of the modeling domain was selected by the Florida DEP staff for predicting impacts at the Chassahowitzka NWA. The southwest corner of the domain is the origin and is located at 27 degrees north latitude and 83.5 degrees west longitude. This location is in the Gulf of Mexico approximately 110 km west of Venice, Florida. For the processing of meteorological and geophysical data, the domain contains 25 grid cells in the x-direction and 28 grid cells in the y-direction. The domain grid resolution is 10 km. The air modeling analysis was performed in the UTM coordinate system.

C.5.4 MESOSCALE MODEL – GENERATION 4 (MM4) DATA

Pennsylvania State University in conjunction with the NCAR Assessment Laboratory developed the MM4 data set, a prognostic wind field or "guess" field, for the United States. The hourly meteorological variables used to create this data set (wind, temperature, dew point depression, and geopotential height for eight standard levels and up to 15 significant levels) are extensive and only allow for one data base set for the year 1990. The analysis used the MM4 data to initialize the CALMET wind field. The MM4 data have a horizontal spacing of 80 km and are used to simulate atmospheric variables within the modeling domain.

The MM4 subset domain was provided by FDEP and consisted of a 6 x 6- cell rectangle, with 80 km grid resolution, extending from the MM4 grid points (49,10) to (54, 15). These data were processed to create a MM4.DAT file, for input to the CALMET model.

The MM4 data set used in the CALMET, although advanced, lacks the fine detail of specific temporal and spatial meteorological variables and geophysical data. These variables were processed into the appropriate format and introduced into the CALMET model through the additional data files obtained from the following sources.

C.5.5 SURFACE DATA STATIONS AND PROCESSING

The surface station data processed for the CALPUFF analyses consisted of data from five NWS stations or Federal Aviation Administration (FAA) Flight Service stations for Gainesville, Tampa, Daytona Beach, Vero Beach, Fort Myers and Orlando. A summary of the surface station information and locations are presented in Table C-4. The surface station parameters include wind speed, wind direction, cloud ceiling height, opaque cloud cover, dry bulb temperature, relative humidity, station pressure, and a precipitation code that is based on current weather conditions. The surface station data were processed by FDEP into a SURF.DAT file format for CALMET input.

Because the modeling domain extends largely over water, C-Man station data from Venice was obtained. These data were processed by Florida DEP into an over-water surface station format (i.e., SEA*.DAT) for input to CALMET. The over-water station data include wind direction, wind speed and air temperature.

C.5.6 UPPER AIR DATA STATIONS AND PROCESSING

The analysis included three upper air NWS stations located in Ruskin, Apalachicola, and West Palm Beach. Data for each station were obtained from the Florida DEP in a format for CALMET input.

The data and locations for the upper air stations are presented in Table C-4.

C.5.7 PRECIPITATION DATA STATIONS AND PROCESSING

Precipitation data were processed from a network of hourly precipitation data files collected from primary and secondary NWS precipitation-recording stations located within the latitude and longitudinal limits of the modeling domain. Data for 14 stations were obtained in NCDC TD-3240 variable format and converted into a fixed-length format. The utility programs PXTRACT and PMERGE were then used to process the data into the format for the PRECIP.DAT file that is used by CALMET. A listing of the precipitation stations used for the modeling analysis is presented in Table C-5.

C.5.8 GEOPHYSICAL DATA PROCESSING

The land-use and terrain information data were developed by the FDEP for the modeling domain and were provided in a GEO.DAT file format for input to CALMET. Terrain elevations for each grid cell of the modeling domain were obtained from Digital Elevation Model (DEM) files obtained from US Geographical Survey (USGS). The DEM data was extracted for the modeling domain grid using the utility extraction program LCELEV. Land-use data were obtained from the USGS GIS.DAT which is based on the ARM3 data. The resolution of the GIS.DAT file is one-eighth of a degree in the east-west direction and one-twelfth of a degree in the north-south direction. Land-use values for the domain grid were obtained with the utility program CAL-LAND. Other parameters processed for the modeling domain by CAL-LAND include surface roughness, surface Albedo, Bowen ratio, soil heat flux, and leaf index field. The land-use parameter values were based on annual averaged values.

Table C-1. IWAQM Phase 2 Refined Modeling Analyses Recommendations [a]

Model Input/Output	Description
Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition. 3. Define background values for ozone and ammonia for area.
Processing	1. For PSD increments: Use highest, second highest 3-hour and 24-hour average SO_2 concentrations; highest, second highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10} and NO_2 concentrations. 2. For haze: process the 24-hour average SO_4, NO_3 and HNO_3 values; compute a 24-hour average relative humidity factor (f(RH)) for the day during which the highest concentration was predicted for each species; calculate extinction coefficients for each species; and compute percent change in extinction using the FLM supplied background extinction.

[a] *IWAQM Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998)

Table C-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, and NO_3, and PM_{10}
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	PCRAMMET (enhanced) for the screening analysis; CALMET for the refined analysis
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3 and PM_{10}
Model Processing	Highest predicted 24-hour SO_4, NO_3 and PM_{10} concentrations for year
Background Values [a]	Ozone: 80 ppb; Ammonia: 10 ppb

[a] Recommended values by the Florida DEP.

Table C-3. CALMET Settings

Parameter	Setting
Horizontal Grid Dimensions	250 by 280 km, 10 km grid resolution
Vertical Grid	9 layers
Weather Station Data Inputs	6 surface, 3 upper air, 14 precipitation stations
Wind model options	Diagnostic wind model, no kinematic effects
Prognostic wind field model	MM4 data, 80 km resolution, 6 x 6 grid, used for wind field initialization
Output	Binary hourly gridded meteorological data file for CALPUFF input

Table C-4. Surface and Upper Air Stations Used in the CALPUFF Analysis

Station Name	Station Symbol	WBAN Number	UTM Coordinates Easting (km)	UTM Coordinates Northing (km)	Zone	Anemometer Height (m)
Surface Stations						
Tampa	TPA	12842	349.20	3094.25	17	6.7
Daytona Beach	DAB	12834	495.14	3228.05	17	9.1
Orlando	ORL	12815	468.96	3146.88	17	10.1
Gainesville	GNV	12816	377.40	3284.12	17	6.7
Vero Beach	VER	12843	557.52	3058.36	17	6.7
Fort Myers	FMY	12835	413.65	2940.38	17	6.1
Upper Air Stations						
Ruskin	TBW	12842	349.20	3094.28	17	NA
West Palm Beach	PBI	12844	587.87	2951.42	17	NA
Apalachicola	AQQ	12832	110.00[a]	3296.00	16	NA

[a] Equivalent coordinate for Zone 17; Zone 16 coordinate is 690.22 km.

Table C-5. Hourly Precipitation Stations Used in the CALPUFF Analysis

Station Name (Florida)	Station Number	UTM Coordinates Easting (km)	UTM Coordinates Northing (km)	UTM Coordinates Zone
Brooksville 7 SSW	81048	358.03	3149.55	17
Daytona Beach WSO AP	82158	495.14	3228.09	17
Deland 1 SSE	82229	470.78	3209.66	17
Inglis 3 E	84273	342.63	3211.65	17
Lakeland	84797	409.87	3099.18	17
Lisbon	85076	423.59	3193.26	17
Lynne	85237	409.26	3230.30	17
Orlando WSO McCoy	86628	468.99	3146.88	17
Parrish	86880	366.99	3054.39	17
Saint Leo	87851	376.48	3135.09	17
St. Petersburg	87886	339.04	3072.21	17
Tampa WSCMO AP	88788	349.17	3094.25	17
Venice	89176	357.59	2998.18	17
Venus	89184	466.756	2996.09	17

APPENDIX D

BUILDING DOWNWASH INFORMATION FROM BPIP

```
'DECKER.  ORIENTED NORTH AS PLANT NORTH 04/18/00'
'ST'
'METERS' 1.00
'UTMN'  0.0
8
'CT1'   1       0
        4       6.706
        -34.0   -24.5
        -43.1   -24.5
        -43.1   -11.7
        -34.0   -11.7

'CT2'   1       0
        4       6.706
        5.1     -24.5
        -4.0    -24.5
        -4.0    -11.7
        5.1     -11.7

'CT3'   1       0
        4       6.706
        44.9    -24.5
        35.7    -24.5
        35.7    -11.7
        44.9    -11.7

'AIR1'  1       0
        4       14.326
        -49.3   -30.6
        -60.3   -30.6
        -60.3   -19.6
        -49.3   -19.6

'AIR2'  1       0
        4       14.326
        -10.2   -30.6
        -21.2   -30.6
        -21.2   -19.6
        -10.2   -19.6

'AIR3'  1       0
        4       14.326
        28.9    -30.6
        17.9    -30.6
        17.9    -19.6
        28.9    -19.6

'TANK1' 1       0
        8       14.630
        -108.8  -6.1
        -112.2  2.0
        -108.8  10.2
        -99.2   13.6
        -91.1   10.2
        -87.7   2.0
        -91.1   -6.1
        -98.6   -10.2

'TANK2' 1       0
        8       14.630
        -108.8  -37.4
        -112.2  -28.9
        -108.8  -20.4
        -99.2   -17.0
        -91.1   -20.4
        -87.7   -28.9
        -91.1   -37.4
        -98.6   -41.5
3
'CT1'   0.0     18.288  -39.08  0.0
'CT2'   0.0     18.288  0.0     0.0
'CT3'   0.0     18.288  39.08   0.0
0
```

BPIP (Dated: 95086)

DATE : 04/18/00
TIME : 11:50:04
DECKER. 04/18/00

============================
BPIP PROCESSING INFORMATION:
============================

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in METERS will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

UTMP is set to UTMN. The input is assumed to be in a local X-Y coordinate system as opposed to a UTM coordinate system. True North is in the positive Y direction.

Plant north is set to 0.00 degrees with respect to True North.

DECKER. 04/18/00

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
CT1	18.29	0.00	36.58	65.00
CT2	18.29	0.00	35.82	65.00
CT3	18.29	0.00	35.82	65.00

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.

** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

BPIP (Dated: 95086)

DATE : 04/18/00
TIME : 11:50:04

DECKER. 04/18/00

BPIP output is in meters

SO BUILDHGT CT1	14.33	14.33	14.33	14.33	14.63	14.63
SO BUILDHGT CT1	14.63	14.63	14.63	14.63	0.00	14.33
SO BUILDHGT CT1	14.33	14.33	14.33	14.33	6.71	6.71
SO BUILDHGT CT1	14.33	14.33	14.33	14.33	14.33	14.33
SO BUILDHGT CT1	0.00	0.00	0.00	0.00	14.33	14.33
SO BUILDHGT CT1	14.33	14.33	14.33	14.33	6.71	6.71
SO BUILDWID CT1	12.74	14.10	15.03	15.50	24.40	23.57
SO BUILDWID CT1	23.32	23.54	23.80	23.33	0.00	15.03
SO BUILDWID CT1	15.50	15.50	15.03	14.10	11.18	9.10
SO BUILDWID CT1	12.74	14.10	15.03	15.50	15.50	15.03
SO BUILDWID CT1	0.00	0.00	0.00	0.00	14.10	15.03
SO BUILDWID CT1	15.50	15.50	15.03	14.10	11.18	9.10

```
SO BUILDHGT CT2        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT CT2        14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT CT2        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT CT2        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT CT2         0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT CT2        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID CT2        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID CT2        14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID CT2        15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID CT2        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID CT2         0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID CT2        15.50   15.50   15.03   14.10   11.18    9.10

SO BUILDHGT CT3        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT CT3        14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT CT3         0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT CT3        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT CT3         0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT CT3         0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID CT3        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID CT3        14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID CT3         0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID CT3        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID CT3         0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID CT3         0.00   15.28   14.37   13.02   11.28    9.20
```

APPENDIX E

SUMMARY OF ISCST AND CALPUFF COMPUTER MODEL INPUT AND OUTPUT FILES (EXAMPLE FILES FOR FIRST YEAR OF MODELING)

Table E-1. Maximum Pollutant Concentrations Predicted for One Combustion Turbine in Simple Cycle Operation Firing Natural Fuel and Distillate Fuel Oil
Based on Modeled Generic Emission Rate

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Natural Gas													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0174	0.0187	0.0203	0.0221	0.0258	0.0273
(10 g/s)							24-Hour	0.2193	0.2360	0.2534	0.2730	0.3090	0.3320
							8-Hour	0.4775	0.5041	0.5441	0.5845	0.6643	0.7884
							3-Hour	1.0096	1.0193	1.0343	1.2192	1.7164	1.7339
							1-Hour	2.0697	2.1964	2.3758	2.5533	2.8763	3.0785
SO_2	10.4	9.3	8.6	7.3	6.5	5.6	Annual	0.00228	0.00218	0.00220	0.00204	0.00211	0.00192
							24-Hour	0.0288	0.0275	0.0274	0.0252	0.0253	0.0233
							3-Hour	0.133	0.119	0.112	0.113	0.140	0.122
PM10	11.0	11.0	11.0	11.0	11.0	11.0	Annual	0.0024	0.0026	0.0028	0.0031	0.0036	0.0038
							24-Hour	0.0304	0.0327	0.0351	0.0378	0.0428	0.0460
NO_x	71.9	63.9	59.3	50.6	44.7	38.5	Annual	0.016	0.015	0.015	0.014	0.015	0.013
CO	35.9	31.4	28.5	25.3	25.2	23.6	8-Hour	0.22	0.20	0.20	0.19	0.21	0.23
							1-Hour	0.93	0.87	0.85	0.81	0.91	0.92
Distillate Fuel Oil													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0169	0.0179	0.0199	0.0216	0.0253	0.0275
(10 g/s)							24-Hour	0.2147	0.2241	0.2495	0.2681	0.3049	0.3322
							8-Hour	0.4671	0.4886	0.5352	0.5743	0.6554	0.7890
							3-Hour	1.0056	1.0134	1.0308	1.2157	1.7114	1.7358
							1-Hour	2.0190	2.0770	2.3380	2.5372	2.8361	3.0805
SO_2	106.9	96.2	87.2	75.3	64.9	56.2	Annual	0.023	0.022	0.022	0.020	0.021	0.019
							24-Hour	0.29	0.27	0.27	0.25	0.25	0.24
							3-Hour	1.35	1.23	1.13	1.15	1.40	1.23
PM10	22.0	22.0	22.0	22.0	22.0	22.0	Annual	0.0047	0.0050	0.0055	0.0060	0.0070	0.0076
							24-Hour	0.060	0.062	0.069	0.074	0.085	0.092
NO_x	352.1	316.9	287.3	248.2	213.9	185.2	Annual	0.075	0.071	0.072	0.067	0.068	0.064
CO	72.6	63.5	56.9	50.0	51.0	47.8	8-Hour	0.43	0.39	0.38	0.36	0.42	0.48
							1-Hour	1.85	1.66	1.68	1.60	1.82	1.86

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.37 lb/hr (10 g/s). Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 10 g/s) by the ratio of the specific pollutant emission rate to the modeled emission rate of 10 g/s.

Table E-2. Maximum Pollutant Concentrations Predicted for One Combustion Turbine Firing Natural Fuel and Distillate Fuel Oil in Simple-Cycle Operation at the PSD Class I Area of the Chassahowitzka NWA
Based on Modeled Generic Emission Rate

	Maximum Emission Rates (lb/hr) by Operating Load and Air Temperature							Maximum Predicted Concentrations (ug/m^3) by Operating Load and Air Temperature (1)					
	Base Load		75% Load		50% Load		Averaging	Base Load		75% Load		50% Load	
Pollutant	32°F	95°F	32°F	95°F	32°F	95°F	Time	32°F	95°F	32°F	95°F	32°F	95°F
Natural Gas													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0031	0.0032	0.0035	0.0037	0.0041	0.0042
(10 g/s)							24-Hour	0.0477	0.0495	0.0575	0.0616	0.0685	0.0711
							8-Hour	0.1449	0.1489	0.1549	0.1666	0.1873	0.1951
							3-Hour	0.3092	0.3185	0.3320	0.3448	0.3692	0.3815
							1-Hour	0.5884	0.6103	0.6424	0.6734	0.7260	0.7451
SO_2	10.4	9.3	8.6	7.3	6.5	5.6	Annual	0.00040	0.00038	0.00037	0.00034	0.00034	0.00030
							24-Hour	0.0063	0.0058	0.0062	0.0057	0.0056	0.0050
							3-Hour	0.041	0.037	0.036	0.032	0.030	0.027
PM10	11.0	11.0	11.0	11.0	11.0	11.0	Annual	0.0004	0.0004	0.0005	0.0005	0.0006	0.0006
							24-Hour	0.0066	0.0069	0.0080	0.0085	0.0095	0.0099
NO_x	71.9	63.9	59.3	50.6	44.7	38.5	Annual	0.003	0.003	0.003	0.002	0.002	0.002
Distillate Fuel Oil													
Generic	79.37	79.37	79.37	79.37	79.37	79.37	Annual	0.0030	0.0031	0.0034	0.0037	0.0041	0.0042
(10 g/s)							24-Hour	0.0470	0.0485	0.0566	0.0606	0.0677	0.0714
							8-Hour	0.1433	0.1466	0.1533	0.1636	0.1849	0.1960
							3-Hour	0.3054	0.3131	0.3290	0.3417	0.3655	0.3829
							1-Hour	0.5795	0.5973	0.6351	0.6657	0.7203	0.7472
SO_2	106.9	96.2	87.2	75.3	64.9	56.2	Annual	0.004	0.004	0.004	0.003	0.003	0.003
							24-Hour	0.06	0.06	0.06	0.06	0.06	0.05
							3-Hour	0.41	0.38	0.36	0.32	0.30	0.27
PM10	22.0	22.0	22.0	22.0	22.0	22.0	Annual	0.0008	0.0009	0.0009	0.0010	0.0011	0.0012
							24-Hour	0.013	0.013	0.016	0.017	0.019	0.020
NO_x	352.1	316.9	287.3	248.2	213.9	185.2	Annual	0.013	0.012	0.012	0.011	0.011	0.010

(1) Concentrations are based on highest predicted concentrations using five years of meteorological for 1987 to 1991 of surface and upper air data from the National Weather Service stations at Tampa International Airport and Ruskin, respectively.

AIR PERMIT APPLICATION FOR
DECKER ENERGY
DECKER POWER PLANT
FT. MEADE, FLORIDA

PREPARED BY
GOLDER ASSOCIATES INC.
6241 NW 23RD STREET, SUTE 500
GAINESVILLE, FLORIDA 32653-1500
(352) 336-5600

JUNE, 2000
PROJECT NO. 993-9562-0700

BPIP / ISCST3 / CALPUFF AIR MODELING FILES
FILE CONTENTS

1. BPIP MODEL

BPIP.ZIP - ZIPPED FILE CONTAINING THE FOLLOWING:

DECKBLDG.BPP	BPIP INPUT FILE FOR THE PROPOSED PROJECT
DECKBLDG.OUT	BPIP OUTPUT FILE - BUILDING DATA USED IN THE ISCST3 MODEL
DECKBLDG.SUM	BPIP OUTPUT FILE - DETAILED BUILDING ANALYSIS

2. ISCST3 MODEL (PROJECT IMPACTS ONLY)

2.1 LOAD ANALYSES FOR DETERMINING WORST-CASE OPERATING LOAD NATURAL GAS AND FUEL OIL FIRING, CLASS I IMPACTS

DEC1C1.ZIP - ZIPPED FILE FOR FUEL OIL FIRING CONTAINING THE FOLLOWING :

DEC1C1.I<YY>/ O<YY>	ISCST INPUT/OUTPUT FILES FOR 5 YEARS FROM 1987 TO 1991 GENERIC MODEL RESULTS USING 10 G/S EMISSION RATE FOR 3 STACKS (YY= LAST 2 DIGITS OF YEAR)
DEC1C1.SUM	SUMMARY OF MAXIMUM CONCENTRATIONS FROM THE ISCST3 MODEL FOR EACH YEAR

DEC2C1.ZIP- ZIPPED FILE FOR NATURAL GAS FIRING CONTAINING THE FOLLOWING :

DEC2C1.I<YY>/ O<YY>	ISCST INPUT/OUTPUT FILES FOR 5 YEARS FROM 1987 TO 1991 GENERIC MODEL RESULTS USING 10 G/S EMISSION RATE FOR 3 STACKS (YY= LAST 2 DIGITS OF YEAR)
DEC2C1.SUM	SUMMARY OF MAXIMUM CONCENTRATIONS FROM THE ISCST3 MODEL FOR EACH YEAR

2.2 LOAD ANALYSES FOR DETERMINING WORST-CASE OPERATING LOAD NATURAL GAS AND FUEL OIL FIRING, CLASS II IMPACTS

DEC1C2.ZIP- ZIPPED FILE FOR FUEL OIL FIRING CONTAINING THE FOLLOWING :

DEC1C2.I<YY>/ O<YY>	ISCST INPUT/OUTPUT FILES FOR 5 YEARS FROM 1987 TO 1991 GENERIC MODEL RESULTS USING 10 G/S EMISSION RATE FOR 3 STACKS (YY= LAST 2 DIGITS OF YEAR)
DEC1C2.SUM	SUMMARY OF MAXIMUM CONCENTRATIONS FROM THE ISCST3 MODEL FOR EACH YEAR

DEC2C2.ZIP- ZIPPED FILE FOR NATURAL GAS FIRING CONTAINING THE FOLLOWING :

DEC2C2.I<YY>/ O<YY>	ISCST INPUT/OUTPUT FILES FOR 5 YEARS FROM 1987 TO 1991 GENERIC MODEL RESULTS USING 10 G/S EMISSION RATE FOR 3 STACKS (YY= LAST 2 DIGITS OF YEAR)
DEC2C2.SUM	SUMMARY OF MAXIMUM CONCENTRATIONS FROM THE ISCST3 MODEL FOR EACH YEAR

2.3 REFINEMENTS FOR FUEL OIL CLASS II IMPACTS, USING SPECIFIC EMISSIONS AND PARMETERS FOR SPECIFIC OPERATING LOAD.

REFINE.ZIP - ZIPPED FILE FOR REFINEMENTS CONTAIN THE FOLLOWING:

RSANC2.I90/O90	1990, SO2 ANNUAL, INITIAL REFINEMENT
RRSANC2.I90/O90	1990, SO2 ANNUAL, FINAL REFINMENT
RS24C2.I89/O89	1989, SO2 24-HOUR, INITIAL REFINEMENT
RRS24C2.I89/O89	1989, SO2 24-HOUR, FINAL REFINEMENT
RS03C2.I89/O89	1989, SO2 3-HOUR
RPANC2.I90/O90	1990, PM ANNUAL
RP24C2.I88/O88	1988, PM 24-HOUR
RNANC2.I90/O90	1990, NO2 ANNUAL, INITIAL REFINEMENT
RRNANC2.I90/O90	1990, NO2 ANNUAL, FINAL REFINEMENT
RC08C2.I88/O88	1988, CO ANNUAL
RC01C2.I87/O87	1987, CO ANNUAL
REFIN.SUM	ISCST SUMMARY OF REFINEMENT FILES

3. CALPUFF MODEL (PROJECT IMPACTS ONLY)

3.1 CLASS I IMPACTS, FUEL OIL FIRING, FOR SO2, NO2, PM, SO4, NO3, CO

ZIPPED FILES CONTAINING THE FOLLOWING:

PUFINP10.ZIP	CALPUFF INPUT FILES FOR 100 PERCENT LOAD
PUFINP50.ZIP	CALPUFF INPUT FILES FOR 50 PERCENT LOAD
PUFLST10.ZIP	CALPUFF LIST FILES FOR 100 PERCENT LOAD
PUFLST50.ZIP	CALPUFF LIST FILES FOR 50 PERCENT LOAD
PSTINP10.ZIP	CALPOST INPUT FILES (FOR SIG. ANALYSIS AND REGIONAL HAZE) FOR 100 PERCENT LOAD
PSTINP50.ZIP	CALPOST INPUT FILES (FOR SIG. ANALYSIS AND REGIONAL HAZE) FOR 50 PERCENT LOAD
PSTLST10.ZIP	CALPOST LIST FILES FOR 100 PERCENT LOAD
PSTLST50.ZIP	CALPOST LIST FILES FOR 50 PERCENT LOAD

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :DEC1C2.087
ISCST3 OUTPUT FILE NUMBER 2 :DEC1C2.088
ISCST3 OUTPUT FILE NUMBER 3 :DEC1C2.089
ISCST3 OUTPUT FILE NUMBER 4 :DEC1C2.090
ISCST3 OUTPUT FILE NUMBER 5 :DEC1C2.091
First title for last output file is: 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
Second title for last output file is: FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.01367	240.	15000.	87123124
	1988	0.01314	220.	15000.	88123124
	1989	0.01206	210.	300.	89123124
	1990	0.01693	250.	15000.	90123124
	1991	0.01509	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.15597	80.	6500.	87040624
	1988	0.21451	220.	15000.	88091324
	1989	0.21465	180.	20000.	89012324
	1990	0.20803	240.	15000.	90102724
	1991	0.17011	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.44012	60.	20000.	87120408
	1988	0.41999	240.	20000.	88011524
	1989	0.46713	180.	20000.	89012308
	1990	0.42971	180.	20000.	90041208
	1991	0.35574	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.86013	110.	20000.	87031003
	1988	0.81349	220.	20000.	88091324
	1989	0.70018	350.	20000.	89060824
	1990	1.00563	270.	1800.	90061315
	1991	0.85391	70.	1800.	91051215
HIGH 1-Hour					
	1987	1.99984	20.	1600.	87070913
	1988	1.76181	20.	1700.	88082914
	1989	2.01896	130.	1600.	89083014
	1990	1.94153	90.	1600.	90072414
	1991	1.96708	330.	1600.	91052413
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.01451	240.	15000.	87123124
	1988	0.01369	220.	15000.	88123124
	1989	0.01212	200.	15000.	89123124
	1990	0.01790	250.	12000.	90123124
	1991	0.01604	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.16052	250.	15000.	87112324
	1988	0.22414	220.	15000.	88091324
	1989	0.22401	180.	20000.	89012324
	1990	0.21722	240.	15000.	90102724
	1991	0.17464	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.45999	60.	20000.	87120408
	1988	0.43819	240.	20000.	88011524
	1989	0.48859	180.	20000.	89012308
	1990	0.44921	180.	20000.	90041208
	1991	0.37377	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.89647	110.	20000.	87031003
	1988	0.84822	220.	20000.	88091324
	1989	0.73043	350.	20000.	89060824
	1990	1.01342	270.	1800.	90061315
	1991	0.86472	70.	1800.	91051215
HIGH 1-Hour					
	1987	2.01446	20.	1600.	87070913
	1988	2.02038	20.	1600.	88062313
	1989	2.07703	330.	1600.	89032712
	1990	2.07302	200.	1600.	90081313
	1991	1.98192	330.	1600.	91052413
SOURCE GROUP ID:	LD7532				

Annual					
	1987	0.01623	240.	12000.	87123124
	1988	0.01530	220.	15000.	88123124
	1989	0.01364	200.	15000.	89123124
	1990	0.01994	250.	12000.	90123124
	1991	0.01800	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.19633	240.	1800.	87072424
	1988	0.24542	220.	15000.	88091324
	1989	0.24952	180.	20000.	89012324
	1990	0.23793	240.	15000.	90102724
	1991	0.18592	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.50323	60.	20000.	87120408
	1988	0.46174	240.	20000.	88011524
	1989	0.53518	180.	20000.	89012308
	1990	0.49153	180.	20000.	90041208
	1991	0.41350	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.97500	110.	20000.	87031003
	1988	0.92421	220.	20000.	88091324
	1989	0.79684	350.	20000.	89060824
	1990	1.03082	270.	1800.	90061315
	1991	0.88796	70.	1800.	91051215
HIGH 1-Hour					
	1987	2.20804	110.	1600.	87080314
	1988	2.28390	70.	1600.	88080514
	1989	2.33798	250.	1600.	89080412
	1990	2.26697	70.	1600.	90090912
	1991	2.20383	320.	1600.	91061514
SOURCE GROUP ID:	LD7592				
Annual					
	1987	0.01729	240.	15000.	87123124
	1988	0.01667	220.	15000.	88123124
	1989	0.01496	200.	15000.	89123124
	1990	0.02156	250.	12000.	90123124
	1991	0.01962	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.20683	250.	12000.	87112324
	1988	0.26340	220.	15000.	88091324
	1989	0.26806	180.	15000.	89012324
	1990	0.25595	240.	15000.	90102724
	1991	0.19523	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.54141	60.	15000.	87120408
	1988	0.53337	160.	1600.	88080716
	1989	0.57425	180.	20000.	89012308
	1990	0.52681	180.	20000.	90041208
	1991	0.44729	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.04765	110.	15000.	87031003
	1988	0.98759	220.	20000.	88091324
	1989	0.85282	350.	15000.	89060824
	1990	1.21573	40.	1600.	90042312
	1991	0.91305	70.	1700.	91051215
HIGH 1-Hour					
	1987	2.50989	250.	1500.	87082212
	1988	2.53719	190.	1500.	88072912
	1989	2.42794	30.	1500.	89062011
	1990	2.47972	160.	1500.	90072613
	1991	2.43522	330.	1500.	91040612
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.02006	250.	11000.	87123124
	1988	0.01890	220.	15000.	88123124
	1989	0.01746	180.	12000.	89123124
	1990	0.02530	250.	10000.	90123124
	1991	0.02261	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.23496	250.	11000.	87112324
	1988	0.27288	220.	15000.	88091324
	1989	0.30493	180.	15000.	89012324
	1990	0.29083	240.	15000.	90102724
	1991	0.22854	250.	5250.	91090224
HIGH 8-Hour					
	1987	0.61818	60.	15000.	87120408
	1988	0.54654	160.	1600.	88080716

	1989	0.65539	180.	15000.	89012308
	1990	0.59683	180.	15000.	90041208
	1991	0.51093	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.18722	110.	15000.	87031003
	1988	1.05975	220.	20000.	88091324
	1989	1.71136	330.	1500.	89062212
	1990	1.24117	40.	1600.	90042312
	1991	1.02702	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.78019	100.	1500.	87090912
	1988	2.78302	60.	1500.	88092413
	1989	2.83612	330.	1500.	89062211
	1990	2.78516	310.	1500.	90090111
	1991	2.81295	50.	1500.	91081312
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.02160	250.	10000.	87123124
	1988	0.02008	220.	15000.	88123124
	1989	0.01891	180.	12000.	89123124
	1990	0.02751	250.	10000.	90123124
	1991	0.02425	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.25539	270.	7500.	87052424
	1988	0.33219	160.	1600.	88080724
	1989	0.32488	180.	15000.	89012324
	1990	0.30969	240.	15000.	90102724
	1991	0.24001	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.62341	60.	20000.	87120408
	1988	0.78896	160.	1600.	88080716
	1989	0.69908	180.	15000.	89012308
	1990	0.63582	180.	15000.	90041208
	1991	0.54467	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.26000	110.	15000.	87031003
	1988	1.47108	170.	1500.	88080712
	1989	1.73579	330.	1500.	89062212
	1990	1.25441	40.	1600.	90042312
	1991	1.09171	270.	20000.	91010306
HIGH 1-Hour					
	1987	3.08048	110.	1400.	87061811
	1988	2.92821	170.	1500.	88080711
	1989	2.91525	20.	1500.	89071612
	1990	3.04789	340.	1400.	90051212
	1991	3.05486	50.	1400.	91042713

