AIR EMISSION PERMIT NO. 13900114-001

IS ISSUED TO

Koda Energy LLC

KODA ENERGY LLC
800 West 1st Avenue
Shakopee, Scott County, MN 55379

The emission units, control equipment and emission stacks at the stationary source authorized in this permit are as described in the following permit application(s):

Permit Type	Application Date
Total Facility Operating Permit	11/17/2006

This permit authorizes the Permittee to operate and construct the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

Permit Type: Federal; Pt 70/NSR Authorization

Issue Date: August 23, 2007

Expiration: August 23, 2012
All Title I Conditions do not expire.

Richard J. Sandberg, Manager
Air Quality Permits Section
Industrial Division

for Brad Moore
Commissioner
Minnesota Pollution Control Agency

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NOTICE TO THE PERMITTEE:

Your stationary source may be subject to the requirements of the Minnesota Pollution Control Agency's (MPCA) solid waste, hazardous waste, and water quality programs. If you wish to obtain information on these programs, including information on obtaining any required permits, please contact the MPCA general information number at:

Metro Area	(651) 296-6300
Outside Metro Area	1-800-657-3864
TTY	(651) 282-5332

The rules governing these programs are contained in Minn. R. chs. 7000-7105. Written questions may be sent to: Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

Questions about this air emission permit or about air quality requirements can also be directed to the telephone numbers and address listed above.

PERMIT SHIELD:

Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Subject to the limitations of Minn. R. 7007.1800 and 7017.0100, subp. 2, notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

FACILITY DESCRIPTION:

Koda Energy will build a 308.18 MMbtu/hr combined heat and power biomass boiler to produce on average, 120,000 lbs/hour of steam for process heat at Rahr Malting and 17.8 MW of electricity. This is combination of steam and electricity represents the total energy output. For example, the facility could produce more than 120,000 lbs/hr of steam, but than would concurrently produce less than 17.8 MW of electricity. The boiler will control NO_x with a low NO_x burner, Secondary Over-Fire Air (SOFA), and a Selective Non-Catalytic Reduction System (SNCR). Particulate Matter Emissions will be controlled by a cyclone and electrostatic precipitator. Good combustion practices will control CO.

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Table A contains limits and other requirements with which your facility must comply. The limits are located in the first column of the table (What To do). The limits can be emission limits or operational limits. This column also contains the actions that you must take and the records you must keep to show that you are complying with the limits. The second column of Table A (Why to do it) lists the regulatory basis for these limits. Appendices included as conditions of your permit are listed in Table A under total facility requirements.

Subject Item: **Total Facility**

What to do	Why to do it
DETERMINING IF A PROJECT/MODIFICATION IS SUBJECT TO NEW SOURCE REVIEW	hdr
These requirements apply where there is a reasonable possibility that a proposed project, analyzed using the actual-to-projected-actual (ATPA) test (either by itself or as part of the hybrid test described in Section 52.21(a)(2)(iv)(f)) and found to not be part of a major modification, may result in a significant emissions increase. If the ATPA test is not used for a particular project, or if there is not a reasonable possibility that the proposed project could result in a significant emissions increase, then these requirements do not apply to that project. Even though a particular modification is not subject to New Source Review, a permit amendment, recordkeeping, or notification may still be required under Minn. R. 7007.1150 - 7007.1500.	Title I Condition: 40 CFR Section 52.21(r)(6); Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 2
Preconstruction Documentation -- Before beginning actual construction on a project, the Permittee shall document the following information: 1. A description of the project 2. Identification of the emission unit(s) whose emissions of an NSR pollutant could be affected 3. The potential emissions of any existing or new emission units affected by the project. 4. A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including the baseline actual emissions, the projected actual emissions, the amount of emissions excluded due to increases not associated with the modification and that the unit(s) could have accommodated during the baseline period, an explanation of why the amounts were excluded, and any creditable contemporaneous increases and decreases that were considered in the determination. The Permittee shall maintain records of this documentation.	Title I Condition: 40 CFR Section 52.21(r)(6); Minn. R. 7007.3000; Minn. R. 7007.0800, subps. 4 & 5
The Permittee shall monitor the actual emissions of any regulated NSR pollutant that could increase as a result of the project and that were analyzed using the ATPA test, and the potential emissions of any regulated NSR pollutant that could increase as a result of the project and that were analyzed using potential emissions in the hybrid test. The Permittee shall calculate and maintain a record of the sum of the actual and potential (if the hybrid test was used in the analysis) emissions of the regulated pollutant, in tons per year on a calendar year basis, for a period of 5 years following resumption of regular operations after the change, or for a period of 10 years following resumption of regular operations after the change if the project increases the design capacity of or potential to emit of any unit associated with the project.	Title I Condition: 40 CFR Section 52.21(r)(6); Minn. R. 7007.3000; Minn. R. 7007.0800, subps. 4 & 5
The Permittee must submit a report to the Agency if the annual summed (actual, plus potential if used in hybrid test) emissions differ from the preconstruction projection and exceed the baseline actual emissions by a significant amount as listed at 40 CFR Section 52.21(b)(23). Such report shall be submitted to the Agency within 60 days after the end of the year in which the exceedances occur. The report shall contain: a. The name and ID number of the facility, and the name and telephone number of the facility contact person b. The annual emissions (actual, plus potential if any part of the project was analyzed using the hybrid test) for each pollutant for which the preconstruction projection and significant emissions increase are exceeded. c. Any other information, such as an explanation as to why the summed emissions differ from the preconstruction projection.	Title I Condition: 40 CFR Section 52.21(r)(6); Minn. R. 7007.3000; Minn. R. 7007.0800, subps. 4 & 5
OPERATIONAL LIMITS	hdr
Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted.	Minn. R. 7011.0020
Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)

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Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment and practices, and the records kept to demonstrate plan implementation.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)
Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emission of any regulated air pollutant. The Commissioner may require feasible and practical modifications in the operation to reduce emissions of air pollutants. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate.	Minn. R. 7019.1000, subp. 4
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010 - 7030.0080
Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A).	Minn. R. 7007.0800, subp. 9(A)
The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
TESTING REQUIREMENTS	hdr
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.	Minn. R. Ch. 7017
Performance Test Notifications and Submittals: Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements. Performance Test Notification (written): due 30 days before each Performance Test Performance Test Plan: due 30 days before each Performance Test Performance Test Pre-test Meeting: due 7 days before each Performance Test Performance Test Report: due 45 days after each Performance Test Performance Test Report - Microfiche Copy: due 105 days after each Performance Test The Notification, Test Plan, and Test Report may be submitted in alternative format as allowed by Minn. R. 7017.2018.	Minn. R. 7017.2030, subp. 1-4, 7017.2018 and Minn. R. 7017.2035, subp. 1-2
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as stated in the MPCA's Notice of Compliance letter granting preliminary approval. Preliminary approval is based on formal review of a subsequent performance test on the same unit as specified by Minn. R. 7017.2025, subp. 3. The limit is final upon issuance of a permit amendment incorporating the change.	Minn. R. 7017.2025
MONITORING REQUIREMENTS	hdr
Monitoring Equipment: Install or make needed repairs to monitoring equipment within 60 days of issuance of the permit if monitoring equipment is not installed and operational on the date the permit is issued.	Minn. R. 7007.0800, subp. 4(D)
Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit).	Minn. R. 7007.0800, subp. 4(D)
Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.	Minn. R. 7007.0800, subp. 4(D)
RECORDKEEPING	hdr

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The Permittee shall maintain records adequate to document compliance at the stationary source, including at a minimum: (1) the date, place, and time of sampling or measurement; (2) the date or dates the analyses were performed; (3) the company or entity that performed the analyses; (4) the analytical techniques or methods used; (5) the results of such analyses; and, (6) the operating conditions existing at the time of sampling or measurement.	Minn. R. 7007.0800, subp. 5(A)
Recordkeeping: Retain all records at the stationary source for a period of five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A).	Minn. R. 7007.0800, subp. 5(C)
Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007.1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350, subp. 2), including records of the emissions resulting from those changes.	Minn. R. 7007.0800, subp. 5(B)
REPORTING/SUBMITTALS	hdr
Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over.	Minn. R. 7019.1000, subp. 3
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2
Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7019.1000, subp. 1
Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.	Minn. R. 7019.1000, subp. 1
Application for Permit Amendment: If a permit amendment is needed, submit an application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed.	Minn. R. 7007.1150 through Minn. R. 7007.1500
Extension Requests: The Permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H).	Minn. R. 7007.1400, subp. 1(H)
Emission Fees: due 60 days after receipt of an MPCA bill	Minn. R. 7002.0005 through Minn. R. 7002.0095
AMBIENT STANDARDS	hdr
Ambient Air Quality Standards: The Permittee shall comply with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0080. Compliance shall be demonstrated upon written request by the MPCA.	40 CFR pt. 50; Minn. Stat. Section 116.07, subds. 4a & 9; Minn. R. 7007.0100, subps. 7A, 7L & 7M; Minn. R. 7007.0800, subps. 1, 2 & 4; Minn. R. 7009.0010-7009.0080.

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Parameters Used in Modeling: The stack heights, emission rates, and other parameters used in the dispersion modeling are listed in the Appendix of this permit. The Permittee must submit to the Commissioner for approval any revisions of these parameters and must wait for a written approval before making such changes. The information submitted must include, at a minimum, the locations, heights, and diameters of the stacks, locations, and dimensions of nearby buildings, the velocity and temperatures of the gases emitted, and the emission rates. The plume dispersion characteristics due to the revisions of the information must be equivalent to or better than the dispersion characteristics modeled. The Permittee shall demonstrate this equivalency in the proposal. If the information does not demonstrate equivalent or better characteristics, or if a conclusion cannot readily be made about the dispersion, the Permittee must remodel.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000
For changes that do not involve an increase in an emission rate and that do not require a permit amendment, this proposal must be submitted as soon as practicable, but no less than 60 days before beginning actual construction of the stack or assiciated emission unit. For changes involving increases in emission rates and that require a minor permit amendment, the proposal must be submitted as soon as practicable, but no less than 60 days before beginning actual construction of the stack or associated emission unit. For changes involving increases in emission rates and that require a permit amendment other than a minor amendment, the proposal must be submitted with the permit application.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000
CHARACTERIZING SOLID WASTE FOR BENEFICIAL USE	hdr
Scope: This part sets out the procedures for characterizing of a solid waste. The agency shall use the results from characterization of a solid waste when evaluating demonstration projects and beneficial use proposals.	Minn. R. 7035.2861, subp. 1
Characterization Procedures: Unless otherwise directed by the agency, a person seeking to characterize a solid waste must follow the steps in items A and B. A. A list of potential chemical constituents present in the solid waste must be developed by evaluation of the pertinent information. B. The solid waste must be analyzed in accordance with the methods, provided in Minn. R. 7035.2861, subpart 3, to provide the following information on its chemical and physical properties: (1) potential chemical constituents identified in item A; and, (2) physical properties that affect the use or management of the solid waste.	Minn. R. 7035.2861, subp. 2
Method of Analysis: The analysis methods used for characterization must be consistent with the beneficial use being proposed. In most cases, total compositional analysis is needed. Depending on how the solid waste will be managed prior to its beneficial use, leaching procedures may also be required. Approved methods of analysis are found in Tests Methods for Evaluating Solid Waste, Physical/Chemical Methods, and EPA Publication SW-846. Equivalent analytical methods may be allowed with Commissioner approval.	Minn. R. 7035.2861, subp. 3

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Subject Item: **GP 001 Biomass Fuel Fabric Filters**

Associated Items: CE 001 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 002 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 003 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 004 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 005 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 006 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

CE 007 Fabric Filter - Low Temperature, i.e., T<180 Degrees F

SV 001 Truck unloading building dust control

SV 002 Rahr by-product blow lines bag filter

SV 003 Bin vent filter- fuel storage #1 North

SV 004 Bin vent filter - fuel storage #2 South

SV 005 Bag filter - grinder #1 & 2 blow lines

SV 006 Bag filter - grinder #3 & 4 bow lines

SV 007 Day/metering bin baghouse

What to do	Why to do it
The following requirements apply to each of the individual stacks (SV 001 - SV 007) separately, except for the performance testing requirements.	hdr
Particulate Matter < 10 micron: less than or equal to 0.0050 grains/dry standard cubic foot	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Total Particulate Matter: less than or equal to 0.0050 grains/dry standard cubic foot (This satisfies Minn. R. 7011.0715.)	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000; Minn. R. 7011.0715
Opacity: less than or equal to 5 percent for SV 001 of fugitive emissions during truck unloading of grain or grain-by products. Otherwise, the opacity shall be less than or equal to 20 percent while unloading non-grain materials.	Minn. R. 7011.1005, subp. 3; Minn. R. 7011.0715
Opacity: less than or equal to 10 percent from SV 002 through SV 007 while grain or grain by-products are being handled, cleaned, dried, stored, ground, or loaded. When the other non-grain biomass materials are being handled, cleaned, dried, stored, ground, or loaded, opacity shall be less than or equal to 20 percent.	Minn. R. 7011.1005, subp. 3; Minn. R. 7011.0715
Total Particulate Matter: greater than or equal to 99.0 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Particulate Matter < 10 micron: greater than or equal to 99.0 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Pressure Drop: The Permittee shall maintain the pressure drop across the fabric filter within the range of operation recommended by the manufacturer, unless a new range is set pursuant to Minn. R. 7017.2025, subp. 3 based on the values recorded during the most recent MPCA-approved performance test where compliance was demonstrated. The new range shall be implemented upon receipt of the Notice of Compliance letter granting preliminary approval. The range is final upon issuance of a major permit amendment incorporating the change. The Permittee shall record the pressure drop at least once every 24 hours when in operation. Within 180 days of startup, the pressure drop range for each baghouse shall be submitted, along with an application for a major amendment. The manufacturer's information must be submitted with the application.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Visible Emissions: The Permittee shall check the fabric filter stack (SV 001- SV 007) for any visible emissions once each day of operation during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit	Title I Condition: Recordkeeping for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation. The Permittee shall document periods of non-operation of the control equipment.	Minn. R. 7007.0800, subp. 14

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Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur: - visible emissions are observed; - the recorded pressure drop is outside the required operating range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the pressure drop to within the permitted range, eliminate visible emissions, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
Monitoring Equipment: The Permittee shall install and maintain the necessary monitoring equipment for measuring and recording pressure drop as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored fabric filter is in operation.	Minn. R. 7007.0800, subp. 4
Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections.	Minn. R. 7007.0800, subp. 4, 5, and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Initial Performance Test: due 90 days after Initial Startup to measure (PM, PM10, and opacity). The three stack/vents with the highest grain loading per dry standard cubic foot of air flow (as based on AP-42 calculations) shall be selected for the testing. The Permittee shall include justification for the selection of the three stack/vents in the test plan.	Minn. R. 7017.2020, subp. 1

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Subject Item: **GP 002 NOx, CO, & O2 Monitors**

Associated Items: MR 002 NOx CEM

MR 003 CO CEM

MR 004 O2 CEM

What to do	Why to do it
CEMS Installation: Install and operate NOx, CO, and O2 CEMS.	Minn. R. 7017.1006
CEMS Monitor Design: Each CEMS shall be designed to complete a minimum of one cycle of sampling, analyzing, and data recording in each 15-minute period.	Minn. R. 7017.1140
Installation Notification: due 60 days before installing the continuous emissions monitoring system. The notification shall include plans and drawings of the system.	Minn. R. 7017.1040, subp. 1
Certification time frame. The owner or operator must conduct and complete certification testing within 90 days after the due date of the first excess emissions report required for the CEMS or COMS. This subpart does not require a recertification test of a previously certified continuous monitoring system, unless the monitor has undergone a change which invalidates its certification.	Minn. R. 7017.1050, subp. 1
CEM Certification Test Pretest Meeting: due 7 days before CEM Certification Test	Minn. R. 7017.1060, subp. 3
Continuous Operation: CEMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment.	Minn. R. 7017.1090, subp. 1
Relative Accuracy Test Audit (RATA) Notification: due 30 days before NOx, CO, and O2 CEMS Relative Accuracy Test Audit (RATA).	Minn. R. 7017.1180, subp. 2
Relative Accuracy Test Audit (RATA) Plan: due 30 days before NOx, CO, and O2 CEMS Relative Accuracy Test Audit (RATA).	Minn. R. 7017.1180, subp. 3
QA Plan: Develop and implement a written quality assurance plan that covers each CEMS. The plan shall be on site and available for inspection within 30 days after monitor certification. The plan shall contain all of the information required by 40 CFR pt. 60, Appendix F, Section 3.	Minn. R. 7017.1170, subp. 2; 40 CFR pt. 60, App. F; section 3
CEMS Daily Calibration Drift Check: Permittees must automatically check the zero (low level value between 0 and 20 percent of span value) and span (50 to 100 percent of span value) calibration drifts at least once daily. The zero and span must, at a minimum, be adjusted whenever the drift exceeds two times the limit specified in 40 CFR pt. 60, Appendix B. 40 CFR pt. 60, Appendix F shall be used to determine out-of-control periods for CEMS.	Minn. R. 7017.1170, subp. 3
CEMS Cylinder Gas Audit (CGA): due before end of each calendar half-year following CEM Certification Test for MR002 (NOx). The first CGA is due within 180 days of the CEMS certification. A CGA is not required during any calendar half-year in which a RATA was performed. A CGA shall be conducted according to the procedures in Code of Federal Regulations, title 40, part 60, appendix F, section 5.1.2.	Minn. R. 7017.1170, subp. 4
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test for MR 002 (NOx). RATA: due before the end of each year following the CEM Certification Test for MR 002 (NOx). The first RATA is due within 365 days of the CEMS Certification Test. A RATA is not required in any calendar year if a RATA conducted in the previous year, for that CEMS, demonstrated a relative accuracy value of less than 15 percent. If a RATA is not conducted in any calendar year, the next RATA shall be conducted during the first half of the following calendar year. Follow the procedures in 40 CFR pt. 60, Appendix F.	Minn. R. 7017.1170, subp. 5
Cylinder Gas Audit: due before end of each calendar half-year following CEM Certification Test for MR 003 (CO). The first CGA is due within 180 days of the CEMS certification. A CGA is not required during any calendar half-year in which a RATA was performed. A CGA shall be conducted according to the procedures in Code of Federal Regulations, title 40, part 60, appendix F, section 5.1.2.	40 CFR pt. 60, Appendix F, section 5.1.2; Minn. R. 7017.1170, subp. 4
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test for MR 003 (CO). RATA: due before the end of each year following the CEM Certification Test for MR 003 (CO). The first RATA is due within 365 days of the CEMS Certification Test. A RATA is not required in any calendar year if a RATA conducted in the previous year, for that CEMS, demonstrated a relative accuracy value of less than 15 percent. If a RATA is not conducted in any calendar year, the next RATA shall be conducted during the first half of the following calendar year. Follow the procedures in 40 CFR pt. 60, Appendix F.	Minn. R. 7017.1170, subp. 5

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Cylinder Gas Audit: due before end of each calendar quarter following CEM Certification Test for MR 004 (O2). The first CGA is due within 180 days of the CEMS certification. A CGA is not required during any calendar half-year in which a RATA was performed. A CGA shall be conducted according to the procedures in Code of Federal Regulations, title 40, part 60, appendix F, section 5.1.2.	40 CFR pt. 60, Appendix F, section 5.1.2; Minn. R. 7017.1170, subp. 4
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test for MR 004 (O2). RATA: due before the end of each year following the CEM Certification Test for MR 004 (O2). The first RATA is due within 365 days of the CEMS Certification Test. A RATA is not required in any calendar year if a RATA conducted in the previous year, for that CEMS, demonstrated a relative accuracy value of less than 15 percent. If a RATA is not conducted in any calendar year, the next RATA shall be conducted during the first half of the following calendar year. Follow the procedures in 40 CFR pt. 60, Appendix F.	Minn. R. 7017.1170, subp. 5
Monitoring Data: Reduce all data to 1-hour averages, in accordance with Minn. R. 7017.1160. 1-hour averages shall be computed from four or more data points equally spaced over each 1-hour period.	Minn. R. 7017.1160
Recordkeeping: The owner or operator must retain records of all CEMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130

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Subject Item: **SV 001 Truck unloading building dust control**

Associated Items: EU 001 Truck unloading station live bottom hopper

EU 002 Truck unloading reclaim auger

EU 003 Truck unloading discharge auger

EU 005 Truck unloading belt conveyor

GP 001 Biomass Fuel Fabric Filters

What to do	Why to do it
The equipment emitting into SV 001 shall not be, in operation, for greater than 22 hours per day.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000
Recordkeeping: The Permittee shall keep records of the dates and hours of operation, daily, when the equipment emitting into SV 001 is in operation. These records may be kept on-site. Dates of non-operation shall also be recorded.	Minn. R. 7007.0800, subp. 5
Opacity: less than or equal to 5 percent of fugitive emissions during truck unloading of grain or grain-by products. Otherwise, the opacity shall be less than or equal to 20 percent while unloading non-grain materials. (See Group 001 for additional requirements.)	Minn. R. 7011.1005, subp. 3; Minn. R. 7011.0715
The Permittee shall clean up spilled commodities, as soon as practicable, using methods that minimize the amount of dust suspended.	Minn. R. 7011.1005, subp. 1
Stack Diameter: The inner diameter at top of stack shall be, at a maximum, 2.0 feet.	Title I Condition: 40 CFR Section 52.21(k); Minn. R. 7007.3000

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Subject Item: **SV 009 Boiler exhaust**

Associated Items: EU 056 Suspension boiler

What to do	Why to do it
The height of SV 009 (from the boiler) shall be 220 feet or greater, above grade.	Minn. R. ch. 4410

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Subject Item: **EU 056 Suspension boiler**

Associated Items: CE 008 Multiple Cyclone w/o Fly Ash Reinjection - Most Multiclones

CE 009 Electrostatic Precipitator - High Efficiency

CE 010 Low NOx Burners

CE 011 Overfire Air

CE 012 Selective Noncatalytic Reduction for NOX

SV 009 Boiler exhaust

What to do	Why to do it
EMISSION LIMITS	hdr
Nitrogen Oxides: less than or equal to 0.25 lbs/million Btu heat input using 30-day Rolling Average while combusting biomass or biomass with natural gas.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
If the required CEMs demonstrates that the NOx averaging time limit is less stringent than what is achievable, based on CEMs results, the Agency may, at its discretion, use the authority under Minn. R. 7007.1600, subp. 2.C to reopen and revise the NOx averaging time to more closely reflect the CEM results. The Permittee shall submit a report/plan to evaluate the CEM results 18 months after initial startup of EU 056.	Minn. R. 7007.1600, subp. 2.c.
Nitrogen Oxides: less than or equal to 0.18 lbs/million Btu heat input using 30-day Rolling Average while combusting natural gas only.	Title I Condition: BACT Lmiit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Total Particulate Matter: less than or equal to 0.030 lbs/million Btu heat input . This limit applies while combusting gas, wood or a mixture of these fuels with any other fuels. Compliance with the PM limit shall be determined through performance testing as described in 40 CFR Section 60.46b(b).	Title I Condition: BACT Lmiit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000; 40 CFR Section 60.43b(h)(1); 40 CFR Section 60.43b(g); 40 CFR Section 60.46b(b); Minn. R. 7011.065
Particulate Matter < 10 micron: less than or equal to 0.037 lbs/million Btu heat input using 3-hour Average while combusting biomass or biomass with natural gas.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Particulate Matter < 10 micron: less than or equal to 0.010 lbs/million Btu heat input using 3-hour Average while combusting natural gas only.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 0.43 lbs/million Btu heat input using 30-day Rolling Average while combusting biomass or biomass with natural gas.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 0.167 lbs/million Btu heat input using 30-day Rolling Average while combusting natural gas only.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
If the required CEMs demonstrates that the CO averaging time limit is less stringent than what is achievable, based on CEMs results, the Agency may, at its discretion, use the authority under Minn. R. 7007.1600, subp. 2.C to reopen and revise the CO averaging time to more closely reflect the CEM results. The Permittee shall submit a report/plan to evaluate the CEM results 18 months after initial startup of EU 056.	Minn. R. 7007.1600, subp. 2.c.
Opacity: less than or equal to 20 percent based on a 6-minute average, except for one 6-minute period per hour of not more than 27 percent opacity while combusting wood and mixtures with wood.	40 CFR Section 60.43b(f); 40 CFR Section 60.43b(g)
HAP-Single: less than or equal to 9.0 tons/year using 12-month Rolling Sum . This includes Koda Energy emissions from both biomass combustion as well as natural gas. Rahr Malting HAP emissions must be also be included.	Title I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
HAPs - Total: less than or equal to 22.5 tons/year using 12-month Rolling Sum . This includes Koda Energy emissions from both biomass combustion as well as natural gas. Rahr Malting HAP emissions must be also be included.	Title I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Sulfur Dioxide: less than or equal to 38 tons/year using 12-month Rolling Sum	Title I Condition: to avoid significant emission thresholds as defined by 40 CFR 52.21; Minn. R. 7007.3000
Ammonia Slip: Limited to less than or equal to 30 ppm. Compliance shall be determined by monitoring the furnance temperature at the injection point and reagent feed rate. The minimum temperature window and maximum feed rate shall be determined by the performance testing below.	Minn. R. 7007.0800, subp. 2
OPERATING LIMITS	hdr
Fuel Usage: less than or equal to 10 percent of the boilers annual capacity for natural gas.	40 CFR Section 60.44b(l)

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Fuel use limited to natural gas, untreated wood, oat hulls, malt and grain by-products, and any other biomass fuels/blends tested and approved. Untreated wood is defined as any wood that has not been subject to any chemical treatment or coating. Biomass includes portions of or all of various vegetation, including trees, untreated wood, oat hulls, malts and grain by-products, energy crops (such as switchgrass), etc.	Minn. R. 7007.0800, subp. 2
The Permittee shall operate and maintain the ESP (CE 009), at all times, that EU 056 is combusting biomass materials. Operation of the ESP is not required when the boiler is burning, only, natural gas. The Permittee shall document periods of non-operation of the ESP control equipment. This documentation shall include the times of non-operation as well as the reason for non-operation.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Except for periods when burning only natural gas and/or periods of startup and shutdown, the Permittee shall operate and maintain the SNCR (CE 012), at all times, that EU 056 is in operation. The Permittee shall document periods of non-operation of the SNCR control equipment.	Title I Condition: BACT Limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
The SNCR system will be adjusted or may be shut down when the ammonia slip exceeds the limit set above, until such time as the system is returned to normal.	Minn. R. 7007.0800, subp. 2
During a period of startup, shutdown, or malfunction, the Permittee shall minimize emissions to the greatest extent which is consistent with safety and good air pollution control practices.	Minn. R. 7007.0800, subp. 2
INITIAL COMPLIANCE DEMONSTRATION	hdr
Initial Performance Test: due 60 days after achieving maximum capacity (production rate), but no later than 180 days after initial startup, of EU 056, for PM and opacity following the procedures and reference methods provided in 40 CFR Section 60.46b(d). A test plan, which will define anticipated operating scenarios, will be submitted to determine at what operating load(s) compliance demonstation will be required. The Permittee must also establish the minimum voltage and secondary current (or total power input) for the ESP (EU 009).	40 CFR Section 60.46b(d); 40 CFR Section 60.8; Title I Condition, compliance with PM BACT limits as per 40 CFR Section 52.21; Minn. R. 7007.3000
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for PM10 while combusting biomass.	Title I Condition, compliance with PM10 BACT limits as per 40 CFR Section 52.21
Initial Performance Test: due 60 days after achieving maximum capacity (production rate), but no later than 180 days after initial startup, of EU 056, for NOx. NOx are to be monitored for 30 successive steam generating unit operating days and the 30-day average emission rate is used to determine compliance. The 30-day average emission rate is calculated as the average of all hourly emissions data recorded by the monitoring system during the 30-day test period.	Title I Condition, compliance with NOx BACT limits as per 40 CFR Section 52.21; Minn. R. 7007.3000
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for acetaldehyde. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and acetaldehyde emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for acrolien. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and acrolien emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for benzene. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and benzene emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for chlorine. Chlorine and alkalinity fuel samples shall be simultanously collected for correlation between fuel content and chlorine emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for formaldehyde. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and formaldehyde emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for HCl. Chlorine and alkalinity fuel samples shall be simultanously collected for correlation between chlorine content and HCl emission. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD

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Initial Performance Test: due 180 days after Initial Startup, of EU 056, for manganese. A HAPs metals (including manganese) fuel sample shall be simultanously collected for correlation between fuel content and manganese emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for styrene. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and styrene emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for toluene. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and toluene emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for mercury. Mercury shall be speciated into elemental, divalent, and particulate. A mercury fuel sample shall be simultanously collected for correlation between mercury fuel content and mercury emission. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded. This testing requirement is for gathering site-specific data for the purpose of generating emission factors when analyzing the addition of biomass materials. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7007.0800, subp. 2
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for speciated dioxins and furans. Copper and chlorine fuel samples shall be simultanously collected for correlation between copper and chlorine fuel content and dioxin/furan emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded. This testing requirement is for gathering site-specific data for the purpose of generating emission factors when analyzing the addition of biomass materials. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7007.0800, subp. 2
Initial Performance Test: due 180 days after Initial Startup, of EU 056, to test for speciated PAHs. A proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and PAH emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded. This testing requirement is for gathering site-specific data for the purpose of generating emission factors when analyzing the addition of biomass materials. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7007.0800, subp. 2
Initial Performance Test: due 180 days after Initial Startup, of EU 056, for SO2. Sulfur and alkalinity fuels sample shall be simultanously collected for correlation between sulfur fuel content and SO2 emissions. This performance test is to be conducted at about 100% operating load. The percent of type of each fuel compromising the overall fuel tested shall be recorded.	Title I Condition: Monitoring to avoid significant emissions threshold as defined by 40 CFR 52.21; Minn. R. 7007.3000
Performance Test: due 180 days after Initial Startup to test for ammonia slip.	Minn. R. 7007.0800, subp. 4
MONTHLY COMPLIANCE DEMONSTRATION	hdr
Fuel Analysis: due before end of each calendar month following Initial Fuel Analysis. This fuel analysis will include both the proximate and ultimate analysis.	Minn. R. 7007.0800, subp. 4
Fuel Analysis: due before end of each calendar month following Initial Fuel Analysis for chlorine and sulfur content in fuel.	Title I Condition: BACT requirement as per 40 CFR 52.21; Minn. R. 7007.3000
ANNUAL COMPLIANCE DEMONSTRATION	hdr
Performance Test: due before end of each calendar year following Initial Startup for ammonia slip.	Minn. R. 7007.0800, subp. 4