All receptor computations reported with respect to a user-specified origin
GRID 0.00 0.00
DISCRETE
0.00 0.00

```
CO STARTING
CO TITLEONE 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00
CO TITLETWO FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2
CO MODELOPT DFAULT CONC RURAL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF     .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID   SRCTYP     XS      YS       ZS
** MODELING ORIGIN CT NO.2 STACK LOCATION
** LOCATION IS USED FOR POLAR DISCRETE RECEPTORS.
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT NO. 1
**  B -  CT NO. 2
**  C -  CT NO. 3
** Source Location Cards:
**         SRCID SRCTYP         XS      YS       ZS
**   UTM                        (m)     (m)      (m)
SO LOCATION  BASE32A  POINT    -39.08  0.0     0.0
SO LOCATION  BASE32B  POINT    0.0     0.0     0.0
SO LOCATION  BASE32C  POINT    39.08   0.0     0.0
**
SO LOCATION  BASE95A  POINT    -39.08  0.0     0.0
SO LOCATION  BASE95B  POINT    0.0     0.0     0.0
SO LOCATION  BASE95C  POINT    39.08   0.0     0.0
**
SO LOCATION  LD7532A  POINT    -39.08  0.0     0.0
SO LOCATION  LD7532B  POINT    0.0     0.0     0.0
SO LOCATION  LD7532C  POINT    39.08   0.0     0.0
**
SO LOCATION  LD7595A  POINT    -39.08  0.0     0.0
SO LOCATION  LD7595B  POINT    0.0     0.0     0.0
SO LOCATION  LD7595C  POINT    39.08   0.0     0.0
**
SO LOCATION  LD5032A  POINT    -39.08  0.0     0.0
SO LOCATION  LD5032B  POINT    0.0     0.0     0.0
SO LOCATION  LD5032C  POINT    39.08   0.0     0.0
**
SO LOCATION  LD5095A  POINT    -39.08  0.0     0.0
SO LOCATION  LD5095B  POINT    0.0     0.0     0.0
SO LOCATION  LD5095C  POINT    39.08   0.0     0.0
**
** Source Parameter Cards:
** POINT:   SRCID            QS       HS        TS        VS        DS
**                         (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A    3.334    18.3      852.0     37.1      6.4
SO SRCPARAM   BASE32B    3.333    18.3      852.0     37.1      6.4
SO SRCPARAM   BASE32C    3.333    18.3      852.0     37.1      6.4
**
SO SRCPARAM   BASE95A    3.334    18.3      884.0     34.7      6.4
SO SRCPARAM   BASE95B    3.333    18.3      884.0     34.7      6.4
SO SRCPARAM   BASE95C    3.333    18.3      884.0     34.7      6.4
**
SO SRCPARAM   LD7532A    3.334    18.3      913.0     30.9      6.4
SO SRCPARAM   LD7532B    3.333    18.3      913.0     30.9      6.4
SO SRCPARAM   LD7532C    3.333    18.3      913.0     30.9      6.4
**
SO SRCPARAM   LD7595A    3.334    18.3      922.0     28.4      6.4
SO SRCPARAM   LD7595B    3.333    18.3      922.0     28.4      6.4
SO SRCPARAM   LD7595C    3.333    18.3      922.0     28.4      6.4
**
SO SRCPARAM   LD5032A    3.334    18.3      864.0     25.5      6.4
SO SRCPARAM   LD5032B    3.333    18.3      864.0     25.5      6.4
SO SRCPARAM   LD5032C    3.333    18.3      864.0     25.5      6.4
**
SO SRCPARAM   LD5095A    3.334    18.3      851.0     24.0      6.4
SO SRCPARAM   LD5095B    3.333    18.3      851.0     24.0      6.4
SO SRCPARAM   LD5095C    3.333    18.3      851.0     24.0      6.4
**
**
SO BUILDHGT BASE32A-BASE95A       14.33    14.33    14.33    14.33    14.63    14.63
```

```
SO BUILDHGT BASE32A-BASE95A       14.63  14.63  14.63  14.63   0.00  14.33
SO BUILDHGT BASE32A-BASE95A       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32A-BASE95A       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32A-BASE95A        0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT BASE32A-BASE95A       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32A-BASE95A       12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID BASE32A-BASE95A       23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID BASE32A-BASE95A       15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32A-BASE95A       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32A-BASE95A        0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID BASE32A-BASE95A       15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32B-BASE95B       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B       14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32B-BASE95B       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B        0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32B-BASE95B       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B       14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B       15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32B-BASE95B       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B        0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B       15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32C-BASE95C       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C       14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C        0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT BASE32C-BASE95C       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C        0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C        0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32C-BASE95C       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C       14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C        0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID BASE32C-BASE95C       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C        0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C        0.00  15.28  14.37  13.02  11.28   9.20
**
SO BUILDHGT LD7532A-LD7595A       14.33  14.33  14.33  14.33  14.63  14.63
SO BUILDHGT LD7532A-LD7595A       14.63  14.63  14.63  14.63   0.00  14.33
SO BUILDHGT LD7532A-LD7595A       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532A-LD7595A       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532A-LD7595A        0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT LD7532A-LD7595A       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532A-LD7595A       12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID LD7532A-LD7595A       23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID LD7532A-LD7595A       15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532A-LD7595A       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532A-LD7595A        0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID LD7532A-LD7595A       15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532B-LD7595B       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B       14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532B-LD7595B       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B        0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B       14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532B-LD7595B       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B       14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B       15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532B-LD7595B       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B        0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B       15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532C-LD7595C       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C       14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C        0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT LD7532C-LD7595C       14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C        0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C        0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD7532C-LD7595C       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C       14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C        0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID LD7532C-LD7595C       12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C        0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C        0.00  15.28  14.37  13.02  11.28   9.20
**
```

```
SO BUILDHGT LD5032A-LD5095A          14.33   14.33   14.33   14.33   14.63   14.63
SO BUILDHGT LD5032A-LD5095A          14.63   14.63   14.63   14.63    0.00   14.33
SO BUILDHGT LD5032A-LD5095A          14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032A-LD5095A          14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD5095A           0.00    0.00    0.00    0.00   14.33   14.33
SO BUILDHGT LD5032A-LD5095A          14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032A-LD5095A          12.74   14.10   15.03   15.50   24.40   23.57
SO BUILDWID LD5032A-LD5095A          23.32   23.54   23.80   23.33    0.00   15.03
SO BUILDWID LD5032A-LD5095A          15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032A-LD5095A          12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032A-LD5095A           0.00    0.00    0.00    0.00   14.10   15.03
SO BUILDWID LD5032A-LD5095A          15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032B-LD5095B          14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B          14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B          14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD5095B          14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B           0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B          14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032B-LD5095B          12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B          14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B          15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032B-LD5095B          12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B           0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B          15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032C-LD5095C          14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C          14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C           0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032C-LD5095C          14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C           0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C           0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD5095C          12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C          14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C           0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID LD5032C-LD5095C          12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C           0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C           0.00   15.28   14.37   13.02   11.28    9.20
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)

SO SRCGROUP BASE32  BASE32A   BASE32B   BASE32C
SO SRCGROUP BASE95  BASE95A   BASE95B   BASE95C
SO SRCGROUP LD7532  LD7532A   LD7532B   LD7532C
SO SRCGROUP LD7592  LD7595A   LD7595B   LD7595C
SO SRCGROUP LD5032  LD5032A   LD5032B   LD5032C
SO SRCGROUP LD5095  LD5095A   LD5095B   LD5095C

SO FINISHED
**
RE STARTING
RE GRIDPOLR POL STA
RE GRIDPOLR POL ORIG  0.0    0.0
RE GRIDPOLR POL GDIR  36  10.00  10.00

RE GRIDPOLR POL DIST                                 300    400    500    600
RE GRIDPOLR POL DIST                 700    800      900   1000   1100   1200
RE GRIDPOLR POL DIST                1300   1400     1500   1600   1700   1800
RE GRIDPOLR POL DIST                1900   2000     2100   2200   2300   2400
RE GRIDPOLR POL DIST                2500   2600     2700   2800   2900   3000
RE GRIDPOLR POL DIST                3250   3500     3750   4000   4250   4500
RE GRIDPOLR POL DIST                4750   5000     5250   5500   5750   6000
RE GRIDPOLR POL DIST                6500   7000     7500   8000   8500   9000
RE GRIDPOLR POL DIST                9500  10000    11000  12000  15000  20000

RE GRIDPOLR POL END

RE DISCPOLR BASE32B       70.        10
RE DISCPOLR BASE32B      100.        10
RE DISCPOLR BASE32B      200.        10
RE DISCPOLR BASE32B       74.        20
RE DISCPOLR BASE32B      100.        20
RE DISCPOLR BASE32B      200.        20
RE DISCPOLR BASE32B       80.        30
RE DISCPOLR BASE32B      100.        30
RE DISCPOLR BASE32B      200.        30
```

```
RE DISCPOLR BASE32B      90.       40
RE DISCPOLR BASE32B     100.       40
RE DISCPOLR BASE32B     200.       40
RE DISCPOLR BASE32B     107.       50
RE DISCPOLR BASE32B     200.       50
RE DISCPOLR BASE32B     137.       60
RE DISCPOLR BASE32B     200.       60
RE DISCPOLR BASE32B     199.       70
RE DISCPOLR BASE32B     200.       70
RE DISCPOLR BASE32B     190.       80
RE DISCPOLR BASE32B     200.       80
RE DISCPOLR BASE32B     200.       90
RE DISCPOLR BASE32B     250.       90
RE DISCPOLR BASE32B     300.       90
RE DISCPOLR BASE32B     190.      100
RE DISCPOLR BASE32B     200.      100
RE DISCPOLR BASE32B     250.      100
RE DISCPOLR BASE32B     199.      110
RE DISCPOLR BASE32B     200.      110
RE DISCPOLR BASE32B     197.      120
RE DISCPOLR BASE32B     200.      120
RE DISCPOLR BASE32B     153.      130
RE DISCPOLR BASE32B     200.      130
RE DISCPOLR BASE32B     129.      140
RE DISCPOLR BASE32B     200.      140
RE DISCPOLR BASE32B     114.      150
RE DISCPOLR BASE32B     200.      150
RE DISCPOLR BASE32B     105.      160
RE DISCPOLR BASE32B     200.      160
RE DISCPOLR BASE32B     100.      170
RE DISCPOLR BASE32B     200.      170
RE DISCPOLR BASE32B      99.      180
RE DISCPOLR BASE32B     100.      180
RE DISCPOLR BASE32B     200.      180
RE DISCPOLR BASE32B     100.      190
RE DISCPOLR BASE32B     200.      190
RE DISCPOLR BASE32B     105.      200
RE DISCPOLR BASE32B     200.      200
RE DISCPOLR BASE32B     114.      210
RE DISCPOLR BASE32B     200.      210
RE DISCPOLR BASE32B     129.      220
RE DISCPOLR BASE32B     200.      220
RE DISCPOLR BASE32B     153.      230
RE DISCPOLR BASE32B     200.      230
RE DISCPOLR BASE32B     197.      240
RE DISCPOLR BASE32B     200.      240
RE DISCPOLR BASE32B     204.      250
RE DISCPOLR BASE32B     195.      260
RE DISCPOLR BASE32B     200.      260
RE DISCPOLR BASE32B     192.      270
RE DISCPOLR BASE32B     200.      270
RE DISCPOLR BASE32B     173.      280
RE DISCPOLR BASE32B     200.      280
RE DISCPOLR BASE32B     141.      290
RE DISCPOLR BASE32B     200.      290
RE DISCPOLR BASE32B     119.      300
RE DISCPOLR BASE32B     200.      300
RE DISCPOLR BASE32B      99.      310
RE DISCPOLR BASE32B     100.      310
RE DISCPOLR BASE32B     200.      310
RE DISCPOLR BASE32B      87.      320
RE DISCPOLR BASE32B     100.      320
RE DISCPOLR BASE32B     200.      320
RE DISCPOLR BASE32B      80.      330
RE DISCPOLR BASE32B     100.      330
RE DISCPOLR BASE32B     200.      330
RE DISCPOLR BASE32B      74.      340
RE DISCPOLR BASE32B     100.      340
RE DISCPOLR BASE32B     200.      340
RE DISCPOLR BASE32B      70.      350
RE DISCPOLR BASE32B     100.      350
RE DISCPOLR BASE32B     200.      350
RE DISCPOLR BASE32B      69.      360
RE DISCPOLR BASE32B     100.      360
RE DISCPOLR BASE32B     200.      360

RE FINISHED
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```
**
ME STARTING
ME INPUTFIL P:\MET\TPATPA87.MET
ME ANEMHGHT    22 FEET
ME SURFDATA  12842      1987       TAMPA
ME UAIRDATA  12842      1987       TAMPA
ME WINDCATS    1.54    3.09    5.14    8.23   10.80
ME FINISHED
**
OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

**************************************
*** SETUP Finishes Successfully ***
**************************************

  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                            PAGE
CONC                            RURAL  FLAT          DFAULT

                                            ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:     18 Source(s);      6 Source Group(s); and    1956 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.71 ;    Decay Coef. =    0.000      ;   Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                               ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.9 MB of RAM.

**Input Runstream File:          DEC1C2.i87
```

```
**Output Print File:            DEC1C2.087
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***         04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                  ***         15:59
**MODELOPTs:                                                                                                              PAGE
CONC                          RURAL  FLAT          DFAULT


                                              *** POINT SOURCE DATA ***

             NUMBER EMISSION RATE                         BASE     STACK    STACK    STACK     STACK    BUILDING EMISSION RATE
   SOURCE     PART. (USER UNITS)      X         Y        ELEV.    HEIGHT   TEMP.   EXIT VEL. DIAMETER   EXISTS   SCALAR VARY
     ID       CATS.                (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)                 BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  BASE32A      0   0.33340E+01   -39.1       0.0      0.0     18.30   852.00    37.10      6.40      YES
  BASE32B      0   0.33330E+01     0.0       0.0      0.0     18.30   852.00    37.10      6.40      YES
  BASE32C      0   0.33330E+01    39.1       0.0      0.0     18.30   852.00    37.10      6.40      YES
  BASE95A      0   0.33340E+01   -39.1       0.0      0.0     18.30   884.00    34.70      6.40      YES
  BASE95B      0   0.33330E+01     0.0       0.0      0.0     18.30   884.00    34.70      6.40      YES
  BASE95C      0   0.33330E+01    39.1       0.0      0.0     18.30   884.00    34.70      6.40      YES
  LD7532A      0   0.33340E+01   -39.1       0.0      0.0     18.30   913.00    30.90      6.40      YES
  LD7532B      0   0.33330E+01     0.0       0.0      0.0     18.30   913.00    30.90      6.40      YES
  LD7532C      0   0.33330E+01    39.1       0.0      0.0     18.30   913.00    30.90      6.40      YES
  LD7595A      0   0.33340E+01   -39.1       0.0      0.0     18.30   922.00    28.40      6.40      YES
  LD7595B      0   0.33330E+01     0.0       0.0      0.0     18.30   922.00    28.40      6.40      YES
  LD7595C      0   0.33330E+01    39.1       0.0      0.0     18.30   922.00    28.40      6.40      YES
  LD5032A      0   0.33340E+01   -39.1       0.0      0.0     18.30   864.00    25.50      6.40      YES
  LD5032B      0   0.33330E+01     0.0       0.0      0.0     18.30   864.00    25.50      6.40      YES
  LD5032C      0   0.33330E+01    39.1       0.0      0.0     18.30   864.00    25.50      6.40      YES
  LD5095A      0   0.33340E+01   -39.1       0.0      0.0     18.30   851.00    24.00      6.40      YES
  LD5095B      0   0.33330E+01     0.0       0.0      0.0     18.30   851.00    24.00      6.40      YES
  LD5095C      0   0.33330E+01    39.1       0.0      0.0     18.30   851.00    24.00      6.40      YES
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***         04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                  ***         15:59
**MODELOPTs:                                                                                                              PAGE
CONC                          RURAL  FLAT          DFAULT


                                       *** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID                                                SOURCE IDs


 BASE32    BASE32A , BASE32B , BASE32C ,

 BASE95    BASE95A , BASE95B , BASE95C ,

 LD7532    LD7532A , LD7532B , LD7532C ,

 LD7592    LD7595A , LD7595B , LD7595C ,

 LD5032    LD5032A , LD5032B , LD5032C ,

 LD5095    LD5095A , LD5095B , LD5095C ,
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***         04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                  ***         15:59
**MODELOPTs:                                                                                                              PAGE
CONC                          RURAL  FLAT          DFAULT

                                      *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.6,  24.4, 0     6  14.6,  2
   7  14.6,  23.3, 0     8  14.6,  23.5, 0     9  14.6,  23.8, 0    10  14.6,  23.3, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
```

```
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29 14.3,  14.1, 0   30 14.3,  1
  31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,


SOURCE ID: BASE32B
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  1
   7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12 14.3,  1
  13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30 14.3,  1
  31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,


SOURCE ID: BASE32C
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  1
   7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12  0.0,
  13  0.0,   0.0, 0   14  6.7,  15.3, 0   15  6.7,  14.4, 0   16  6.7,  13.0, 0   17  6.7,  11.3, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30  0.0,
  31  0.0,   0.0, 0   32  6.7,  15.3, 0   33  6.7,  14.4, 0   34  6.7,  13.0, 0   35  6.7,  11.3, 0   36  6.7,


SOURCE ID: BASE95A
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.6,  24.4, 0    6 14.6,  2
   7 14.6,  23.3, 0    8 14.6,  23.5, 0    9 14.6,  23.8, 0   10 14.6,  23.3, 0   11  0.0,   0.0, 0   12 14.3,  1
  13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29 14.3,  14.1, 0   30 14.3,  1
  31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,

  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                           PAGE
CONC                             RURAL  FLAT          DFAULT

                                             *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: BASE95B
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  1
   7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12 14.3,  1
  13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30 14.3,  1
  31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,


SOURCE ID: BASE95C
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  1
   7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12  0.0,
  13  0.0,   0.0, 0   14  6.7,  15.3, 0   15  6.7,  14.4, 0   16  6.7,  13.0, 0   17  6.7,  11.3, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30  0.0,
  31  0.0,   0.0, 0   32  6.7,  15.3, 0   33  6.7,  14.4, 0   34  6.7,  13.0, 0   35  6.7,  11.3, 0   36  6.7,


SOURCE ID: LD7532A
 IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH     BW WAK IFV  BH
   1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.6,  24.4, 0    6 14.6,  2
   7 14.6,  23.3, 0    8 14.6,  23.5, 0    9 14.6,  23.8, 0   10 14.6,  23.3, 0   11  0.0,   0.0, 0   12 14.3,  1
  13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,
  19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  1
  25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29 14.3,  14.1, 0   30 14.3,  1
  31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,
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SOURCE ID: LD7532B
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,

 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***         04/2
                                  *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                ***         15:59
**MODELOPTs:                                                                                                          PAGE
CONC                         RURAL  FLAT          DFAULT

                                        *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12   0.0,
  13   0.0,   0.0, 0    14   6.7,  15.3, 0    15   6.7,  14.4, 0    16   6.7,  13.0, 0    17   6.7,  11.3, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30   0.0,
  31   0.0,   0.0, 0    32   6.7,  15.3, 0    33   6.7,  14.4, 0    34   6.7,  13.0, 0    35   6.7,  11.3, 0    36   6.7,

SOURCE ID: LD7595A
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.6,  24.4, 0     6  14.6,  2
   7  14.6,  23.3, 0     8  14.6,  23.5, 0     9  14.6,  23.8, 0    10  14.6,  23.3, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29  14.3,  14.1, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,

SOURCE ID: LD7595B
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,

SOURCE ID: LD7595C
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12   0.0,
  13   0.0,   0.0, 0    14   6.7,  15.3, 0    15   6.7,  14.4, 0    16   6.7,  13.0, 0    17   6.7,  11.3, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30   0.0,
  31   0.0,   0.0, 0    32   6.7,  15.3, 0    33   6.7,  14.4, 0    34   6.7,  13.0, 0    35   6.7,  11.3, 0    36   6.7,

 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***         04/2
                                  *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                ***         15:59
**MODELOPTs:                                                                                                          PAGE
CONC                         RURAL  FLAT          DFAULT

                                        *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A
 IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH      BW  WAK  IFV  BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.6,  24.4, 0     6  14.6,  2
   7  14.6,  23.3, 0     8  14.6,  23.5, 0     9  14.6,  23.8, 0    10  14.6,  23.3, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29  14.3,  14.1, 0    30  14.3,  1
```

```
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,


SOURCE ID: LD5032B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,


SOURCE ID: LD5032C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12   0.0,
  13   0.0,   0.0, 0    14   6.7,  15.3, 0    15   6.7,  14.4, 0    16   6.7,  13.0, 0    17   6.7,  11.3, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30   0.0,
  31   0.0,   0.0, 0    32   6.7,  15.3, 0    33   6.7,  14.4, 0    34   6.7,  13.0, 0    35   6.7,  11.3, 0    36   6.7,


SOURCE ID: LD5095A
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.6,  24.4, 0     6  14.6,  2
   7  14.6,  23.3, 0     8  14.6,  23.5, 0     9  14.6,  23.8, 0    10  14.6,  23.3, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29  14.3,  14.1, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,

 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                           PAGE
CONC                          RURAL  FLAT           DFAULT

                                         *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: LD5095B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12  14.3,  1
  13  14.3,  15.5, 0    14  14.3,  15.5, 0    15  14.3,  15.0, 0    16  14.3,  14.1, 0    17   6.7,  11.2, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30  14.3,  1
  31  14.3,  15.5, 0    32  14.3,  15.5, 0    33  14.3,  15.0, 0    34  14.3,  14.1, 0    35   6.7,  11.2, 0    36   6.7,


SOURCE ID: LD5095C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH
   1  14.3,  12.7, 0     2  14.3,  14.1, 0     3  14.3,  15.0, 0     4  14.3,  15.5, 0     5  14.3,  15.5, 0     6  14.3,  1
   7  14.3,  14.1, 0     8   0.0,   0.0, 0     9   0.0,   0.0, 0    10   0.0,   0.0, 0    11   0.0,   0.0, 0    12   0.0,
  13   0.0,   0.0, 0    14   6.7,  15.3, 0    15   6.7,  14.4, 0    16   6.7,  13.0, 0    17   6.7,  11.3, 0    18   6.7,
  19  14.3,  12.7, 0    20  14.3,  14.1, 0    21  14.3,  15.0, 0    22  14.3,  15.5, 0    23  14.3,  15.5, 0    24  14.3,  1
  25   0.0,   0.0, 0    26   0.0,   0.0, 0    27   0.0,   0.0, 0    28   0.0,   0.0, 0    29   0.0,   0.0, 0    30   0.0,
  31   0.0,   0.0, 0    32   6.7,  15.3, 0    33   6.7,  14.4, 0    34   6.7,  13.0, 0    35   6.7,  11.3, 0    36   6.7,

 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                           PAGE
CONC                          RURAL  FLAT           DFAULT


                                      *** GRIDDED RECEPTOR NETWORK SUMMARY ***

                                 *** NETWORK ID: POL      ;  NETWORK TYPE: GRIDPOLR ***

                                         *** ORIGIN FOR POLAR NETWORK ***
                              X-ORIG =      0.00 ;   Y-ORIG =        0.00  (METERS)
```

*** DISTANCE RANGES OF NETWORK ***
(METERS)

```
300.0,   400.0,   500.0,   600.0,   700.0,   800.0,   900.0,   1000.0,  1100.0,  1200.0,
1300.0,  1400.0,  1500.0,  1600.0,  1700.0,  1800.0,  1900.0,  2000.0,  2100.0,  2200.0,
2300.0,  2400.0,  2500.0,  2600.0,  2700.0,  2800.0,  2900.0,  3000.0,  3250.0,  3500.0,
3750.0,  4000.0,  4250.0,  4500.0,  4750.0,  5000.0,  5250.0,  5500.0,  5750.0,  6000.0,
6500.0,  7000.0,  7500.0,  8000.0,  8500.0,  9000.0,  9500.0,  10000.0, 11000.0, 12000.0,
15000.0, 20000.0,
```

*** DIRECTION RADIALS OF NETWORK ***
(DEGREES)

```
10.0,  20.0,  30.0,  40.0,  50.0,  60.0,  70.0,  80.0,  90.0,  100.0,
110.0, 120.0, 130.0, 140.0, 150.0, 160.0, 170.0, 180.0, 190.0, 200.0,
210.0, 220.0, 230.0, 240.0, 250.0, 260.0, 270.0, 280.0, 290.0, 300.0,
310.0, 320.0, 330.0, 340.0, 350.0, 360.0,
```


**MODELOPTs:
CONC RURAL FLAT DFAULT

*** DISCRETE POLAR RECEPTORS ***
ORIGIN: (DIST, DIR, ZELEV, ZFLAG)
SRCID: (METERS,DEG,METERS,METERS)

```
BASE32B : (  70.0,  10.0, 0.0, 0.0);   BASE32B : ( 100.0,  10.0, 0.0, 0.0);
BASE32B : ( 200.0,  10.0, 0.0, 0.0);   BASE32B : (  74.0,  20.0, 0.0, 0.0);
BASE32B : ( 100.0,  20.0, 0.0, 0.0);   BASE32B : ( 200.0,  20.0, 0.0, 0.0);
BASE32B : (  80.0,  30.0, 0.0, 0.0);   BASE32B : ( 100.0,  30.0, 0.0, 0.0);
BASE32B : ( 200.0,  30.0, 0.0, 0.0);   BASE32B : (  90.0,  40.0, 0.0, 0.0);
BASE32B : ( 100.0,  40.0, 0.0, 0.0);   BASE32B : ( 200.0,  40.0, 0.0, 0.0);
BASE32B : ( 107.0,  50.0, 0.0, 0.0);   BASE32B : ( 200.0,  50.0, 0.0, 0.0);
BASE32B : ( 137.0,  60.0, 0.0, 0.0);   BASE32B : ( 200.0,  60.0, 0.0, 0.0);
BASE32B : ( 199.0,  70.0, 0.0, 0.0);   BASE32B : ( 200.0,  70.0, 0.0, 0.0);
BASE32B : ( 190.0,  80.0, 0.0, 0.0);   BASE32B : ( 200.0,  80.0, 0.0, 0.0);
BASE32B : ( 200.0,  90.0, 0.0, 0.0);   BASE32B : ( 250.0,  90.0, 0.0, 0.0);
BASE32B : ( 300.0,  90.0, 0.0, 0.0);   BASE32B : ( 190.0, 100.0, 0.0, 0.0);
BASE32B : ( 200.0, 100.0, 0.0, 0.0);   BASE32B : ( 250.0, 100.0, 0.0, 0.0);
BASE32B : ( 199.0, 110.0, 0.0, 0.0);   BASE32B : ( 200.0, 110.0, 0.0, 0.0);
BASE32B : ( 197.0, 120.0, 0.0, 0.0);   BASE32B : ( 200.0, 120.0, 0.0, 0.0);
BASE32B : ( 153.0, 130.0, 0.0, 0.0);   BASE32B : ( 200.0, 130.0, 0.0, 0.0);
BASE32B : ( 129.0, 140.0, 0.0, 0.0);   BASE32B : ( 200.0, 140.0, 0.0, 0.0);
BASE32B : ( 114.0, 150.0, 0.0, 0.0);   BASE32B : ( 200.0, 150.0, 0.0, 0.0);
BASE32B : ( 105.0, 160.0, 0.0, 0.0);   BASE32B : ( 200.0, 160.0, 0.0, 0.0);
BASE32B : ( 100.0, 170.0, 0.0, 0.0);   BASE32B : ( 200.0, 170.0, 0.0, 0.0);
BASE32B : (  99.0, 180.0, 0.0, 0.0);   BASE32B : ( 100.0, 180.0, 0.0, 0.0);
BASE32B : ( 200.0, 180.0, 0.0, 0.0);   BASE32B : ( 100.0, 190.0, 0.0, 0.0);
BASE32B : ( 200.0, 190.0, 0.0, 0.0);   BASE32B : ( 105.0, 200.0, 0.0, 0.0);
BASE32B : ( 200.0, 200.0, 0.0, 0.0);   BASE32B : ( 114.0, 210.0, 0.0, 0.0);
BASE32B : ( 200.0, 210.0, 0.0, 0.0);   BASE32B : ( 129.0, 220.0, 0.0, 0.0);
BASE32B : ( 200.0, 220.0, 0.0, 0.0);   BASE32B : ( 153.0, 230.0, 0.0, 0.0);
BASE32B : ( 200.0, 230.0, 0.0, 0.0);   BASE32B : ( 197.0, 240.0, 0.0, 0.0);
BASE32B : ( 200.0, 240.0, 0.0, 0.0);   BASE32B : ( 204.0, 250.0, 0.0, 0.0);
BASE32B : ( 195.0, 260.0, 0.0, 0.0);   BASE32B : ( 200.0, 260.0, 0.0, 0.0);
BASE32B : ( 192.0, 270.0, 0.0, 0.0);   BASE32B : ( 200.0, 270.0, 0.0, 0.0);
BASE32B : ( 173.0, 280.0, 0.0, 0.0);   BASE32B : ( 200.0, 280.0, 0.0, 0.0);
BASE32B : ( 141.0, 290.0, 0.0, 0.0);   BASE32B : ( 200.0, 290.0, 0.0, 0.0);
BASE32B : ( 119.0, 300.0, 0.0, 0.0);   BASE32B : ( 200.0, 300.0, 0.0, 0.0);
BASE32B : (  99.0, 310.0, 0.0, 0.0);   BASE32B : ( 100.0, 310.0, 0.0, 0.0);
BASE32B : ( 200.0, 310.0, 0.0, 0.0);   BASE32B : (  87.0, 320.0, 0.0, 0.0);
BASE32B : ( 100.0, 320.0, 0.0, 0.0);   BASE32B : ( 200.0, 320.0, 0.0, 0.0);
BASE32B : (  80.0, 330.0, 0.0, 0.0);   BASE32B : ( 100.0, 330.0, 0.0, 0.0);
BASE32B : ( 200.0, 330.0, 0.0, 0.0);   BASE32B : (  74.0, 340.0, 0.0, 0.0);
BASE32B : ( 100.0, 340.0, 0.0, 0.0);   BASE32B : ( 200.0, 340.0, 0.0, 0.0);
BASE32B : (  70.0, 350.0, 0.0, 0.0);   BASE32B : ( 100.0, 350.0, 0.0, 0.0);
BASE32B : ( 200.0, 350.0, 0.0, 0.0);   BASE32B : (  69.0, 360.0, 0.0, 0.0);
BASE32B : ( 100.0, 360.0, 0.0, 0.0);   BASE32B : ( 200.0, 360.0, 0.0, 0.0);
```