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Performance Test: due before end of each calendar year following Initial Startup for SO2. The Permitttee may perform performance tests for SO2 every third year if three successive performance tests produce results that are 75% or less of the limit. The limit is a tested emission rate, in lb/mmBtu that if coupled with the maximum operating capacity of the boiler would produce annual emissions that are 75% or less than 38 tpy. Upon demonstration of annual emisions that are 75% or less than 38 tpy, the next performance test is conducted within 36 months of the anniversary date of the third consecutive performance test that demonstrates compliance with the emission limit. Thereafter, the Permittee shall conduct performance tests every third year but no later than 36 months following the previous performance tests. If a performance test does not demonstrate compliance with the emission limit, the Permittee shall conduct annual performance tests until all performance tests over 3 consecutive years demonstrate compliance with the SO2 emission limit.	Title I Condition: Monitoring to avoid classification as a major source under 40 CFR 52.21; Minn. R. 7007.3000
CONTINOUS MONITORING REQUIREMENTS	hdr
The Permittee shall install, calibrate, maintain, and operate a continous monitoring system for measuring opacity and record the output of the system. The procedures under 40 CFR Section 60.13 shall be followed for installation, evaluation, and operation of the COMs. See MR 001 for additional requirements.	40 CFR Section 60.48b(a); 40 CFR Section 60.48b(e); 40 CFR Section 60.13
The Permittee shall install, calibrate, maintain, and operate a continous monitoring system for NOx, CO, and O2 and record the output of the system. See Group 002 for additional requirements.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
The NOx, CO, and O2 CEMs shall be operated and data recorded during all perods of operation except for continous monitoring system breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
The 1-hour average NOx and CO emission rates measured by the NOx and CO CEMs shall be expressed in lb/MMBtu heat input and shall be used to calculate the average emission rates.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
The 1-hour average O2 emission rates measured by the O2 CEMs shall be expressed in "% units" and shall be used to calculate the average emission rates.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
REPORTING AND RECORDKEEPING REQUIREMENTS	hdr
Fuel Calculations: The Permittee shall record and maintain records of the amounts of each fuel combusted during, each day. By the 15th day of the month, the Permittee shall calculate the annual capacity factor individually for natural gas for the reporting period during the previous month. The natural gas annual capacity factor is determined on a 12-month rolling average basis. The annual capacity factor shall be calculated by comparing the 12 months previous gas usage in mmBtu to 308.18mmBtu * 8760 hours.	40 CFR Section 60.49b(d); Minn. R. 7007.0800, subps 4 and 5; Title I Condition: Monitoring to avoid significant emissions threshold as defined by 40 CFR 52.21 and 40 CFR Part 63; Minn. R. 7007.3000
HAP Calculations: Total and Single HAPs shall be calculated by multiplying operation rate by an approved emission factor. The emission factors shall be from approved performance tests for mercury, dioxin, PAHs, acetaldehyde, acrolien, benzene, chlorine, formaldehyde, hydrogen chloride, styrene, toluene, and manganese. If emission factors are not available from testing, and for all other HAPs, AP-42 emission factors shall be used. HAPs, from natural gas combustion, shall also be included in this calculations. AP-42 factors shall be used for natural gas. HAP emissions, from Rahr Malting, must be included in both the single and total HAPs calculations. The Permittee may use other emission factors upon MPCA approval.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
The Permittee shall keep records of the type and amount of all fuels burned to demonstrate that all fuel types and mixtures would result in lower emissions of HCl and SO2 than the applicable emission limit.	Minn. R. 7007.0800, subp. 4 and 5
The Permittee shall maintain the records of opacity.	40 CFR Section 60.49b(f)
Single HAPs Recordkeeping: By the 15th day of the month, the Permittee shall calculate and record the tons of the individual HAPs emitted during the previous calendar month, and the tons of HAPs emitted during the previous 12-month period. Both Koda Energy and Rahr Malting emissions shall be included in these calculations. These calculations shall be based on the emission factors developed during the stack emission testing, operation rates, and AP-42 emission factors, and the monthly fuel analysis for chlorine. Emissions from both the biomass and natural gas combustion shall be included. The relationship between chlorine content and HCl emissions shall be established by the above mentioned stack testing and simultaneous fuel sampling and analysis.	Title I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD

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Total HAPs Recordkeeping: By the 15th day of the month, the Permittee shall calculate and record the tons of the total HAPs emitted during the previous calendar month, and the total tons of HAPs emitted during the previous 12-month period. Both Koda Energy and Rahr Malting emissions shall be included in these calculations. These calculations shall be based on the emission factors developed during the stack emission testing, operation rates, and AP-42 emission factors, and the monthly fuel analysis for chlorine. Emissions from both the biomass and natural gas combustion shall be included. The relationship between chlorine content and HCl emissions shall be established by the above mentioned stack testing and simultaneous fuel sampling and analysis.	Title I Condition: to avoid classification as a major source under 40 CFR Section 63, subp. DDDDD
SO2 Recordkeeping: By the 15th day of the month, the Permittee shall calculate and record the tons of SO2 emitted during the previous calendar month, and the tons of SO2 emitted during the previous 12-month period. These calculations shall be based on the emission factors developed during the stack emission testing and the monthly fuel analysis for sulfur. Each type of fuel burned during the month shall be tracked and sampled for sulfur content. The relationship between sulfur content and SO2 emissions shall be established by the above mentioned stack testing and simultaneous fuel sampling and analysis.	Tilte I Condition: to avoid classification as a major source under 40 CFR Section 52.21; Minn. R. 7070.3000
NOx Recordkeeping: The Permittee shall calculate the 30-day average NOx emission rate (lb/MMBtu heat input) at the end of operating day from the measured hourly emission rates recorded during the previous 30-day period.	Minn. R. 7007.0800, subp. 5
CO Recordkeeping: The Permittee shall calculate the 30-day average CO emission rate (lb/MMBtu heat input) each hour from the measured values for the previous 30-day period.	Minn. R. 7007.0800, subp. 5
NOx Recordkeeping: During any 30-day period in which biomass is burned with or without natural gas, and natural gas is burned alone, the NOx limit shall be calculated as follows: NOxl = (0.25*(B + Gb) + 0.18(Go))/(B + Gb + Go) Where: NOxl = NOx limit in lb/mmBtu 0.25 = NOx limit when burning biomass with or with natural gas, in lb/mmBtu 0.18 = NOx limit when burning natural gas alone B = heat input of biomass in mmBtu during the previous 30 day period Gb = heat input of natural gas in mmBtu burned concurrently with biomass Go = heat input of natural gas in mmBtu burned as a sole fuel The 30 day NOx limit shall be calculated each day, and compared to the CEM average emission rate measured over the previous 30 day period. Heating value of the biomass shall be determined by the monthly fuel analysis.	Title I Condition: Recordkeeping for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
CO Recordkeeping: During any 30-day period in which biomass is burned with or without natural gas, and natural gas is burned alone, the CO limit shall be calculated as follows: COl = (0.43*(B + Gb) + 0.167(Go))/(B + Gb + Go) Where: COl = CO limit in lb/mmBtu 0.43 = CO limit when burning biomass with or with natural gas, in lb/mmBtu 0.167 = CO limit when burning natural gas alone B = heat input of biomass in mmBtu during the previous 30 day period Gb = heat input of natural gas in mmBtu burned concurrently with biomass Go = heat input of natural gas in mmBtu burned as a sole fuel The 30 day CO limit shall be calculated each day, and compared to the CEM average emission rate measured over the previous 30 day period. Heating value of the biomass shall be determined by the monthly fuel analysis.	Title I Condition: Recordkeeping for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Start-up on biomass prohibited: During start-up of the boiler, natural gas shall be used to achieve combustion chamber operating temperatures.	Minn. R. 7007.0800, subp. 2
Biomass Use during Start-ups and Shutdowns: The Permittee shall use of natural gas to warm the combustion and pollution control devices and maintain good combustion conditions in the combustion chamber from the time the biomass feed has been discontinued until the combustion chamber is clear of combustible material or active combustion ceases. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7007.0800, subp. 2

Recordkeeping: maintain records of the occurence and duration of any startup, shutdown, or malfunction in the operation of the facility including: any malfunction of the air pollution control equipment; or any periods during a continuous monitoring system or monitoring system is inoperative.	Minn. R. 7007.0800, subp. 2
ADDITIONAL BIOMASS FUEL TESTING PRE-AUTHORIZATION	hdr
Pre-Authorized Biomass Fuel Testing Authorization: The Permittee is pre-authorized to conduct test burns of the following biomass fuels. The following biomass fuels may be tested either alone or as blends with pre-authorized fuels: -energy crops (grasses, stalks, stems, straws, and wood); and, - similar materials to what is currently authorized (grains and grain processing byproducts, distillers, dried grains, hulls, husks, shells, pits, and dry wood). This testing requirement is for gathering site-specific data for the purpose of generating emission factors when analyzing the addition of biomass materials.	Minn. R. 7007.0800, subp. 2
Any MPCA-approved biomass fuel must be accomodated with existing equipment, at the facility. In no instance does this permit authorize the Permittee to make any physical or operational changes that would trigger the applicability of a New Source Performance Standard, Maximum Achievable Control Technology, or Prevention of Significant Deterioration.	40 CFR Section 52.21; 40 CFR Part 60; 40 CFR Part 63
Biomass Fuel Testing Restrictions: Test burns shall be conducted, in accordance, with a MPCA-approved test plan and limited to no more than 30 days of operation and a test period not to exceed 60 days of duration.	Minn. R. 7007.0800, subp. 2
Biomass Fuel Testing Requirements: Initial test burns shall be conducted to measure emissions of PM, PM10, opacity, CO, NOx, SO2, HCl, acrolien, benzene, chlorine, formaldehyde, manganese, styrene, and toluene, mercury, dioxin, PAHs, and other chemicals of potential interest, as determined by the MPCA, for the purpose of developing emission factors. In addition, a proximate and ultimate fuel analysis shall be simultanously collected for correlation between fuel content and emissions. Upon MPCA satisfaction of test results, this list may be reduced.	Minn. R. 7007.0800, subp. 2
Biomass Fuel Testing Submittals: 30-days prior to testing of a biomass fuel or blend, the Permittee shall submit a written performance test notification and test plan. the test plan shall: 1) meet the requirements of Minn. R. 7017.2030; 2) describe which pre-authorized fuel or blend is to be combusted; and, 3) include: - the type and estimated amount of fuels to be tested; - operating parameters and anticipated fuel mixes during the test; - air pollutants, fuel parameters, and other chemicals of potential interest as determined by the MPCA that will be measured during the testing; and - a testing schedule.	Minn. R. 7017.2030, subp. 1-4; Minn. R. 7017.2018
Performance Test Notifications and Submittals: Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements. Performance Test Pre-test Meeting: due 7 days before each Performance Test Performance Test Report: due 45 days after each Performance Test Performance Test Report - Microfiche Copy: due 105 days after each Performance Test The Notification, Test Plan, and Test Report may be submitted in alternative format as allowed by Minn. R. 7017.2018.	Minn. R. 7017.2030, subp. 1-4, 7017.2018 and Minn. R. 7017.2035, subp. 1-2
Additional Biomass Fuels/Blends Evaluation: Upon approval of the performance tests, for the emissions listed in the biomass fuel testing requirements, the Permittee shall complete a Risk Assessment Screening Analysis. The Permittee shall use the emission factors developed during the above testing as input data for use of the MPCA's Risk Assessment Screening Spreadsheet (RASS) available at http://www.pca.state.mn.us/air/aera-risk.html. All of the remaining emission factors shall be the same as those initially used. The Permittee may also choose to use a more refined dispersion model for the analysis.	Minn. R. 7007.0800, subp. 2

Additional Biomass Fuels/Blends Evaluation Continued: If the results of the RASS demonstrate that all of the risks are equal to or less than the risks calculated in the initial facility permitting RASS, the Permittee may submit an application for the authorization to combust the additional fuels. This application shall be made in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500, if a permit amendment is needed. If the results of the RASS demonstrate that any one of the risk(s) exceed the risk(s) calculated in the initial facility permitting RASS, the Permittee may submit the results of the RASS for MPCA evaluation.	Minn. R. 7007.0800, subp. 2

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Subject Item: **EU 065 Dustless ash loadout**

Associated Items: CE 014 Ash silo dustless loadout

SV 008 Bin vent filter - ash fuel storage

What to do	Why to do it
Prior to loadout, the ash shall be wetted to a moisture content that will minimize fugitive emissions.	Title I Condition: BACT requirement as per 40 CFR Section 52.21; Minn. R. 7007.3000
The ash loadout shall be conducted within a fully enclosed building/structure.	Title I Condition: BACT requirement as per 40 CFR Section 52.21; Minn. R. 7007.3000
Particulate Matter < 10 micron: less than or equal to 0.0020 grains/dry standard cubic foot	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Total Particulate Matter: less than or equal to 0.0020 grains/dry standard cubic foot (This satisfies Minn. R. 7011.0715.)	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000; Minn. R. 7011.0715
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715
Total Particulate Matter: greater than or equal to 99.0 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Particulate Matter < 10 micron: greater than or equal to 99.0 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21(j); Minn. R. 7007.3000
Visible Emissions: The Permittee shall check the fabric filter stack (SV 008) for any visible emissions once each day, while loading, during daylight hours. During inclement weather, the Permittee shall read and record the pressure drop across the fabric filter, once each day of operation.	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Recordkeeping of Visible Emissions and Pressure Drop. The Permittee shall record the time and date of each visible emission inspection and pressure drop reading, and whether or not any visible emissions were observed, and whether or not the observed pressure drop was within the range specified in this permit	Title I Condition: Recordkeeping for 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
The Permittee shall operate and maintain the fabric filter at all times that any emission unit controlled by the fabric filter is in operation. The Permittee shall document periods of non-operation of the control equipment.	Minn. R. 7007.0800, subp. 14
Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur: - visible emissions are observed; - the recorded pressure drop is outside the required operating range; or - the fabric filter or any of its components are found during the inspections to need repair. Corrective actions shall return the pressure drop to within the permitted range, eliminate visible emissions, and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the fabric filter. The Permittee shall keep a record of the type and date of any corrective action taken for each filter.	Minn. R. 7007.0800, subp. 4, 5, and 14
Monitoring Equipment: The Permittee shall install and maintain the necessary monitoring equipment for measuring and recording pressure drop as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored fabric filter is in operation.	Minn. R. 7007.0800, subp. 4
Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections.	Minn. R. 7007.0800, subp. 4, 5, and 14
The Permittee shall operate and maintain the fabric filter in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff.	Minn. R. 7007.0800, subp. 14
Initial Performance Test: due 90 days after Initial Startup, of EU 056, to measure (PM, PM10, and opacity) for SV 008.	Minn. R. 7017.2020, subp. 1

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Subject Item: **CE 009 Electrostatic Precipitator - High Efficiency**

Associated Items: EU 056 Suspension boiler

What to do	Why to do it
EMISSION AND OPERATIONAL LIMITS	hdr
Total Particulate Matter: less than or equal to 99.4 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21; Minn. R. 7007.3000
Particulate Matter < 10 micron: less than or equal to 99.4 percent control efficiency	Title I Condition: BACT limit as per 40 CFR Section 52.21; Minn. R. 7007.3000
Total Secondary Power Input: The Permittee shall maintain the total power input to the ESP with the parameters recommended by the manufacturer, unless a new range is set pursuant to Minn. R. 7017.2025, subp. 3. during the most recent MPCA approved performance test where compliance for Total Particulate Matter and/or Particulate Matter less than 10 microns emissions was demonstrated. If the one-hour rolling average total secondary power input drops below the minimum limit, this shall be reported as a deviation. The power input shall be submitted, along with an application for a major amendment. The manufacturer's information must be submitted with the application.	Title I Condition: BACT limit as per 40 CFR Section 52.21; Minn. R. 7007.3000
MONITORING AND RECORDKEEPING	hdr
Secondary Current and Secondary Voltage Monitoring: The Permittee shall collect the secondary current and voltage or total power input monitoring system data for the ESP. The secondary current and secondary voltage are to be measured continuously.	Title I Condition: Monitoring for 40 CFR Section 52.21 BACT Limit; Minn. R. 7007.3000
Data Collection: The Permittee shall maintain a continuous hard copy readout or computer disk file of the total secondary voltage and secondary current. The total secondary voltage and secondary current shall be recorded at least once every 15 minutes.	Title I Condition: Monitoring for 40 CFR Section 52.21 BACT Limit; Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 and 5; 40 CFR SEction 64
Recordkeeping: Every 15 minutes, the power input shall be calculated with the following equation: Total power input (P) = ((V1*I1) + (V2*I2) . . .(Vn*In)) where P = total power input to the ESP V = secondary voltage in each field I = current in each field Each four consecutive 15 minute power input values shall then be averaged into a hourly average. The hourly average power input shall be calculated and recorded.	40 CFR Section 64 ; Title I Condition: Recordkeeping for 40 CFR Section 52.21 BACT Limit; Minn. R. 7007.3000
Daily Monitoring: The Permittee shall physically verify the operation of the Continuous Parameter Monitoring System (CPMS) at least once each operating day to verify that it is working and recording properly. The Permittee shall maintain a written record of the daily verifications.	Minn. R. 7007.0800, subp. 4 and 5
Monitoring Equipment: The Permittee must install and maintain a continuous parameter monitoring system (CPMS) for monitoring the ESP total secondary power input as required by this permit. The monitoring equipment must be installed, in use, and properly maintained, including maintaining the necessary parts for routine repairs of the monitoring equipment, whenever operation of the monitored control equipment is required.	Minn. R. 7007.0800, subp. 4 and 5
Quarterly Inspections: At least once per calendar quarter, or more frequently if required by the manufacturer, the Permittee shall inspect the control equipment components that are subject to wear or plugging, for example: bearings, belts, hoses, fans, nozzles, orifices, and ducts. The Permittee shall maintain a written record of the inspection and any corrective actions taken resulting from the inspection.	Minn. R. 7007.0800, subp. 4, 5 and 14
Annual Inspections: At least once per calendar year, or more frequently if required by the manufacturer, the Permittee shall inspect the control equipment components not covered by the quarterly inspections. This includes, but is not limited to, components that are not subject to wear or plugging including structural components, housings, and hoods. The Permittee shall maintain a written record of the inspection and any corrective actions taken resulting from the inspection.	Minn. R. 7007.0800, subp. 4, 5 and 14
Annual Calibration: The Permittee shall calibrate the voltmeter and ammeter at least annually and shall maintain a written record of the calibration and any action resulting from the calibration. Annual replacement is acceptable in lieu of calibration.	Minn. R. 7007.0800, subp. 4, 5 and 14

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Operation and Maintenance of ESP: The Permittee shall operate and maintain the ESP in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available on-site for use by staff and review by MPCA staff.	Minn. R. 7007.0800, subp. 14
Corrective Actions: If the ESP power input is less than the power input determined by the manufacturer or the power input durning the most recent performance test that determined compliance with the emission limits, the Permittee shall take the following steps, as soon as possible: 1) an inspection of the ESP system; 2) corrective action to return operation to within the permitted range; and 3) reporting of corrective action taken and the date. Corrective action shall will be taken if the ESP or any of its components are found during the inspections to need repair. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the ESP.	40 CFR Part 64; Minn. R. 7007.0800, subp. 4, 5 and 14
QA/QC: The Permittee shall confirm that the meters read zero when the ESP (CE 009) is not operating.	40 CFR Section 64.3
Recordkeeping: The owner or operator shall maintain records of monitoring data monitor performance data, corrective actions taken, any written quality improvement plan required pursuant to 64.8 and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained. The owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements.	40 CFR Section 64.8

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Subject Item: FS 001 Road emissions due to truck hauling/transportation

What to do	Why to do it
Vehicle Traffic speeds shall not exceed 10 mph on all facility roads or parking surfaces. Signs shall be posted restricting the speeds to 10 mph.	Title I Condition: BACT requirement as per 40 CFR Section 52.21(k); Minn. R. 7007.3000
All roads or parking surfaces shall be paved. Under dry pavement conditions, sweeping is required, twice weekly. Sweeping is not required if the pavement is wet, or snow or ice covered.	Title I Condition: BACT requirement as per 40 CFR Section 52.21(k); Minn. R. 7007.3000
Recordkeeping: The Permittee shall record the dates of the required sweepings. The records are to be maintained on-site.	Minn. R. 7007.0800, subp. 5

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Subject Item: MR 001 COM

What to do	Why to do it
Installation Notification: due 60 days before installing the continuous opacity monitoring system. The notification shall include the plans and drawings of the system.	Minn. R. 7017.1040, subp. 1
Opacity CEMS: The Permittee shall install, calibrate, maintain, and operate a continuous opacity monitoring systems (COMS).	40 CFR Section 60.48b(a)
All COMS shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data for each successive 6-minute period.	Minn. R. 7017.1200, subp. 1, 2 & 3; 40 CFR Section 60.13(e)(1); 40 CFR Section 60.13(h)
COMS Certification Test: due 60 days after achieving maximum capacity but not later than 180 days after initial startup.	Minn. R. 7017.1050, subp. 1; 40 CFR Section 60.8(a)
COMS Certification Test Pretest Meeting: due 7 days before COMS Certification Test	Minn. R. 7017.1060, subp. 3
Continuous Operation: COMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. A COMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment. Acceptable monitor downtime includes reasonable periods as listed in Items A, B, C and D of Minn. R. 7017.1090, subp. 2.	Minn. R. 7017.1090, subp. 1; 40 CFR Section 60.13(e)
QA Plan Required: Develop and implement a written quality assurance plan which covers each COMS. The plan shall be on site and available for inspection within 30 days after monitor certification. The plan shall contain the written procedures listed in Minn. R. 7017.1210, subp. 1.	Minn. R. 7017.1210, subp. 1
COMS QA/QC: The owner or operator of an affected facility is subject to the performance specifications listed in 40 CFR pt. 60, Appendix B and shall operate, calibrate, and maintain each COMS according to the QA/QC procedures in Minn. R. 7017.1210.	40 CFR Section 60.13(a); Minn. R. 7017.1210
COMS Daily Calibration Drift Check: The Permittee must automatically, intrinsic to the opacity monitor, check the zero and upscale (span) calibration drifts at least once daily. The acceptable range is defined in 40 CFR pt. 60, Appendix B PS-1. For COMS without automatic zero adjustments, the optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero and span drift adjustments. For COMS with automatic zero adjustments, the optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity. Minimum procedures must include an automated methjod for producing a simulated zero opacity condition and an upscale opacity condition as specified in 40 CFR 60.13(d)(2).	Minn. R. 7017.1210, subp. 2; 40 CFR Section 60.13(d)(l) regarding COMS and 60.13(d)(2)
COMS Calibration Error Audit: due before end of each half-year following COMS Certification Test. The first Calibraion Error Audit is due within 180 days of the COMS Certification Test. Conduct three point calibration error audits at least 3 months apart but no greater than 8 months apart. Conduct audits in accordance with Minn. R. 7017.1210, subp. 3.	Minn. R. 7017.1210, subp. 3
Attenuator Calibration: The Permittee shall have an independent testing company conduct calibrations of each of the neutral density filters used in the calibration error audit according to the procedure in Code of Federal Regulations, Title 40, Part 60, Appendix B, Section 7.1.3.1 within the time frame of opacity stability guaranteed by the attenuator manufacturer. The manufacturer's guarantee of stability shall be on site available for inspection.	Minn. R. 7017.1210, subp. 4
Recordkeeping: The owner or operator must retain records of all COMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130; 40 CFR Section 60.7(f)

TABLE B: SUBMITTALS

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

Table B lists most of the submittals required by this permit. Please note that some submittal requirements may appear in Table A or, if applicable, within a compliance schedule located in Table C. Table B is divided into two sections in order to separately list one-time only and recurrent submittal requirements.

Send submittals that are required to be submitted to the U.S. EPA regional office to:

Mr. George Czerniak
Air and Radiation Branch
EPA Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Each submittal must be postmarked or received by the date specified in the applicable Table. Those submittals required by parts 7007.0100 to 7007.1850 must be certified by a responsible official, defined in Minn. R. 7007.0100, subp. 21. Other submittals shall be certified as appropriate if certification is required by an applicable rule or permit condition.

Send submittals that are required by the Acid Rain Program to:

U.S. Environmental Protection Agency
Clean Air Markets Division
1200 Pennsylvania Avenue NW (6204N)
Washington, D.C. 20460

Send any application for a permit or permit amendment to:

AQ Permit Technical Advisor
Industrial Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Also, where required by an applicable rule or permit condition, send to the Permit Technical Advisor notices of:
- accumulated insignificant activities,
- installation of control equipment,
- replacement of an emissions unit, and
- changes that contravene a permit term.

Unless another person is identified in the applicable Table, send all other submittals to:

AQ Compliance Tracking Coordinator
Industrial Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
CEM Certification Test Plan	due 30 days before CEM Certification Test	GP002
CEM Certification Test Report - Microfiche Copy	due 105 days after CEM Certification Test	GP002
CEM Certification Test Report	due 45 days after CEM Certification Test	GP002
COMS Certification Test Plan	due 30 days before COMS Certification Test	MR001
COMS Certification Test Report - Microfiche Copy	due 105 days after COMS Certification Test	MR001
COMS Certification Test Report	due 45 days after COMS Certification Test	MR001
Notification of the Actual Date of Initial Startup	due 15 days after Initial Startup in accordance with 40 CFR Section 60.49b(a). This notification shall include: 1) The design heat input capacity and the identification of the fuels to be combusted, 2) The annual capacity factor at which the Permittee anticipates operating the facility based on all fuels fired and based on each individual fuel fired.	EU056
Notification of the Date Construction Began	due 30 days after Start Of Construction	EU056
Relative Accuracy Test Audit (RATA) Notification	due 30 days before CEMS Relative Accuracy Test Audit (RATA).	Total Facility
Relative Accuracy Test Audit (RATA) Results Summary	due 45 days after CEMS Relative Accuracy Test Audit (RATA) for MR 002 (NOx) for each calendar year in which a RATA was performed.	MR002
Relative Accuracy Test Audit (RATA) Results Summary	due 45 days after CEMS Relative Accuracy Test Audit (RATA) for MR 003 (CO) for each calendar year in which a RATA was performed.	MR003
Relative Accuracy Test Audit (RATA) Results Summary	due 45 days after CEMS Relative Accuracy Test Audit (RATA) for MR 004 (O2).	MR004
Testing Frequency Plan	due 60 days after Initial Performance Test for PM, PM10, and opacity emissions. The plan shall specify a testing frequency based on the test data and MPCA guidance. Future performance tests based on one-year (12 month), 36 month, and 60 month intervals, or as applicable, shall be required upon written approval of the MPCA.	EU056, EU065, GP001

TABLE B: RECURRENT SUBMITTALS

Facility Name: Koda Energy LLC

Permit Number: 13900114 - 001

What to send	When to send	Portion of Facility Affected
COMS Calibration Error Audit Results Summary	due 30 days after end of each calendar quarter following COMS Certification Test	MR001
Cylinder Gas Audit (CGA) Results Summary	due 30 days after end of each calendar quarter following end of the calendar quarter in which the Audit was performed for MR 002 (NOx).	MR002
Cylinder Gas Audit (CGA) Results Summary	due 30 days after end of each calendar quarter following end of the calendar quarter in which the Audit was performed for MR 003 (CO).	MR003
Cylinder Gas Audit (CGA) Results Summary	due 30 days after end of each calendar quarter following end of the calendar quarter in which the Audit was performed for MR 004 (O2).	MR004
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (MR 001). Excess opacity emissions are all 6-minute periods during which the average opacity exceeds the above opacity limit.	MR001
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The downtime portion of the EER shall include a report on all periods that the CEMS was out-of-control. The EER shall indicate all periods of monitor bypass and all periods of exceedances of the limit including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions.	Total Facility
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occured, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification	due 30 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted on a form approved by the Commissioner, both to the Commissioner and to the US EPA regional office in Chicago. This report covers all deviations experienced during the calendar year.	Total Facility
Emissions Inventory Report	due 91 days after end of each calendar year following Permit Issuance. To be submitted on a form approved by the Commissioner.	Total Facility

APPENDIX MATERIAL
Facility Name:Koda Energy LLC
Permit Number: 13900114-001

Appendix – Modeling Parameters Used for Koda Energy and Rahr Malting in Shakopee, Scott County, Minnesota

Hardcopy Report Submittals
Koda Energy Major Permit Application – Combined Heat and Power Biomass (November 2006).

Air Modeling Impact Assessment of Proposed Koda Energy Cogeneration Facility, Koda Energy, Shakopee, Minnesota (November 2006; revised June 2007).

Electronic (CD-ROM) Submittals
Air Modeling Impact Assessment for Koda Energy, LLC, November 2006, prepared by Golder Associates Inc.

Koda Energy Air Modeling Files, June 2007, prepared by Golder Associates Inc., received June 12, 2007.

Full Details
See CD-ROM for full data details.

Summary Report (this is a computer-generated "REPORT" with simple headers, simple sources, and selected parameters)
The summary report is for simple (constant) emission rates and corresponding stack/source parameters. It does not fully document details regarding
model control options, emission rates with varying emission scalars, corresponding stack/source parameters, wind speed categories for wind erosion, building profile input program (BPIP) outputs, various output selections (e.g., EVENTFIL, MULTYEAR, PLOTFILE, POSTFILE, MAXIFILE), applicable "INCLUDED" file information, receptor grids, or other special features described in the following EPA modeling user guides:

Old AERMOD (04300): http://www.epa.gov/scram001/7thconf/aermod/aermodugb.pdf

New AERMOD (07026): http://www.epa.gov/scram001/dispersion_prefrec.htm#aermod

Note: If any difference exists between summary values in this appendix vs. the hardcopy report vs. the electronic CD-ROM modeled values, the electronic CD-ROM modeled values prevail.

For Your Information
Emission rates in the last table are not in units indicated but rather equivalent risk emission rate (ERER) units (a.k.a. Q/CHI sums).

For state environmental review purposes, the stack height for the Koda Energy biomass boiler (SV009) shall be at least (220 feet) above grade.