**MODELOPTs:
CONC RURAL FLAT DFAULT

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***

(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/2
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2 *** 15:59
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: P:\MET\TPATPA87.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: TAMPA
YEAR: 1987 YEAR: 1987

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87	01	01	01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87	01	01	02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87	01	01	03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87	01	01	04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87	01	01	05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87	01	01	06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87	01	01	07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87	01	01	08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87	01	01	09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87	01	01	10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87	01	01	12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87	01	01	13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00

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87 01 01 14   119.0   7.72  287.6  4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 15   132.0   7.20  288.2  4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 16   134.0   7.72  289.3  4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 17   141.0   7.20  288.2  4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 18   137.0   5.14  287.6  5    1286.4  1238.1    0.0000       0.0  0.0000   0   0.00
87 01 01 19   144.0   3.60  286.5  5    1281.2  1078.6    0.0000       0.0  0.0000   0   0.00
87 01 01 20   117.0   2.06  285.4  6    1276.0   919.0    0.0000       0.0  0.0000   0   0.00
87 01 01 21   110.0   1.54  284.8  7    1270.9   759.5    0.0000       0.0  0.0000   0   0.00
87 01 01 22   112.0   0.00  283.7  7    1265.7   600.0    0.0000       0.0  0.0000   0   0.00
87 01 01 23   120.0   2.57  283.7  6    1260.5   440.5    0.0000       0.0  0.0000   0   0.00
87 01 01 24   130.0   1.54  282.6  7    1255.4   281.0    0.0000       0.0  0.0000   0   0.00


*** NOTES:  STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
            FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                    *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT          DFAULT

                        *** THE   1ST HIGHEST  1-HR AVERAGE CONCENTRATION   VALUES FOR SOURCE GROUP:  LD5095    ***
                            INCLUDING SOURCE(S):      LD5095A , LD5095B , LD5095C ,

                                        *** DISCRETE POLAR RECEPTOR POINTS ***

                                   ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)               **

    ORIGIN                                                                ORIGIN
     SRCID       DIST (M)    DIR (DEG)        CONC      (YYMMDDHH)         SRCID      DIST (M)    DIR (DEG)         CONC      (YYM
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   BASE32B :      200.00       350.00        0.21703  (87122018)      BASE32B :       69.00       360.00         0.00614  (870
   BASE32B :      100.00       360.00        0.00080  (87121220)      BASE32B :      200.00       360.00         0.21549  (870
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                    *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                 ***        15:59
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT          DFAULT

                                        *** THE SUMMARY OF MAXIMUM PERIOD (  8760 HRS) RESULTS ***


                                   ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)               **

                                                                                                   NETWORK
GROUP ID                        AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   1ST HIGHEST VALUE IS      0.01367 AT (  -12990.38,    -7500.00,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.01355 AT (  -10392.30,    -6000.00,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.01345 AT (   -9526.28,    -5500.00,      0.00,       0.00)  GP     POL

BASE95   1ST HIGHEST VALUE IS      0.01451 AT (  -12990.38,    -7500.00,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.01443 AT (  -10392.30,    -6000.00,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.01434 AT (   -9526.28,    -5500.00,      0.00,       0.00)  GP     POL

LD7532   1ST HIGHEST VALUE IS      0.01623 AT (  -10392.30,    -6000.00,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.01620 AT (  -12990.38,    -7500.00,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.01618 AT (   -9526.28,    -5500.00,      0.00,       0.00)  GP     POL

LD7592   1ST HIGHEST VALUE IS      0.01729 AT (  -12990.38,    -7500.00,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.01728 AT (  -10392.30,    -6000.00,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.01722 AT (   -9526.28,    -5500.00,      0.00,       0.00)  GP     POL

LD5032   1ST HIGHEST VALUE IS      0.02006 AT (  -10336.62,    -3762.22,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.02006 AT (   -9396.93,    -3420.20,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.02002 AT (  -11276.31,    -4104.24,      0.00,       0.00)  GP     POL

LD5095   1ST HIGHEST VALUE IS      0.02160 AT (   -9396.93,    -3420.20,      0.00,       0.00)  GP     POL
         2ND HIGHEST VALUE IS      0.02158 AT (  -10336.62,    -3762.22,      0.00,       0.00)  GP     POL
         3RD HIGHEST VALUE IS      0.02152 AT (   -8927.08,    -3249.19,      0.00,       0.00)  GP     POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
```

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/2
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2 *** 15:59
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWO GRID-
BASE32	HIGH	1ST HIGH VALUE IS	0.15597c	ON 87040624: AT (	6401.25,	1128.71,	0.00,	0.00)	GP	POL
BASE95	HIGH	1ST HIGH VALUE IS	0.16052	ON 87112324: AT (	-14095.39,	-5130.30,	0.00,	0.00)	GP	POL
LD7532	HIGH	1ST HIGH VALUE IS	0.19633c	ON 87072424: AT (	-1558.85,	-900.00,	0.00,	0.00)	GP	POL
LD7592	HIGH	1ST HIGH VALUE IS	0.20683	ON 87112324: AT (	-11276.31,	-4104.24,	0.00,	0.00)	GP	POL
LD5032	HIGH	1ST HIGH VALUE IS	0.23496	ON 87112324: AT (	-10336.62,	-3762.22,	0.00,	0.00)	GP	POL
LD5095	HIGH	1ST HIGH VALUE IS	0.25539	ON 87052424: AT (	-7500.00,	0.00,	0.00,	0.00)	GP	POL

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/2
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2 *** 15:59
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWO GRID-
BASE32	HIGH	1ST HIGH VALUE IS	0.44012	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00)	GP	POL
BASE95	HIGH	1ST HIGH VALUE IS	0.45999	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00)	GP	POL
LD7532	HIGH	1ST HIGH VALUE IS	0.50323	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00)	GP	POL
LD7592	HIGH	1ST HIGH VALUE IS	0.54141	ON 87120408: AT (	12990.38,	7500.00,	0.00,	0.00)	GP	POL
LD5032	HIGH	1ST HIGH VALUE IS	0.61818	ON 87120408: AT (	12990.38,	7500.00,	0.00,	0.00)	GP	POL
LD5095	HIGH	1ST HIGH VALUE IS	0.62341	ON 87120408: AT (	17320.51,	10000.00,	0.00,	0.00)	GP	POL

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/2
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2 *** 15:59
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 3-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWO GRID-

```
BASE32   HIGH  1ST HIGH VALUE IS      0.86013  ON 87031003: AT (   18793.85,    -6840.40,       0.00,      0.00)  GP    POL

BASE95   HIGH  1ST HIGH VALUE IS      0.89647  ON 87031003: AT (   18793.85,    -6840.40,       0.00,      0.00)  GP    POL

LD7532   HIGH  1ST HIGH VALUE IS      0.97500  ON 87031003: AT (   18793.85,    -6840.40,       0.00,      0.00)  GP    POL

LD7592   HIGH  1ST HIGH VALUE IS      1.04765  ON 87031003: AT (   14095.39,    -5130.30,       0.00,      0.00)  GP    POL

LD5032   HIGH  1ST HIGH VALUE IS      1.18722  ON 87031003: AT (   14095.39,    -5130.30,       0.00,      0.00)  GP    POL

LD5095   HIGH  1ST HIGH VALUE IS      1.26000  ON 87031003: AT (   14095.39,    -5130.30,       0.00,      0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                  ***        15:59
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT         DFAULT

                                         *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                   ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                  **

                                                 DATE                                                                 NETWO
GROUP ID                               AVERAGE CONC     (YYMMDDHH)           RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      1.99984  ON 87070913: AT (     547.23,     1503.51,       0.00,      0.00)  GP    POL

BASE95   HIGH  1ST HIGH VALUE IS      2.01446  ON 87070913: AT (     547.23,     1503.51,       0.00,      0.00)  GP    POL

LD7532   HIGH  1ST HIGH VALUE IS      2.20804  ON 87080314: AT (    1503.51,     -547.23,       0.00,      0.00)  GP    POL

LD7592   HIGH  1ST HIGH VALUE IS      2.50989  ON 87082212: AT (   -1409.54,     -513.03,       0.00,      0.00)  GP    POL

LD5032   HIGH  1ST HIGH VALUE IS      2.78019  ON 87090912: AT (    1477.21,     -260.47,       0.00,      0.00)  GP    POL

LD5095   HIGH  1ST HIGH VALUE IS      3.08048  ON 87061811: AT (    1315.57,     -478.83,       0.00,      0.00)  GP    POL

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/21/00              ***        04/2
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 2                  ***        15:59
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT         DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          0 Warning Message(s)
A Total of        531 Informational Message(s)

A Total of        531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
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*** ISCST3 Finishes Successfully ***
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ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :DEC2C2.087
ISCST3 OUTPUT FILE NUMBER 2 :DEC2C2.088
ISCST3 OUTPUT FILE NUMBER 3 :DEC2C2.089
ISCST3 OUTPUT FILE NUMBER 4 :DEC2C2.090
ISCST3 OUTPUT FILE NUMBER 5 :DEC2C2.091
First title for last output file is: 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
Second title for last output file is: NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 2

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.01398	240.	15000.	87123124
	1988	0.01341	220.	15000.	88123124
	1989	0.01209	210.	300.	89123124
	1990	0.01735	250.	15000.	90123124
	1991	0.01551	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.15807	230.	7000.	87042724
	1988	0.21932	220.	15000.	88091324
	1989	0.21919	180.	20000.	89012324
	1990	0.21252	240.	15000.	90102724
	1991	0.17236	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.44989	60.	20000.	87120408
	1988	0.42882	240.	20000.	88011524
	1989	0.47754	180.	20000.	89012308
	1990	0.43926	180.	20000.	90041208
	1991	0.36454	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.87803	110.	20000.	87031003
	1988	0.83086	220.	20000.	88091324
	1989	0.71536	350.	20000.	89060824
	1990	1.00956	270.	1800.	90061315
	1991	0.85939	70.	1800.	91051215
HIGH 1-Hour					
	1987	2.00719	20.	1600.	87070913
	1988	2.01339	20.	1600.	88062313
	1989	2.06971	330.	1600.	89032712
	1990	1.94832	90.	1600.	90072414
	1991	1.97452	330.	1600.	91052413
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.01506	240.	15000.	87123124
	1988	0.01444	220.	15000.	88123124
	1989	0.01270	200.	15000.	89123124
	1990	0.01867	250.	12000.	90123124
	1991	0.01670	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.18039	270.	10000.	87052424
	1988	0.23133	220.	15000.	88091324
	1989	0.23603	180.	20000.	89012324
	1990	0.22407	240.	15000.	90102724
	1991	0.17813	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.47451	60.	20000.	87120408
	1988	0.45180	240.	15000.	88011524
	1989	0.50407	180.	20000.	89012308
	1990	0.46339	180.	20000.	90041208
	1991	0.38698	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.92293	110.	20000.	87031003
	1988	0.87404	220.	20000.	88091324
	1989	0.75302	350.	20000.	89060824
	1990	1.01934	270.	1800.	90061315
	1991	0.87275	70.	1800.	91051215
HIGH 1-Hour					
	1987	2.18616	110.	1600.	87080314
	1988	2.03125	20.	1600.	88062313
	1989	2.19643	330.	1600.	89062212
	1990	2.19341	290.	1600.	90071012
	1991	2.16652	190.	1600.	91090612
SOURCE GROUP ID:	LD7532				

Annual					
	1987	0.01650	240.	12000.	87123124
	1988	0.01570	220.	15000.	88123124
	1989	0.01389	200.	15000.	89123124
	1990	0.02029	250.	12000.	90123124
	1991	0.01851	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.19706	240.	1800.	87072424
	1988	0.24962	220.	15000.	88091324
	1989	0.25343	180.	20000.	89012324
	1990	0.24203	240.	15000.	90102724
	1991	0.18806	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.51158	60.	20000.	87120408
	1988	0.46946	240.	20000.	88011524
	1989	0.54406	180.	20000.	89012308
	1990	0.49963	180.	20000.	90041208
	1991	0.42120	240.	20000.	91122608
HIGH 3-Hour					
	1987	0.99006	110.	20000.	87031003
	1988	0.93909	220.	20000.	88091324
	1989	0.80992	350.	20000.	89060824
	1990	1.03429	270.	1800.	90061315
	1991	0.89253	70.	1700.	91051215
HIGH 1-Hour					
	1987	2.21471	110.	1600.	87080314
	1988	2.35317	30.	1600.	88082213
	1989	2.34449	250.	1600.	89080412
	1990	2.29397	100.	1600.	90060812
	1991	2.37582	130.	1600.	91092113
SOURCE GROUP ID:	LD7592				
Annual					
	1987	0.01765	240.	12000.	87123124
	1988	0.01701	220.	15000.	88123124
	1989	0.01524	200.	15000.	89123124
	1990	0.02209	250.	11000.	90123124
	1991	0.02022	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.21060	250.	12000.	87112324
	1988	0.26806	220.	15000.	88091324
	1989	0.27300	180.	15000.	89012324
	1990	0.26063	240.	15000.	90102724
	1991	0.19771	270.	8500.	91061124
HIGH 8-Hour					
	1987	0.55187	60.	15000.	87120408
	1988	0.53511	160.	1600.	88080716
	1989	0.58446	180.	15000.	89012308
	1990	0.57125	160.	1600.	90061716
	1991	0.45593	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.06678	110.	15000.	87031003
	1988	1.00580	220.	15000.	88091324
	1989	0.86923	350.	15000.	89060824
	1990	1.21918	40.	1600.	90042312
	1991	0.92022	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.51721	250.	1500.	87082212
	1988	2.55331	360.	1500.	88081913
	1989	2.51546	180.	1500.	89041613
	1990	2.54619	20.	1500.	90050211
	1991	2.44167	330.	1500.	91040612
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.02034	250.	11000.	87123124
	1988	0.01924	220.	15000.	88123124
	1989	0.01775	200.	15000.	89123124
	1990	0.02576	250.	10000.	90123124
	1991	0.02307	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.24420	270.	7500.	87052424
	1988	0.27684	220.	15000.	88091324
	1989	0.30900	180.	15000.	89012324
	1990	0.29471	240.	15000.	90102724
	1991	0.23094	250.	5250.	91090224
HIGH 8-Hour					
	1987	0.62657	60.	15000.	87120408
	1988	0.54807	160.	1600.	88080716

	1989	0.66432	180.	15000.	89012308
	1990	0.60488	180.	15000.	90041208
	1991	0.51788	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.20235	110.	15000.	87031003
	1988	1.07349	220.	20000.	88091324
	1989	1.71643	330.	1500.	89062212
	1990	1.24398	40.	1600.	90042312
	1991	1.04049	270.	20000.	91010306
HIGH 1-Hour					
	1987	2.87625	200.	1500.	87083012
	1988	2.78887	60.	1500.	88092413
	1989	2.84166	330.	1500.	89062211
	1990	2.79101	310.	1500.	90090111
	1991	2.81830	50.	1500.	91081312
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.02151	250.	10000.	87123124
	1988	0.02015	220.	15000.	88123124
	1989	0.01867	180.	12000.	89123124
	1990	0.02725	250.	10000.	90123124
	1991	0.02432	240.	15000.	91123124
HIGH 24-Hour					
	1987	0.25425	270.	7500.	87052424
	1988	0.33196	160.	1600.	88080724
	1989	0.32314	180.	15000.	89012324
	1990	0.30809	240.	15000.	90102724
	1991	0.23909	250.	5000.	91090224
HIGH 8-Hour					
	1987	0.62039	60.	20000.	87120408
	1988	0.78842	160.	1600.	88080716
	1989	0.69524	180.	15000.	89012308
	1990	0.63250	180.	15000.	90041208
	1991	0.54179	240.	20000.	91122608
HIGH 3-Hour					
	1987	1.25393	110.	15000.	87031003
	1988	1.47013	170.	1500.	88080712
	1989	1.73389	330.	1500.	89062212
	1990	1.25339	40.	1600.	90042312
	1991	1.08636	270.	20000.	91010306
HIGH 1-Hour					
	1987	3.07846	110.	1400.	87061811
	1988	2.92635	170.	1500.	88080711
	1989	2.91339	20.	1500.	89071612
	1990	2.98992	70.	1500.	90043014
	1991	3.05282	50.	1400.	91042713

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
CO TITLEONE 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
CO TITLETWO NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1
CO MODELOPT DFAULT CONC RURAL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID   SRCTYP     XS      YS       ZS
** MODELING ORIGIN CT NO.2 STACK LOCATION
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT NO. 1
**  B -  CT NO. 2
**  C -  CT NO. 3
** Source Location Cards:
**         SRCID SRCTYP        XS      YS       ZS
**   UTM                       (m)     (m)      (m)
SO LOCATION  BASE32A  POINT   419400   3069700  0.0
SO LOCATION  BASE32B  POINT   419400   3069700  0.0
SO LOCATION  BASE32C  POINT   419400   3069700  0.0
**
SO LOCATION  BASE95A  POINT    419400   3069700  0.0
SO LOCATION  BASE95B  POINT    419400   3069700  0.0
SO LOCATION  BASE95C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7532A  POINT    419400   3069700  0.0
SO LOCATION  LD7532B  POINT    419400   3069700  0.0
SO LOCATION  LD7532C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7595A  POINT    419400   3069700  0.0
SO LOCATION  LD7595B  POINT    419400   3069700  0.0
SO LOCATION  LD7595C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5032A  POINT    419400   3069700  0.0
SO LOCATION  LD5032B  POINT    419400   3069700  0.0
SO LOCATION  LD5032C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5095A  POINT    419400   3069700  0.0
SO LOCATION  LD5095B  POINT    419400   3069700  0.0
SO LOCATION  LD5095C  POINT    419400   3069700  0.0
**
** Source Parameter Cards:
** POINT:   SRCID          QS       HS        TS        VS        DS
**                        (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     3.334    18.3      853.0     36.2       6.4
SO SRCPARAM   BASE32B     3.333    18.3      853.0     36.2       6.4
SO SRCPARAM   BASE32C     3.333    18.3      853.0     36.2       6.4
**
SO SRCPARAM   BASE95A     3.334    18.3      880.0     33.6       6.4
SO SRCPARAM   BASE95B     3.333    18.3      880.0     33.6       6.4
SO SRCPARAM   BASE95C     3.333    18.3      880.0     33.6       6.4
**
SO SRCPARAM   LD7532A     3.334    18.3      902.0     30.5       6.4
SO SRCPARAM   LD7532B     3.333    18.3      902.0     30.5       6.4
SO SRCPARAM   LD7532C     3.333    18.3      902.0     30.5       6.4
**
SO SRCPARAM   LD7595A     3.334    18.3      911.0     28.0       6.4
SO SRCPARAM   LD7595B     3.333    18.3      911.0     28.0       6.4
SO SRCPARAM   LD7595C     3.333    18.3      911.0     28.0       6.4
**
SO SRCPARAM   LD5032A     3.334    18.3      853.0     25.3       6.4
SO SRCPARAM   LD5032B     3.333    18.3      853.0     25.3       6.4
SO SRCPARAM   LD5032C     3.333    18.3      853.0     25.3       6.4
**
SO SRCPARAM   LD5095A     3.334    18.3      840.0     24.3       6.4
SO SRCPARAM   LD5095B     3.333    18.3      840.0     24.3       6.4
SO SRCPARAM   LD5095C     3.333    18.3      840.0     24.3       6.4
**
**
SO BUILDHGT BASE32A-BASE95A       14.33   14.33   14.33   14.33   14.63   14.63
SO BUILDHGT BASE32A-BASE95A       14.63   14.63   14.63   14.63    0.00   14.33
```

```
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32A-BASE95A     0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32A-BASE95A    12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID BASE32A-BASE95A    23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID BASE32A-BASE95A    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32A-BASE95A    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32A-BASE95A     0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID BASE32A-BASE95A    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B    14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B     0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32B-BASE95B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B    14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32B-BASE95B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B     0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32C-BASE95C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C    14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT BASE32C-BASE95C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32C-BASE95C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C    14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C     0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID BASE32C-BASE95C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C     0.00  15.28  14.37  13.02  11.28   9.20
**
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33  14.63  14.63
SO BUILDHGT LD7532A-LD7595A    14.63  14.63  14.63  14.63   0.00  14.33
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532A-LD7595A     0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532A-LD7595A    12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID LD7532A-LD7595A    23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID LD7532A-LD7595A    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532A-LD7595A    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532A-LD7595A     0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID LD7532A-LD7595A    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B    14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B     0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532B-LD7595B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B    14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532B-LD7595B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B     0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532C-LD7595C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C    14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT LD7532C-LD7595C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD7532C-LD7595C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C    14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C     0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID LD7532C-LD7595C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C     0.00  15.28  14.37  13.02  11.28   9.20
**
SO BUILDHGT LD5032A-LD5095A    14.33  14.33  14.33  14.33  14.63  14.63
```

```
SO BUILDHGT LD5032A-LD5095A        14.63    14.63    14.63    14.63     0.00    14.33
SO BUILDHGT LD5032A-LD5095A        14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032A-LD5095A        14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032A-LD5095A         0.00     0.00     0.00     0.00    14.33    14.33
SO BUILDHGT LD5032A-LD5095A        14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDWID LD5032A-LD5095A        12.74    14.10    15.03    15.50    24.40    23.57
SO BUILDWID LD5032A-LD5095A        23.32    23.54    23.80    23.33     0.00    15.03
SO BUILDWID LD5032A-LD5095A        15.50    15.50    15.03    14.10    11.18     9.10
SO BUILDWID LD5032A-LD5095A        12.74    14.10    15.03    15.50    15.50    15.03
SO BUILDWID LD5032A-LD5095A         0.00     0.00     0.00     0.00    14.10    15.03
SO BUILDWID LD5032A-LD5095A        15.50    15.50    15.03    14.10    11.18     9.10
**
SO BUILDHGT LD5032B-LD5095B        14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032B-LD5095B        14.33     0.00     0.00     0.00     0.00    14.33
SO BUILDHGT LD5032B-LD5095B        14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDHGT LD5032B-LD5095B        14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032B-LD5095B         0.00     0.00     0.00     0.00     0.00    14.33
SO BUILDHGT LD5032B-LD5095B        14.33    14.33    14.33    14.33     6.71     6.71
SO BUILDWID LD5032B-LD5095B        12.74    14.10    15.03    15.50    15.50    15.03
SO BUILDWID LD5032B-LD5095B        14.10     0.00     0.00     0.00     0.00    15.03
SO BUILDWID LD5032B-LD5095B        15.50    15.50    15.03    14.10    11.18     9.10
SO BUILDWID LD5032B-LD5095B        12.74    14.10    15.03    15.50    15.50    15.03
SO BUILDWID LD5032B-LD5095B         0.00     0.00     0.00     0.00     0.00    15.03
SO BUILDWID LD5032B-LD5095B        15.50    15.50    15.03    14.10    11.18     9.10
**
SO BUILDHGT LD5032C-LD5095C        14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032C-LD5095C        14.33     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032C-LD5095C         0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDHGT LD5032C-LD5095C        14.33    14.33    14.33    14.33    14.33    14.33
SO BUILDHGT LD5032C-LD5095C         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT LD5032C-LD5095C         0.00     6.71     6.71     6.71     6.71     6.71
SO BUILDWID LD5032C-LD5095C        12.74    14.10    15.03    15.50    15.50    15.03
SO BUILDWID LD5032C-LD5095C        14.10     0.00     0.00     0.00     0.00     0.00
SO BUILDWID LD5032C-LD5095C         0.00    15.28    14.37    13.02    11.28     9.20
SO BUILDWID LD5032C-LD5095C        12.74    14.10    15.03    15.50    15.50    15.03
SO BUILDWID LD5032C-LD5095C         0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDWID LD5032C-LD5095C         0.00    15.28    14.37    13.02    11.28     9.20
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)

SO SRCGROUP BASE32  BASE32A   BASE32B   BASE32C
SO SRCGROUP BASE95  BASE95A   BASE95B   BASE95C
SO SRCGROUP LD7532  LD7532A   LD7532B   LD7532C
SO SRCGROUP LD7595  LD7595A   LD7595B   LD7595C
SO SRCGROUP LD5032  LD5032A   LD5032B   LD5032C
SO SRCGROUP LD5095  LD5095A   LD5095B   LD5095C

SO FINISHED
**
RE STARTING
**            UTM(m)    UTM(m)
RE DISCCART   340300    3165700
RE DISCCART   340300    3167700
RE DISCCART   340300    3169800
RE DISCCART   340700    3171900
RE DISCCART   342000    3174000
RE DISCCART   343000    3176200
RE DISCCART   343700    3178300
RE DISCCART   342400    3180600
RE DISCCART   341100    3183400
RE DISCCART   339000    3183400
RE DISCCART   336500    3183400
RE DISCCART   334000    3183400
RE DISCCART   331500    3183400

RE FINISHED
**
ME STARTING
ME INPUTFIL P:\MET\TPATPA87.MET
ME ANEMHGHT    22 FEET
ME SURFDATA  12842      1987        TAMPA
ME UAIRDATA  12842      1987        TAMPA
ME WINDCATS    1.54     3.09     5.14     8.23    10.80
ME FINISHED
**
OU STARTING
```

```
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00          ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1          ***        15:05:
**MODELOPTs:                                                                                                   PAGE
CONC                        RURAL  FLAT         DFAULT

                                              ***     MODEL SETUP OPTIONS SUMMARY      ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
          1. Final Plume Rise.
          2. Stack-tip Downwash.
          3. Buoyancy-induced Dispersion.
          4. Use Calms Processing Routine.
          5. Not Use Missing Data Processing Routine.
          6. Default Wind Profile Exponents.
          7. Default Vertical Potential Temperature Gradients.
          8. "Upper Bound" Values for Supersquat Buildings.
          9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);     6 Source Group(s); and     13 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
        Model Outputs Tables of PERIOD Averages by Receptor
        Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.71 ;   Decay Coef. =    0.000     ;    Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                            ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.2 MB of RAM.