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 *** AERMOD - VERSION 07026 ***    *** Koda Energy PSD Increment Study NOX Scenario B   June 2007
***        05/30/07
                                   ***
***        13:17:33
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\NOXPSDB.O86
 **This Run Includes:    51 Source(s);      1 Source Group(s); and    1006 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    8.85   70.26  307.73   54.86  179.99   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457375 4960369     230    0.00    0.00    0.00    7.93   26.02   2.760   9.055
-264.   -537.   -934.    0.00    0.00       0
   POINT SV006     457381 4960335     230    0.00    0.00    0.00    7.93   26.02   2.760   9.055
-264.   -537.   -934.    0.00    0.00       0
   POINT SV007     457388 4960350     230    0.00    0.00    0.00   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.00    0.00    0.00    7.32   24.02   1.070   3.510
-264.   -537.   -934.    0.00    0.00       0
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.00    0.00    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
  VOLUME L0000252  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000253  457392 4960330     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000254  457399 4960336     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000255  457419 4960340     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000256  457432 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000257  457446 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000258  457452 4960335     230    0.00    0.00    0.00    2.29    7.51   4.910   1.070
  VOLUME L0000259  457257 4960304     230    0.00    0.00    0.00    2.29    7.51   7.340   1.070
  VOLUME L0000260  457268 4960315     230    0.00    0.00    0.00    2.29    7.51   7.340   1.070
  VOLUME L0000261  457278 4960327     230    0.00    0.00    0.00    2.29    7.51   7.340   1.070
  VOLUME L0000262  457303 4960346     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000263  457303 4960359     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000264  457303 4960373     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000265  457302 4960386     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000266  457302 4960400     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000267  457313 4960406     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000268  457327 4960409     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000269  457342 4960412     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000270  457356 4960414     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000271  457371 4960417     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000272  457386 4960420     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000273  457400 4960423     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000274  457415 4960426     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000275  457429 4960429     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000276  457444 4960431     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000277  457459 4960434     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000278  457474 4960436     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000279  457488 4960438     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000280  457503 4960440     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000281  457518 4960442     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000282  457533 4960444     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070

  VOLUME L0000283  457548 4960446     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000284  457563 4960448     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000285  457578 4960451     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000286  457593 4960453     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000287  457607 4960455     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
  VOLUME L0000288  457622 4960457     230    0.00    0.00    0.00    2.29    7.51   6.990   1.070
```

VOLUME	L0000289	457637	4960459	230	0.00	0.00	0.00	2.29	7.51	6.990	1.070
VOLUME	L0000290	457652	4960461	230	0.00	0.00	0.00	2.29	7.51	6.990	1.070
VOLUME	L0000291	457667	4960463	230	0.00	0.00	0.00	2.29	7.51	6.990	1.070
TOTAL					8.85	70.26	307.73				

```
 *** AERMOD - VERSION 07026 ***    *** Koda Energy PSD Increment Study PM10 Scenario A June 2007
***        06/04/07
                                   ***
***        12:22:29
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\PMPSDA.O86
 **This Run Includes:    51 Source(s);      1 Source Group(s); and    1001 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    0.86    6.84   29.96   54.86  179.99   1.980   6.496
436.    163.    325.   11.42 2248.03   74506
   POINT SV005     457375 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.09    0.41   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.09    0.41   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
-264.   -537.   -934.   32.34 6366.14   20026
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
  VOLUME L0000252  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000253  457392 4960330     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000254  457399 4960336     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000255  457419 4960340     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000256  457432 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000257  457446 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000258  457452 4960335     230    0.00    0.00    0.00    2.29    7.51   4.910   1.070
  VOLUME L0000259  457257 4960304     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000260  457268 4960315     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000261  457278 4960327     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000262  457303 4960346     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000263  457303 4960359     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000264  457303 4960373     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000265  457302 4960386     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000266  457302 4960400     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000267  457313 4960406     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000268  457327 4960409     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000269  457342 4960412     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000270  457356 4960414     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070

  VOLUME L0000271  457371 4960417     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000272  457386 4960420     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000273  457400 4960423     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000274  457415 4960426     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000275  457429 4960429     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000276  457444 4960431     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000277  457459 4960434     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000278  457474 4960436     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000279  457488 4960438     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000280  457503 4960440     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000281  457518 4960442     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000282  457533 4960444     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000283  457548 4960446     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000284  457563 4960448     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000285  457578 4960451     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000286  457593 4960453     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000287  457607 4960455     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000288  457622 4960457     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
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VOLUME	L0000289	457637	4960459	230	0.00	0.00	0.00	2.29	7.51	6.900	1.070
VOLUME	L0000290	457652	4960461	230	0.00	0.00	0.00	2.29	7.51	6.900	1.070
VOLUME	L0000291	457667	4960463	230	0.00	0.00	0.00	2.29	7.51	6.900	1.070
TOTAL					1.18	9.38	41.06				
SUMP=					1.18	9.35	40.95				
SUMV=					0.00	0.03	0.11				

```
 *** AERMOD - VERSION 07026 ***    *** Koda Energy PSD Increment Study PM10 Scenario B (100%
load) June 200 ***        06/04/07
                                  ***
***        12:22:54
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\PMPSDB.O86
 **This Run Includes:    51 Source(s);      1 Source Group(s); and    1001 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    1.44   11.40   49.94   54.86  179.99   1.980   6.496
451.    178.    352.   19.60 3858.27  127874
   POINT SV005     457375 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.09    0.41   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.09    0.41   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
-264.   -537.   -934.   32.34 6366.14   20026
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
  VOLUME L0000252  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000253  457392 4960330     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000254  457399 4960336     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000255  457419 4960340     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000256  457432 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000257  457446 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000258  457452 4960335     230    0.00    0.00    0.00    2.29    7.51   4.910   1.070
  VOLUME L0000259  457257 4960304     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000260  457268 4960315     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000261  457278 4960327     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000262  457303 4960346     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000263  457303 4960359     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000264  457303 4960373     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000265  457302 4960386     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000266  457302 4960400     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000267  457313 4960406     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000268  457327 4960409     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000269  457342 4960412     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000270  457356 4960414     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000271  457371 4960417     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000272  457386 4960420     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000273  457400 4960423     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000274  457415 4960426     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000275  457429 4960429     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000276  457444 4960431     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000277  457459 4960434     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000278  457474 4960436     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000279  457488 4960438     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000280  457503 4960440     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000281  457518 4960442     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000282  457533 4960444     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000283  457548 4960446     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000284  457563 4960448     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000285  457578 4960451     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000286  457593 4960453     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000287  457607 4960455     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000288  457622 4960457     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000289  457637 4960459     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
```

VOLUME	L0000290	457652	4960461	230	0.00	0.00	0.00	2.29	7.51	6.900	1.070
VOLUME	L0000291	457667	4960463	230	0.00	0.00	0.00	2.29	7.51	6.900	1.070
TOTAL					1.76	13.94	61.04				
SUMP=					1.75	13.91	60.93				
SUMV=					0.00	0.03	0.11				

```
 *** AERMOD - VERSION 07026 ***    *** NAAQS - June 2007 Koda Energy/Rahr Malting NAAQS Scenerio
B (MAX) 5  ***        05/31/07
                                  ***
***        17:49:29
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\NAN5YRB.O86
 **This Run Includes:   233 Source(s);      7 Source Group(s); and    1145 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    9.71   77.04  337.42   54.86  179.99   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.    0.00    0.00       0
   POINT SV006     457381 4960335     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.    0.00    0.00       0
   POINT SV007     457388 4960350     230    0.00    0.00    0.00   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.00    0.00    0.00    7.32   24.02   1.070   3.510
-264.   -537.   -934.    0.00    0.00       0
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.00    0.00    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.09    0.68    2.99   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.00    0.00    0.00   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.00    0.00    0.00   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.00    0.00    0.00   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.00    0.00    0.00   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.00    0.00    0.00    3.70   12.14   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV99_R    457647 4960431     230    0.00    0.00    0.00    8.38   27.49   3.000   9.843
0.   -273.   -460.   13.35 2627.95  199949
   POINT SV98_R    457522 4960508     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV97_R    457526 4960519     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV03_R    457514 4960520     230    1.83   14.53   63.65   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.00    0.00    0.00   10.00   32.81   1.070   3.510
294.     21.     70.    0.00    0.00       0
   POINT SV27_R    457341 4960476     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    2.16   17.15   75.12   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0001195  457275 4960485     230    0.36    2.86   12.50   37.49  123.00   1.560  12.140
  VOLUME L0001196  457276 4960482     230    0.36    2.86   12.50   37.49  123.00   1.560  12.140
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VOLUME L0001197	457276	4960478	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001198	457277	4960475	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001199	457277	4960472	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001200	457278	4960468	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001201	457279	4960465	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001202	457279	4960462	230	0.36	2.86	12.50	37.49	123.00	1.560	12.140
VOLUME L0001227	457395	4960513	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001228	457396	4960513	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001229	457398	4960513	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001230	457399	4960514	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001231	457401	4960514	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001232	457402	4960514	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001233	457404	4960514	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001234	457405	4960515	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001235	457407	4960515	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001236	457409	4960515	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001237	457410	4960515	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001238	457412	4960516	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001239	457413	4960516	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001240	457415	4960516	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001241	457416	4960516	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001242	457418	4960517	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001243	457419	4960517	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001244	457421	4960517	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001245	457422	4960517	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001246	457424	4960518	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001247	457426	4960518	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001248	457427	4960518	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001249	457429	4960518	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001250	457430	4960519	230	0.03	0.27	1.17	38.40	125.98	0.730	17.160
VOLUME L0001251	457451	4960517	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001252	457451	4960515	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001253	457451	4960513	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001254	457452	4960512	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001255	457452	4960510	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001256	457452	4960508	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001257	457453	4960506	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001258	457453	4960504	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001259	457453	4960502	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001260	457453	4960500	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001261	457454	4960498	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001262	457454	4960496	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001263	457454	4960495	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001264	457455	4960493	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001265	457455	4960491	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001266	457455	4960489	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001267	457456	4960487	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001268	457456	4960485	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001269	457456	4960483	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001270	457457	4960481	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001271	457473	4960524	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001272	457473	4960522	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001273	457474	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001274	457474	4960519	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001275	457474	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001276	457474	4960516	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001277	457475	4960514	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001278	457475	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001279	457475	4960511	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001280	457476	4960509	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001281	457476	4960508	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001282	457498	4960528	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001283	457498	4960526	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001284	457498	4960525	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001285	457498	4960523	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001286	457499	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001287	457499	4960520	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001288	457499	4960518	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001289	457500	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001290	457500	4960515	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001291	457500	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001292	457500	4960512	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001293	457460	4960410	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME L0001294	457460	4960409	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME L0001295	457460	4960407	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020

VOLUME	L0001296	457460	4960406	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001297	457461	4960404	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001298	457461	4960403	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001299	457461	4960401	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001300	457461	4960400	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001301	457462	4960398	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001302	457462	4960397	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001303	457462	4960395	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001304	457462	4960394	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001305	457463	4960392	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001306	457463	4960391	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001307	457463	4960389	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001308	457463	4960387	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001309	457464	4960386	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001310	457464	4960384	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001311	457464	4960383	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001312	457464	4960381	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001313	457465	4960380	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001314	457465	4960378	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001315	457465	4960377	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001316	457465	4960375	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001317	457466	4960374	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001318	457466	4960372	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001319	457466	4960371	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001320	457466	4960369	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001321	457467	4960368	230	0.03	0.27	1.19	22.86	75.00	0.720	11.020
VOLUME	L0001322	457572	4960429	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001323	457574	4960430	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001324	457575	4960430	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001325	457577	4960430	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001326	457578	4960430	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001327	457580	4960431	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001328	457581	4960431	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001329	457583	4960431	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001330	457584	4960431	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001331	457586	4960432	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001332	457587	4960432	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001333	457589	4960432	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001334	457591	4960432	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001335	457592	4960433	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001336	457594	4960433	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001337	457595	4960433	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001338	457597	4960433	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001339	457598	4960434	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001340	457600	4960434	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001341	457601	4960434	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001342	457603	4960435	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001343	457604	4960435	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001344	457606	4960435	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001345	457607	4960435	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001346	457609	4960436	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001347	457610	4960436	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001348	457612	4960436	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001349	457613	4960436	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001350	457615	4960437	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001351	457616	4960437	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001352	457618	4960437	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001353	457619	4960437	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001354	457621	4960438	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001355	457622	4960438	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001356	457624	4960438	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001357	457625	4960438	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001358	457627	4960439	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001359	457628	4960439	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
VOLUME	L0001360	457630	4960439	230	0.04	0.34	1.51	30.48	100.00	0.720	14.230
TOTAL					20.16	160.01	700.78				
SUMP=					13.79	109.40	479.17				
SUMV=					6.38	50.60	221.62				

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 *** AERMOD - VERSION 07026 ***    *** NAAQS - Koda Energy/Rahr Malting NAAQS Scenario A (MAX) 5
Year Run w ***        06/05/07
                                  ***
***        09:14:54
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\PAN5YRA.O86
 **This Run Includes:   340 Source(s);      3 Source Group(s); and    1145 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    0.86    6.84   29.96   54.86  179.99   1.980   6.496
436.    163.    325.   11.42 2248.03   74506
   POINT SV005     457376 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
0.   -273.   -460.   32.34 6366.14   20026
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
0.   -273.   -460.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.03    0.14   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.03    0.21    0.94   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.02    0.13    0.59   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.01    0.07    0.31   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.02    0.15    0.66   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.01    0.06    0.24    3.66   12.01   1.040   3.412
294.     21.     70.   13.76 2708.66   24767
   POINT SV99_R    457647 4960431     230    0.01    0.07    0.31    8.38   27.49   3.000   9.843
0.   -273.   -460.   12.99 2557.09  194557
   POINT SV98_R    457522 4960508     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV97_R    457526 4960519     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV03_R    457514 4960520     230    0.06    0.51    2.22   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.03    0.27    1.18   10.00   32.81   1.070   3.510
294.     21.     70.   16.65 3277.56   31723

   POINT SV27_R    457341 4960476     230    0.01    0.08    0.35   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.01    0.06    0.24   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.01    0.06    0.24   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00   21.64   71.00   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.01    0.08    0.35   12.00   39.37   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.07    0.54    2.36   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0000899  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
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  VOLUME L0000900  457392 4960330     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000901  457399 4960336     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000902  457419 4960340     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000903  457432 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
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  VOLUME L0000907  457268 4960315     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
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  VOLUME L0000909  457303 4960346     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
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  VOLUME L0000911  457303 4960373     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000912  457302 4960386     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000913  457302 4960400     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000914  457313 4960406     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000915  457327 4960409     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000916  457342 4960412     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000917  457356 4960414     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
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  VOLUME L0000919  457386 4960420     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
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  VOLUME L0000922  457429 4960429     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000923  457444 4960431     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
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  VOLUME L0000925  457467 4960436     230    0.00    0.00    0.00    2.29    7.51   5.570   1.070
  VOLUME L0000926  457479 4960438     230    0.00    0.00    0.00    2.29    7.51   5.570   1.070
  VOLUME L0000927  457494 4960441     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000928  457510 4960443     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000929  457525 4960445     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000930  457541 4960446     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000931  457556 4960448     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
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*HROFDY*
  VOLUME L0001195  457275 4960485     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001196  457276 4960482     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001197  457276 4960478     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001198  457277 4960475     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001199  457277 4960472     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001200  457278 4960468     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001201  457279 4960465     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001202  457279 4960462     230    0.08    0.62    2.69   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001227  457395 4960513     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001228  457396 4960513     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001229  457398 4960513     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001230  457399 4960514     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001231  457401 4960514     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001232  457402 4960514     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001233  457404 4960514     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001234  457405 4960515     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001235  457407 4960515     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001236  457409 4960515     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001237  457410 4960515     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
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  VOLUME L0001238  457412 4960516     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001239  457413 4960516     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001240  457415 4960516     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
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*SEASON*
  VOLUME L0001242  457418 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001243  457419 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
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  VOLUME L0001244  457421 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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  VOLUME L0001255  457452 4960510     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001256  457452 4960508     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
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  VOLUME L0001258  457453 4960504     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001259  457453 4960502     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001260  457453 4960500     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
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  VOLUME L0001264  457455 4960493     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001265  457455 4960491     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001266  457455 4960489     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
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  VOLUME L0001268  457456 4960485     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001269  457456 4960483     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
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  VOLUME L0001271  457473 4960524     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001272  457473 4960522     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001273  457474 4960521     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001274  457474 4960519     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001275  457474 4960517     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001276  457474 4960516     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
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  VOLUME L0001283  457498 4960526     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
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  VOLUME L0001289  457500 4960517     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001290  457500 4960515     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001291  457500 4960513     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001292  457500 4960512     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001293  457460 4960410     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
  VOLUME L0001295  457460 4960407     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001296  457460 4960406     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001301  457462 4960398     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001305  457463 4960392     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001311  457464 4960383     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001312  457464 4960381     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001313  457465 4960380     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001316  457465 4960375     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001319  457466 4960371     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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*SEASON*
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VOLUME	L0001339	457598	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
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SEASON											
VOLUME	L0001341	457601	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001342	457603	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001343	457604	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001344	457606	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001345	457607	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001346	457609	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001347	457610	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
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VOLUME	L0001348	457612	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001349	457613	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001350	457615	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001351	457616	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001352	457618	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
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SEASON											
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SEASON											
VOLUME	L0001355	457622	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001356	457624	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001357	457625	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001358	457627	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001359	457628	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001360	457630	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
TOTAL					3.82	30.31	132.77				
SUMP=					1.47	11.70	51.25				
SUMV=					2.35	18.61	81.52				

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 *** AERMOD - VERSION 07026 ***    *** NAAQS - Koda Energy/Rahr Malting NAAQS Scenerio B (MAX) 5
Year Run w ***        06/05/07
                                  ***
***        11:27:24
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\PAN5YRB.O86
 **This Run Includes:   340 Source(s);      3 Source Group(s); and    1145 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    1.44   11.40   49.94   54.86  179.99   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
0.   -273.   -460.   32.34 6366.14   20026
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
0.   -273.   -460.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.03    0.14   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.03    0.21    0.94   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.02    0.13    0.59   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.01    0.07    0.31   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.02    0.15    0.66   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.01    0.06    0.24    3.66   12.01   1.040   3.412
294.     21.     70.   13.76 2708.66   24767
   POINT SV99_R    457647 4960431     230    0.01    0.07    0.31    8.38   27.49   3.000   9.843
0.   -273.   -460.   12.99 2557.09  194557
   POINT SV98_R    457522 4960508     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV97_R    457526 4960519     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV03_R    457514 4960520     230    0.06    0.51    2.22   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.03    0.27    1.18   10.00   32.81   1.070   3.510
294.     21.     70.   16.65 3277.56   31723
   POINT SV27_R    457341 4960476     230    0.01    0.08    0.35   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.01    0.06    0.24   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.01    0.06    0.24   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00   21.64   71.00   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.01    0.08    0.35   12.00   39.37   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.07    0.54    2.36   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0000899  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
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*HROFDY*
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*HROFDY*
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  VOLUME L0001242  457418 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001243  457419 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
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  VOLUME L0001244  457421 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001245  457422 4960517     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001246  457424 4960518     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001247  457426 4960518     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001248  457427 4960518     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001249  457429 4960518     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001250  457430 4960519     230    0.01    0.09    0.40   38.40  125.98   0.730  17.160
*SEASON*
  VOLUME L0001251  457451 4960517     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001252  457451 4960515     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001253  457451 4960513     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001254  457452 4960512     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001255  457452 4960510     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001256  457452 4960508     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001257  457453 4960506     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001258  457453 4960504     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001259  457453 4960502     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001260  457453 4960500     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001261  457454 4960498     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001262  457454 4960496     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001263  457454 4960495     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001264  457455 4960493     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001265  457455 4960491     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001266  457455 4960489     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001267  457456 4960487     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001268  457456 4960485     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001269  457456 4960483     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001270  457457 4960481     230    0.01    0.10    0.42   24.99   81.99   0.890   9.400
  VOLUME L0001271  457473 4960524     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001272  457473 4960522     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001273  457474 4960521     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001274  457474 4960519     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001275  457474 4960517     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001276  457474 4960516     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001277  457475 4960514     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001278  457475 4960513     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001279  457475 4960511     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001280  457476 4960509     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001281  457476 4960508     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001282  457498 4960528     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001283  457498 4960526     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001284  457498 4960525     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001285  457498 4960523     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001286  457499 4960521     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001287  457499 4960520     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001288  457499 4960518     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001289  457500 4960517     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001290  457500 4960515     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001291  457500 4960513     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001292  457500 4960512     230    0.01    0.09    0.38   23.16   75.98   0.760  13.260
  VOLUME L0001293  457460 4960410     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001294  457460 4960409     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001295  457460 4960407     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001296  457460 4960406     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001297  457461 4960404     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001298  457461 4960403     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001299  457461 4960401     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001300  457461 4960400     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001301  457462 4960398     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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  VOLUME L0001302  457462 4960397     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001303  457462 4960395     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001304  457462 4960394     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001305  457463 4960392     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001306  457463 4960391     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001307  457463 4960389     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001308  457463 4960387     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001309  457464 4960386     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
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*SEASON*
  VOLUME L0001311  457464 4960383     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001312  457464 4960381     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001313  457465 4960380     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001314  457465 4960378     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001315  457465 4960377     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001316  457465 4960375     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001317  457466 4960374     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001318  457466 4960372     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001319  457466 4960371     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001320  457466 4960369     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001321  457467 4960368     230    0.02    0.12    0.54   22.86   75.00   0.720  11.020
*SEASON*
  VOLUME L0001322  457572 4960429     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001323  457574 4960430     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001324  457575 4960430     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001325  457577 4960430     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001326  457578 4960430     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001327  457580 4960431     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
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*SEASON*
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*SEASON*
  VOLUME L0001330  457584 4960431     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
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*SEASON*
  VOLUME L0001332  457587 4960432     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001333  457589 4960432     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001334  457591 4960432     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001335  457592 4960433     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001336  457594 4960433     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001337  457595 4960433     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
  VOLUME L0001338  457597 4960433     230    0.01    0.09    0.40   30.48  100.00   0.720  14.230
*SEASON*
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VOLUME	L0001339	457598	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001340	457600	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001341	457601	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001342	457603	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001343	457604	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001344	457606	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001345	457607	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001346	457609	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001347	457610	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001348	457612	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001349	457613	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001350	457615	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001351	457616	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001352	457618	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001353	457619	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001354	457621	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001355	457622	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001356	457624	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001357	457625	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001358	457627	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001359	457628	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
VOLUME	L0001360	457630	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
SEASON											
TOTAL					4.39	34.88	152.75				
SUMP=					2.05	16.26	71.23				
SUMV=					2.35	18.61	81.52				

```
 *** AERMOD - VERSION 07026 ***    *** NAAQS - Koda Energy/Rahr Malting NAAQS Scenario A 5 Year
Run with FA ***        06/05/07
                                  ***
***        07:23:45
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\P245YRA.O86
 **This Run Includes:   347 Source(s);      8 Source Group(s); and     494 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    0.86    6.84   29.96   54.86  179.99   1.980   6.496
436.    163.    325.   11.42 2248.03   74506
   POINT SV005     457376 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
0.   -273.   -460.   32.34 6366.14   20026

   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
0.   -273.   -460.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.03    0.14   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.04    0.30    1.32   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.04    0.31    1.36   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.01    0.07    0.31   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.02    0.15    0.66   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.01    0.08    0.35    3.66   12.01   1.040   3.412
294.     21.     70.   13.76 2708.66   24767
   POINT SV99_R    457647 4960431     230    0.01    0.07    0.31    8.38   27.49   3.000   9.843
0.   -273.   -460.   12.99 2557.09  194557
   POINT SV98_R    457522 4960508     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV97_R    457526 4960519     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV03_R    457514 4960520     230    0.06    0.51    2.22   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.10    0.76    3.34   10.00   32.81   1.070   3.510
294.     21.     70.   16.65 3277.56   31723
   POINT SV27_R    457341 4960476     230    0.02    0.17    0.76   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.01    0.08    0.35   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.02    0.13    0.56   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00   21.64   71.00   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.03    0.24    1.04   12.00   39.37   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.07    0.54    2.36   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0000899  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
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VOLUME	L0001271	457473	4960524	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001272	457473	4960522	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001273	457474	4960521	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001274	457474	4960519	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001275	457474	4960517	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001276	457474	4960516	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001277	457475	4960514	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001278	457475	4960513	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001279	457475	4960511	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001280	457476	4960509	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001281	457476	4960508	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001282	457498	4960528	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001283	457498	4960526	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001284	457498	4960525	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001285	457498	4960523	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001286	457499	4960521	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001287	457499	4960520	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001288	457499	4960518	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001289	457500	4960517	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001290	457500	4960515	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001291	457500	4960513	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001292	457500	4960512	230	0.01	0.09	0.38	23.16	75.98	0.760	13.260
VOLUME	L0001293	457460	4960410	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001294	457460	4960409	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001295	457460	4960407	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001296	457460	4960406	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001297	457461	4960404	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001298	457461	4960403	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001299	457461	4960401	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001300	457461	4960400	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001301	457462	4960398	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001302	457462	4960397	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001303	457462	4960395	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001304	457462	4960394	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001305	457463	4960392	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001306	457463	4960391	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001307	457463	4960389	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001308	457463	4960387	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001309	457464	4960386	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001310	457464	4960384	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001311	457464	4960383	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001312	457464	4960381	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001313	457465	4960380	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001314	457465	4960378	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001315	457465	4960377	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001316	457465	4960375	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001317	457466	4960374	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001318	457466	4960372	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001319	457466	4960371	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001320	457466	4960369	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001321	457467	4960368	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001322	457572	4960429	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001323	457574	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001324	457575	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001325	457577	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001326	457578	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001327	457580	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001328	457581	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001329	457583	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001330	457584	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001331	457586	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001332	457587	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001333	457589	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001334	457591	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001335	457592	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001336	457594	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001337	457595	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001338	457597	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001339	457598	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001340	457600	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001341	457601	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001342	457603	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001343	457604	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001344	457606	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230

VOLUME	L0001345	457607	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001346	457609	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001347	457610	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001348	457612	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001349	457613	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001350	457615	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001351	457616	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001352	457618	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001353	457619	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001354	457621	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001355	457622	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001356	457624	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001357	457625	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001358	457627	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001359	457628	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001360	457630	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
TOTAL					3.96	31.44	137.71				
SUMP=					1.62	12.83	56.19				
SUMV=					2.35	18.61	81.52				

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 *** AERMOD - VERSION 07026 ***    *** NAAQS - Koda Energy/Rahr Malting NAAQS Scenerio B (MAX) 5
Year Run w ***        06/05/07
                                  ***
***        07:23:34
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_11TH\P245YRB.O86
 **This Run Includes:   347 Source(s);      8 Source Group(s); and     494 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    1.44   11.40   49.94   54.86  179.99   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.08    0.67    2.93    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.01    0.09    0.38   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.01    0.10    0.42   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.11    0.86    3.75    7.32   24.02   0.610   2.001
0.   -273.   -460.   32.34 6366.14   20026
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.02    0.07    7.62   25.00   0.250   0.820
0.   -273.   -460.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.01    0.06   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.03    0.14   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.04    0.30    1.32   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.04    0.31    1.36   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.01    0.07    0.31   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.02    0.15    0.66   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.01    0.08    0.35    3.66   12.01   1.040   3.412
294.     21.     70.   13.76 2708.66   24767
   POINT SV99_R    457647 4960431     230    0.01    0.07    0.31    8.38   27.49   3.000   9.843
0.   -273.   -460.   12.99 2557.09  194557
   POINT SV98_R    457522 4960508     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV97_R    457526 4960519     230    0.00    0.02    0.07   11.58   37.99   3.960  12.992
0.   -273.   -460.    9.77 1923.23  254965
   POINT SV03_R    457514 4960520     230    0.06    0.51    2.22   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.10    0.76    3.34   10.00   32.81   1.070   3.510
294.     21.     70.   16.65 3277.56   31723
   POINT SV27_R    457341 4960476     230    0.02    0.17    0.76   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.01    0.08    0.35   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.02    0.13    0.56   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00   21.64   71.00   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.03    0.24    1.04   12.00   39.37   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.07    0.54    2.36   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0000899  457384 4960323     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000900  457392 4960330     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
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  VOLUME L0000901  457399 4960336     230    0.00    0.00    0.00    2.29    7.51   4.610   1.070
  VOLUME L0000902  457419 4960340     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000903  457432 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000904  457446 4960341     230    0.00    0.00    0.00    2.29    7.51   6.130   1.070
  VOLUME L0000905  457452 4960335     230    0.00    0.00    0.00    2.29    7.51   4.910   1.070
  VOLUME L0000906  457257 4960304     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000907  457268 4960315     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000908  457278 4960327     230    0.00    0.00    0.01    2.29    7.51   7.340   1.070
  VOLUME L0000909  457303 4960346     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000910  457303 4960359     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000911  457303 4960373     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000912  457302 4960386     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000913  457302 4960400     230    0.00    0.00    0.00    2.29    7.51   6.280   1.070
  VOLUME L0000914  457313 4960406     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000915  457327 4960409     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000916  457342 4960412     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000917  457356 4960414     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000918  457371 4960417     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000919  457386 4960420     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000920  457400 4960423     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000921  457415 4960426     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000922  457429 4960429     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000923  457444 4960431     230    0.00    0.00    0.00    2.29    7.51   6.900   1.070
  VOLUME L0000924  457456 4960434     230    0.00    0.00    0.00    2.29    7.51   5.570   1.070
  VOLUME L0000925  457467 4960436     230    0.00    0.00    0.00    2.29    7.51   5.570   1.070
  VOLUME L0000926  457479 4960438     230    0.00    0.00    0.00    2.29    7.51   5.570   1.070
  VOLUME L0000927  457494 4960441     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000928  457510 4960443     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000929  457525 4960445     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000930  457541 4960446     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000931  457556 4960448     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
  VOLUME L0000932  457572 4960450     230    0.00    0.00    0.00    2.29    7.51   7.220   1.070
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VOLUME	L0001309	457464	4960386	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001310	457464	4960384	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001311	457464	4960383	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001312	457464	4960381	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001313	457465	4960380	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001314	457465	4960378	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001315	457465	4960377	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001316	457465	4960375	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001317	457466	4960374	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001318	457466	4960372	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001319	457466	4960371	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001320	457466	4960369	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001321	457467	4960368	230	0.02	0.12	0.54	22.86	75.00	0.720	11.020
VOLUME	L0001322	457572	4960429	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001323	457574	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001324	457575	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001325	457577	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001326	457578	4960430	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001327	457580	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001328	457581	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001329	457583	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001330	457584	4960431	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001331	457586	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001332	457587	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001333	457589	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001334	457591	4960432	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001335	457592	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001336	457594	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001337	457595	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001338	457597	4960433	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001339	457598	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001340	457600	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001341	457601	4960434	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001342	457603	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001343	457604	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001344	457606	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230

VOLUME	L0001345	457607	4960435	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001346	457609	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001347	457610	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001348	457612	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001349	457613	4960436	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001350	457615	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001351	457616	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001352	457618	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001353	457619	4960437	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001354	457621	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001355	457622	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001356	457624	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001357	457625	4960438	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001358	457627	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001359	457628	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
VOLUME	L0001360	457630	4960439	230	0.01	0.09	0.40	30.48	100.00	0.720	14.230
TOTAL					4.54	36.00	157.68				
SUMP=					2.19	17.39	76.16				
SUMV=					2.35	18.61	81.52				