**Input Runstream File:          DEC2C1.i87
**Output Print File:             DEC2C1.087
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00          ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1          ***        15:05:
**MODELOPTs:                                                                                                   PAGE
CONC                        RURAL  FLAT         DFAULT


                                                   *** POINT SOURCE DATA ***
```

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE32B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE32C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE95A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
BASE95B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
BASE95C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
LD7532A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7532B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7532C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7595A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD7595B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD7595C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD5032A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5032B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5032C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5095A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	
LD5095B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	
LD5095C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9

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 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30 14.3,  15
 31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,   9


SOURCE ID: BASE32C
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  15
  7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12  0.0,   0
 13  0.0,   0.0, 0   14  6.7,  15.3, 0   15  6.7,  14.4, 0   16  6.7,  13.0, 0   17  6.7,  11.3, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30  0.0,   0
 31  0.0,   0.0, 0   32  6.7,  15.3, 0   33  6.7,  14.4, 0   34  6.7,  13.0, 0   35  6.7,  11.3, 0   36  6.7,   9


SOURCE ID: BASE95A
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.6,  24.4, 0    6 14.6,  23
  7 14.6,  23.3, 0    8 14.6,  23.5, 0    9 14.6,  23.8, 0   10 14.6,  23.3, 0   11  0.0,   0.0, 0   12 14.3,  15
 13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29 14.3,  14.1, 0   30 14.3,  15
 31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,   9

  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***       04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1            ***       15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                          RURAL  FLAT         DFAULT

                                         *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: BASE95B
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  15
  7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12 14.3,  15
 13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30 14.3,  15
 31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,   9


SOURCE ID: BASE95C
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  15
  7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12  0.0,   0
 13  0.0,   0.0, 0   14  6.7,  15.3, 0   15  6.7,  14.4, 0   16  6.7,  13.0, 0   17  6.7,  11.3, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30  0.0,   0
 31  0.0,   0.0, 0   32  6.7,  15.3, 0   33  6.7,  14.4, 0   34  6.7,  13.0, 0   35  6.7,  11.3, 0   36  6.7,   9


SOURCE ID: LD7532A
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.6,  24.4, 0    6 14.6,  23
  7 14.6,  23.3, 0    8 14.6,  23.5, 0    9 14.6,  23.8, 0   10 14.6,  23.3, 0   11  0.0,   0.0, 0   12 14.3,  15
 13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29 14.3,  14.1, 0   30 14.3,  15
 31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,   9


SOURCE ID: LD7532B
IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     BW  WAK IFV   BH     B
  1 14.3,  12.7, 0    2 14.3,  14.1, 0    3 14.3,  15.0, 0    4 14.3,  15.5, 0    5 14.3,  15.5, 0    6 14.3,  15
  7 14.3,  14.1, 0    8  0.0,   0.0, 0    9  0.0,   0.0, 0   10  0.0,   0.0, 0   11  0.0,   0.0, 0   12 14.3,  15
 13 14.3,  15.5, 0   14 14.3,  15.5, 0   15 14.3,  15.0, 0   16 14.3,  14.1, 0   17  6.7,  11.2, 0   18  6.7,   9
 19 14.3,  12.7, 0   20 14.3,  14.1, 0   21 14.3,  15.0, 0   22 14.3,  15.5, 0   23 14.3,  15.5, 0   24 14.3,  15
 25  0.0,   0.0, 0   26  0.0,   0.0, 0   27  0.0,   0.0, 0   28  0.0,   0.0, 0   29  0.0,   0.0, 0   30 14.3,  15
 31 14.3,  15.5, 0   32 14.3,  15.5, 0   33 14.3,  15.0, 0   34 14.3,  14.1, 0   35  6.7,  11.2, 0   36  6.7,   9
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*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.3,	15.5, 0	6	14.3,	15
7	14.3,	14.1, 0	8	0.0,	0.0, 0	9	0.0,	0.0, 0	10	0.0,	0.0, 0	11	0.0,	0.0, 0	12	0.0,	0
13	0.0,	0.0, 0	14	6.7,	15.3, 0	15	6.7,	14.4, 0	16	6.7,	13.0, 0	17	6.7,	11.3, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15
25	0.0,	0.0, 0	26	0.0,	0.0, 0	27	0.0,	0.0, 0	28	0.0,	0.0, 0	29	0.0,	0.0, 0	30	0.0,	0
31	0.0,	0.0, 0	32	6.7,	15.3, 0	33	6.7,	14.4, 0	34	6.7,	13.0, 0	35	6.7,	11.3, 0	36	6.7,	9

SOURCE ID: LD7595A

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.6,	24.4, 0	6	14.6,	23
7	14.6,	23.3, 0	8	14.6,	23.5, 0	9	14.6,	23.8, 0	10	14.6,	23.3, 0	11	0.0,	0.0, 0	12	14.3,	15
13	14.3,	15.5, 0	14	14.3,	15.5, 0	15	14.3,	15.0, 0	16	14.3,	14.1, 0	17	6.7,	11.2, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15
25	0.0,	0.0, 0	26	0.0,	0.0, 0	27	0.0,	0.0, 0	28	0.0,	0.0, 0	29	14.3,	14.1, 0	30	14.3,	15
31	14.3,	15.5, 0	32	14.3,	15.5, 0	33	14.3,	15.0, 0	34	14.3,	14.1, 0	35	6.7,	11.2, 0	36	6.7,	9

SOURCE ID: LD7595B

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.3,	15.5, 0	6	14.3,	15
7	14.3,	14.1, 0	8	0.0,	0.0, 0	9	0.0,	0.0, 0	10	0.0,	0.0, 0	11	0.0,	0.0, 0	12	14.3,	15
13	14.3,	15.5, 0	14	14.3,	15.5, 0	15	14.3,	15.0, 0	16	14.3,	14.1, 0	17	6.7,	11.2, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15
25	0.0,	0.0, 0	26	0.0,	0.0, 0	27	0.0,	0.0, 0	28	0.0,	0.0, 0	29	0.0,	0.0, 0	30	14.3,	15
31	14.3,	15.5, 0	32	14.3,	15.5, 0	33	14.3,	15.0, 0	34	14.3,	14.1, 0	35	6.7,	11.2, 0	36	6.7,	9

SOURCE ID: LD7595C

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.3,	15.5, 0	6	14.3,	15
7	14.3,	14.1, 0	8	0.0,	0.0, 0	9	0.0,	0.0, 0	10	0.0,	0.0, 0	11	0.0,	0.0, 0	12	0.0,	0
13	0.0,	0.0, 0	14	6.7,	15.3, 0	15	6.7,	14.4, 0	16	6.7,	13.0, 0	17	6.7,	11.3, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15
25	0.0,	0.0, 0	26	0.0,	0.0, 0	27	0.0,	0.0, 0	28	0.0,	0.0, 0	29	0.0,	0.0, 0	30	0.0,	0
31	0.0,	0.0, 0	32	6.7,	15.3, 0	33	6.7,	14.4, 0	34	6.7,	13.0, 0	35	6.7,	11.3, 0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.6,	24.4, 0	6	14.6,	23
7	14.6,	23.3, 0	8	14.6,	23.5, 0	9	14.6,	23.8, 0	10	14.6,	23.3, 0	11	0.0,	0.0, 0	12	14.3,	15
13	14.3,	15.5, 0	14	14.3,	15.5, 0	15	14.3,	15.0, 0	16	14.3,	14.1, 0	17	6.7,	11.2, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15
25	0.0,	0.0, 0	26	0.0,	0.0, 0	27	0.0,	0.0, 0	28	0.0,	0.0, 0	29	14.3,	14.1, 0	30	14.3,	15
31	14.3,	15.5, 0	32	14.3,	15.5, 0	33	14.3,	15.0, 0	34	14.3,	14.1, 0	35	6.7,	11.2, 0	36	6.7,	9

SOURCE ID: LD5032B

IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	BW WAK	IFV	BH	B
1	14.3,	12.7, 0	2	14.3,	14.1, 0	3	14.3,	15.0, 0	4	14.3,	15.5, 0	5	14.3,	15.5, 0	6	14.3,	15
7	14.3,	14.1, 0	8	0.0,	0.0, 0	9	0.0,	0.0, 0	10	0.0,	0.0, 0	11	0.0,	0.0, 0	12	14.3,	15
13	14.3,	15.5, 0	14	14.3,	15.5, 0	15	14.3,	15.0, 0	16	14.3,	14.1, 0	17	6.7,	11.2, 0	18	6.7,	9
19	14.3,	12.7, 0	20	14.3,	14.1, 0	21	14.3,	15.0, 0	22	14.3,	15.5, 0	23	14.3,	15.5, 0	24	14.3,	15

25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5032C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

SOURCE ID: LD5095A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5095B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5095C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

(340300.0, 3165700.0, 0.0, 0.0); (340300.0, 3167700.0, 0.0, 0.0);
(340300.0, 3169800.0, 0.0, 0.0); (340700.0, 3171900.0, 0.0, 0.0);
(342000.0, 3174000.0, 0.0, 0.0); (343000.0, 3176200.0, 0.0, 0.0);
(343700.0, 3178300.0, 0.0, 0.0); (342400.0, 3180600.0, 0.0, 0.0);
(341100.0, 3183400.0, 0.0, 0.0); (339000.0, 3183400.0, 0.0, 0.0);
(336500.0, 3183400.0, 0.0, 0.0); (334000.0, 3183400.0, 0.0, 0.0);
(331500.0, 3183400.0, 0.0, 0.0);

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: P:\MET\TPATPA87.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: TAMPA
YEAR: 1987 YEAR: 1987

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87 01 01 01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87 01 01 02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87 01 01 03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87 01 01 04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87 01 01 05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87 01 01 06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87 01 01 07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87 01 01 08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87 01 01 09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87 01 01 10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87 01 01 11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00

```
87 01 01 12  116.0   6.17  287.0   4    1182.0  1182.0    0.0000       0.0  0.0000   0   0.00
87 01 01 13  133.0   7.20  287.6   4    1235.0  1235.0    0.0000       0.0  0.0000   0   0.00
87 01 01 14  119.0   7.72  287.6   4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 15  132.0   7.20  288.2   4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 16  134.0   7.72  289.3   4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 17  141.0   7.20  288.2   4    1288.0  1288.0    0.0000       0.0  0.0000   0   0.00
87 01 01 18  137.0   5.14  287.6   5    1286.4  1238.1    0.0000       0.0  0.0000   0   0.00
87 01 01 19  144.0   3.60  286.5   5    1281.2  1078.6    0.0000       0.0  0.0000   0   0.00
87 01 01 20  117.0   2.06  285.4   6    1276.0   919.0    0.0000       0.0  0.0000   0   0.00
87 01 01 21  110.0   1.54  284.8   7    1270.9   759.5    0.0000       0.0  0.0000   0   0.00
87 01 01 22  112.0   0.00  283.7   7    1265.7   600.0    0.0000       0.0  0.0000   0   0.00
87 01 01 23  120.0   2.57  283.7   6    1260.5   440.5    0.0000       0.0  0.0000   0   0.00
87 01 01 24  130.0   1.54  282.6   7    1255.4   281.0    0.0000       0.0  0.0000   0   0.00


*** NOTES:  STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
            FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
  *** ISCST3 - VERSION 99155 ***     *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00                    ***        04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1                   ***        15:05:
**MODELOPTs:                                                                                                            PAGE
CONC                            RURAL  FLAT          DFAULT

                                          *** THE SUMMARY OF MAXIMUM PERIOD (  8760 HRS) RESULTS ***


                                      ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                    **

                                                                                                    NETWORK
GROUP ID                         AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   1ST HIGHEST VALUE IS       0.00215 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00203 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00190 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

BASE95   1ST HIGHEST VALUE IS       0.00225 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00211 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00198 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

LD7532   1ST HIGHEST VALUE IS       0.00240 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00226 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00212 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

LD7595   1ST HIGHEST VALUE IS       0.00257 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00241 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00226 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

LD5032   1ST HIGHEST VALUE IS       0.00283 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00264 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00247 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

LD5095   1ST HIGHEST VALUE IS       0.00292 AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
         2ND HIGHEST VALUE IS       0.00272 AT (  340300.00,  3167700.00,      0.00,      0.00)  DC       NA
         3RD HIGHEST VALUE IS       0.00254 AT (  340300.00,  3169800.00,      0.00,      0.00)  DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***     *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00                    ***        04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1                   ***        15:05:
**MODELOPTs:                                                                                                            PAGE
CONC                            RURAL  FLAT          DFAULT

                                          *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***


                                      ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                    **

                                                   DATE                                                           NETWOR
GROUP ID                            AVERAGE CONC   (YYMMDDHH)           RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.03953c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00)  DC       NA
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```
BASE95   HIGH  1ST HIGH VALUE IS      0.04061c ON 87122224: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.04216c ON 87122224: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.04363c ON 87122224: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.04616  ON 87061524: AT (  343000.00,  3176200.00,       0.00,       0.00)  DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.04770  ON 87061524: AT (  343000.00,  3176200.00,       0.00,       0.00)  DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00                    ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1                    ***        15:05:
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT         DFAULT

                                                *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                        ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                   **

                                                      DATE                                                             NETWOR
GROUP ID                                AVERAGE CONC     (YYMMDDHH)              RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.14493c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

BASE95   HIGH  1ST HIGH VALUE IS      0.14889c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.15458c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.15997c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.16884c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.17200c ON 87122208: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00                    ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1                    ***        15:05:
**MODELOPTs:                                                                                                            PAGE
CONC                          RURAL  FLAT         DFAULT

                                                *** THE SUMMARY OF HIGHEST  3-HR RESULTS ***

                                        ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                   **

                                                      DATE                                                             NETWOR
GROUP ID                                AVERAGE CONC     (YYMMDDHH)              RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.30919  ON 87011003: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

BASE95   HIGH  1ST HIGH VALUE IS      0.31851  ON 87011003: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.33197  ON 87011003: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.34477  ON 87011003: AT (  340300.00,  3165700.00,       0.00,       0.00)  DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.36917  ON 87061506: AT (  343000.00,  3176200.00,       0.00,       0.00)  DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.38154  ON 87061506: AT (  343000.00,  3176200.00,       0.00,       0.00)  DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
```

```
                    GP = GRIDPOLR
                    DC = DISCCART
                    DP = DISCPOLR
                    BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00     ***      04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1    ***      15:05:
**MODELOPTs:                                                                                            PAGE
CONC                      RURAL  FLAT        DFAULT

                                            *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                    ** CONC OF GEN     IN (MICROGRAMS/CUBIC-METER)              **

                                                       DATE                                                        NETWOR
GROUP ID                          AVERAGE CONC     (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.58844  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

BASE95   HIGH  1ST HIGH VALUE IS      0.61029  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

LD7532   HIGH  1ST HIGH VALUE IS      0.64237  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

LD7595   HIGH  1ST HIGH VALUE IS      0.67341  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

LD5032   HIGH  1ST HIGH VALUE IS      0.72602  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

LD5095   HIGH  1ST HIGH VALUE IS      0.74511  ON 87072906: AT (  340300.00,  3167700.00,      0.00,      0.00)  DC      NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00     ***      04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1    ***      15:05:
**MODELOPTs:                                                                                            PAGE
CONC                      RURAL  FLAT        DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          0 Warning Message(s)
A Total of        531 Informational Message(s)

A Total of        531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :DEC1C1.087
ISCST3 OUTPUT FILE NUMBER 2 :DEC1C1.088
ISCST3 OUTPUT FILE NUMBER 3 :DEC1C1.089
ISCST3 OUTPUT FILE NUMBER 4 :DEC1C1.090
ISCST3 OUTPUT FILE NUMBER 5 :DEC1C1.091
First title for last output file is: 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
Second title for last output file is: FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE32					
Annual					
	1987	0.00211	340300.	3165700.	87123124
	1988	0.00302	340300.	3165700.	88123124
	1989	0.00301	343700.	3178300.	89123124
	1990	0.00196	340300.	3167700.	90123124
	1991	0.00204	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03909	340300.	3165700.	87122224
	1988	0.04699	343000.	3176200.	88112624
	1989	0.04564	340300.	3165700.	89100624
	1990	0.04335	341100.	3183400.	90021424
	1991	0.03423	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.14331	340300.	3165700.	87122208
	1988	0.11439	343000.	3176200.	88082608
	1989	0.13647	340700.	3171900.	89093008
	1990	0.08447	341100.	3183400.	90021408
	1991	0.10256	343700.	3178300.	91072724
HIGH 3-Hour					
	1987	0.30540	340300.	3165700.	87011003
	1988	0.19833	343000.	3176200.	88060606
	1989	0.28330	340300.	3165700.	89030503
	1990	0.17332	340300.	3167700.	90112406
	1991	0.24682	342000.	3174000.	91120303
HIGH 1-Hour					
	1987	0.57952	340300.	3167700.	87072906
	1988	0.55801	340300.	3165700.	88092120
	1989	0.57855	340300.	3167700.	89091508
	1990	0.51997	340300.	3167700.	90112405
	1991	0.57827	340300.	3167700.	91070907
SOURCE GROUP ID: BASE95					
Annual					
	1987	0.00218	340300.	3165700.	87123124
	1988	0.00310	340300.	3165700.	88123124
	1989	0.00313	343700.	3178300.	89123124
	1990	0.00202	340300.	3167700.	90123124
	1991	0.00212	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03997	340300.	3165700.	87122224
	1988	0.04839	343000.	3176200.	88112624
	1989	0.04769	340300.	3165700.	89100624
	1990	0.04845	341100.	3183400.	90021424
	1991	0.03570	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.14656	340300.	3165700.	87122208
	1988	0.11726	343000.	3176200.	88082608
	1989	0.13921	340700.	3171900.	89093008
	1990	0.08820	341100.	3183400.	90021408
	1991	0.10564	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.31305	340300.	3165700.	87011003
	1988	0.20483	343000.	3176200.	88060606
	1989	0.29300	340300.	3165700.	89030503
	1990	0.17802	340300.	3167700.	90112406
	1991	0.25178	342000.	3174000.	91120303
HIGH 1-Hour					
	1987	0.59728	340300.	3167700.	87072906
	1988	0.57520	340300.	3165700.	88092120
	1989	0.59624	340300.	3167700.	89091508
	1990	0.53405	340300.	3167700.	90112405
	1991	0.59594	340300.	3167700.	91070907
SOURCE GROUP ID: LD7532					

Annual					
	1987	0.00238	340300.	3165700.	87123124
	1988	0.00333	340300.	3165700.	88123124
	1989	0.00341	343700.	3178300.	89123124
	1990	0.00219	340300.	3167700.	90123124
	1991	0.00227	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04181	340300.	3165700.	87122224
	1988	0.05141	343000.	3176200.	88112624
	1989	0.05663	340300.	3165700.	89100624
	1990	0.05162	341100.	3183400.	90021424
	1991	0.04180	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.15331	340300.	3165700.	87122208
	1988	0.12332	343000.	3176200.	88082608
	1989	0.15224	340300.	3165700.	89100608
	1990	0.09630	341100.	3183400.	90021408
	1991	0.11328	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.32900	340300.	3165700.	87011003
	1988	0.21886	343000.	3176200.	88060606
	1989	0.31384	340300.	3165700.	89030503
	1990	0.18785	340300.	3167700.	90112406
	1991	0.26234	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.63512	340300.	3167700.	87072906
	1988	0.61183	340300.	3165700.	88092120
	1989	0.63401	340300.	3167700.	89091508
	1990	0.56355	340300.	3167700.	90112405
	1991	0.63369	340300.	3167700.	91070907
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00254	340300.	3165700.	87123124
	1988	0.00355	340300.	3165700.	88123124
	1989	0.00366	343700.	3178300.	89123124
	1990	0.00230	340300.	3167700.	90123124
	1991	0.00241	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04327	340300.	3165700.	87122224
	1988	0.05384	343000.	3176200.	88112624
	1989	0.06059	340300.	3165700.	89100624
	1990	0.05424	341100.	3183400.	90021424
	1991	0.04444	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.15865	340300.	3165700.	87122208
	1988	0.12815	343000.	3176200.	88082608
	1989	0.16362	340300.	3165700.	89100608
	1990	0.10303	341100.	3183400.	90021408
	1991	0.11956	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.34165	340300.	3165700.	87011003
	1988	0.23040	343000.	3176200.	88060606
	1989	0.33091	340300.	3165700.	89030503
	1990	0.19570	340300.	3167700.	90112406
	1991	0.27517	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.66569	340300.	3167700.	87072906
	1988	0.64144	340300.	3165700.	88092120
	1989	0.66455	340300.	3167700.	89091508
	1990	0.58709	340300.	3167700.	90112405
	1991	0.66422	340300.	3167700.	91070907
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00279	340300.	3165700.	87123124
	1988	0.00391	340300.	3165700.	88123124
	1989	0.00408	343700.	3178300.	89123124
	1990	0.00248	340300.	3167700.	90123124
	1991	0.00266	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04579	340300.	3165700.	87122224
	1988	0.05892	340300.	3165700.	88073124
	1989	0.06770	340300.	3165700.	89100624
	1990	0.05900	341100.	3183400.	90021424
	1991	0.04958	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.16788	340300.	3165700.	87122208
	1988	0.13665	343000.	3176200.	88082608

	1989	0.18494	340300.	3165700.	89100608
	1990	0.11541	341100.	3183400.	90021408
	1991	0.13088	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.36548	343000.	3176200.	87061506
	1988	0.25141	343000.	3176200.	88060606
	1989	0.36185	340300.	3165700.	89030503
	1990	0.20940	340300.	3167700.	90112406
	1991	0.29839	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.72027	340300.	3167700.	87072906
	1988	0.69432	340300.	3165700.	88092120
	1989	0.71922	340300.	3167700.	89091508
	1990	0.62821	340300.	3167700.	90112405
	1991	0.71892	340300.	3167700.	91070907
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00292	340300.	3165700.	87123124
	1988	0.00406	340300.	3165700.	88123124
	1989	0.00424	343700.	3178300.	89123124
	1990	0.00257	340300.	3167700.	90123124
	1991	0.00278	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04787	343000.	3176200.	87061524
	1988	0.06182	340300.	3165700.	88073124
	1989	0.07138	340300.	3165700.	89100624
	1990	0.06143	341100.	3183400.	90021424
	1991	0.05230	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.17236	340300.	3165700.	87122208
	1988	0.14078	343000.	3176200.	88082608
	1989	0.19598	340300.	3165700.	89100608
	1990	0.12179	341100.	3183400.	90021408
	1991	0.13665	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.38290	343000.	3176200.	87061506
	1988	0.26204	343000.	3176200.	88060606
	1989	0.37744	340300.	3165700.	89030503
	1990	0.21613	340300.	3167700.	90112406
	1991	0.31001	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.74720	340300.	3167700.	87072906
	1988	0.72042	340300.	3165700.	88092120
	1989	0.74618	340300.	3167700.	89091508
	1990	0.64838	340300.	3167700.	90112405
	1991	0.74588	340300.	3167700.	91070907

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
CO TITLEONE 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00
CO TITLETWO FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1
CO MODELOPT DFAULT CONC RURAL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID   SRCTYP     XS     YS       ZS
** MODELING ORIGIN CT NO.2 STACK LOCATION
**  CT STACK NUMBER CODE
** ------------------------
**  A -  CT NO. 1
**  B -  CT NO. 2
**  C -  CT NO. 3
** Source Location Cards:
**         SRCID SRCTYP        XS      YS        ZS
**   UTM                       (m)     (m)       (m)
SO LOCATION  BASE32A  POINT  419400   3069700  0.0
SO LOCATION  BASE32B  POINT  419400   3069700  0.0
SO LOCATION  BASE32C  POINT  419400   3069700  0.0
**
SO LOCATION  BASE95A  POINT    419400   3069700  0.0
SO LOCATION  BASE95B  POINT    419400   3069700  0.0
SO LOCATION  BASE95C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7532A  POINT    419400   3069700  0.0
SO LOCATION  LD7532B  POINT    419400   3069700  0.0
SO LOCATION  LD7532C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7595A  POINT    419400   3069700  0.0
SO LOCATION  LD7595B  POINT    419400   3069700  0.0
SO LOCATION  LD7595C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5032A  POINT    419400   3069700  0.0
SO LOCATION  LD5032B  POINT    419400   3069700  0.0
SO LOCATION  LD5032C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5095A  POINT    419400   3069700  0.0
SO LOCATION  LD5095B  POINT    419400   3069700  0.0
SO LOCATION  LD5095C  POINT    419400   3069700  0.0
**
** Source Parameter Cards:
** POINT:   SRCID           QS        HS         TS        VS         DS
**                         (g/s)      (m)        (K)      (m/s)       (m)
SO SRCPARAM   BASE32A     3.334     18.3      852.0      37.1       6.4
SO SRCPARAM   BASE32B     3.333     18.3      852.0      37.1       6.4
SO SRCPARAM   BASE32C     3.333     18.3      852.0      37.1       6.4
**
SO SRCPARAM   BASE95A     3.334     18.3      884.0      34.7       6.4
SO SRCPARAM   BASE95B     3.333     18.3      884.0      34.7       6.4
SO SRCPARAM   BASE95C     3.333     18.3      884.0      34.7       6.4
**
SO SRCPARAM   LD7532A     3.334     18.3      913.0      30.9       6.4
SO SRCPARAM   LD7532B     3.333     18.3      913.0      30.9       6.4
SO SRCPARAM   LD7532C     3.333     18.3      913.0      30.9       6.4
**
SO SRCPARAM   LD7595A     3.334     18.3      922.0      28.4       6.4
SO SRCPARAM   LD7595B     3.333     18.3      922.0      28.4       6.4
SO SRCPARAM   LD7595C     3.333     18.3      922.0      28.4       6.4
**
SO SRCPARAM   LD5032A     3.334     18.3      864.0      25.5       6.4
SO SRCPARAM   LD5032B     3.333     18.3      864.0      25.5       6.4
SO SRCPARAM   LD5032C     3.333     18.3      864.0      25.5       6.4
**
SO SRCPARAM   LD5095A     3.334     18.3      851.0      24.0       6.4
SO SRCPARAM   LD5095B     3.333     18.3      851.0      24.0       6.4
SO SRCPARAM   LD5095C     3.333     18.3      851.0      24.0       6.4
**
**
SO BUILDHGT BASE32A-BASE95A        14.33    14.33    14.33    14.33    14.63    14.63
SO BUILDHGT BASE32A-BASE95A        14.63    14.63    14.63    14.63     0.00    14.33
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SO BUILDHGT BASE32A-BASE95A      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32A-BASE95A      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32A-BASE95A       0.00    0.00    0.00    0.00   14.33   14.33
SO BUILDHGT BASE32A-BASE95A      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID BASE32A-BASE95A      12.74   14.10   15.03   15.50   24.40   23.57
SO BUILDWID BASE32A-BASE95A      23.32   23.54   23.80   23.33    0.00   15.03
SO BUILDWID BASE32A-BASE95A      15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID BASE32A-BASE95A      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID BASE32A-BASE95A       0.00    0.00    0.00    0.00   14.10   15.03
SO BUILDWID BASE32A-BASE95A      15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT BASE32B-BASE95B      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B      14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT BASE32B-BASE95B      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT BASE32B-BASE95B      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32B-BASE95B       0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT BASE32B-BASE95B      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID BASE32B-BASE95B      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID BASE32B-BASE95B      14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID BASE32B-BASE95B      15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID BASE32B-BASE95B      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID BASE32B-BASE95B       0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID BASE32B-BASE95B      15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT BASE32C-BASE95C      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32C-BASE95C      14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C       0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT BASE32C-BASE95C      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT BASE32C-BASE95C       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT BASE32C-BASE95C       0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID BASE32C-BASE95C      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID BASE32C-BASE95C      14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C       0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID BASE32C-BASE95C      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID BASE32C-BASE95C       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID BASE32C-BASE95C       0.00   15.28   14.37   13.02   11.28    9.20
**
**
SO BUILDHGT LD7532A-LD7595A      14.33   14.33   14.33   14.33   14.63   14.63
SO BUILDHGT LD7532A-LD7595A      14.63   14.63   14.63   14.63    0.00   14.33
SO BUILDHGT LD7532A-LD7595A      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD7532A-LD7595A      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD7532A-LD7595A       0.00    0.00    0.00    0.00   14.33   14.33
SO BUILDHGT LD7532A-LD7595A      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD7532A-LD7595A      12.74   14.10   15.03   15.50   24.40   23.57
SO BUILDWID LD7532A-LD7595A      23.32   23.54   23.80   23.33    0.00   15.03
SO BUILDWID LD7532A-LD7595A      15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD7532A-LD7595A      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD7532A-LD7595A       0.00    0.00    0.00    0.00   14.10   15.03
SO BUILDWID LD7532A-LD7595A      15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD7532B-LD7595B      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD7532B-LD7595B      14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD7532B-LD7595B      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD7532B-LD7595B      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD7532B-LD7595B       0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD7532B-LD7595B      14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD7532B-LD7595B      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD7532B-LD7595B      14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD7532B-LD7595B      15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD7532B-LD7595B      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD7532B-LD7595B       0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD7532B-LD7595B      15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD7532C-LD7595C      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD7532C-LD7595C      14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD7532C-LD7595C       0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD7532C-LD7595C      14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD7532C-LD7595C       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD7532C-LD7595C       0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD7532C-LD7595C      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD7532C-LD7595C      14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD7532C-LD7595C       0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID LD7532C-LD7595C      12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD7532C-LD7595C       0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD7532C-LD7595C       0.00   15.28   14.37   13.02   11.28    9.20
**
```

```
**
SO BUILDHGT LD5032A-LD5095A        14.33   14.33   14.33   14.33   14.63   14.63
SO BUILDHGT LD5032A-LD5095A        14.63   14.63   14.63   14.63    0.00   14.33
SO BUILDHGT LD5032A-LD5095A        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032A-LD5095A        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD5095A         0.00    0.00    0.00    0.00   14.33   14.33
SO BUILDHGT LD5032A-LD5095A        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032A-LD5095A        12.74   14.10   15.03   15.50   24.40   23.57
SO BUILDWID LD5032A-LD5095A        23.32   23.54   23.80   23.33    0.00   15.03
SO BUILDWID LD5032A-LD5095A        15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032A-LD5095A        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032A-LD5095A         0.00    0.00    0.00    0.00   14.10   15.03
SO BUILDWID LD5032A-LD5095A        15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032B-LD5095B        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B        14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD5095B        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B         0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B        14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032B-LD5095B        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B        14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B        15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032B-LD5095B        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B         0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B        15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032C-LD5095C        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C        14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C         0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032C-LD5095C        14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C         0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C         0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD5095C        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C        14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C         0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID LD5032C-LD5095C        12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C         0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C         0.00   15.28   14.37   13.02   11.28    9.20
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)          (MICROGRAMS/CUBIC-METER)

SO SRCGROUP BASE32   BASE32A   BASE32B   BASE32C
SO SRCGROUP BASE95   BASE95A   BASE95B   BASE95C
SO SRCGROUP LD7532   LD7532A   LD7532B   LD7532C
SO SRCGROUP LD7595   LD7595A   LD7595B   LD7595C
SO SRCGROUP LD5032   LD5032A   LD5032B   LD5032C
SO SRCGROUP LD5095   LD5095A   LD5095B   LD5095C
**
SO FINISHED
RE STARTING
**              UTM(m)    UTM(m)
RE DISCCART     340300     3165700
RE DISCCART     340300     3167700
RE DISCCART     340300     3169800
RE DISCCART     340700     3171900
RE DISCCART     342000     3174000
RE DISCCART     343000     3176200
RE DISCCART     343700     3178300
RE DISCCART     342400     3180600
RE DISCCART     341100     3183400
RE DISCCART     339000     3183400
RE DISCCART     336500     3183400
RE DISCCART     334000     3183400
RE DISCCART     331500     3183400

RE FINISHED
**
ME STARTING
ME INPUTFIL P:\MET\TPATPA87.MET
ME ANEMHGHT    22 FEET
ME SURFDATA  12842      1987        TAMPA
ME UAIRDATA  12842      1987        TAMPA
ME WINDCATS    1.54     3.09     5.14     8.23    10.80
ME FINISHED
**
```

```
OU STARTING
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00         ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1          ***        13:39:
**MODELOPTs:                                                                                                   PAGE
CONC                        RURAL  FLAT          DFAULT

                                          ***     MODEL SETUP OPTIONS SUMMARY      ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);      6 Source Group(s); and      13 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.71 ;    Decay Coef. =    0.000     ;   Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.2 MB of RAM.