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 *** AERMOD - VERSION 07026 ***    *** AERA - Dispersion Factors for Rahr SV10_R and SV03_R
***        06/07/07
                                   ***
***        16:20:13
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_08TH\AERAALL.O86
 **This Run Includes:   171 Source(s);     14 Source Group(s); and    1145 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    1.00    7.94   34.76   67.06  220.01   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    1.00    7.94   34.76    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    1.00    7.94   34.76    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    1.00    7.94   34.76   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    1.00    7.94   34.76   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    1.00    7.94   34.76   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    1.00    7.94   34.76    7.32   24.02   1.070   3.510
-264.   -537.   -934.   10.56 2078.74   20120
   POINT SV008     457413 4960340     230    1.00    7.94   34.76   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    1.00    7.94   34.76    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    1.00    7.94   34.76   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    1.00    7.94   34.76   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.00    0.00   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.00    0.00    0.00   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.00    0.00    0.00   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.00    0.00    0.00   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.00    0.00    0.00   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.00    0.00    0.00    3.70   12.14   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV99_R    457647 4960431     230    0.00    0.00    0.00    8.38   27.49   3.000   9.843
0.   -273.   -460.   13.35 2627.95  199949
   POINT SV98_R    457522 4960508     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV97_R    457526 4960519     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV03_R    457514 4960520     230    1.00    7.94   34.76   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.00    0.00    0.00   10.00   32.81   1.070   3.510
294.     21.     70.    0.00    0.00       0
   POINT SV27_R    457341 4960476     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.00    0.00    0.00   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0001195  457275 4960485     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
  VOLUME L0001196  457276 4960482     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
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VOLUME L0001197	457276	4960478	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001198	457277	4960475	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001199	457277	4960472	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001200	457278	4960468	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001201	457279	4960465	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001202	457279	4960462	230	0.13	0.99	4.34	37.49	123.00	1.560	12.140
VOLUME L0001227	457395	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001228	457396	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001229	457398	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001230	457399	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001231	457401	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001232	457402	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001233	457404	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001234	457405	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001235	457407	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001236	457409	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001237	457410	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001238	457412	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001239	457413	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001240	457415	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001241	457416	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001242	457418	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001243	457419	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001244	457421	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001245	457422	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001246	457424	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001247	457426	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001248	457427	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001249	457429	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001250	457430	4960519	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME L0001251	457451	4960517	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001252	457451	4960515	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001253	457451	4960513	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001254	457452	4960512	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001255	457452	4960510	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001256	457452	4960508	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001257	457453	4960506	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001258	457453	4960504	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001259	457453	4960502	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001260	457453	4960500	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001261	457454	4960498	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001262	457454	4960496	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001263	457454	4960495	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001264	457455	4960493	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001265	457455	4960491	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001266	457455	4960489	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001267	457456	4960487	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001268	457456	4960485	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001269	457456	4960483	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001270	457457	4960481	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME L0001271	457473	4960524	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001272	457473	4960522	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001273	457474	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001274	457474	4960519	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001275	457474	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001276	457474	4960516	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001277	457475	4960514	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001278	457475	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001279	457475	4960511	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001280	457476	4960509	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001281	457476	4960508	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001282	457498	4960528	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001283	457498	4960526	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001284	457498	4960525	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001285	457498	4960523	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001286	457499	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001287	457499	4960520	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001288	457499	4960518	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001289	457500	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001290	457500	4960515	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001291	457500	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001292	457500	4960512	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME L0001293	457460	4960410	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001294	457460	4960409	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001295	457460	4960407	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020

VOLUME	L0001296	457460	4960406	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001297	457461	4960404	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001298	457461	4960403	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001299	457461	4960401	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001300	457461	4960400	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001301	457462	4960398	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001302	457462	4960397	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001303	457462	4960395	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001304	457462	4960394	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001305	457463	4960392	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001306	457463	4960391	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001307	457463	4960389	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001308	457463	4960387	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001309	457464	4960386	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001310	457464	4960384	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001311	457464	4960383	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001312	457464	4960381	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001313	457465	4960380	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001314	457465	4960378	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001315	457465	4960377	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001316	457465	4960375	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001317	457466	4960374	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001318	457466	4960372	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001319	457466	4960371	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001320	457466	4960369	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001321	457467	4960368	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001322	457572	4960429	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001323	457574	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001324	457575	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001325	457577	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001326	457578	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001327	457580	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001328	457581	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001329	457583	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001330	457584	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001331	457586	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001332	457587	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001333	457589	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001334	457591	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001335	457592	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001336	457594	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001337	457595	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001338	457597	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001339	457598	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001340	457600	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001341	457601	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001342	457603	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001343	457604	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001344	457606	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001345	457607	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001346	457609	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001347	457610	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001348	457612	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001349	457613	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001350	457615	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001351	457616	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001352	457618	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001353	457619	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001354	457621	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001355	457622	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001356	457624	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001357	457625	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001358	457627	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001359	457628	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001360	457630	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
TOTAL					13.00	103.17	451.88				
SUMP=					12.00	95.24	417.12				
SUMV=					1.00	7.94	34.76				

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 *** AERMOD - VERSION 07026 ***    *** AERA - Dispersion Factors for Farmer Risk
***        06/08/07
                                  ***
***        10:19:41
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_08TH\AERAFRM.O86
 **This Run Includes:   171 Source(s);      4 Source Group(s); and    1632 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    1.00    7.94   34.76   67.06  220.01   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.    0.00    0.00       0
   POINT SV006     457381 4960335     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.    0.00    0.00       0
   POINT SV007     457388 4960350     230    0.00    0.00    0.00   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.00    0.00    0.00    7.32   24.02   1.070   3.510
-264.   -537.   -934.    0.00    0.00       0
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.00    0.00    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.00    0.00   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.00    0.00    0.00   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.00    0.00    0.00   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.00    0.00    0.00   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.00    0.00    0.00   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.00    0.00    0.00    3.70   12.14   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV99_R    457647 4960431     230    0.00    0.00    0.00    8.38   27.49   3.000   9.843
0.   -273.   -460.   13.35 2627.95  199949
   POINT SV98_R    457522 4960508     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV97_R    457526 4960519     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV03_R    457514 4960520     230    1.00    7.94   34.76   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.00    0.00    0.00   10.00   32.81   1.070   3.510
294.     21.     70.    0.00    0.00       0
   POINT SV27_R    457341 4960476     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.00    0.00    0.00   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0001195  457275 4960485     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
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  VOLUME L0001196  457276 4960482     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001197  457276 4960478     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001198  457277 4960475     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001199  457277 4960472     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001200  457278 4960468     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001201  457279 4960465     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001202  457279 4960462     230    0.13    0.99    4.34   37.49  123.00   1.560  12.140
*SEASON*
  VOLUME L0001227  457395 4960513     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001228  457396 4960513     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001229  457398 4960513     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001230  457399 4960514     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001231  457401 4960514     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001232  457402 4960514     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001233  457404 4960514     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001234  457405 4960515     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001235  457407 4960515     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001236  457409 4960515     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001237  457410 4960515     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001238  457412 4960516     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001239  457413 4960516     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001240  457415 4960516     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001241  457416 4960516     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001242  457418 4960517     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001243  457419 4960517     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001244  457421 4960517     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001245  457422 4960517     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001246  457424 4960518     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001247  457426 4960518     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001248  457427 4960518     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001249  457429 4960518     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001250  457430 4960519     230    0.00    0.00    0.00   38.40  125.98   0.730  17.160
  VOLUME L0001251  457451 4960517     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001252  457451 4960515     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001253  457451 4960513     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001254  457452 4960512     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001255  457452 4960510     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001256  457452 4960508     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001257  457453 4960506     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001258  457453 4960504     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001259  457453 4960502     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001260  457453 4960500     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001261  457454 4960498     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001262  457454 4960496     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001263  457454 4960495     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001264  457455 4960493     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001265  457455 4960491     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001266  457455 4960489     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001267  457456 4960487     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001268  457456 4960485     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001269  457456 4960483     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001270  457457 4960481     230    0.00    0.00    0.00   24.99   81.99   0.890   9.400
  VOLUME L0001271  457473 4960524     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001272  457473 4960522     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001273  457474 4960521     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001274  457474 4960519     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001275  457474 4960517     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001276  457474 4960516     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001277  457475 4960514     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001278  457475 4960513     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001279  457475 4960511     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001280  457476 4960509     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001281  457476 4960508     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001282  457498 4960528     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001283  457498 4960526     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001284  457498 4960525     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001285  457498 4960523     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001286  457499 4960521     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
  VOLUME L0001287  457499 4960520     230    0.00    0.00    0.00   23.16   75.98   0.760  13.260
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VOLUME	L0001288	457499	4960518	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001289	457500	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001290	457500	4960515	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001291	457500	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001292	457500	4960512	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001293	457460	4960410	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001294	457460	4960409	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001295	457460	4960407	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001296	457460	4960406	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001297	457461	4960404	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001298	457461	4960403	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001299	457461	4960401	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001300	457461	4960400	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001301	457462	4960398	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001302	457462	4960397	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001303	457462	4960395	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001304	457462	4960394	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001305	457463	4960392	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001306	457463	4960391	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001307	457463	4960389	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001308	457463	4960387	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001309	457464	4960386	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001310	457464	4960384	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001311	457464	4960383	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001312	457464	4960381	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001313	457465	4960380	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001314	457465	4960378	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001315	457465	4960377	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001316	457465	4960375	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001317	457466	4960374	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001318	457466	4960372	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001319	457466	4960371	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001320	457466	4960369	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001321	457467	4960368	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001322	457572	4960429	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001323	457574	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001324	457575	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001325	457577	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001326	457578	4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001327	457580	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001328	457581	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001329	457583	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001330	457584	4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001331	457586	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001332	457587	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001333	457589	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001334	457591	4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001335	457592	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001336	457594	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001337	457595	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001338	457597	4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001339	457598	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001340	457600	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001341	457601	4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001342	457603	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001343	457604	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001344	457606	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001345	457607	4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001346	457609	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001347	457610	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001348	457612	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001349	457613	4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001350	457615	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001351	457616	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001352	457618	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001353	457619	4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001354	457621	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001355	457622	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001356	457624	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001357	457625	4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001358	457627	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001359	457628	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME	L0001360	457630	4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
TOTAL					3.00	23.81	104.28				
SUMP=					2.00	15.87	69.52				

SUMV= 1.00 7.94 34.76

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 *** AERMOD - VERSION 07026 ***    *** Refined Risk Model Acute 1-hr Inhalation (AI1KODA)
***        06/07/07
                                  ***
***        13:44:29
 U:\PROJECTS\DBECKER\PROJECTS\KE_JUN07\JUN_08TH\AI1KODA.O86
 **This Run Includes:   171 Source(s);      4 Source Group(s); and    1145 Receptor(s)
     AREA SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) XDIM(M) YDIM(M)
   VOLUME SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  SYI(M)  SZI(M)
 AREACIRC SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) RADIUS  #VERTS.
 AREAPOLY SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT) #VERTS.  SZI(M)
    POINT SRCIDNT EASTINGNORTHING ELEV(M)   G/SEC  #/HOUR  T/YEAR  HGT(M) HGT(FT)  DIA(M) DIA(FT)
DEG(K)  DEG(C)  DEG(F) VS(M/S) VS(F/M)    ACFM
  ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
------- ------- ------- ------- ------- -------
   POINT SV009     457444 4960359     230    0.04    0.31    1.36   67.06  220.01   1.980   6.496
450.    177.    350.   19.60 3858.27  127874
   POINT SV005     457376 4960369     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV006     457381 4960335     230    0.00    0.00    0.00    7.93   26.02   0.840   2.756
-264.   -537.   -934.   13.21 2600.39   15512
   POINT SV007     457388 4960350     230    0.00    0.00    0.00   19.51   64.01   0.180   0.591
-264.   -537.   -934.    0.00    0.00       0
   POINT SV010     457401 4960388     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV011     457390 4960386     230    0.00    0.00    0.00   16.76   54.99   6.710  22.014
0.   -273.   -460.    9.68 1905.51  725298
   POINT SV001     457294 4960334     230    0.00    0.00    0.00    7.32   24.02   1.070   3.510
-264.   -537.   -934.   10.56 2078.74   20120
   POINT SV008     457413 4960340     230    0.00    0.00    0.00   20.12   66.01   0.200   0.656
-269.   -542.   -944.    0.00    0.00       0
   POINT SV002     457292 4960334     230    0.00    0.00    0.00    7.62   25.00   0.250   0.820
-264.   -537.   -934.    0.00    0.00       0
   POINT SV003     457321 4960335     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV004     457322 4960326     230    0.00    0.00    0.00   26.82   87.99   0.720   2.362
0.   -273.   -460.    0.00    0.00       0
   POINT SV01_R    457527 4960514     230    0.00    0.00    0.00   10.06   33.01   0.000   0.000
0.   -273.   -460.    0.00    0.00       0
   POINT SV02_R    457526 4960521     230    0.00    0.00    0.00   11.58   37.99   0.310   1.017
444.    171.    340.    0.00    0.00       0
   POINT SV11_R    457455 4960475     230    0.00    0.00    0.00   19.20   62.99   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV13_R    457468 4960477     230    0.00    0.00    0.00   17.70   58.07   1.220   4.003
294.     21.     70.    0.00    0.00       0
   POINT SV12_R    457427 4960470     230    0.00    0.00    0.00   24.10   79.07   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV29_R    457369 4960459     230    0.00    0.00    0.00   31.40  103.02   0.200   0.656
294.     21.     70.    0.00    0.00       0
   POINT SV28_R    457318 4960481     230    0.00    0.00    0.00    3.70   12.14   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV99_R    457647 4960431     230    0.00    0.00    0.00    8.38   27.49   3.000   9.843
0.   -273.   -460.   13.35 2627.95  199949
   POINT SV98_R    457522 4960508     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV97_R    457526 4960519     230    0.00    0.00    0.00   11.58   37.99   3.960  12.992
0.   -273.   -460.    7.66 1507.87  199901
   POINT SV03_R    457514 4960520     230    0.00    0.01    0.06   23.47   77.00   4.310  14.140
322.     49.    120.   19.26 3791.34  595397
   POINT SV14_R    457338 4960490     230    0.00    0.00    0.00   10.00   32.81   1.070   3.510
294.     21.     70.    0.00    0.00       0
   POINT SV27_R    457341 4960476     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV26_R    457340 4960481     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV25_R    457339 4960485     230    0.00    0.00    0.00   10.00   32.81   1.040   3.412
294.     21.     70.    0.00    0.00       0
   POINT SV21_R    457509 4960436     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV17_R    457510 4960431     230    0.00    0.00    0.00    4.11   13.48   0.720   2.362
294.     21.     70.    0.00    0.00       0
   POINT SV18_R    457204 4960385     230    0.00    0.00    0.00   15.24   50.00   0.200   0.656
771.    498.    928.   69.7013720.47    4640
  VOLUME L0001195  457275 4960485     230    0.00    0.00    0.01   37.49  123.00   1.560  12.140
  VOLUME L0001196  457276 4960482     230    0.00    0.00    0.01   37.49  123.00   1.560  12.140
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VOLUME	L0001197	457276	4960478	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001198	457277	4960475	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001199	457277	4960472	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001200	457278	4960468	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001201	457279	4960465	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001202	457279	4960462	230	0.00	0.00	0.01	37.49	123.00	1.560	12.140
VOLUME	L0001227	457395	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001228	457396	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001229	457398	4960513	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001230	457399	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001231	457401	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001232	457402	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001233	457404	4960514	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001234	457405	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001235	457407	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001236	457409	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001237	457410	4960515	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001238	457412	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001239	457413	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001240	457415	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001241	457416	4960516	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001242	457418	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001243	457419	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001244	457421	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001245	457422	4960517	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001246	457424	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001247	457426	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001248	457427	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001249	457429	4960518	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001250	457430	4960519	230	0.00	0.00	0.00	38.40	125.98	0.730	17.160
VOLUME	L0001251	457451	4960517	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001252	457451	4960515	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001253	457451	4960513	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001254	457452	4960512	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001255	457452	4960510	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001256	457452	4960508	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001257	457453	4960506	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001258	457453	4960504	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001259	457453	4960502	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001260	457453	4960500	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001261	457454	4960498	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001262	457454	4960496	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001263	457454	4960495	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001264	457455	4960493	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001265	457455	4960491	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001266	457455	4960489	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001267	457456	4960487	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001268	457456	4960485	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001269	457456	4960483	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001270	457457	4960481	230	0.00	0.00	0.00	24.99	81.99	0.890	9.400
VOLUME	L0001271	457473	4960524	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001272	457473	4960522	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001273	457474	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001274	457474	4960519	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001275	457474	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001276	457474	4960516	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001277	457475	4960514	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001278	457475	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001279	457475	4960511	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001280	457476	4960509	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001281	457476	4960508	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001282	457498	4960528	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001283	457498	4960526	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001284	457498	4960525	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001285	457498	4960523	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001286	457499	4960521	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001287	457499	4960520	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001288	457499	4960518	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001289	457500	4960517	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001290	457500	4960515	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001291	457500	4960513	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001292	457500	4960512	230	0.00	0.00	0.00	23.16	75.98	0.760	13.260
VOLUME	L0001293	457460	4960410	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001294	457460	4960409	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME	L0001295	457460	4960407	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020