**Input Runstream File:          DEC1C1.i87
**Output Print File:             DEC1C1.087
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00         ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1          ***        13:39:
**MODELOPTs:                                                                                                   PAGE
CONC                        RURAL  FLAT          DFAULT


                                               *** POINT SOURCE DATA ***
```

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	852.00	37.10	6.40	YES	
BASE32B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	852.00	37.10	6.40	YES	
BASE32C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	852.00	37.10	6.40	YES	
BASE95A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	884.00	34.70	6.40	YES	
BASE95B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	884.00	34.70	6.40	YES	
BASE95C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	884.00	34.70	6.40	YES	
LD7532A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	913.00	30.90	6.40	YES	
LD7532B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	913.00	30.90	6.40	YES	
LD7532C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	913.00	30.90	6.40	YES	
LD7595A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	922.00	28.40	6.40	YES	
LD7595B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	922.00	28.40	6.40	YES	
LD7595C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	922.00	28.40	6.40	YES	
LD5032A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	864.00	25.50	6.40	YES	
LD5032B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	864.00	25.50	6.40	YES	
LD5032C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	864.00	25.50	6.40	YES	
LD5095A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	851.00	24.00	6.40	YES	
LD5095B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	851.00	24.00	6.40	YES	
LD5095C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	851.00	24.00	6.40	YES	

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
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CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15

```
   13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30  14.3,  15
   31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,   9


SOURCE ID: BASE32C
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,  15
    7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12   0.0,   0
   13   0.0,    0.0, 0    14   6.7,   15.3, 0    15   6.7,   14.4, 0    16   6.7,   13.0, 0    17   6.7,   11.3, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30   0.0,   0
   31   0.0,    0.0, 0    32   6.7,   15.3, 0    33   6.7,   14.4, 0    34   6.7,   13.0, 0    35   6.7,   11.3, 0    36   6.7,   9


SOURCE ID: BASE95A
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.6,   24.4, 0     6  14.6,  23
    7  14.6,   23.3, 0     8  14.6,   23.5, 0     9  14.6,   23.8, 0    10  14.6,   23.3, 0    11   0.0,    0.0, 0    12  14.3,  15
   13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29  14.3,   14.1, 0    30  14.3,  15
   31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,   9

  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00                 ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1                 ***        13:39:
**MODELOPTs:                                                                                                          PAGE
CONC                          RURAL  FLAT          DFAULT

                                            *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: BASE95B
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,  15
    7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12  14.3,  15
   13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30  14.3,  15
   31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,   9


SOURCE ID: BASE95C
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,  15
    7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12   0.0,   0
   13   0.0,    0.0, 0    14   6.7,   15.3, 0    15   6.7,   14.4, 0    16   6.7,   13.0, 0    17   6.7,   11.3, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30   0.0,   0
   31   0.0,    0.0, 0    32   6.7,   15.3, 0    33   6.7,   14.4, 0    34   6.7,   13.0, 0    35   6.7,   11.3, 0    36   6.7,   9


SOURCE ID: LD7532A
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.6,   24.4, 0     6  14.6,  23
    7  14.6,   23.3, 0     8  14.6,   23.5, 0     9  14.6,   23.8, 0    10  14.6,   23.3, 0    11   0.0,    0.0, 0    12  14.3,  15
   13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29  14.3,   14.1, 0    30  14.3,  15
   31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,   9


SOURCE ID: LD7532B
 IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH      BW  WAK  IFV    BH    B
    1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,  15
    7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12  14.3,  15
   13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,   9
   19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,  15
   25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30  14.3,  15
   31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,   9
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*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

SOURCE ID: LD7595A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD7595B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD7595C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5032B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9

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  19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,   15
  25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30  14.3,   15
  31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,    9
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SOURCE ID: LD5032C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      B
   1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,   15
   7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12   0.0,    0
  13   0.0,    0.0, 0    14   6.7,   15.3, 0    15   6.7,   14.4, 0    16   6.7,   13.0, 0    17   6.7,   11.3, 0    18   6.7,    9
  19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,   15
  25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30   0.0,    0
  31   0.0,    0.0, 0    32   6.7,   15.3, 0    33   6.7,   14.4, 0    34   6.7,   13.0, 0    35   6.7,   11.3, 0    36   6.7,    9
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SOURCE ID: LD5095A
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      B
   1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.6,   24.4, 0     6  14.6,   23
   7  14.6,   23.3, 0     8  14.6,   23.5, 0     9  14.6,   23.8, 0    10  14.6,   23.3, 0    11   0.0,    0.0, 0    12  14.3,   15
  13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,    9
  19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,   15
  25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29  14.3,   14.1, 0    30  14.3,   15
  31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,    9
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 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00                 ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1                ***        13:39:
**MODELOPTs:                                                                                                          PAGE
CONC                        RURAL  FLAT          DFAULT
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*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

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SOURCE ID: LD5095B
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      B
   1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,   15
   7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12  14.3,   15
  13  14.3,   15.5, 0    14  14.3,   15.5, 0    15  14.3,   15.0, 0    16  14.3,   14.1, 0    17   6.7,   11.2, 0    18   6.7,    9
  19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,   15
  25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30  14.3,   15
  31  14.3,   15.5, 0    32  14.3,   15.5, 0    33  14.3,   15.0, 0    34  14.3,   14.1, 0    35   6.7,   11.2, 0    36   6.7,    9
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SOURCE ID: LD5095C
 IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      BW  WAK  IFV   BH      B
   1  14.3,   12.7, 0     2  14.3,   14.1, 0     3  14.3,   15.0, 0     4  14.3,   15.5, 0     5  14.3,   15.5, 0     6  14.3,   15
   7  14.3,   14.1, 0     8   0.0,    0.0, 0     9   0.0,    0.0, 0    10   0.0,    0.0, 0    11   0.0,    0.0, 0    12   0.0,    0
  13   0.0,    0.0, 0    14   6.7,   15.3, 0    15   6.7,   14.4, 0    16   6.7,   13.0, 0    17   6.7,   11.3, 0    18   6.7,    9
  19  14.3,   12.7, 0    20  14.3,   14.1, 0    21  14.3,   15.0, 0    22  14.3,   15.5, 0    23  14.3,   15.5, 0    24  14.3,   15
  25   0.0,    0.0, 0    26   0.0,    0.0, 0    27   0.0,    0.0, 0    28   0.0,    0.0, 0    29   0.0,    0.0, 0    30   0.0,    0
  31   0.0,    0.0, 0    32   6.7,   15.3, 0    33   6.7,   14.4, 0    34   6.7,   13.0, 0    35   6.7,   11.3, 0    36   6.7,    9
```

```
 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00                 ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1                ***        13:39:
**MODELOPTs:                                                                                                          PAGE
CONC                        RURAL  FLAT          DFAULT
```

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZFLAG)
(METERS)

```
   ( 340300.0, 3165700.0,       0.0,       0.0);          ( 340300.0, 3167700.0,       0.0,       0.0);
   ( 340300.0, 3169800.0,       0.0,       0.0);          ( 340700.0, 3171900.0,       0.0,       0.0);
   ( 342000.0, 3174000.0,       0.0,       0.0);          ( 343000.0, 3176200.0,       0.0,       0.0);
   ( 343700.0, 3178300.0,       0.0,       0.0);          ( 342400.0, 3180600.0,       0.0,       0.0);
   ( 341100.0, 3183400.0,       0.0,       0.0);          ( 339000.0, 3183400.0,       0.0,       0.0);
   ( 336500.0, 3183400.0,       0.0,       0.0);          ( 334000.0, 3183400.0,       0.0,       0.0);
   ( 331500.0, 3183400.0,       0.0,       0.0);
```

```
 *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00                 ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1                ***        13:39:
**MODELOPTs:                                                                                                          PAGE
CONC                        RURAL  FLAT          DFAULT
```

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: P:\MET\TPATPA87.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: TAMPA
YEAR: 1987 YEAR: 1987

YR MN DY HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87 01 01 01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87 01 01 02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87 01 01 03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87 01 01 04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87 01 01 05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87 01 01 06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87 01 01 07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87 01 01 08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87 01 01 09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87 01 01 10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00

87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00
87	01	01	12	116.0	6.17	287.0	4	1182.0	1182.0	0.0000	0.0	0.0000	0	0.00
87	01	01	13	133.0	7.20	287.6	4	1235.0	1235.0	0.0000	0.0	0.0000	0	0.00
87	01	01	14	119.0	7.72	287.6	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	15	132.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	16	134.0	7.72	289.3	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	17	141.0	7.20	288.2	4	1288.0	1288.0	0.0000	0.0	0.0000	0	0.00
87	01	01	18	137.0	5.14	287.6	5	1286.4	1238.1	0.0000	0.0	0.0000	0	0.00
87	01	01	19	144.0	3.60	286.5	5	1281.2	1078.6	0.0000	0.0	0.0000	0	0.00
87	01	01	20	117.0	2.06	285.4	6	1276.0	919.0	0.0000	0.0	0.0000	0	0.00
87	01	01	21	110.0	1.54	284.8	7	1270.9	759.5	0.0000	0.0	0.0000	0	0.00
87	01	01	22	112.0	0.00	283.7	7	1265.7	600.0	0.0000	0.0	0.0000	0	0.00
87	01	01	23	120.0	2.57	283.7	6	1260.5	440.5	0.0000	0.0	0.0000	0	0.00
87	01	01	24	130.0	1.54	282.6	7	1255.4	281.0	0.0000	0.0	0.0000	0	0.00

*** NOTES: STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
BASE32	1ST HIGHEST VALUE IS	0.00211	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00198	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00186	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA
BASE95	1ST HIGHEST VALUE IS	0.00218	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00205	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00193	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA
LD7532	1ST HIGHEST VALUE IS	0.00238	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00223	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00209	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA
LD7595	1ST HIGHEST VALUE IS	0.00254	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00238	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00223	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA
LD5032	1ST HIGHEST VALUE IS	0.00279	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00261	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00244	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA
LD5095	1ST HIGHEST VALUE IS	0.00292	AT (340300.00, 3165700.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.00273	AT (340300.00, 3167700.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.00255	AT (340300.00, 3169800.00, 0.00, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

*** ISCST3 - VERSION 99155 *** *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 13:39:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF GEN IN (MICROGRAMS/CUBIC-METER) **

GROUP ID	AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWOR GRID-I

```
BASE32   HIGH  1ST HIGH VALUE IS      0.03909c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

BASE95   HIGH  1ST HIGH VALUE IS      0.03997c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.04181c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.04327c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.04579c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.04787  ON 87061524: AT (  343000.00,  3176200.00,      0.00,      0.00) DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00            ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1             ***        13:39:
**MODELOPTs:                                                                                                      PAGE
CONC                        RURAL  FLAT          DFAULT

                                             *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***


                                       ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)               **

                                                    DATE                                                          NETWOR
GROUP ID                          AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.14331c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

BASE95   HIGH  1ST HIGH VALUE IS      0.14656c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.15331c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.15865c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.16788c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.17236c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00            ***        04/21
                                   *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1             ***        13:39:
**MODELOPTs:                                                                                                      PAGE
CONC                        RURAL  FLAT          DFAULT

                                             *** THE SUMMARY OF HIGHEST  3-HR RESULTS ***


                                       ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)               **

                                                    DATE                                                          NETWOR
GROUP ID                          AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.30540  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

BASE95   HIGH  1ST HIGH VALUE IS      0.31305  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7532   HIGH  1ST HIGH VALUE IS      0.32900  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD7595   HIGH  1ST HIGH VALUE IS      0.34165  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC       NA

LD5032   HIGH  1ST HIGH VALUE IS      0.36548  ON 87061506: AT (  343000.00,  3176200.00,      0.00,      0.00) DC       NA

LD5095   HIGH  1ST HIGH VALUE IS      0.38290  ON 87061506: AT (  343000.00,  3176200.00,      0.00,      0.00) DC       NA
```

```
 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00        ***      04/21
                                    *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1        ***      13:39:
**MODELOPTs:                                                                                                 PAGE
CONC                       RURAL  FLAT          DFAULT

                                          *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                    ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                 **

                                                        DATE                                                      NETWOR
GROUP ID                               AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS       0.57952  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

BASE95   HIGH  1ST HIGH VALUE IS       0.59728  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

LD7532   HIGH  1ST HIGH VALUE IS       0.63512  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

LD7595   HIGH  1ST HIGH VALUE IS       0.66569  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

LD5032   HIGH  1ST HIGH VALUE IS       0.72027  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

LD5095   HIGH  1ST HIGH VALUE IS       0.74720  ON 87072906: AT (  340300.00,  3167700.00,       0.00,      0.00)  DC      NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE  04/21/00        ***      04/21
                                    *** FUEL OIL, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1        ***      13:39:
**MODELOPTs:                                                                                                 PAGE
CONC                       RURAL  FLAT          DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of          0 Fatal Error Message(s)
A Total of          0 Warning Message(s)
A Total of        531 Informational Message(s)

A Total of        531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

ISCBOB3 RELEASE 98056

ISCST3 OUTPUT FILE NUMBER 1 :DEC2C1.087
ISCST3 OUTPUT FILE NUMBER 2 :DEC2C1.088
ISCST3 OUTPUT FILE NUMBER 3 :DEC2C1.089
ISCST3 OUTPUT FILE NUMBER 4 :DEC2C1.090
ISCST3 OUTPUT FILE NUMBER 5 :DEC2C1.091
First title for last output file is: 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
Second title for last output file is: NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1

AVERAGING TIME	YEAR	CONC (ug/m3)	DIR (deg) or X (m)	DIST (m) or Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID:	BASE32				
Annual					
	1987	0.00215	340300.	3165700.	87123124
	1988	0.00306	340300.	3165700.	88123124
	1989	0.00306	343700.	3178300.	89123124
	1990	0.00199	340300.	3167700.	90123124
	1991	0.00208	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.03953	340300.	3165700.	87122224
	1988	0.04769	343000.	3176200.	88112624
	1989	0.04666	340300.	3165700.	89100624
	1990	0.04770	341100.	3183400.	90021424
	1991	0.03496	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.14493	340300.	3165700.	87122208
	1988	0.11584	343000.	3176200.	88082608
	1989	0.13785	340700.	3171900.	89093008
	1990	0.08631	341100.	3183400.	90021408
	1991	0.10382	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.30919	340300.	3165700.	87011003
	1988	0.20157	343000.	3176200.	88060606
	1989	0.28813	340300.	3165700.	89030503
	1990	0.17565	340300.	3167700.	90112406
	1991	0.24930	342000.	3174000.	91120303
HIGH 1-Hour					
	1987	0.58844	340300.	3167700.	87072906
	1988	0.56665	340300.	3165700.	88092120
	1989	0.58747	340300.	3167700.	89091508
	1990	0.52696	340300.	3167700.	90112405
	1991	0.58719	340300.	3167700.	91070907
SOURCE GROUP ID:	BASE95				
Annual					
	1987	0.00225	340300.	3165700.	87123124
	1988	0.00318	340300.	3165700.	88123124
	1989	0.00322	343700.	3178300.	89123124
	1990	0.00209	340300.	3167700.	90123124
	1991	0.00216	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04061	340300.	3165700.	87122224
	1988	0.04942	343000.	3176200.	88112624
	1989	0.04921	340300.	3165700.	89100624
	1990	0.04952	341100.	3183400.	90021424
	1991	0.03679	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.14889	340300.	3165700.	87122208
	1988	0.11935	343000.	3176200.	88082608
	1989	0.14329	340300.	3165700.	89100608
	1990	0.09092	341100.	3183400.	90021408
	1991	0.10821	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.31851	340300.	3165700.	87011003
	1988	0.20961	343000.	3176200.	88060606
	1989	0.30009	340300.	3165700.	89030503
	1990	0.18138	340300.	3167700.	90112406
	1991	0.25534	342000.	3174000.	91120303
HIGH 1-Hour					
	1987	0.61029	340300.	3167700.	87072906
	1988	0.58779	340300.	3165700.	88092120
	1989	0.60925	340300.	3167700.	89091508
	1990	0.54415	340300.	3167700.	90112405
	1991	0.60895	340300.	3167700.	91070907
SOURCE GROUP ID:	LD7532				

Annual					
	1987	0.00240	340300.	3165700.	87123124
	1988	0.00340	340300.	3165700.	88123124
	1989	0.00346	343700.	3178300.	89123124
	1990	0.00221	340300.	3167700.	90123124
	1991	0.00230	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04216	340300.	3165700.	87122224
	1988	0.05198	343000.	3176200.	88112624
	1989	0.05751	340300.	3165700.	89100624
	1990	0.05223	341100.	3183400.	90021424
	1991	0.04241	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.15458	340300.	3165700.	87122208
	1988	0.12447	343000.	3176200.	88082608
	1989	0.15490	340300.	3165700.	89100608
	1990	0.09785	341100.	3183400.	90021408
	1991	0.11473	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.33197	340300.	3165700.	87011003
	1988	0.22157	343000.	3176200.	88060606
	1989	0.31784	340300.	3165700.	89030503
	1990	0.18970	340300.	3167700.	90112406
	1991	0.26537	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.64237	340300.	3167700.	87072906
	1988	0.61886	340300.	3165700.	88092120
	1989	0.64128	340300.	3167700.	89091508
	1990	0.56909	340300.	3167700.	90112405
	1991	0.64096	340300.	3167700.	91070907
SOURCE GROUP ID:	LD7595				
Annual					
	1987	0.00257	340300.	3165700.	87123124
	1988	0.00359	340300.	3165700.	88123124
	1989	0.00370	343700.	3178300.	89123124
	1990	0.00232	340300.	3167700.	90123124
	1991	0.00243	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04363	340300.	3165700.	87122224
	1988	0.05447	343000.	3176200.	88112624
	1989	0.06157	340300.	3165700.	89100624
	1990	0.05490	341100.	3183400.	90021424
	1991	0.04514	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.15997	340300.	3165700.	87122208
	1988	0.12936	343000.	3176200.	88082608
	1989	0.16655	340300.	3165700.	89100608
	1990	0.10474	341100.	3183400.	90021408
	1991	0.12113	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.34477	340300.	3165700.	87011003
	1988	0.23333	343000.	3176200.	88060606
	1989	0.33524	340300.	3165700.	89030503
	1990	0.19764	340300.	3167700.	90112406
	1991	0.27843	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.67341	340300.	3167700.	87072906
	1988	0.64892	340300.	3165700.	88092120
	1989	0.67229	340300.	3167700.	89091508
	1990	0.59293	340300.	3167700.	90112405
	1991	0.67197	340300.	3167700.	91070907
SOURCE GROUP ID:	LD5032				
Annual					
	1987	0.00283	340300.	3165700.	87123124
	1988	0.00395	340300.	3165700.	88123124
	1989	0.00411	343700.	3178300.	89123124
	1990	0.00250	340300.	3167700.	90123124
	1991	0.00269	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04616	343000.	3176200.	87061524
	1988	0.05954	340300.	3165700.	88073124
	1989	0.06847	340300.	3165700.	89100624
	1990	0.05951	341100.	3183400.	90021424
	1991	0.05015	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.16884	340300.	3165700.	87122208
	1988	0.13754	343000.	3176200.	88082608

	1989	0.18727	340300.	3165700.	89100608
	1990	0.11674	341100.	3183400.	90021408
	1991	0.13208	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.36917	343000.	3176200.	87061506
	1988	0.25366	343000.	3176200.	88060606
	1989	0.36515	340300.	3165700.	89030503
	1990	0.21083	340300.	3167700.	90112406
	1991	0.30086	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.72602	340300.	3167700.	87072906
	1988	0.69989	340300.	3165700.	88092120
	1989	0.72500	340300.	3167700.	89091508
	1990	0.63248	340300.	3167700.	90112405
	1991	0.72471	340300.	3167700.	91070907
SOURCE GROUP ID:	LD5095				
Annual					
	1987	0.00292	340300.	3165700.	87123124
	1988	0.00405	340300.	3165700.	88123124
	1989	0.00422	343700.	3178300.	89123124
	1990	0.00257	340300.	3167700.	90123124
	1991	0.00276	340300.	3165700.	91123124
HIGH 24-Hour					
	1987	0.04770	343000.	3176200.	87061524
	1988	0.06160	340300.	3165700.	88073124
	1989	0.07109	340300.	3165700.	89100624
	1990	0.06123	341100.	3183400.	90021424
	1991	0.05209	340300.	3165700.	91072724
HIGH 8-Hour					
	1987	0.17200	340300.	3165700.	87122208
	1988	0.14046	343000.	3176200.	88082608
	1989	0.19510	340300.	3165700.	89100608
	1990	0.12125	341100.	3183400.	90021408
	1991	0.13616	340300.	3165700.	91030608
HIGH 3-Hour					
	1987	0.38154	343000.	3176200.	87061506
	1988	0.26119	343000.	3176200.	88060606
	1989	0.37619	340300.	3165700.	89030503
	1990	0.21558	340300.	3167700.	90112406
	1991	0.30910	340300.	3165700.	91052903
HIGH 1-Hour					
	1987	0.74511	340300.	3167700.	87072906
	1988	0.71840	340300.	3165700.	88092120
	1989	0.74412	340300.	3167700.	89091508
	1990	0.64674	340300.	3167700.	90112405
	1991	0.74383	340300.	3167700.	91070907

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
CO TITLEONE 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00
CO TITLETWO NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1
CO MODELOPT DFAULT CONC RURAL
CO AVERTIME  PERIOD 24 8 3 1
CO POLLUTID GEN
CO DCAYCOEF    .000000
CO RUNORNOT RUN
CO FINISHED

SO STARTING

** Source Location Cards:
**          SRCID   SRCTYP     XS      YS        ZS
** MODELING ORIGIN CT NO.2 STACK LOCATION
**  CT STACK NUMBER CODE
** -----------------------
**  A -  CT NO. 1
**  B -  CT NO. 2
**  C -  CT NO. 3
** Source Location Cards:
**         SRCID SRCTYP        XS      YS        ZS
**   UTM                       (m)     (m)       (m)
SO LOCATION  BASE32A  POINT   419400   3069700  0.0
SO LOCATION  BASE32B  POINT   419400   3069700  0.0
SO LOCATION  BASE32C  POINT   419400   3069700  0.0
**
SO LOCATION  BASE95A  POINT    419400   3069700  0.0
SO LOCATION  BASE95B  POINT    419400   3069700  0.0
SO LOCATION  BASE95C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7532A  POINT    419400   3069700  0.0
SO LOCATION  LD7532B  POINT    419400   3069700  0.0
SO LOCATION  LD7532C  POINT    419400   3069700  0.0
**
SO LOCATION  LD7595A  POINT    419400   3069700  0.0
SO LOCATION  LD7595B  POINT    419400   3069700  0.0
SO LOCATION  LD7595C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5032A  POINT    419400   3069700  0.0
SO LOCATION  LD5032B  POINT    419400   3069700  0.0
SO LOCATION  LD5032C  POINT    419400   3069700  0.0
**
SO LOCATION  LD5095A  POINT    419400   3069700  0.0
SO LOCATION  LD5095B  POINT    419400   3069700  0.0
SO LOCATION  LD5095C  POINT    419400   3069700  0.0
**
** Source Parameter Cards:
** POINT:   SRCID          QS       HS        TS        VS        DS
**                        (g/s)     (m)       (K)      (m/s)      (m)
SO SRCPARAM   BASE32A     3.334    18.3      853.0     36.2       6.4
SO SRCPARAM   BASE32B     3.333    18.3      853.0     36.2       6.4
SO SRCPARAM   BASE32C     3.333    18.3      853.0     36.2       6.4
**
SO SRCPARAM   BASE95A     3.334    18.3      880.0     33.6       6.4
SO SRCPARAM   BASE95B     3.333    18.3      880.0     33.6       6.4
SO SRCPARAM   BASE95C     3.333    18.3      880.0     33.6       6.4
**
SO SRCPARAM   LD7532A     3.334    18.3      902.0     30.5       6.4
SO SRCPARAM   LD7532B     3.333    18.3      902.0     30.5       6.4
SO SRCPARAM   LD7532C     3.333    18.3      902.0     30.5       6.4
**
SO SRCPARAM   LD7595A     3.334    18.3      911.0     28.0       6.4
SO SRCPARAM   LD7595B     3.333    18.3      911.0     28.0       6.4
SO SRCPARAM   LD7595C     3.333    18.3      911.0     28.0       6.4
**
SO SRCPARAM   LD5032A     3.334    18.3      853.0     25.3       6.4
SO SRCPARAM   LD5032B     3.333    18.3      853.0     25.3       6.4
SO SRCPARAM   LD5032C     3.333    18.3      853.0     25.3       6.4
**
SO SRCPARAM   LD5095A     3.334    18.3      840.0     24.3       6.4
SO SRCPARAM   LD5095B     3.333    18.3      840.0     24.3       6.4
SO SRCPARAM   LD5095C     3.333    18.3      840.0     24.3       6.4
**
**
SO BUILDHGT BASE32A-BASE95A        14.33   14.33   14.33   14.33   14.63   14.63
SO BUILDHGT BASE32A-BASE95A        14.63   14.63   14.63   14.63    0.00   14.33
```

```
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32A-BASE95A     0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT BASE32A-BASE95A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32A-BASE95A    12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID BASE32A-BASE95A    23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID BASE32A-BASE95A    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32A-BASE95A    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32A-BASE95A     0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID BASE32A-BASE95A    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B    14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32B-BASE95B     0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT BASE32B-BASE95B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID BASE32B-BASE95B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B    14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID BASE32B-BASE95B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32B-BASE95B     0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID BASE32B-BASE95B    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT BASE32C-BASE95C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C    14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT BASE32C-BASE95C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT BASE32C-BASE95C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BASE32C-BASE95C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID BASE32C-BASE95C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C    14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C     0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID BASE32C-BASE95C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID BASE32C-BASE95C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BASE32C-BASE95C     0.00  15.28  14.37  13.02  11.28   9.20
**
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33  14.63  14.63
SO BUILDHGT LD7532A-LD7595A    14.63  14.63  14.63  14.63   0.00  14.33
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532A-LD7595A     0.00   0.00   0.00   0.00  14.33  14.33
SO BUILDHGT LD7532A-LD7595A    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532A-LD7595A    12.74  14.10  15.03  15.50  24.40  23.57
SO BUILDWID LD7532A-LD7595A    23.32  23.54  23.80  23.33   0.00  15.03
SO BUILDWID LD7532A-LD7595A    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532A-LD7595A    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532A-LD7595A     0.00   0.00   0.00   0.00  14.10  15.03
SO BUILDWID LD7532A-LD7595A    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B    14.33   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532B-LD7595B     0.00   0.00   0.00   0.00   0.00  14.33
SO BUILDHGT LD7532B-LD7595B    14.33  14.33  14.33  14.33   6.71   6.71
SO BUILDWID LD7532B-LD7595B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B    14.10   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B    15.50  15.50  15.03  14.10  11.18   9.10
SO BUILDWID LD7532B-LD7595B    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532B-LD7595B     0.00   0.00   0.00   0.00   0.00  15.03
SO BUILDWID LD7532B-LD7595B    15.50  15.50  15.03  14.10  11.18   9.10
**
SO BUILDHGT LD7532C-LD7595C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C    14.33   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDHGT LD7532C-LD7595C    14.33  14.33  14.33  14.33  14.33  14.33
SO BUILDHGT LD7532C-LD7595C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT LD7532C-LD7595C     0.00   6.71   6.71   6.71   6.71   6.71
SO BUILDWID LD7532C-LD7595C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C    14.10   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C     0.00  15.28  14.37  13.02  11.28   9.20
SO BUILDWID LD7532C-LD7595C    12.74  14.10  15.03  15.50  15.50  15.03
SO BUILDWID LD7532C-LD7595C     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID LD7532C-LD7595C     0.00  15.28  14.37  13.02  11.28   9.20
**
SO BUILDHGT LD5032A-LD5095A    14.33  14.33  14.33  14.33  14.63  14.63
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SO BUILDHGT LD5032A-LD5095A         14.63   14.63   14.63   14.63    0.00   14.33
SO BUILDHGT LD5032A-LD5095A         14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032A-LD5095A         14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032A-LD5095A          0.00    0.00    0.00    0.00   14.33   14.33
SO BUILDHGT LD5032A-LD5095A         14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032A-LD5095A         12.74   14.10   15.03   15.50   24.40   23.57
SO BUILDWID LD5032A-LD5095A         23.32   23.54   23.80   23.33    0.00   15.03
SO BUILDWID LD5032A-LD5095A         15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032A-LD5095A         12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032A-LD5095A          0.00    0.00    0.00    0.00   14.10   15.03
SO BUILDWID LD5032A-LD5095A         15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032B-LD5095B         14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B         14.33    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B         14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDHGT LD5032B-LD5095B         14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032B-LD5095B          0.00    0.00    0.00    0.00    0.00   14.33
SO BUILDHGT LD5032B-LD5095B         14.33   14.33   14.33   14.33    6.71    6.71
SO BUILDWID LD5032B-LD5095B         12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B         14.10    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B         15.50   15.50   15.03   14.10   11.18    9.10
SO BUILDWID LD5032B-LD5095B         12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032B-LD5095B          0.00    0.00    0.00    0.00    0.00   15.03
SO BUILDWID LD5032B-LD5095B         15.50   15.50   15.03   14.10   11.18    9.10
**
SO BUILDHGT LD5032C-LD5095C         14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C         14.33    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C          0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDHGT LD5032C-LD5095C         14.33   14.33   14.33   14.33   14.33   14.33
SO BUILDHGT LD5032C-LD5095C          0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT LD5032C-LD5095C          0.00    6.71    6.71    6.71    6.71    6.71
SO BUILDWID LD5032C-LD5095C         12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C         14.10    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C          0.00   15.28   14.37   13.02   11.28    9.20
SO BUILDWID LD5032C-LD5095C         12.74   14.10   15.03   15.50   15.50   15.03
SO BUILDWID LD5032C-LD5095C          0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID LD5032C-LD5095C          0.00   15.28   14.37   13.02   11.28    9.20
**
**
SO EMISUNIT    .100000E+07 (GRAMS/SEC)         (MICROGRAMS/CUBIC-METER)

SO SRCGROUP BASE32  BASE32A   BASE32B   BASE32C
SO SRCGROUP BASE95  BASE95A   BASE95B   BASE95C
SO SRCGROUP LD7532  LD7532A   LD7532B   LD7532C
SO SRCGROUP LD7595  LD7595A   LD7595B   LD7595C
SO SRCGROUP LD5032  LD5032A   LD5032B   LD5032C
SO SRCGROUP LD5095  LD5095A   LD5095B   LD5095C

SO FINISHED
**
RE STARTING
**              UTM(m)   UTM(m)
RE DISCCART     340300     3165700
RE DISCCART     340300     3167700
RE DISCCART     340300     3169800
RE DISCCART     340700     3171900
RE DISCCART     342000     3174000
RE DISCCART     343000     3176200
RE DISCCART     343700     3178300
RE DISCCART     342400     3180600
RE DISCCART     341100     3183400
RE DISCCART     339000     3183400
RE DISCCART     336500     3183400
RE DISCCART     334000     3183400
RE DISCCART     331500     3183400

RE FINISHED
**
ME STARTING
ME INPUTFIL P:\MET\TPATPA87.MET
ME ANEMHGHT    22 FEET
ME SURFDATA  12842      1987       TAMPA
ME UAIRDATA  12842      1987       TAMPA
ME WINDCATS    1.54     3.09     5.14     8.23    10.80
ME FINISHED
**
OU STARTING
```

```
OU RECTABLE ALLAVE FIRST
OU FINISHED

************************************
*** SETUP Finishes Successfully ***
************************************

  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1              ***        15:05:
**MODELOPTs:                                                                                                       PAGE
CONC                       RURAL  FLAT         DFAULT

                                            ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Intermediate Terrain Processing is Selected

**Model Is Setup For Calculation of Average CONCentration Values.

  --  SCAVENGING/DEPOSITION LOGIC --
**Model Uses NO DRY DEPLETION.  DDPLETE =  F
**Model Uses NO WET DEPLETION.  WDPLETE =  F
**NO WET SCAVENGING Data Provided.
**NO GAS DRY DEPOSITION Data Provided.
**Model Does NOT Use GRIDDED TERRAIN Data for Depletion Calculations

**Model Uses RURAL Dispersion.

**Model Uses Regulatory DEFAULT Options:
           1. Final Plume Rise.
           2. Stack-tip Downwash.
           3. Buoyancy-induced Dispersion.
           4. Use Calms Processing Routine.
           5. Not Use Missing Data Processing Routine.
           6. Default Wind Profile Exponents.
           7. Default Vertical Potential Temperature Gradients.
           8. "Upper Bound" Values for Supersquat Buildings.
           9. No Exponential Decay for RURAL Mode

**Model Assumes Receptors on FLAT Terrain.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  4 Short Term Average(s) of:  24-HR   8-HR   3-HR   1-HR
    and Calculates PERIOD Averages

**This Run Includes:    18 Source(s);      6 Source Group(s); and      13 Receptor(s)

**The Model Assumes A Pollutant Type of:  GEN

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of PERIOD Averages by Receptor
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Anem. Hgt. (m) =     6.71 ;    Decay Coef. =    0.000      ;   Rot. Angle =     0.0
                 Emission Units = (GRAMS/SEC)                               ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = (MICROGRAMS/CUBIC-METER)

**Approximate Storage Requirements of Model =     1.2 MB of RAM.

**Input Runstream File:          DEC2C1.i87
**Output Print File:             DEC2C1.087
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1              ***        15:05:
**MODELOPTs:                                                                                                       PAGE
CONC                       RURAL  FLAT         DFAULT


                                                  *** POINT SOURCE DATA ***
```

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (USER UNITS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
BASE32A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE32B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE32C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	36.20	6.40	YES	
BASE95A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
BASE95B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
BASE95C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	880.00	33.60	6.40	YES	
LD7532A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7532B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7532C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	902.00	30.50	6.40	YES	
LD7595A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD7595B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD7595C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	911.00	28.00	6.40	YES	
LD5032A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5032B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5032C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	853.00	25.30	6.40	YES	
LD5095A	0	0.33340E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	
LD5095B	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	
LD5095C	0	0.33330E+01	419400.0	3069700.0	0.0	18.30	840.00	24.30	6.40	YES	

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID	SOURCE IDs
BASE32	BASE32A , BASE32B , BASE32C ,
BASE95	BASE95A , BASE95B , BASE95C ,
LD7532	LD7532A , LD7532B , LD7532C ,
LD7595	LD7595A , LD7595B , LD7595C ,
LD5032	LD5032A , LD5032B , LD5032C ,
LD5095	LD5095A , LD5095B , LD5095C ,

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: BASE32A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: BASE32B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9

```
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29   0.0,   0.0, 0   30  14.3,  15
  31  14.3,  15.5, 0   32  14.3,  15.5, 0   33  14.3,  15.0, 0   34  14.3,  14.1, 0   35   6.7,  11.2, 0   36   6.7,   9


SOURCE ID: BASE32C
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.3,  15.5, 0    6  14.3,  15
   7  14.3,  14.1, 0    8   0.0,   0.0, 0    9   0.0,   0.0, 0   10   0.0,   0.0, 0   11   0.0,   0.0, 0   12   0.0,   0
  13   0.0,   0.0, 0   14   6.7,  15.3, 0   15   6.7,  14.4, 0   16   6.7,  13.0, 0   17   6.7,  11.3, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29   0.0,   0.0, 0   30   0.0,   0
  31   0.0,   0.0, 0   32   6.7,  15.3, 0   33   6.7,  14.4, 0   34   6.7,  13.0, 0   35   6.7,  11.3, 0   36   6.7,   9


SOURCE ID: BASE95A
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.6,  24.4, 0    6  14.6,  23
   7  14.6,  23.3, 0    8  14.6,  23.5, 0    9  14.6,  23.8, 0   10  14.6,  23.3, 0   11   0.0,   0.0, 0   12  14.3,  15
  13  14.3,  15.5, 0   14  14.3,  15.5, 0   15  14.3,  15.0, 0   16  14.3,  14.1, 0   17   6.7,  11.2, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29  14.3,  14.1, 0   30  14.3,  15
  31  14.3,  15.5, 0   32  14.3,  15.5, 0   33  14.3,  15.0, 0   34  14.3,  14.1, 0   35   6.7,  11.2, 0   36   6.7,   9

  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***          04/21
                                    *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1             ***          15:05:
**MODELOPTs:                                                                                                          PAGE
CONC                           RURAL  FLAT          DFAULT

                                            *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: BASE95B
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.3,  15.5, 0    6  14.3,  15
   7  14.3,  14.1, 0    8   0.0,   0.0, 0    9   0.0,   0.0, 0   10   0.0,   0.0, 0   11   0.0,   0.0, 0   12  14.3,  15
  13  14.3,  15.5, 0   14  14.3,  15.5, 0   15  14.3,  15.0, 0   16  14.3,  14.1, 0   17   6.7,  11.2, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29   0.0,   0.0, 0   30  14.3,  15
  31  14.3,  15.5, 0   32  14.3,  15.5, 0   33  14.3,  15.0, 0   34  14.3,  14.1, 0   35   6.7,  11.2, 0   36   6.7,   9


SOURCE ID: BASE95C
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.3,  15.5, 0    6  14.3,  15
   7  14.3,  14.1, 0    8   0.0,   0.0, 0    9   0.0,   0.0, 0   10   0.0,   0.0, 0   11   0.0,   0.0, 0   12   0.0,   0
  13   0.0,   0.0, 0   14   6.7,  15.3, 0   15   6.7,  14.4, 0   16   6.7,  13.0, 0   17   6.7,  11.3, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29   0.0,   0.0, 0   30   0.0,   0
  31   0.0,   0.0, 0   32   6.7,  15.3, 0   33   6.7,  14.4, 0   34   6.7,  13.0, 0   35   6.7,  11.3, 0   36   6.7,   9


SOURCE ID: LD7532A
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.6,  24.4, 0    6  14.6,  23
   7  14.6,  23.3, 0    8  14.6,  23.5, 0    9  14.6,  23.8, 0   10  14.6,  23.3, 0   11   0.0,   0.0, 0   12  14.3,  15
  13  14.3,  15.5, 0   14  14.3,  15.5, 0   15  14.3,  15.0, 0   16  14.3,  14.1, 0   17   6.7,  11.2, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29  14.3,  14.1, 0   30  14.3,  15
  31  14.3,  15.5, 0   32  14.3,  15.5, 0   33  14.3,  15.0, 0   34  14.3,  14.1, 0   35   6.7,  11.2, 0   36   6.7,   9


SOURCE ID: LD7532B
 IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     BW  WAK  IFV   BH     B
   1  14.3,  12.7, 0    2  14.3,  14.1, 0    3  14.3,  15.0, 0    4  14.3,  15.5, 0    5  14.3,  15.5, 0    6  14.3,  15
   7  14.3,  14.1, 0    8   0.0,   0.0, 0    9   0.0,   0.0, 0   10   0.0,   0.0, 0   11   0.0,   0.0, 0   12  14.3,  15
  13  14.3,  15.5, 0   14  14.3,  15.5, 0   15  14.3,  15.0, 0   16  14.3,  14.1, 0   17   6.7,  11.2, 0   18   6.7,   9
  19  14.3,  12.7, 0   20  14.3,  14.1, 0   21  14.3,  15.0, 0   22  14.3,  15.5, 0   23  14.3,  15.5, 0   24  14.3,  15
  25   0.0,   0.0, 0   26   0.0,   0.0, 0   27   0.0,   0.0, 0   28   0.0,   0.0, 0   29   0.0,   0.0, 0   30  14.3,  15
  31  14.3,  15.5, 0   32  14.3,  15.5, 0   33  14.3,  15.0, 0   34  14.3,  14.1, 0   35   6.7,  11.2, 0   36   6.7,   9
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*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD7532C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

SOURCE ID: LD7595A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD7595B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD7595C

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	0.0,	0
13	0.0,	0.0,	0	14	6.7,	15.3,	0	15	6.7,	14.4,	0	16	6.7,	13.0,	0	17	6.7,	11.3,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	0.0,	0.0,	0	30	0.0,	0
31	0.0,	0.0,	0	32	6.7,	15.3,	0	33	6.7,	14.4,	0	34	6.7,	13.0,	0	35	6.7,	11.3,	0	36	6.7,	9

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: LD5032A

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.6,	24.4,	0	6	14.6,	23
7	14.6,	23.3,	0	8	14.6,	23.5,	0	9	14.6,	23.8,	0	10	14.6,	23.3,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15
25	0.0,	0.0,	0	26	0.0,	0.0,	0	27	0.0,	0.0,	0	28	0.0,	0.0,	0	29	14.3,	14.1,	0	30	14.3,	15
31	14.3,	15.5,	0	32	14.3,	15.5,	0	33	14.3,	15.0,	0	34	14.3,	14.1,	0	35	6.7,	11.2,	0	36	6.7,	9

SOURCE ID: LD5032B

IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	BW	WAK	IFV	BH	B
1	14.3,	12.7,	0	2	14.3,	14.1,	0	3	14.3,	15.0,	0	4	14.3,	15.5,	0	5	14.3,	15.5,	0	6	14.3,	15
7	14.3,	14.1,	0	8	0.0,	0.0,	0	9	0.0,	0.0,	0	10	0.0,	0.0,	0	11	0.0,	0.0,	0	12	14.3,	15
13	14.3,	15.5,	0	14	14.3,	15.5,	0	15	14.3,	15.0,	0	16	14.3,	14.1,	0	17	6.7,	11.2,	0	18	6.7,	9
19	14.3,	12.7,	0	20	14.3,	14.1,	0	21	14.3,	15.0,	0	22	14.3,	15.5,	0	23	14.3,	15.5,	0	24	14.3,	15

```
  25  0.0,   0.0, 0    26  0.0,   0.0, 0    27  0.0,   0.0, 0    28  0.0,   0.0, 0    29  0.0,   0.0, 0    30 14.3,  15
  31 14.3,  15.5, 0    32 14.3,  15.5, 0    33 14.3,  15.0, 0    34 14.3,  14.1, 0    35  6.7,  11.2, 0    36  6.7,   9


SOURCE ID: LD5032C
 IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    B
   1 14.3,  12.7, 0     2 14.3,  14.1, 0     3 14.3,  15.0, 0     4 14.3,  15.5, 0     5 14.3,  15.5, 0     6 14.3,  15
   7 14.3,  14.1, 0     8  0.0,   0.0, 0     9  0.0,   0.0, 0    10  0.0,   0.0, 0    11  0.0,   0.0, 0    12  0.0,   0
  13  0.0,   0.0, 0    14  6.7,  15.3, 0    15  6.7,  14.4, 0    16  6.7,  13.0, 0    17  6.7,  11.3, 0    18  6.7,   9
  19 14.3,  12.7, 0    20 14.3,  14.1, 0    21 14.3,  15.0, 0    22 14.3,  15.5, 0    23 14.3,  15.5, 0    24 14.3,  15
  25  0.0,   0.0, 0    26  0.0,   0.0, 0    27  0.0,   0.0, 0    28  0.0,   0.0, 0    29  0.0,   0.0, 0    30  0.0,   0
  31  0.0,   0.0, 0    32  6.7,  15.3, 0    33  6.7,  14.4, 0    34  6.7,  13.0, 0    35  6.7,  11.3, 0    36  6.7,   9


SOURCE ID: LD5095A
 IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    B
   1 14.3,  12.7, 0     2 14.3,  14.1, 0     3 14.3,  15.0, 0     4 14.3,  15.5, 0     5 14.6,  24.4, 0     6 14.6,  23
   7 14.6,  23.3, 0     8 14.6,  23.5, 0     9 14.6,  23.8, 0    10 14.6,  23.3, 0    11  0.0,   0.0, 0    12 14.3,  15
  13 14.3,  15.5, 0    14 14.3,  15.5, 0    15 14.3,  15.0, 0    16 14.3,  14.1, 0    17  6.7,  11.2, 0    18  6.7,   9
  19 14.3,  12.7, 0    20 14.3,  14.1, 0    21 14.3,  15.0, 0    22 14.3,  15.5, 0    23 14.3,  15.5, 0    24 14.3,  15
  25  0.0,   0.0, 0    26  0.0,   0.0, 0    27  0.0,   0.0, 0    28  0.0,   0.0, 0    29 14.3,  14.1, 0    30 14.3,  15
  31 14.3,  15.5, 0    32 14.3,  15.5, 0    33 14.3,  15.0, 0    34 14.3,  14.1, 0    35  6.7,  11.2, 0    36  6.7,   9

 *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***      04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1              ***      15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                         RURAL  FLAT         DFAULT

                                        *** DIRECTION SPECIFIC BUILDING DIMENSIONS ***


SOURCE ID: LD5095B
 IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    B
   1 14.3,  12.7, 0     2 14.3,  14.1, 0     3 14.3,  15.0, 0     4 14.3,  15.5, 0     5 14.3,  15.5, 0     6 14.3,  15
   7 14.3,  14.1, 0     8  0.0,   0.0, 0     9  0.0,   0.0, 0    10  0.0,   0.0, 0    11  0.0,   0.0, 0    12 14.3,  15
  13 14.3,  15.5, 0    14 14.3,  15.5, 0    15 14.3,  15.0, 0    16 14.3,  14.1, 0    17  6.7,  11.2, 0    18  6.7,   9
  19 14.3,  12.7, 0    20 14.3,  14.1, 0    21 14.3,  15.0, 0    22 14.3,  15.5, 0    23 14.3,  15.5, 0    24 14.3,  15
  25  0.0,   0.0, 0    26  0.0,   0.0, 0    27  0.0,   0.0, 0    28  0.0,   0.0, 0    29  0.0,   0.0, 0    30 14.3,  15
  31 14.3,  15.5, 0    32 14.3,  15.5, 0    33 14.3,  15.0, 0    34 14.3,  14.1, 0    35  6.7,  11.2, 0    36  6.7,   9


SOURCE ID: LD5095C
 IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    BW  WAK  IFV  BH    B
   1 14.3,  12.7, 0     2 14.3,  14.1, 0     3 14.3,  15.0, 0     4 14.3,  15.5, 0     5 14.3,  15.5, 0     6 14.3,  15
   7 14.3,  14.1, 0     8  0.0,   0.0, 0     9  0.0,   0.0, 0    10  0.0,   0.0, 0    11  0.0,   0.0, 0    12  0.0,   0
  13  0.0,   0.0, 0    14  6.7,  15.3, 0    15  6.7,  14.4, 0    16  6.7,  13.0, 0    17  6.7,  11.3, 0    18  6.7,   9
  19 14.3,  12.7, 0    20 14.3,  14.1, 0    21 14.3,  15.0, 0    22 14.3,  15.5, 0    23 14.3,  15.5, 0    24 14.3,  15
  25  0.0,   0.0, 0    26  0.0,   0.0, 0    27  0.0,   0.0, 0    28  0.0,   0.0, 0    29  0.0,   0.0, 0    30  0.0,   0
  31  0.0,   0.0, 0    32  6.7,  15.3, 0    33  6.7,  14.4, 0    34  6.7,  13.0, 0    35  6.7,  11.3, 0    36  6.7,   9

 *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***      04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1              ***      15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                         RURAL  FLAT         DFAULT


                                          *** DISCRETE CARTESIAN RECEPTORS ***
                                           (X-COORD, Y-COORD, ZELEV, ZFLAG)
                                                      (METERS)

    ( 340300.0, 3165700.0,       0.0,       0.0);          ( 340300.0, 3167700.0,       0.0,       0.0);     [redacted]
    ( 340300.0, 3169800.0,       0.0,       0.0);          ( 340700.0, 3171900.0,       0.0,       0.0);
    ( 342000.0, 3174000.0,       0.0,       0.0);          ( 343000.0, 3176200.0,       0.0,       0.0);
    ( 343700.0, 3178300.0,       0.0,       0.0);          ( 342400.0, 3180600.0,       0.0,       0.0);
    ( 341100.0, 3183400.0,       0.0,       0.0);          ( 339000.0, 3183400.0,       0.0,       0.0);
    ( 336500.0, 3183400.0,       0.0,       0.0);          ( 334000.0, 3183400.0,       0.0,       0.0);
    ( 331500.0, 3183400.0,       0.0,       0.0);
 *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***      04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1              ***      15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                         RURAL  FLAT         DFAULT
```

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** ISCST3 - VERSION 99155 *** *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00 *** 04/21
*** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP. CLASS 1 *** 15:05:
**MODELOPTs: PAGE
CONC RURAL FLAT DFAULT

*** THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

FILE: P:\MET\TPATPA87.MET
FORMAT: (4I2,2F9.4,F6.1,I2,2F7.1,f9.4,f10.1,f8.4,i4,f7.2)
SURFACE STATION NO.: 12842 UPPER AIR STATION NO.: 12842
NAME: TAMPA NAME: TAMPA
YEAR: 1987 YEAR: 1987

YR	MN	DY	HR	FLOW VECTOR	SPEED (M/S)	TEMP (K)	STAB CLASS	MIXING HEIGHT (M) RURAL	URBAN	USTAR (M/S)	M-O LENGTH (M)	Z-0 (M)	IPCODE	PRATE (mm/HR)
87	01	01	01	341.0	6.17	293.7	4	598.7	598.7	0.0000	0.0	0.0000	0	0.00
87	01	01	02	358.0	4.12	293.2	5	651.8	1306.0	0.0000	0.0	0.0000	0	0.00
87	01	01	03	34.0	6.17	293.2	4	704.8	704.8	0.0000	0.0	0.0000	0	0.00
87	01	01	04	73.0	6.69	291.5	4	757.8	757.8	0.0000	0.0	0.0000	0	0.00
87	01	01	05	83.0	7.20	290.9	4	810.8	810.8	0.0000	0.0	0.0000	0	0.00
87	01	01	06	102.0	7.20	290.4	4	863.8	863.8	0.0000	0.0	0.0000	0	0.00
87	01	01	07	105.0	6.69	289.3	4	916.9	916.9	0.0000	0.0	0.0000	0	0.00
87	01	01	08	113.0	7.72	288.7	4	969.9	969.9	0.0000	0.0	0.0000	0	0.00
87	01	01	09	107.0	6.17	288.2	4	1022.9	1022.9	0.0000	0.0	0.0000	0	0.00
87	01	01	10	121.0	6.17	288.2	4	1075.9	1075.9	0.0000	0.0	0.0000	0	0.00
87	01	01	11	114.0	6.69	287.6	4	1128.9	1128.9	0.0000	0.0	0.0000	0	0.00

```
87 01 01 12  116.0   6.17  287.0  4    1182.0  1182.0    0.0000      0.0  0.0000   0   0.00
87 01 01 13  133.0   7.20  287.6  4    1235.0  1235.0    0.0000      0.0  0.0000   0   0.00
87 01 01 14  119.0   7.72  287.6  4    1288.0  1288.0    0.0000      0.0  0.0000   0   0.00
87 01 01 15  132.0   7.20  288.2  4    1288.0  1288.0    0.0000      0.0  0.0000   0   0.00
87 01 01 16  134.0   7.72  289.3  4    1288.0  1288.0    0.0000      0.0  0.0000   0   0.00
87 01 01 17  141.0   7.20  288.2  4    1288.0  1288.0    0.0000      0.0  0.0000   0   0.00
87 01 01 18  137.0   5.14  287.6  5    1286.4  1238.1    0.0000      0.0  0.0000   0   0.00
87 01 01 19  144.0   3.60  286.5  5    1281.2  1078.6    0.0000      0.0  0.0000   0   0.00
87 01 01 20  117.0   2.06  285.4  6    1276.0   919.0    0.0000      0.0  0.0000   0   0.00
87 01 01 21  110.0   1.54  284.8  7    1270.9   759.5    0.0000      0.0  0.0000   0   0.00
87 01 01 22  112.0   0.00  283.7  7    1265.7   600.0    0.0000      0.0  0.0000   0   0.00
87 01 01 23  120.0   2.57  283.7  6    1260.5   440.5    0.0000      0.0  0.0000   0   0.00
87 01 01 24  130.0   1.54  282.6  7    1255.4   281.0    0.0000      0.0  0.0000   0   0.00


*** NOTES:  STABILITY CLASS 1=A, 2=B, 3=C, 4=D, 5=E AND 6=F.
            FLOW VECTOR IS DIRECTION TOWARD WHICH WIND IS BLOWING.
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00           ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1           ***       15:05:
**MODELOPTs:                                                                                                    PAGE
CONC                       RURAL  FLAT          DFAULT

                                        *** THE SUMMARY OF MAXIMUM PERIOD (  8760 HRS) RESULTS ***


                                    ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                 **

                                                                                                  NETWORK
GROUP ID                          AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZFLAG)   OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   1ST HIGHEST VALUE IS       0.00215 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00203 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00190 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

BASE95   1ST HIGHEST VALUE IS       0.00225 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00211 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00198 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

LD7532   1ST HIGHEST VALUE IS       0.00240 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00226 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00212 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

LD7595   1ST HIGHEST VALUE IS       0.00257 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00241 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00226 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

LD5032   1ST HIGHEST VALUE IS       0.00283 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00264 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00247 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

LD5095   1ST HIGHEST VALUE IS       0.00292 AT (  340300.00,  3165700.00,      0.00,       0.00)  DC      NA
         2ND HIGHEST VALUE IS       0.00272 AT (  340300.00,  3167700.00,      0.00,       0.00)  DC      NA
         3RD HIGHEST VALUE IS       0.00254 AT (  340300.00,  3169800.00,      0.00,       0.00)  DC      NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00           ***        04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1           ***       15:05:
**MODELOPTs:                                                                                                    PAGE
CONC                       RURAL  FLAT          DFAULT

                                        *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***


                                    ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                 **

                                                 DATE                                                          NETWOR
GROUP ID                            AVERAGE CONC    (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS        0.03953c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00)  DC      NA
```

```
BASE95   HIGH  1ST HIGH VALUE IS      0.04061c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7532   HIGH  1ST HIGH VALUE IS      0.04216c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7595   HIGH  1ST HIGH VALUE IS      0.04363c ON 87122224: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD5032   HIGH  1ST HIGH VALUE IS      0.04616  ON 87061524: AT (  343000.00,  3176200.00,      0.00,      0.00) DC     NA
LD5095   HIGH  1ST HIGH VALUE IS      0.04770  ON 87061524: AT (  343000.00,  3176200.00,      0.00,      0.00) DC     NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***      04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1             ***      15:05:
**MODELOPTs:                                                                                                    PAGE
CONC                        RURAL  FLAT          DFAULT

                                         *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                  ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                 **

                                                 DATE                                                           NETWOR
GROUP ID                            AVERAGE CONC    (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.14493c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
BASE95   HIGH  1ST HIGH VALUE IS      0.14889c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7532   HIGH  1ST HIGH VALUE IS      0.15458c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7595   HIGH  1ST HIGH VALUE IS      0.15997c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD5032   HIGH  1ST HIGH VALUE IS      0.16884c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD5095   HIGH  1ST HIGH VALUE IS      0.17200c ON 87122208: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
  *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***      04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1             ***      15:05:
**MODELOPTs:                                                                                                    PAGE
CONC                        RURAL  FLAT          DFAULT

                                         *** THE SUMMARY OF HIGHEST  3-HR RESULTS ***

                                  ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                 **

                                                 DATE                                                           NETWOR
GROUP ID                            AVERAGE CONC    (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.30919  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
BASE95   HIGH  1ST HIGH VALUE IS      0.31851  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7532   HIGH  1ST HIGH VALUE IS      0.33197  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD7595   HIGH  1ST HIGH VALUE IS      0.34477  ON 87011003: AT (  340300.00,  3165700.00,      0.00,      0.00) DC     NA
LD5032   HIGH  1ST HIGH VALUE IS      0.36917  ON 87061506: AT (  343000.00,  3176200.00,      0.00,      0.00) DC     NA
LD5095   HIGH  1ST HIGH VALUE IS      0.38154  ON 87061506: AT (  343000.00,  3176200.00,      0.00,      0.00) DC     NA

 *** RECEPTOR TYPES:  GC = GRIDCART
```

```
                  GP = GRIDPOLR
                  DC = DISCCART
                  DP = DISCPOLR
                  BD = BOUNDARY
 *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***       04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1             ***       15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                    RURAL  FLAT        DFAULT

                                      *** THE SUMMARY OF HIGHEST  1-HR RESULTS ***

                                 ** CONC OF GEN      IN (MICROGRAMS/CUBIC-METER)                **

                                                  DATE                                                           NETWOR
GROUP ID                          AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-I
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BASE32   HIGH  1ST HIGH VALUE IS      0.58844  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

BASE95   HIGH  1ST HIGH VALUE IS      0.61029  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

LD7532   HIGH  1ST HIGH VALUE IS      0.64237  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

LD7595   HIGH  1ST HIGH VALUE IS      0.67341  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

LD5032   HIGH  1ST HIGH VALUE IS      0.72602  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

LD5095   HIGH  1ST HIGH VALUE IS      0.74511  ON 87072906: AT (  340300.00,  3167700.00,     0.00,     0.00)  DC     NA

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
                      BD = BOUNDARY
 *** ISCST3 - VERSION 99155 ***    *** 1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE 04/21/00              ***       04/21
                                   *** NAT GAS, GEN. EM. RATES, 3 LOADS / 2 TEMP.  CLASS 1             ***       15:05:
**MODELOPTs:                                                                                                     PAGE
CONC                    RURAL  FLAT        DFAULT

*** Message Summary : ISCST3 Model Execution ***

 --------- Summary of Total Messages --------

A Total of           0 Fatal Error Message(s)
A Total of           0 Warning Message(s)
A Total of         531 Informational Message(s)

A Total of         531 Calm Hours Identified

   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***

   ********   WARNING MESSAGES   ********
              ***  NONE  ***

   ************************************
   *** ISCST3 Finishes Successfully ***
   ************************************
```

TABLE OF REFINEMENT SUMMARY FILES

```
                                                    ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RRSANC2.090
 First title for last output file is:   1990 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE            04/25/00
 Second title for last output file is:  FUEL OIL, SO2 ANNUAL EM. RATES, BASE / 32oF 2ND REFINE CLASS 2


 AVERAGING TIME     YEAR     CONC         DIR (deg)    DIST (m)   PERIOD ENDING
                            (ug/m3)       or X (m)     or Y (m)   (YYMMDDHH)
 ------------------------------------------------------------------------------
 SOURCE GROUP ID:  BASE32
 Annual
                    1990    0.07101          254.        14800.      90123124
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00           0.00
 DISCRETE          0.00           0.00

==========================================================================================

                                                    ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RRS24C2.089
 First title for last output file is:   1989 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE         04/25/00
 Second title for last output file is:  FUEL OIL, SO2 24 HR EM. RATES, BASE/32oF 2ND REFINE CLASS 2


 AVERAGING TIME     YEAR     CONC         DIR (deg)    DIST (m)   PERIOD ENDING
                            (ug/m3)       or X (m)     or Y (m)   (YYMMDDHH)
 ------------------------------------------------------------------------------
 SOURCE GROUP ID:  BASE32
 HIGH 24-Hour
                    1989    0.95574          188.        20000.      89120424
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00           0.00
 DISCRETE          0.00           0.00

==========================================================================================

                                                     ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RSO3C2.089
 First title for last output file is:   1989 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE      04/25/00
 Second title for last output file is:  FUEL OIL, SO2 3 HR. RATES, 50% LOAD/32oF  REFINE CLASS 2


 AVERAGING TIME     YEAR     CONC         DIR (deg)    DIST (m)   PERIOD ENDING
                            (ug/m3)       or X (m)     or Y (m)   (YYMMDDHH)
 ------------------------------------------------------------------------------
 SOURCE GROUP ID:  LD5032
 HIGH  3-Hour
                    1989    4.22211          332.         1500.      89062212
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00           0.00
 DISCRETE          0.00           0.00

==========================================================================================
                                                    ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RPANC2.090
 First title for last output file is:   1990 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE           04/25/00
 Second title for last output file is:  FUEL OIL, PM ANNUAL EM. RATES, 50% LOAD/95oF REFINE  CLASS 2


 AVERAGING TIME     YEAR     CONC         DIR (deg)    DIST (m)   PERIOD ENDING
                            (ug/m3)       or X (m)     or Y (m)   (YYMMDDHH)
 ------------------------------------------------------------------------------
 SOURCE GROUP ID:  LD5095
 Annual
                    1990    0.02367          254.        10300.      90123124
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00           0.00
 DISCRETE          0.00           0.00
```

```
==========================================================================================

                                                      ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RP24C2.088
 First title for last output file is:   1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE          04/25/00
 Second title for last output file is:  FUEL OIL, PM 24 HR EM. RATES, 50% LOAD/95oF REFINE  CLASS 2


 AVERAGING TIME     YEAR      CONC          DIR (deg)     DIST (m)   PERIOD ENDING
                            (ug/m3)         or X (m)      or Y (m)   (YYMMDDHH)
 ----------------------------------------------------------------------------
 SOURCE GROUP ID:  LD5095
 HIGH 24-Hour
                    1988     0.28030           164.        1600.        88080724
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00            0.00
 DISCRETE          0.00            0.00

==========================================================================================
                                                      ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RRNANC2.090
 First title for last output file is:   1990 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE          04/25/00
 Second title for last output file is:  FUEL OIL, NO2 ANNUAL EM. RATES, BASE/32oF 2ND REFINE CLASS 2


 AVERAGING TIME     YEAR      CONC          DIR (deg)     DIST (m)   PERIOD ENDING
                            (ug/m3)         or X (m)      or Y (m)   (YYMMDDHH)
 ----------------------------------------------------------------------------
 SOURCE GROUP ID:  BASE32
 Annual
                    1990     0.23385           254.        14800.       90123124
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00            0.00
 DISCRETE          0.00            0.00

==========================================================================================

                                                      ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RC08C2.088
 First title for last output file is:   1988 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE          04/25/00
 Second title for last output file is:  FUEL OIL, CO 8 HR EM. RATES, 50% LOAD/95oF REFINE  CLASS 2


 AVERAGING TIME     YEAR      CONC          DIR (deg)     DIST (m)   PERIOD ENDING
                            (ug/m3)         or X (m)      or Y (m)   (YYMMDDHH)
 ----------------------------------------------------------------------------
 SOURCE GROUP ID:  LD5095
 HIGH  8-Hour
                    1988     1.44676           164.        1600.        88080716
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00            0.00
 DISCRETE          0.00            0.00

==========================================================================================

                                                      ISCBOB3 RELEASE 98056
 ISCST3 OUTPUT FILE NUMBER 1 :RC01C2.087
 First title for last output file is:   1987 DECKER, FT. MEADE 3 CTS/SIMPLE CYCLE          04/25/00
 Second title for last output file is:  FUEL OIL, CO 1 HR EM. RATES, 50% LOAD/95oF REFINE  CLASS 2


 AVERAGING TIME     YEAR      CONC          DIR (deg)     DIST (m)   PERIOD ENDING
                            (ug/m3)         or X (m)      or Y (m)   (YYMMDDHH)
 ----------------------------------------------------------------------------
 SOURCE GROUP ID:  LD5095
 HIGH  1-Hour
                    1987     5.56334           110.        1400.        87061811
  All receptor computations reported with respect to a user-specified origin
 GRID              0.00            0.00
 DISCRETE          0.00            0.00
```

```
DECKER FT MEADE AQRV IMPACTS AT CHASSAHOWITZKA NWA, SO2                4/24/00
RECEPTORS AT CHASSAHOWITZKA NWA, ALL AVERAGING ITMES, CALPOST
3 SIMPLE-CYCLE CTS, NATURAL GAS, BASE LOAD, 32 DEGREES
---------------- Run title (3 lines) ------------------------------------------

                    CALPOST MODEL CONTROL FILE
                    --------------------------

-------------------------------------------------------------------------------

INPUT GROUP: 0 -- Input and Output File Names
--------------

Input Files
-----------

File                       Default File Name
----                       -----------------
Conc/Dep Flux File         MODEL.DAT          ! MODDAT =CALPUFF.CON   !
Relative Humidity File     VISB.DAT           * VISDAT =    *
Background Data File       BACK.DAT           *BACKDAT =    *
Transmissometer/           VSRN.DAT           *VSRDAT =    *
Nephelometer Data File

Output Files
------------

File                       Default File Name
----                       -----------------
List File                  CALPOST.LST        ! PSTLST =CALPOST.LST   !

Pathname for Timeseries Files   (blank)       * TSPATH =    *
(activate with exclamation points only if
providing NON-BLANK character string)

Pathname for Plot Files   (blank)             * PLPATH =    *
(activate with exclamation points only if
 providing NON-BLANK character string)

User Character String (U) to augment default filenames
(activate with exclamation points only if
 providing NON-BLANK character string)

Timeseries                 TSttUUUU.DAT       * TSUNAM =    *

Top Nth Rank Plot          RttUUUUU.DAT
                       or  RttiiUUU.GRD       * TUNAM =    *

Exceedance Plot            XttUUUUU.DAT
                       or  XttUUUUU.GRD       * XUNAM =    *

Echo Plot                  jjjtthhU.DAT
(Specific Days)        or  jjjtthhU.GRD       * EUNAM =    *

Visibility Plot            V24UUUUU.DAT       * VUNAM =    *
(Daily Peak Summary)

-------------------------------------------------------------------------------
All file names will be converted to lower case if LCFILES = T
Otherwise, if LCFILES = F, file names will be converted to UPPER CASE
         T = lower case      ! LCFILES = T !
         F = UPPER CASE
NOTE: (1) file/path names can be up to 70 characters in length
NOTE: (2) Filenames for ALL PLOT and TIMESERIES FILES are constructed
          using a template that includes a pathname, user-supplied
          character(s), and fixed strings (tt,ii,jjj, and hh), where
                tt = Averaging Period (e.g. 03)
                ii = Rank (e.g. 02)
                jjj= Julian Day
                hh = Hour(ending)
          are determined internally based on selections made below.
          If a path or user-supplied character(s) are supplied, each
          must contain at least 1 non-blank character.

!END!
-------------------------------------------------------------------------------
```

```
INPUT GROUP: 1 -- General run control parameters
--------------

     Option to run all periods found
     in the met. file(s)  (METRUN)        Default: 0   ! METRUN =   0  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in CALPUFF data file(s)

     Starting date:    Year  (ISYR) --    No default   ! ISYR  =  1990   !
     (used only if     Month (ISMO) --    No default   ! ISMO  =  1   !
      METRUN = 0)      Day   (ISDY) --    No default   ! ISDY  =  6   !
                       Hour  (ISHR) --    No default   ! ISHR  =  0   !

     Number of hours to process (NHRS) -- No default   ! NHRS  =  8616  !

     Process every hour of data?(NREP) -- Default: 1   ! NREP  =  1  !
      (1 = every hour processed,
       2 = every 2nd hour processed,
       5 = every 5th hour processed, etc.)

Species & Concentration/Deposition Information
----------------------------------------------

      Species to process (ASPEC)       -- No default   ! ASPEC = SO2  !
      (ASPEC = VISIB for visibility processing)

      Layer/deposition code (ILAYER)   -- Default: 1   ! ILAYER =  1  !
        '1'  for CALPUFF concentrations,
        '-1' for dry deposition fluxes,
        '-2' for wet deposition fluxes,
        '-3' for wet+dry deposition fluxes.

      Scaling factors of the form:     -- Defaults:    ! A =  0.0     !
            X(new) = X(old) * A + B        A = 0.0     ! B =  0.0     !
        (NOT applied if A = B = 0.0)       B = 0.0

      Add Hourly Background Concentrations/Fluxes?
                              (LBACK)  -- Default: F   ! LBACK =  F !

Receptor information
--------------------

  Gridded receptors processed?    (LG) -- Default: F   ! LG  = F  !
  Discrete receptors processed?   (LD) -- Default: F   ! LD  = T  !
  CTSG Complex terrain receptors processed?
                                 (LCT) -- Default: F   ! LCT = F  !

--Select range of DISCRETE receptors (only used when LD = T):

  Select ALL DISCRETE receptors by setting NDRECP flag to -1;
                             OR
  Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each
     0 = discrete receptor not processed
     1 = discrete receptor processed
  using repeated value notation to select blocks of receptors:
     23*1, 15*0, 12*1
  Flag for all receptors after the last one assigned is set to 0
  (NDRECP) -- Default: -1
                                              ! NDRECP =  -1  !


--Select range of GRIDDED receptors (only used when LG = T):

       X index of LL corner (IBGRID) -- Default: -1     ! IBGRID = -1  !
           (-1 OR 1 <= IBGRID <= NX)

       Y index of LL corner (JBGRID) -- Default: -1     ! JBGRID = -1  !
           (-1 OR 1 <= JBGRID <= NY)

       X index of UR corner (IEGRID) -- Default: -1     ! IEGRID = -1  !
           (-1 OR 1 <= IEGRID <= NX)

       Y index of UR corner (JEGRID) -- Default: -1     ! JEGRID = -1  !
           (-1 OR 1 <= JEGRID <= NY)

  Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1
```

```
--Specific gridded receptors can also be excluded from CALPOST
  processing by filling a processing grid array with 0s and 1s.  If the
  processing flag for receptor index (i,j) is 1 (ON), that receptor
  will be processed if it lies within the range delineated by IBGRID,
  JBGRID,IEGRID,JEGRID and if LG=T. If it is 0 (OFF), it will not be
  processed in the run.  By default, all array values are set to 1 (ON).

  Number of gridded receptor rows provided in Subgroup (1a) to
  identify specific gridded receptors to process
                          (NGONOFF) -- Default: 0      ! NGONOFF =  0  !

!END!


--------------
Subgroup (1a) -- Specific gridded receptors included/excluded
--------------

    Specific gridded receptors are excluded from CALPOST processing
    by filling a processing grid array with 0s and 1s.  A total of
    NGONOFF lines are read here.  Each line corresponds to one 'row'
    in the sampling grid, starting with the NORTHERNMOST row that
    contains receptors that you wish to exclude, and finishing with
    row 1 to the SOUTH (no intervening rows may be skipped).  Within
    a row, each receptor position is assigned either a 0 or 1,
    starting with the westernmost receptor.
       0 = gridded receptor not processed
       1 = gridded receptor processed

    Repeated value notation may be used to select blocks of receptors:
       23*1, 15*0, 12*1

    Because all values are initially set to 1, any receptors north of
    the first row entered, or east of the last value provided in a row,
    remain ON.

    (NGXRECP) -- Default: 1


-------------------------------------------------------------------------------

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)
--------------

    Maximum relative humidity (%) used in particle growth curve
                              (RHMAX) -- Default: 98   ! RHMAX  = 0.0 !

    Modeled species to be included in computing the light extinction
     Include SULFATE?          (LVSO4) -- Default: T   ! LVSO4  = T  !
     Include NITRATE?          (LVNO3) -- Default: T   ! LVNO3  = T  !
     Include ORGANIC CARBON?   (LVOC)  -- Default: T   ! LVOC   = T  !
     Include COARSE PARTICLES? (LVPMC) -- Default: T   ! LVPMC  = T  !
     Include FINE PARTICLES?   (LVPMF) -- Default: T   ! LVPMF  = T  !

    And, when ranking for TOP-N, TOP-50, and Exceedance tables,
     Include BACKGROUND?       (LVBK)  -- Default: T   ! LVBK   = T  !

    Species name used for particulates in MODEL.DAT file
                 COARSE    (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
                 FINE      (SPECPMF) -- Default: PMF ! SPECPMF = PMF !

Extinction Efficiency (1/Mm per ug/m**3)
----------------------------------------
    MODELED particulate species:
              PM  COARSE    (EEPMC) -- Default: 0.6 ! EEPMC  = 0.6 !
              PM  FINE      (EEPMF) -- Default: 1.0 ! EEPMF  = 1.0 !
    BACKGROUND particulate species:
              PM  COARSE  (EEPMCBK) -- Default: 0.6 ! EEPMCBK = 0.6 !
    Other species:
             AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4  = 3.0 !
             AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3  = 3.0 !
             ORGANIC CARBON   (EEOC)  -- Default: 4.0 ! EEOC   = 4.0 !
             SOIL             (EESOIL)-- Default: 1.0 ! EESOIL = 1.0 !
             ELEMENTAL CARBON (EEEC)  -- Default: 10. ! EEEC   = 10.0 !
```

```
Background Extinction Computation
---------------------------------

    Method used for background light extinction
                              (MVISBK) -- Default: 6   ! MVISBK =  2  !

         1 =  Supply single light extinction and hygroscopic fraction
              - IWAQM (1993) RH adjustment applied to hygroscopic background
                and modeled sulfate and nitrate
         2 =  Compute extinction from speciated PM measurements (A)
              - Hourly RH adjustment applied to observed and modeled sulfate
                and nitrate
              - RH factor is capped at RHMAX
         3 =  Compute extinction from speciated PM measurements (B)
              - Hourly RH adjustment applied to observed and modeled sulfate
                and nitrate
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         4 =  Read hourly transmissometer background extinction measurements
              - Hourly RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         5 =  Read hourly nephelometer background extinction measurements
              - Rayleigh extinction value (BEXTRAY) added to measurement
              - Hourly RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         6 =  Compute extinction from speciated PM measurements
              - FLAG RH adjustment factor applied to observed and
                modeled sulfate and nitrate

    Additional inputs used for MVISBK = 1:
    --------------------------------------
     Background light extinction (1/Mm)
                              (BEXTBK) -- No default   ! BEXTBK = 0.0 !
     Percentage of particles affected by relative humidity
                              (RHFRAC) -- No default   ! RHFRAC = 0.0 !

    Additional inputs used for MVISBK = 6:
    --------------------------------------
     Extinction coefficients for hygroscopic species (modeled and
     background) are computed using a monthly RH adjustment factor
     in place of an hourly RH factor (VISB.DAT file is NOT needed).
     Enter the 12 monthly factors here (RHFAC).  Month 1 is January.

     (RHFAC)  -- No default     ! RHFAC = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,6:
    ------------------------------------------
     Background extinction coefficients are computed from monthly
     CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3),
     coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and
     elemental carbon (BKEC).  Month 1 is January.
     (ug/m**3)

     (BKSO4)  -- No default     ! BKSO4 = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKNO3)  -- No default     ! BKNO3 = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKPMC)  -- No default     ! BKPMC = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKOC)   -- No default     ! BKOC  = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKSOIL) -- No default     ! BKSOIL= 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !
     (BKEC)   -- No default     ! BKEC  = 0.0, 0.0, 0.0, 0.0,
```

```
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,5,6:
    -----------------------------------------
     Extinction due to Rayleigh scattering is added (1/Mm)
                               (BEXTRAY) -- Default: 10.0 ! BEXTRAY = 0.0 !

!END!
-------------------------------------------------------------------------------

INPUT GROUP: 3 -- Output options
--------------

Output Units
------------
    Units for All Output       (IPRTU) -- Default: 1   ! IPRTU =  3   !
                    for              for
                Concentration    Deposition
       1 =         g/m**3          g/m**2/s
       2 =        mg/m**3         mg/m**2/s
       3 =        ug/m**3         ug/m**2/s
       4 =        ng/m**3         ng/m**2/s
       5 =      Odour Units

    Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)


Averaging time(s) reported
-------------------------

    1-hr averages            (L1HR) -- Default: T   !   L1HR = T  !

    3-hr averages            (L3HR) -- Default: T   !   L3HR = T  !

    24-hr averages          (L24HR) -- Default: T   !  L24HR = T  !

    Run-length averages     (LRUNL) -- Default: T   !  LRUNL = T  !

    User-specified averaging time in hours - results for
    an averaging time of NAVG hours are reported for
    NAVG greater than 0:
                             (NAVG) -- Default: 0   !   NAVG =  8  !


Types of tabulations reported
-----------------------------

   1) Visibility: daily visibility tabulations are always reported
                  for the selected receptors when ASPEC = VISIB.
                  In addition, any of the other tabulations listed
                  below may be chosen to characterize the light
                  extinction coefficients.
                  [List file or Plot/Analysis File]


   2) Top 50 table for each averaging time selected
      [List file only]
                             (LT50) -- Default: T   !   LT50 = T  !

   3) Top 'N' table for each averaging time selected
      [List file or Plot file]
                            (LTOPN) -- Default: F   !  LTOPN = T  !

        -- Number of 'Top-N' values at each receptor
           selected (NTOP must be <= 4)
                             (NTOP) -- Default: 4   ! NTOP =  2   !

        -- Specific ranks of 'Top-N' values reported
           (NTOP values must be entered)
                    (ITOP(4) array) -- Default:     ! ITOP =  1 , 2   !
                                       1,2,3,4


   4) Threshold exceedance counts for each receptor and each averaging
      time selected
      [List file or Plot file]
```

```
                         (LEXCD) -- Default: F   !  LEXCD = F  !

      -- Identify the threshold for each averaging time by assigning a
         non-negative value (output units).

                                 -- Default: -1.0
         Threshold for  1-hr averages   (THRESH1) !  THRESH1 = -1.0  !
         Threshold for  3-hr averages   (THRESH3) !  THRESH3 = -1.0  !
         Threshold for 24-hr averages  (THRESH24) ! THRESH24 = -1.0  !
         Threshold for NAVG-hr averages (THRESHN) !  THRESHN = -1.0  !


      -- Counts for the shortest averaging period selected can be
         tallied daily, and receptors that experience more than NCOUNT
         counts over any NDAY period will be reported.  This type of
         exceedance violation output is triggered only if NDAY > 0.

         Accumulation period(Days)
                          (NDAY) -- Default: 0   !   NDAY =  0  !
         Number of exceedances allowed
                        (NCOUNT) -- Default: 1   !  NCOUNT =  1  !


   5) Selected day table(s)

      Echo Option -- Many records are written each averaging period
      selected and output is grouped by day
      [List file or Plot file]
                         (LECHO) -- Default: F   !  LECHO = F  !

      Timeseries Option -- Averages at all selected receptors for
      each selected averaging period are written to timeseries files.
      Each file contains one averaging period, and all receptors are
      written to a single record each averaging time.
      [TSttUUUU.DAT files]
                         (LTIME) -- Default: F   !  LTIME = F  !

      -- Days selected for output
                    (IECHO(366)) -- Default: 366*0
         ! IECHO  = 366*0  !
         (366 values must be entered)

Plot output options
------------------

     Plot files can be created for the Top-N, Exceedance, and Echo
     tables selected above.  Two formats for these files are available,
     DATA and GRID.  In the DATA format, results at all receptors are
     listed along with the receptor location [x,y,val1,val2,...].
     In the GRID format, results at only gridded receptors are written,
     using a compact representation.  The gridded values are written in
     rows (x varies), starting with the most southern row of the grid.
     The GRID format is given the .GRD extension, and includes headers
     compatible with the SURFER(R) plotting software.

     A plotting and analysis file can also be created for the daily
     peak visibility summary output, in DATA format only.

     Generate Plot file output in addition to writing tables
     to List file?
                               (LPLT) -- Default: F   ! LPLT  = F !

     Use GRID format rather than DATA format,
     when available?
                               (LGRD) -- Default: F   ! LGRD  = F !


Additional Debug Output
----------------------

   Output selected information to List file
    for debugging?
                             (LDEBUG) -- Default: F  ! LDEBUG  = F !

!END!
```

```
************************************************************************************************************
                                             CALPOST  Version 5.2          Level 991104
************************************************************************************************************



 Run Title:
    DECKER FT MEADE AQRV IMPACTS AT CHASSAHOWITZKA NWA, SO2                  4/24/00
    RECEPTORS AT CHASSAHOWITZKA NWA, ALL AVERAGING ITMES, CALPOST
    3 SIMPLE-CYCLE CTS, FUEL OIL, BASE LOAD, 32 DEGREES

-------------------------------------------------------------------------------

INPUT GROUP: 1 -- General run control parameters
--------------

     Option to run all periods found
     in the met. file(s)  (METRUN)       Default: 0   ! METRUN =   0  !

         METRUN = 0 - Run period explicitly defined below
         METRUN = 1 - Run all periods in CALPUFF data file(s)

     Starting date:    Year  (ISYR) --    No default   ! ISYR  =  1990   !
     (used only if     Month (ISMO) --    No default   ! ISMO  =  1   !
      METRUN = 0)      Day   (ISDY) --    No default   ! ISDY  =  6   !
                       Hour  (ISHR) --    No default   ! ISHR  =  0   !

     Number of hours to process (NHRS) -- No default   ! NHRS  =  8616  !

     Process every hour of data?(NREP) -- Default: 1   ! NREP  =  1  !
      (1 = every hour processed,
       2 = every 2nd hour processed,
       5 = every 5th hour processed, etc.)

Species & Concentration/Deposition Information
----------------------------------------------

      Species to process (ASPEC)       -- No default   ! ASPEC = SO2  !
      (ASPEC = VISIB for visibility processing)

      Layer/deposition code (ILAYER)   -- Default: 1   ! ILAYER =  1  !
        '1'  for CALPUFF concentrations,
        '-1' for dry deposition fluxes,
        '-2' for wet deposition fluxes,
        '-3' for wet+dry deposition fluxes.

      Scaling factors of the form:     -- Defaults:    ! A =  0.0    !
            X(new) = X(old) * A + B        A = 0.0     ! B =  0.0    !
        (NOT applied if A = B = 0.0)       B = 0.0

      Add Hourly Background Concentrations/Fluxes?
                            (LBACK)  -- Default: F   ! LBACK =  F !

Receptor information
--------------------

  Gridded receptors processed?    (LG) -- Default: F   ! LG  = F  !
  Discrete receptors processed?   (LD) -- Default: F   ! LD  = T  !
  CTSG Complex terrain receptors processed?
                                 (LCT) -- Default: F   ! LCT = F  !

--Select range of DISCRETE receptors (only used when LD = T):

  Select ALL DISCRETE receptors by setting NDRECP flag to -1;
                              OR
  Select SPECIFIC DISCRETE receptors by entering a flag (0,1) for each
     0 = discrete receptor not processed
     1 = discrete receptor processed
  using repeated value notation to select blocks of receptors:
     23*1, 15*0, 12*1
  Flag for all receptors after the last one assigned is set to 0
  (NDRECP) -- Default: -1
                                              ! NDRECP =  -1  !


--Select range of GRIDDED receptors (only used when LG = T):
```

```
      X index of LL corner (IBGRID) -- Default: -1     ! IBGRID = -1  !
          (-1 OR 1 <= IBGRID <= NX)

      Y index of LL corner (JBGRID) -- Default: -1     ! JBGRID = -1  !
          (-1 OR 1 <= JBGRID <= NY)

      X index of UR corner (IEGRID) -- Default: -1     ! IEGRID = -1  !
          (-1 OR 1 <= IEGRID <= NX)

      Y index of UR corner (JEGRID) -- Default: -1     ! JEGRID = -1  !
          (-1 OR 1 <= JEGRID <= NY)

  Note: Entire grid is processed if IBGRID=JBGRID=IEGRID=JEGRID=-1


--Specific gridded receptors can also be excluded from CALPOST
  processing by filling a processing grid array with 0s and 1s.  If the
  processing flag for receptor index (i,j) is 1 (ON), that receptor
  will be processed if it lies within the range delineated by IBGRID,
  JBGRID,IEGRID,JEGRID and if LG=T. If it is 0 (OFF), it will not be
  processed in the run.  By default, all array values are set to 1 (ON).

  Number of gridded receptor rows provided in Subgroup (1a) to
  identify specific gridded receptors to process
                        (NGONOFF) -- Default: 0      ! NGONOFF =  0  !

!END!


-------------
Subgroup (1a) -- Specific gridded receptors included/excluded
-------------

    Specific gridded receptors are excluded from CALPOST processing
    by filling a processing grid array with 0s and 1s.  A total of
    NGONOFF lines are read here.  Each line corresponds to one 'row'
    in the sampling grid, starting with the NORTHERNMOST row that
    contains receptors that you wish to exclude, and finishing with
    row 1 to the SOUTH (no intervening rows may be skipped).  Within
    a row, each receptor position is assigned either a 0 or 1,
    starting with the westernmost receptor.
       0 = gridded receptor not processed
       1 = gridded receptor processed

    Repeated value notation may be used to select blocks of receptors:
       23*1, 15*0, 12*1

    Because all values are initially set to 1, any receptors north of
    the first row entered, or east of the last value provided in a row,
    remain ON.

    (NGXRECP) -- Default: 1


--------------------------------------------------------------------------------

INPUT GROUP: 2 -- Visibility Parameters (ASPEC = VISIB)
-------------

    Maximum relative humidity (%) used in particle growth curve
                           (RHMAX) -- Default: 98    ! RHMAX  = 0.0 !

    Modeled species to be included in computing the light extinction
     Include SULFATE?          (LVSO4) -- Default: T    ! LVSO4  = T  !
     Include NITRATE?          (LVNO3) -- Default: T    ! LVNO3  = T  !
     Include ORGANIC CARBON?   (LVOC)  -- Default: T    ! LVOC   = T  !
     Include COARSE PARTICLES? (LVPMC) -- Default: T    ! LVPMC  = T  !
     Include FINE PARTICLES?   (LVPMF) -- Default: T    ! LVPMF  = T  !

    And, when ranking for TOP-N, TOP-50, and Exceedance tables,
     Include BACKGROUND?       (LVBK)  -- Default: T    ! LVBK   = T  !

    Species name used for particulates in MODEL.DAT file
                COARSE    (SPECPMC) -- Default: PMC ! SPECPMC = PMC !
                FINE      (SPECPMF) -- Default: PMF ! SPECPMF = PMF !
```

```
Extinction Efficiency (1/Mm per ug/m**3)
----------------------------------------
    MODELED particulate species:
           PM  COARSE      (EEPMC) -- Default: 0.6 ! EEPMC  = 0.6 !
           PM  FINE        (EEPMF) -- Default: 1.0 ! EEPMF  = 1.0 !
    BACKGROUND particulate species:
           PM  COARSE    (EEPMCBK) -- Default: 0.6 ! EEPMCBK = 0.6 !
    Other species:
          AMMONIUM SULFATE (EESO4) -- Default: 3.0 ! EESO4  = 3.0 !
          AMMONIUM NITRATE (EENO3) -- Default: 3.0 ! EENO3  = 3.0 !
          ORGANIC CARBON   (EEOC)  -- Default: 4.0 ! EEOC   = 4.0 !
          SOIL             (EESOIL)-- Default: 1.0 ! EESOIL = 1.0 !
          ELEMENTAL CARBON (EEEC)  -- Default: 10. ! EEEC   = 10.0 !

Background Extinction Computation
---------------------------------

    Method used for background light extinction
                         (MVISBK) -- Default: 6   ! MVISBK =  2  !

         1 =  Supply single light extinction and hygroscopic fraction
              - IWAQM (1993) RH adjustment applied to hygroscopic background
                and modeled sulfate and nitrate
         2 =  Compute extinction from speciated PM measurements (A)
              - Hourly RH adjustment applied to observed and modeled sulfate
                and nitrate
              - RH factor is capped at RHMAX
         3 =  Compute extinction from speciated PM measurements (B)
              - Hourly RH adjustment applied to observed and modeled sulfate
                and nitrate
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         4 =  Read hourly transmissometer background extinction measurements
              - Hourly RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         5 =  Read hourly nephelometer background extinction measurements
              - Rayleigh extinction value (BEXTRAY) added to measurement
              - Hourly RH adjustment applied to modeled sulfate and nitrate
              - Hour excluded if measurement invalid (missing, interference,
                or large RH)
              - Receptor-hour excluded if RH>RHMAX
              - Receptor-day excluded if fewer than 6 valid receptor-hours
         6 =  Compute extinction from speciated PM measurements
              - FLAG RH adjustment factor applied to observed and
                modeled sulfate and nitrate

    Additional inputs used for MVISBK = 1:
    --------------------------------------
     Background light extinction (1/Mm)
                         (BEXTBK) -- No default   ! BEXTBK = 0.0 !
     Percentage of particles affected by relative humidity
                         (RHFRAC) -- No default   ! RHFRAC = 0.0 !

    Additional inputs used for MVISBK = 6:
    --------------------------------------
     Extinction coefficients for hygroscopic species (modeled and
     background) are computed using a monthly RH adjustment factor
     in place of an hourly RH factor (VISB.DAT file is NOT needed).
     Enter the 12 monthly factors here (RHFAC).  Month 1 is January.

     (RHFAC)  -- No default     ! RHFAC = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,6:
    ----------------------------------------
     Background extinction coefficients are computed from monthly
     CONCENTRATIONS of ammonium sulfate (BKSO4), ammonium nitrate (BKNO3),
     coarse particulates (BKPMC), organic carbon (BKOC), soil (BKSOIL), and
     elemental carbon (BKEC).  Month 1 is January.
     (ug/m**3)

     (BKSO4)  -- No default     ! BKSO4 = 0.0, 0.0, 0.0, 0.0,
                                          0.0, 0.0, 0.0, 0.0,
```

```
                                         0.0, 0.0, 0.0, 0.0 !
     (BKNO3)  -- No default      ! BKNO3 = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKPMC)  -- No default      ! BKPMC = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKOC)   -- No default      ! BKOC  = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKSOIL) -- No default      ! BKSOIL= 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !
     (BKEC)   -- No default      ! BKEC  = 0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0,
                                         0.0, 0.0, 0.0, 0.0 !

    Additional inputs used for MVISBK = 2,3,5,6:
    ------------------------------------------
     Extinction due to Rayleigh scattering is added (1/Mm)
                            (BEXTRAY) -- Default: 10.0 ! BEXTRAY = 0.0 !

!END!
-------------------------------------------------------------------------------

INPUT GROUP: 3 -- Output options
--------------

Output Units
------------
    Units for All Output      (IPRTU) -- Default: 1   ! IPRTU =  3   !
                   for             for
               Concentration    Deposition
       1 =        g/m**3         g/m**2/s
       2 =       mg/m**3        mg/m**2/s
       3 =       ug/m**3        ug/m**2/s
       4 =       ng/m**3        ng/m**2/s
       5 =      Odour Units

    Visibility: extinction expressed in 1/Mega-meters (IPRTU is ignored)


Averaging time(s) reported
--------------------------

    1-hr averages           (L1HR) -- Default: T   !   L1HR = T  !

    3-hr averages           (L3HR) -- Default: T   !   L3HR = T  !

    24-hr averages         (L24HR) -- Default: T   !  L24HR = T  !

    Run-length averages    (LRUNL) -- Default: T   !  LRUNL = T  !

    User-specified averaging time in hours - results for
    an averaging time of NAVG hours are reported for
    NAVG greater than 0:
                            (NAVG) -- Default: 0   !   NAVG =  8  !


Types of tabulations reported
-----------------------------

   1) Visibility: daily visibility tabulations are always reported
                  for the selected receptors when ASPEC = VISIB.
                  In addition, any of the other tabulations listed
                  below may be chosen to characterize the light
                  extinction coefficients.
                  [List file or Plot/Analysis File]


   2) Top 50 table for each averaging time selected
      [List file only]
                            (LT50) -- Default: T   !   LT50 = T  !

   3) Top 'N' table for each averaging time selected
      [List file or Plot file]
                           (LTOPN) -- Default: F   !  LTOPN = T  !
```

```
        -- Number of 'Top-N' values at each receptor
           selected (NTOP must be <= 4)
                            (NTOP) -- Default: 4   ! NTOP =  2   !

        -- Specific ranks of 'Top-N' values reported
           (NTOP values must be entered)
                   (ITOP(4) array) -- Default:     ! ITOP =  1 , 2   !
                                       1,2,3,4


    4) Threshold exceedance counts for each receptor and each averaging
       time selected
       [List file or Plot file]
                           (LEXCD) -- Default: F   !  LEXCD = F  !

        -- Identify the threshold for each averaging time by assigning a
           non-negative value (output units).

                                        -- Default: -1.0
           Threshold for  1-hr averages   (THRESH1) !  THRESH1 = -1.0  !
           Threshold for  3-hr averages   (THRESH3) !  THRESH3 = -1.0  !
           Threshold for 24-hr averages  (THRESH24) ! THRESH24 = -1.0  !
           Threshold for NAVG-hr averages (THRESHN) !  THRESHN = -1.0  !


        -- Counts for the shortest averaging period selected can be
           tallied daily, and receptors that experience more than NCOUNT
           counts over any NDAY period will be reported.  This type of
           exceedance violation output is triggered only if NDAY > 0.

           Accumulation period(Days)
                            (NDAY) -- Default: 0   !    NDAY =  0  !
           Number of exceedances allowed
                          (NCOUNT) -- Default: 1   !  NCOUNT =  1  !


    5) Selected day table(s)

       Echo Option -- Many records are written each averaging period
       selected and output is grouped by day
       [List file or Plot file]
                           (LECHO) -- Default: F   !  LECHO = F  !

       Timeseries Option -- Averages at all selected receptors for
       each selected averaging period are written to timeseries files.
       Each file contains one averaging period, and all receptors are
       written to a single record each averaging time.
       [TSttUUUU.DAT files]
                           (LTIME) -- Default: F   !  LTIME = F  !

        -- Days selected for output
                      (IECHO(366)) -- Default: 366*0
           ! IECHO  = 366*0  !
           (366 values must be entered)

  Plot output options
  -------------------

      Plot files can be created for the Top-N, Exceedance, and Echo
      tables selected above.  Two formats for these files are available,
      DATA and GRID.  In the DATA format, results at all receptors are
      listed along with the receptor location [x,y,val1,val2,...].
      In the GRID format, results at only gridded receptors are written,
      using a compact representation.  The gridded values are written in
      rows (x varies), starting with the most southern row of the grid.
      The GRID format is given the .GRD extension, and includes headers
      compatible with the SURFER(R) plotting software.

      A plotting and analysis file can also be created for the daily
      peak visibility summary output, in DATA format only.

      Generate Plot file output in addition to writing tables
      to List file?
                                (LPLT) -- Default: F   ! LPLT  = F !

      Use GRID format rather than DATA format,
```

```
     when available?
                                (LGRD) -- Default: F   ! LGRD   = F !


 Additional Debug Output
 -----------------------

    Output selected information to List file
     for debugging?
                              (LDEBUG) -- Default: F  ! LDEBUG  = F !

 !END!

------------------------------------------------
NOTICE: Starting year in control file sets the
        expected century for the simulation.  All
        YY years are converted to YYYY years in
        the range:         1940        2039
------------------------------------------------


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  CALPOST Control File Input Summary ------------------------

     Replace run data with data in Puff file 1=Y:    0
                      Run starting date -- year: 1990
                                          month:    1
                                            day:    5
                                     Julian day:    5
         Time at beginning of run  -  hour(0-23):   23
                                   -     second:    0
                            Run length (hours): 8616


 Every hour of data processed -- NREP = 1


  Species & Concentration/Deposition Information
                                       Species: SO2
                        Layer of processed data:    1
     (>0=conc, -1=dry flux, -2=wet flux, -3=wet & dry flux)
                  Multiplicative scaling factor: 0.0000E+00
                        Additive scaling factor: 0.0000E+00
                 Hourly background values used?: F


  Receptor information
                   Gridded receptors processed?: F
                  Discrete receptors processed?: T
       CTSG Complex terrain receptors processed?: F

  Discrete Receptors Processed

  (All Discrete Receptors are Used)


  Visibility Processing is NOT Selected



  Output options
                     Units requested for output:   (ug/m**3)

  Averaging time(s) selected
      User-specified averaging time (NAVG hours):     8
                                 1-hr averages:     T
                                 3-hr averages:     T
                                24-hr averages:     T
                              NAVG-hr averages:     T
                         Length of run averages:     T
```

```
  Output components selected
                                             Top-50:     T
                 Top-N values at each receptor:     T
              Exceedance counts at each receptor:     F
        Output selected information for debugging:     F
                  Echo tables for selected days:     F
                  Time-series for selected days:     F

  Top "n" table control
        Number of "top" values at each receptor:     2
        Specific ranks of "top" values reported:   1   2


  Plot file option
                             Plot files created:     F


IDENTIFICATION OF PROCESSED MODEL FILE ----------

CALPUFF     5.2         991104a

REFINED SIGNIFICANT IMPACT ANALYSIS, CALPUFF, DECKER FT MEADE 3 S-C CTS 4/24/00
RECEPTORS AT CHASSAHOWITZKA NWA, PLANT ONLY, NATURAL GAS FUEL
FDEP CHASSAHOWITZKA CALMET DOMAIN WITH PRECIPITATION, NAT. GAS, BASE/32 DEG

Averaging time for values reported from model:
                1   HOUR

Number of averaging periods in file from model:
             8616

Chemical species names for each layer in model:
SO2           1
SO4           1
NOX           1
HNO3          1
NO3           1
PM10          1
CO            1



**************    NOTICE    ***************
NDRECP array reset to full range: all 1s


 ---------------------------------------------------------------------------------------------------------------------------
          INPUT FILES

 Default Name     Unit No.     File Name and Path
 ------------     --------     ------------------
  CALPOST.INP        5         calpost.inp
    MODEL.DAT        4         calpuff.con


 ---------------------------------------------------------------------------------------------------------------------------
          OUTPUT FILES

 Default Name     Unit No.     File Name and Path
 ------------     --------     ------------------
  CALPOST.LST        8         calpost.lst

****************************************************************************************************************************
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                                    SO2           1

             TOP-50    1   HOUR AVERAGE  CONCENTRATION VALUES  (ug/m**3)

             YEAR  DAY TIME(HHMM) RECEPTOR  TYPE   CONCENTRATION   COORDINATES (km)

             1990   88    0900    (  0,    6)  D     6.1812E-01     343.000  3176.200
             1990   88    0900    (  0,    7)  D     6.0870E-01     343.700  3178.300
```

1990	88	0900	(0, 5)	D	5.9750E-01	342.000	3174.000
1990	88	0900	(0, 8)	D	5.7989E-01	342.400	3180.600
1990	88	0900	(0, 4)	D	5.4172E-01	340.700	3171.900
1990	88	0900	(0, 9)	D	5.4057E-01	341.100	3183.400
1990	88	0900	(0, 10)	D	5.3741E-01	339.000	3183.400
1990	136	0900	(0, 1)	D	5.2586E-01	340.300	3165.700
1990	88	0900	(0, 11)	D	5.1904E-01	336.500	3183.400
1990	136	0900	(0, 2)	D	5.0880E-01	340.300	3167.700
1990	88	0900	(0, 12)	D	4.8703E-01	334.000	3183.400
1990	88	0900	(0, 3)	D	4.7731E-01	340.300	3169.800
1990	136	0900	(0, 3)	D	4.6303E-01	340.300	3169.800
1990	88	1000	(0, 6)	D	4.5178E-01	343.000	3176.200
1990	88	1000	(0, 7)	D	4.5136E-01	343.700	3178.300
1990	88	0900	(0, 13)	D	4.4772E-01	331.500	3183.400
1990	88	1000	(0, 8)	D	4.4157E-01	342.400	3180.600
1990	332	0700	(0, 1)	D	4.3962E-01	340.300	3165.700
1990	341	1400	(0, 1)	D	4.3321E-01	340.300	3165.700
1990	88	1000	(0, 5)	D	4.3198E-01	342.000	3174.000
1990	123	0900	(0, 1)	D	4.2869E-01	340.300	3165.700
1990	136	0800	(0, 1)	D	4.2810E-01	340.300	3165.700
1990	88	1000	(0, 9)	D	4.2577E-01	341.100	3183.400
1990	88	1000	(0, 10)	D	4.2569E-01	339.000	3183.400
1990	88	0800	(0, 5)	D	4.2430E-01	342.000	3174.000
1990	332	0700	(0, 2)	D	4.1934E-01	340.300	3167.700
1990	88	0800	(0, 6)	D	4.1763E-01	343.000	3176.200
1990	88	1000	(0, 11)	D	4.1249E-01	336.500	3183.400
1990	88	1000	(0, 12)	D	4.1107E-01	334.000	3183.400
1990	88	0900	(0, 2)	D	4.0950E-01	340.300	3167.700
1990	88	0800	(0, 4)	D	4.0911E-01	340.700	3171.900
1990	291	1100	(0, 1)	D	4.0855E-01	340.300	3165.700
1990	136	0900	(0, 4)	D	4.0069E-01	340.700	3171.900
1990	341	1400	(0, 2)	D	3.9787E-01	340.300	3167.700
1990	88	0800	(0, 7)	D	3.9611E-01	343.700	3178.300
1990	46	0900	(0, 1)	D	3.9143E-01	340.300	3165.700
1990	354	1200	(0, 5)	D	3.9001E-01	342.000	3174.000
1990	354	1200	(0, 4)	D	3.8983E-01	340.700	3171.900
1990	88	1000	(0, 13)	D	3.8979E-01	331.500	3183.400
1990	354	1200	(0, 3)	D	3.8962E-01	340.300	3169.800
1990	88	1000	(0, 4)	D	3.8807E-01	340.700	3171.900
1990	291	1100	(0, 2)	D	3.8693E-01	340.300	3167.700
1990	88	0800	(0, 3)	D	3.8656E-01	340.300	3169.800
1990	46	0900	(0, 2)	D	3.8636E-01	340.300	3167.700
1990	332	0700	(0, 3)	D	3.8606E-01	340.300	3169.800
1990	354	1200	(0, 2)	D	3.8570E-01	340.300	3167.700
1990	89	0700	(0, 10)	D	3.8331E-01	339.000	3183.400
1990	354	1200	(0, 1)	D	3.8108E-01	340.300	3165.700
1990	354	1200	(0, 6)	D	3.7935E-01	343.000	3176.200
1990	89	0700	(0, 11)	D	3.7652E-01	336.500	3183.400

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TOP-50 3 HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	TIME(HHMM)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
1990	88	1100	(0, 7)	D	4.5741E-01	343.700	3178.300
1990	88	1100	(0, 6)	D	4.5333E-01	343.000	3176.200
1990	88	1100	(0, 8)	D	4.4639E-01	342.400	3180.600
1990	88	1100	(0, 9)	D	4.3069E-01	341.100	3183.400
1990	88	1100	(0, 5)	D	4.2781E-01	342.000	3174.000
1990	88	1100	(0, 10)	D	4.2627E-01	339.000	3183.400
1990	88	1100	(0, 11)	D	4.0957E-01	336.500	3183.400
1990	88	1100	(0, 12)	D	3.9041E-01	334.000	3183.400
1990	88	1100	(0, 4)	D	3.7909E-01	340.700	3171.900
1990	88	1100	(0, 13)	D	3.6082E-01	331.500	3183.400
1990	123	1100	(0, 1)	D	3.6020E-01	340.300	3165.700
1990	136	1100	(0, 1)	D	3.4330E-01	340.300	3165.700
1990	136	1100	(0, 2)	D	3.3533E-01	340.300	3167.700
1990	88	1100	(0, 3)	D	3.3215E-01	340.300	3169.800
1990	123	1100	(0, 2)	D	3.2348E-01	340.300	3167.700
1990	291	1100	(0, 1)	D	3.1811E-01	340.300	3165.700
1990	136	1100	(0, 3)	D	3.1553E-01	340.300	3169.800

1990	20	0800	(0,	4)	D	2.9894E-01	340.700	3171.900
1990	20	0800	(0,	5)	D	2.9540E-01	342.000	3174.000
1990	89	0500	(0,	9)	D	2.9195E-01	341.100	3183.400
1990	291	1100	(0,	2)	D	2.9124E-01	340.300	3167.700
1990	89	0500	(0,	7)	D	2.9114E-01	343.700	3178.300
1990	89	0500	(0,	8)	D	2.9112E-01	342.400	3180.600
1990	20	0800	(0,	3)	D	2.8907E-01	340.300	3169.800
1990	88	1100	(0,	2)	D	2.8698E-01	340.300	3167.700
1990	332	0800	(0,	1)	D	2.8598E-01	340.300	3165.700
1990	136	1100	(0,	4)	D	2.8524E-01	340.700	3171.900
1990	332	0800	(0,	2)	D	2.8455E-01	340.300	3167.700
1990	136	1100	(0,	13)	D	2.8158E-01	331.500	3183.400
1990	123	1100	(0,	3)	D	2.8128E-01	340.300	3169.800
1990	332	0800	(0,	3)	D	2.7817E-01	340.300	3169.800
1990	20	0800	(0,	12)	D	2.7572E-01	334.000	3183.400
1990	20	0800	(0,	13)	D	2.7477E-01	331.500	3183.400
1990	20	0800	(0,	6)	D	2.7330E-01	343.000	3176.200
1990	20	0800	(0,	2)	D	2.7290E-01	340.300	3167.700
1990	20	1100	(0,	6)	D	2.7107E-01	343.000	3176.200
1990	192	1100	(0,	1)	D	2.6961E-01	340.300	3165.700
1990	228	1100	(0,	1)	D	2.6859E-01	340.300	3165.700
1990	20	1100	(0,	7)	D	2.6757E-01	343.700	3178.300
1990	332	0800	(0,	13)	D	2.6568E-01	331.500	3183.400
1990	354	1400	(0,	1)	D	2.6564E-01	340.300	3165.700
1990	20	0800	(0,	11)	D	2.6559E-01	336.500	3183.400
1990	332	0800	(0,	4)	D	2.6547E-01	340.700	3171.900
1990	89	0500	(0,	10)	D	2.6390E-01	339.000	3183.400
1990	291	1100	(0,	3)	D	2.6302E-01	340.300	3169.800
1990	88	0800	(0,	4)	D	2.6249E-01	340.700	3171.900
1990	89	0500	(0,	6)	D	2.6209E-01	343.000	3176.200
1990	20	1100	(0,	5)	D	2.6178E-01	342.000	3174.000
1990	88	0800	(0,	3)	D	2.6146E-01	340.300	3169.800
1990	136	0800	(0,	1)	D	2.6076E-01	340.300	3165.700

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TOP-50 24 HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	TIME(HHMM)	RECEPTOR		TYPE	CONCENTRATION	COORDINATES (km)	
1990	136	2300	(0,	1)	D	1.2422E-01	340.300	3165.700
1990	136	2300	(0,	2)	D	1.1828E-01	340.300	3167.700
1990	136	2300	(0,	3)	D	1.1070E-01	340.300	3169.800
1990	228	2300	(0,	1)	D	1.0126E-01	340.300	3165.700
1990	136	2300	(0,	4)	D	1.0096E-01	340.700	3171.900
1990	228	2300	(0,	2)	D	9.9755E-02	340.300	3167.700
1990	88	2300	(0,	6)	D	9.9522E-02	343.000	3176.200
1990	20	2300	(0,	6)	D	9.9303E-02	343.000	3176.200
1990	20	2300	(0,	5)	D	9.9301E-02	342.000	3174.000
1990	88	2300	(0,	7)	D	9.9017E-02	343.700	3178.300
1990	228	2300	(0,	3)	D	9.7619E-02	340.300	3169.800
1990	136	2300	(0,	13)	D	9.6825E-02	331.500	3183.400
1990	88	2300	(0,	5)	D	9.6760E-02	342.000	3174.000
1990	20	2300	(0,	7)	D	9.6304E-02	343.700	3178.300
1990	88	2300	(0,	8)	D	9.6285E-02	342.400	3180.600
1990	228	2300	(0,	4)	D	9.6004E-02	340.700	3171.900
1990	228	2300	(0,	5)	D	9.5338E-02	342.000	3174.000
1990	20	2300	(0,	4)	D	9.4548E-02	340.700	3171.900
1990	20	2300	(0,	8)	D	9.4439E-02	342.400	3180.600
1990	228	2300	(0,	6)	D	9.3667E-02	343.000	3176.200
1990	123	2300	(0,	1)	D	9.3490E-02	340.300	3165.700
1990	20	2300	(0,	10)	D	9.3334E-02	339.000	3183.400
1990	88	2300	(0,	9)	D	9.2803E-02	341.100	3183.400
1990	20	2300	(0,	11)	D	9.2404E-02	336.500	3183.400
1990	88	2300	(0,	10)	D	9.1883E-02	339.000	3183.400
1990	20	2300	(0,	9)	D	9.1702E-02	341.100	3183.400
1990	228	2300	(0,	7)	D	9.1400E-02	343.700	3178.300
1990	88	2300	(0,	4)	D	9.0103E-02	340.700	3171.900
1990	20	2300	(0,	3)	D	8.9371E-02	340.300	3169.800
1990	136	2300	(0,	12)	D	8.9014E-02	334.000	3183.400
1990	88	2300	(0,	11)	D	8.8887E-02	336.500	3183.400
1990	20	2300	(0,	12)	D	8.8605E-02	334.000	3183.400

```
1990  136   2300   (  0,   5)  D    8.6936E-02    342.000  3174.000
1990  192   2300   (  0,   1)  D    8.6459E-02    340.300  3165.700
1990  228   2300   (  0,   8)  D    8.6177E-02    342.400  3180.600
1990   88   2300   (  0,  12)  D    8.5194E-02    334.000  3183.400
1990  291   2300   (  0,   1)  D    8.4205E-02    340.300  3165.700
1990   20   2300   (  0,   2)  D    8.4010E-02    340.300  3167.700
1990   88   2300   (  0,   3)  D    8.3645E-02    340.300  3169.800
1990  291   2300   (  0,   2)  D    8.2629E-02    340.300  3167.700
1990   20   2300   (  0,  13)  D    8.2407E-02    331.500  3183.400
1990  123   2300   (  0,   2)  D    8.2174E-02    340.300  3167.700
1990  192   2300   (  0,   2)  D    8.2058E-02    340.300  3167.700
1990   89   2300   (  0,   7)  D    8.0864E-02    343.700  3178.300
1990  228   2300   (  0,   9)  D    8.0618E-02    341.100  3183.400
1990   88   2300   (  0,  13)  D    7.9837E-02    331.500  3183.400
1990  136   2300   (  0,  11)  D    7.9668E-02    336.500  3183.400
1990  291   2300   (  0,   3)  D    7.9633E-02    340.300  3169.800
1990   89   2300   (  0,   8)  D    7.9388E-02    342.400  3180.600
1990  228   2300   (  0,  10)  D    7.8203E-02    339.000  3183.400

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TOP-50    8   HOUR AVERAGE   CONCENTRATION VALUES  (ug/m**3)

YEAR  DAY TIME(HHMM) RECEPTOR  TYPE   CONCENTRATION    COORDINATES (km)

1990  136   1500   (  0,   1)  D    2.6222E-01    340.300  3165.700
1990  136   1500   (  0,   2)  D    2.5355E-01    340.300  3167.700
1990   88   1500   (  0,   7)  D    2.4988E-01    343.700  3178.300
1990   88   1500   (  0,   8)  D    2.4529E-01    342.400  3180.600
1990   88   1500   (  0,   6)  D    2.4509E-01    343.000  3176.200
1990  123   1500   (  0,   1)  D    2.4154E-01    340.300  3165.700
1990  136   1500   (  0,   3)  D    2.3957E-01    340.300  3169.800
1990   88   1500   (  0,   9)  D    2.3919E-01    341.100  3183.400
1990   88   1500   (  0,  10)  D    2.3397E-01    339.000  3183.400
1990   88   1500   (  0,   5)  D    2.3024E-01    342.000  3174.000
1990  291   1500   (  0,   1)  D    2.2365E-01    340.300  3165.700
1990   88   1500   (  0,  11)  D    2.2264E-01    336.500  3183.400
1990  136   1500   (  0,   4)  D    2.2018E-01    340.700  3171.900
1990   20   1500   (  0,   7)  D    2.1894E-01    343.700  3178.300
1990  291   1500   (  0,   2)  D    2.1832E-01    340.300  3167.700
1990   20   1500   (  0,   6)  D    2.1654E-01    343.000  3176.200
1990   20   1500   (  0,   8)  D    2.1632E-01    342.400  3180.600
1990  123   1500   (  0,   2)  D    2.1499E-01    340.300  3167.700
1990   20   1500   (  0,   9)  D    2.1289E-01    341.100  3183.400
1990   20   1500   (  0,  10)  D    2.0987E-01    339.000  3183.400
1990   88   1500   (  0,  12)  D    2.0977E-01    334.000  3183.400
1990  136   1500   (  0,  13)  D    2.0930E-01    331.500  3183.400
1990  291   1500   (  0,   3)  D    2.0873E-01    340.300  3169.800
1990  228   1500   (  0,   1)  D    2.0602E-01    340.300  3165.700
1990   88   1500   (  0,   4)  D    2.0468E-01    340.700  3171.900
1990   20   1500   (  0,   5)  D    2.0434E-01    342.000  3174.000
1990  192   1500   (  0,   1)  D    2.0083E-01    340.300  3165.700
1990  228   1500   (  0,   2)  D    2.0003E-01    340.300  3167.700
1990   20   1500   (  0,  11)  D    1.9872E-01    336.500  3183.400
1990  291   1500   (  0,   4)  D    1.9767E-01    340.700  3171.900
1990  226   1500   (  0,   5)  D    1.9338E-01    342.000  3174.000
1990   88   1500   (  0,  13)  D    1.9256E-01    331.500  3183.400
1990  228   1500   (  0,   3)  D    1.9251E-01    340.300  3169.800
1990  136   1500   (  0,  12)  D    1.9248E-01    334.000  3183.400
1990  226   1500   (  0,   6)  D    1.9222E-01    343.000  3176.200
1990  136   1500   (  0,   5)  D    1.9095E-01    342.000  3174.000
1990  192   1500   (  0,   2)  D    1.8908E-01    340.300  3167.700
1990  226   1500   (  0,   4)  D    1.8890E-01    340.700  3171.900
1990  226   1500   (  0,  12)  D    1.8789E-01    334.000  3183.400
1990  226   1500   (  0,   8)  D    1.8727E-01    342.400  3180.600
1990   89   0700   (  0,   7)  D    1.8717E-01    343.700  3178.300
1990  228   1500   (  0,   4)  D    1.8648E-01    340.700  3171.900
1990  226   1500   (  0,   7)  D    1.8646E-01    343.700  3178.300
1990  226   1500   (  0,  11)  D    1.8601E-01    336.500  3183.400
1990  123   1500   (  0,   3)  D    1.8590E-01    340.300  3169.800
1990  226   1500   (  0,  13)  D    1.8582E-01    331.500  3183.400
1990   89   0700   (  0,   8)  D    1.8450E-01    342.400  3180.600
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1990	291	1500	(0, 5)	D	1.8397E-01	342.000	3174.000
1990	228	1500	(0, 5)	D	1.8294E-01	342.000	3174.000
1990	226	1500	(0, 10)	D	1.8258E-01	339.000	3183.400

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TOP-50 8616 HOUR AVERAGE CONCENTRATION VALUES (ug/m**3)

YEAR	DAY	TIME(HHMM)	RECEPTOR	TYPE	CONCENTRATION	COORDINATES (km)	
1990	364	2300	(0, 1)	D	6.7575E-03	340.300	3165.700
1990	364	2300	(0, 2)	D	6.5984E-03	340.300	3167.700
1990	364	2300	(0, 3)	D	6.4410E-03	340.300	3169.800
1990	364	2300	(0, 4)	D	6.2844E-03	340.700	3171.900
1990	364	2300	(0, 5)	D	6.1300E-03	342.000	3174.000
1990	364	2300	(0, 6)	D	5.9789E-03	343.000	3176.200
1990	364	2300	(0, 7)	D	5.8447E-03	343.700	3178.300
1990	364	2300	(0, 8)	D	5.7071E-03	342.400	3180.600
1990	364	2300	(0, 9)	D	5.5456E-03	341.100	3183.400
1990	364	2300	(0, 10)	D	5.5388E-03	339.000	3183.400
1990	364	2300	(0, 11)	D	5.5213E-03	336.500	3183.400
1990	364	2300	(0, 12)	D	5.5033E-03	334.000	3183.400
1990	364	2300	(0, 13)	D	5.4756E-03	331.500	3183.400
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000
0	0	0000	(0, 0)		-9.9900E+31	0.000	0.000

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SO2 1

2 RANKED 1 HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING TIME) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	5.2586E-01 (1990,136,0900)	4.3962E-01 (1990,332,0700)

2	340.300	3167.700	5.0880E-01 (1990,136,0900)	4.1934E-01 (1990,332,0700)
3	340.300	3169.800	4.7731E-01 (1990,088,0900)	4.6303E-01 (1990,136,0900)
4	340.700	3171.900	5.4172E-01 (1990,088,0900)	4.0911E-01 (1990,088,0800)
5	342.000	3174.000	5.9750E-01 (1990,088,0900)	4.3198E-01 (1990,088,1000)
6	343.000	3176.200	6.1812E-01 (1990,088,0900)	4.5178E-01 (1990,088,1000)
7	343.700	3178.300	6.0870E-01 (1990,088,0900)	4.5136E-01 (1990,088,1000)
8	342.400	3180.600	5.7989E-01 (1990,088,0900)	4.4157E-01 (1990,088,1000)
9	341.100	3183.400	5.4057E-01 (1990,088,0900)	4.2577E-01 (1990,088,1000)
10	339.000	3183.400	5.3741E-01 (1990,088,0900)	4.2569E-01 (1990,088,1000)
11	336.500	3183.400	5.1904E-01 (1990,088,0900)	4.1249E-01 (1990,088,1000)
12	334.000	3183.400	4.8703E-01 (1990,088,0900)	4.1107E-01 (1990,088,1000)
13	331.500	3183.400	4.4772E-01 (1990,088,0900)	3.8979E-01 (1990,088,1000)

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SO2 1

2 RANKED 3 HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING TIME) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	3.6020E-01 (1990,123,1100)	3.4330E-01 (1990,136,1100)
2	340.300	3167.700	3.3533E-01 (1990,136,1100)	3.2348E-01 (1990,123,1100)
3	340.300	3169.800	3.3215E-01 (1990,088,1100)	3.1553E-01 (1990,136,1100)
4	340.700	3171.900	3.7909E-01 (1990,088,1100)	2.9894E-01 (1990,020,0800)
5	342.000	3174.000	4.2781E-01 (1990,088,1100)	2.9540E-01 (1990,020,0800)
6	343.000	3176.200	4.5333E-01 (1990,088,1100)	2.7330E-01 (1990,020,0800)
7	343.700	3178.300	4.5741E-01 (1990,088,1100)	2.9114E-01 (1990,089,0500)
8	342.400	3180.600	4.4639E-01 (1990,088,1100)	2.9112E-01 (1990,089,0500)
9	341.100	3183.400	4.3069E-01 (1990,088,1100)	2.9195E-01 (1990,089,0500)
10	339.000	3183.400	4.2627E-01 (1990,088,1100)	2.6390E-01 (1990,089,0500)
11	336.500	3183.400	4.0957E-01 (1990,088,1100)	2.6559E-01 (1990,020,0800)
12	334.000	3183.400	3.9041E-01 (1990,088,1100)	2.7572E-01 (1990,020,0800)
13	331.500	3183.400	3.6082E-01 (1990,088,1100)	2.8158E-01 (1990,136,1100)

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SO2 1

2 RANKED 24 HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING TIME) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	1.2422E-01 (1990,136,2300)	1.0126E-01 (1990,228,2300)
2	340.300	3167.700	1.1828E-01 (1990,136,2300)	9.9755E-02 (1990,228,2300)
3	340.300	3169.800	1.1070E-01 (1990,136,2300)	9.7619E-02 (1990,228,2300)
4	340.700	3171.900	1.0096E-01 (1990,136,2300)	9.6004E-02 (1990,228,2300)
5	342.000	3174.000	9.9301E-02 (1990,020,2300)	9.6760E-02 (1990,088,2300)
6	343.000	3176.200	9.9522E-02 (1990,088,2300)	9.9303E-02 (1990,020,2300)
7	343.700	3178.300	9.9017E-02 (1990,088,2300)	9.6304E-02 (1990,020,2300)
8	342.400	3180.600	9.6285E-02 (1990,088,2300)	9.4439E-02 (1990,020,2300)
9	341.100	3183.400	9.2803E-02 (1990,088,2300)	9.1702E-02 (1990,020,2300)
10	339.000	3183.400	9.3334E-02 (1990,020,2300)	9.1883E-02 (1990,088,2300)
11	336.500	3183.400	9.2404E-02 (1990,020,2300)	8.8887E-02 (1990,088,2300)
12	334.000	3183.400	8.9014E-02 (1990,136,2300)	8.8605E-02 (1990,020,2300)
13	331.500	3183.400	9.6825E-02 (1990,136,2300)	8.2407E-02 (1990,020,2300)

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SO2 1

2 RANKED 8 HOUR AVERAGE CONCENTRATION VALUES AT EACH DISCRETE RECEPTOR (YEAR,DAY,ENDING TIME) (ug/m**3)

RECEPTOR	COORDINATES (km)		1 RANK	2 RANK
1	340.300	3165.700	2.6222E-01 (1990,136,1500)	2.4154E-01 (1990,123,1500)
2	340.300	3167.700	2.5355E-01 (1990,136,1500)	2.1832E-01 (1990,291,1500)
3	340.300	3169.800	2.3957E-01 (1990,136,1500)	2.0873E-01 (1990,291,1500)
4	340.700	3171.900	2.2018E-01 (1990,136,1500)	2.0468E-01 (1990,088,1500)
5	342.000	3174.000	2.3024E-01 (1990,088,1500)	2.0434E-01 (1990,020,1500)
6	343.000	3176.200	2.4509E-01 (1990,088,1500)	2.1654E-01 (1990,020,1500)

7	343.700	3178.300	2.4988E-01	(1990,088,1500)	2.1894E-01	(1990,020,1500)
8	342.400	3180.600	2.4529E-01	(1990,088,1500)	2.1632E-01	(1990,020,1500)
9	341.100	3183.400	2.3919E-01	(1990,088,1500)	2.1289E-01	(1990,020,1500)
10	339.000	3183.400	2.3397E-01	(1990,088,1500)	2.0987E-01	(1990,020,1500)
11	336.500	3183.400	2.2264E-01	(1990,088,1500)	1.9872E-01	(1990,020,1500)
12	334.000	3183.400	2.0977E-01	(1990,088,1500)	1.9248E-01	(1990,136,1500)
13	331.500	3183.400	2.0930E-01	(1990,136,1500)	1.9256E-01	(1990,088,1500)

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8616 HOUR AVERAGE CONCENTRATION AT EACH RECEPTOR FOR THE PERIOD ENDING YEAR: 1990 DAY: 364 HOUR(0-23): 23 SEC:

DISCRETE RECEPTORS: SO2 1

RECEPTOR	COORDINATES (km)		CONCENTRATION	RECEPTOR	COORDINATES (km)		CONCENTRATION
1	340.300	3165.700	6.7575E-03	7	343.700	3178.300	5.8447E-03
2	340.300	3167.700	6.5984E-03	8	342.400	3180.600	5.7071E-03
3	340.300	3169.800	6.4410E-03	9	341.100	3183.400	5.5456E-03
4	340.700	3171.900	6.2844E-03	10	339.000	3183.400	5.5388E-03
5	342.000	3174.000	6.1300E-03	11	336.500	3183.400	5.5213E-03
6	343.000	3176.200	5.9789E-03	12	334.000	3183.400	5.5033E-03
				13	331.500	3183.400	5.4756E-03

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SUMMARY SECTION

SO2 1

(ug/m**3)

RECEPTOR	COORDINATES (km)		TYPE	PEAK (YEAR,DAY,ENDING TIME)	FOR RANK	FOR AVERAGE PERIOD
6	343.000	3176.200	DISCRETE	6.1812E-01 (1990,088,0900)	RANK 1	1 HOUR
3	340.300	3169.800	DISCRETE	4.6303E-01 (1990,136,0900)	RANK 2	1 HOUR
7	343.700	3178.300	DISCRETE	4.5741E-01 (1990,088,1100)	RANK 1	3 HOUR
1	340.300	3165.700	DISCRETE	3.4330E-01 (1990,136,1100)	RANK 2	3 HOUR
1	340.300	3165.700	DISCRETE	1.2422E-01 (1990,136,2300)	RANK 1	24 HOUR
1	340.300	3165.700	DISCRETE	1.0126E-01 (1990,228,2300)	RANK 2	24 HOUR
1	340.300	3165.700	DISCRETE	2.6222E-01 (1990,136,1500)	RANK 1	8 HOUR
1	340.300	3165.700	DISCRETE	2.4154E-01 (1990,123,1500)	RANK 2	8 HOUR
1	340.300	3165.700	DISCRETE	6.7575E-03	RANK 1	8616 HOUR

7099 3400 0000 1453 2986

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Name (Please Print Clearly) (to be completed by mailer)
Mr. Macauley Whiting, Peace River Sta.
Street, Apt. No., or PO Box No.
163 East Morse Blvd., Ste. 200
City, State, ZIP+4
Winter Park, FL 32789

PS Form 3800, July 1999 | See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

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Mr. Macauley Whiting, Jr.
Peace River Station, L.L.C.
163 East Morse Blvd., Ste. 200
Winter Park, FL 32789

COMPLETE THIS SECTION ON DELIVERY

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B. Date of Delivery 1 2 01

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D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
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