VOLUME L0001296	457460 4960406	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001297	457461 4960404	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001298	457461 4960403	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001299	457461 4960401	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001300	457461 4960400	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001301	457462 4960398	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001302	457462 4960397	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001303	457462 4960395	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001304	457462 4960394	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001305	457463 4960392	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001306	457463 4960391	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001307	457463 4960389	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001308	457463 4960387	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001309	457464 4960386	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001310	457464 4960384	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001311	457464 4960383	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001312	457464 4960381	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001313	457465 4960380	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001314	457465 4960378	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001315	457465 4960377	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001316	457465 4960375	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001317	457466 4960374	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001318	457466 4960372	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001319	457466 4960371	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001320	457466 4960369	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001321	457467 4960368	230	0.00	0.00	0.00	22.86	75.00	0.720	11.020
VOLUME L0001322	457572 4960429	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001323	457574 4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001324	457575 4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001325	457577 4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001326	457578 4960430	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001327	457580 4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001328	457581 4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001329	457583 4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001330	457584 4960431	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001331	457586 4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001332	457587 4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001333	457589 4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001334	457591 4960432	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001335	457592 4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001336	457594 4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001337	457595 4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001338	457597 4960433	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001339	457598 4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001340	457600 4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001341	457601 4960434	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001342	457603 4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001343	457604 4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001344	457606 4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001345	457607 4960435	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001346	457609 4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001347	457610 4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001348	457612 4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001349	457613 4960436	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001350	457615 4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001351	457616 4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001352	457618 4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001353	457619 4960437	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001354	457621 4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001355	457622 4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001356	457624 4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001357	457625 4960438	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001358	457627 4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001359	457628 4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
VOLUME L0001360	457630 4960439	230	0.00	0.00	0.00	30.48	100.00	0.720	14.230
TOTAL			0.04	0.35	1.53				
SUMP=			0.04	0.33	1.43				
SUMV=			0.00	0.02	0.10				

TECHNICAL SUPPORT DOCUMENT
For
AIR EMISSION PERMIT NO. 13900114-001

This Technical Support Document (TSD) is intended for all parties interested in the permit and to meet the requirements that have been set forth by the federal and state regulations (40 CFR § 70.7(a)(5) and Minn. R. 7007.0850, subp. 1). The purpose of this document is to provide the legal and factual justification for each applicable requirement or policy decision considered in the determination to issue the permit.

1. General Information

1.1. Applicant and Stationary Source Location:

Owner/Operator Address and Phone Number	Facility Address (SIC Code: 4911)
Koda Energy, LLC 800 West First Avenue Shakopee, MN 55379 Contact: Mr. Paul Kramer, President Phone: 952-496-7002	Same

1.2. Description Of The Facility

Koda Energy is a limited liability corporation (LLC) co-owned by the Rahr Malting Company and the Shakopee Mdewakanton Sioux Community. Koda Energy will build a 308.18 MMbtu/hr combined heat and power biomass boiler to produce an average of 120,000 lbs/hour of steam for process heat at Rahr Malting and 17.8 MW of electricity. This is combination of steam and electricity represents the total energy output. For example, the facility could produce more than 120,000 lbs/hr of steam, but than would concurrently produce less than 17.8 MW of electricity. Or the facility could produce more electricity, if it produced less steam.

The boiler will control NO_x with a low NO_x burner, Separated Over-Fire Air (SOFA), and a Selective Non-Catalytic Reduction System (SNCR). Particulate Matter Emissions will be controlled by a cyclone and electrostatic precipitator. Good combustion practices will control Carbon Monoxide (CO). Koda Energy will lease land for the project from the Rahr Malting Company.

Potential emissions of carbon monoxide and nitrogen oxides will exceed 250 tons per year so the proposed project is a major source under EPA New Source Review Rules. Because the potential emissions of CO and NOx exceed 100 tons per year, the project required an Environmental Assessment Worksheet (EAW) and an Air Emissions Risk Analysis (AERA).

Emissions will result from fuel handling and processing, fuel combustion, ash handling and disposal, and truck traffic.

1.3 Description of the Activities Allowed By This Permit Action

This permit authorizes construction of the biomass boiler, and fuel and ash handling equipment.

1.4. Faciltity Emissions:

Koda Emissions from All Sources

Activity	PM	PM_{10}	NO_X	CO	SO_X	VOC	Single HAP	Total HAP
SV001 Truck Unloading	4.2071	3.856						
SV002 Blow Lines	0.0657	0.0657						
SV003 and 4, Fuel Transport	0.1126	0.1126						
SV005 and 6 Biomass Transport	5.8567	5.8567						
SV007 Ground Fuel Transport	0.3575	0.3575						
Boiler SV009	40.49	40.49	337	580	37.78	22.4	25.6	46.34
Ash Handling SV008	0.0025	0.0025						
Traffic	0.6103	0.1189						
Total	51.70	50.85	337	580	37.78	22.4	25.6	46.34

Facility Classification

Classification	Major/Affected Source	Synthetic Minor	Minor
PSD	X		
Part 70 Permit Program	X		
Part 63 NESHAP		X	

2. Regulatory and/or Statutory Basis

New Source Review

The proposed facility is a major source under new source review. The addition of the biomass fired boiler exceeds significant emission increase levels for PM_{10}, NO_x, and CO. Accordingly, the facility was required to complete a Best Available Control Technology Analysis, and an Ambient Impacts Analysis for those pollutants. Those analyses are attached and are summarized below in Section 3.

Part 70 Permit Program

The facility is a major source under the Part 70 permit program.

New Source Performance Standards (NSPS)

The biomass fired boiler is subject to 40 CFR pt. 60, subp. Db. Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

National Emission Standards for Hazardous Air Pollutants (NESHAP)

Koda Energy has accepted limits in its permits for hazardous air pollutants that render the source a synthetic minor one under 40 CFR Part 63. Therefore, the facility is not a major source of hazardous air pollutants and no NESHAP standards apply.

Clean Air Interstate Rule (CAIR)

On March 10, 2005, the EPA adopted a new rule to address the interstate transport of air pollutants known as the Clean Air Interstate Rule (CAIR). CAIR is a cap and trade program that will permanently cap emissions of SO_2 and NO_X in the eastern United States and achieves large reductions of SO_2 and/or NO_X emissions across 28 eastern states and the District of Columbia. In Minnesota, CAIR applies for fine particulate matter only, and not for ozone. As defined at 40 CFR § 51.123(cc),

> *Electric generating unit* or *EGU* means:
>
> (1) … a stationary, fossil fuel-fired boiler or stationary, fossil fuel-fired combustion turbine serving at any time, since the start-up of the unit's combustion chamber, a generator with nameplate capacity of more than 25 MWe producing electricity for sale.

Affected sources are all fossil fuel-fired electric generating units with a nameplate capacity of greater than 25 MW. The Koda nameplate capacity is less than 25 MW.

Minnesota State Rules

- Minn. R. 7011.0715 Standards of Performance for Post-1969 Industrial Process Equipment
- Minn. Rule 7011.0150 – Prevention of Airborne PM
- Minn. Rule 7011.1005 – Standards of Performance for Dry Bulk Agricultural Commodity Facilities

Compliance Assurance Monitoring, (CAM) 40 CFR Part 64

The new boiler is subject to requirements set forth in 40 CFR pt. 64 for particulate matter and PM_{10}. Koda Energy has proposed to satisfy CAM requirements by incorporating the opacity standard set by the applicable New Source Performance Standard (40 CFR Part 60, subp. Db), and proposing to include as a permit condition the operation of the electrostatic precipitator consistent with performance testing results. This is similar to the compliance demonstration proposed in the applicable NESHAP standard, 40 CFR pt. 63, subp. DDDDD. Since the CAM regulations specifically exempt emission units from CAM if they are subject to a standard promulgated after November 5, 1990, (40 CFR § 64.2(b)(i)) staff determined that using a compliance demonstration method similar to subp. DDDDD (promulgated in 2004), would satisfy the CAM criteria.

The facility also has potential emissions for NOx and CO that exceed major source levels, and so the boiler is potentially subject to CAM requirements for those pollutants. However, 40 CFR § 64.2 Applicability, exempts sources with continuous emission monitors. That section specifically exempts as follows:

"(vi) Emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method, as defined in §64.1. The exemption provided in this paragraph (b)(1)(vi) shall not apply if the applicable compliance method includes an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device (such as a surface coating line controlled by an incinerator for which continuous compliance is determined by calculating emissions on the basis of coating records and an assumed control device efficiency factor based on an initial performance test; in this example, this part would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage)."

The Koda CAM plan is attached.

Environmental Review

Minnesota Rules require the completion of an environmental assessment worksheet (EAW) if potential emissions increase by more than 250 tons per year for criteria pollutants. There are potential emission increases greater than 250 tons per year for nitrogen oxides and carbon monoxide, thus the facility was required to complete an EAW. That EAW was publicly noticed on July 2, 2007.

Regulatory Overview of the Modification

EU, GP, or SV	Applicable Regulations	Comments:
EU056 Boiler	Title I Condition, 40 CFR § 52.21 BACT limits 40 CFR Part 60, Subp. Db to avoid 40 CFR Part 63 40 CFR Part 64	The boiler is subject to BACT limits for PM, PM_{10}, Nitrogen Oxides and Carbon Monoxide. It is subject to, an opacity limit, and a PM limit set under 40 CFR Part 60, Subp. Db. It is not subject to a NOx limit under Subp. Db because natural gas limited to less than 10% of the annual capacity heat input is specifically exempted from the NOx limits. The permit contains such a limit. There are also limits set for hazardous air pollutants that render the source a synthetic minor one under 40 CFR Part 63 and that limit sulfur dioxide limits to less than significant emission increase levels under 40 CFR § 52.21. 40 CFR Part 64 requires a CAM plan for PM and PM_{10}.
EU001-055, Fuel handling and processing equipment	Minn. R. 7011.0715 Title I Condition, 40 CFR § 52.21, BACT limits, Minn. R. 7011.1005	Minnesota Rules for Industrial Process Equipment sets particulate matter emission limits. The BACT limits set for this equipment are less than that allowed under Minn. R. 7011.0715. Minn. R. 7011.1005 sets opacity and control requirements for many of the emission units.
EU057-EU065, Ash handling equipment	Minn. R. 7011.0715 Title I Condition, 40 CFR § 52.21, BACT limits	The BACT limits set for this equipment are less than that allowed under Minn. R. 7011.0715.
FS001, Traffic emissions	Minn. R. 7011.0150, 40 CFR § 52.21, BACT limits	Roads are required to be paved and swept twice weekly

3. Technical Information

3.1 Federal Prevention of Significant Deterioration Summary BACT Analyses:

Summary:

Emission Unit	Pollutant	Emission Limit	Control Technology
EU056 Boiler burning biomass	PM	0.030 lb/mmBtu	Cyclone and ESP
	PM_{10}	0.037 lb/mmBtu	Cyclone and ESP
	NO_x	0.25 lb/mmBtu on a 30-day rolling average	Selective Non-Catalytic Reduction, low NOx burners and Over fire air
	CO	0.43 lb/mmBtu on a 30-day rolling average	Good Combustion Practices
EU056 Boiler burning natural gas	PM	0.010 lb/mmBtu	Good Combustion Practices
	PM10	0.010 lb/mmBtu	Good Combustion Practices
	NOx	0.18 lb/mmBtu on a 30-day rolling average	Selective Non-Catalytic Reduction, low NOx burners and Over fire air
	CO	0.43 lb/mmBtu on a 30-day rolling average	Good Combustion Practices
EU001-055, Fuel handling and processing equipment	PM and PM_{10}	0.005 gr/dscf	Fabric Filter
EU057-EU065, Ash handling equipment	PM and PM_{10}	0.002 gr/dscf	Fabric Filter
FS002, Road traffic	PM and PM_{10}	None	Paved roads and twice weekly sweeping

For all sources except for CO emissions when the boiler is burning natural gas, the top technically feasible option was chosen, and no financial analysis was necessary. For the CO oxidation catalyst to be used when burning natural gas, controls were deemed unreasonably expensive. Due to catalyst poisoning concerns, the biomass can't go through the catalyst. Hence, the facility would need to install a separate exhaust system and new stack to accommodate the biomass.

3.2 Air Quality Analysis

Koda Energy will be considered a major source.

The proposed boiler will be constructed in an area that is attaining the National Ambient Air Quality Standards (NAAQS), or is not designated. This means that federal New Source Review (NSR) Prevention of Significant Deterioration (PSD) rules must be evaluated for applicability. PSD is the permitting process by which U.S. Environmental Protection Agency (EPA), through MPCA, ensures that areas with good air quality are not degraded due to new development. Based upon total project potential emissions, PSD review is required for PM, Particulate Matter smaller than 10 microns (PM_{10}), NO_x and CO. PSD permitting requires demonstration of compliance with national ambient air quality standards based on refined air dispersion modeling, compliance with increment consumption, an analysis of additional impacts such as growth, and a Class I area impact analysis. Class I areas are areas of special national or regional natural, scenic, recreational, or historic value for which the PSD regulations are intended to provide special protection. The Federal Land Managers generally require that all PSD projects located within 200 km of PSD Class I areas be evaluated for their potential to impact the existing air quality and Air Quality Related Values at those areas. The nearest PSD Class I area to the Koda Energy facility, the Rainbow Lake National Wilderness Area in Wisconsin is approximately 250 km from the proposed project. Since the project is more than 200 km from the PSD Class I area, an assessment of the proposed project's emission upon that area was not performed. The FLM were contacted about this project.

The Koda Energy Project will exceed the Significant Emission Rate (SER) for NOx, PM10, and CO. A Significant Impact Analysis (SIA) was performed for each pollutant that exceeded the SER.

The impacts from all facilities have been evaluated for their cumulative impacts by means of the prescribed EPA model, and the total impact is compared to PSD increment and NAAQS standards. Below is a summary of the NAAQS compliance analysis and PSD increment consumption. The predicted impacts are all below the NAAQS standards and PSD increment standards.

Koda Energy Project NAAQS Compliance Summary

Pollutant	NAAQS ug/m^3	Koda Energy and All Known Contributors ug/m^3
PM_{10} - annual	50	43.3
PM_{10} – 24 hour	150	142
NOx – annual	100	82.8
CO 8-hour	10,000	4060
CO 1-hour	40,000	4756

Koda Energy Project PSD Increment Consumption

Pollutant	Class II PSD Increment Standard ug/m^3	Koda Energy and All Known Contributors ug/m^3
PM_{10} - annual	17	4.5
PM_{10} – 24 hour	30	27.3
NOx – annual	25	5.9

Air Impact Summary

The analysis competed as part of this assessment indicates that the proposed Koda Energy Project will not adversely affect the ambient air quality in the area.

3.3 Additional Impact Analysis

Impacts Due to Associated Direct Growth

The proposed project is not expected to significantly impact industrial, commercial, and residential growth in the area. Koda Energy will purchase biomass fuel from various sources within an approximately 50 mile radius. Fuel sources will include industrial byproducts from existing sources, agricultural byproducts, and potentially, agricultural energy crops; therefore, minimal industrial growth is expected. The will directly and indirectly create up to 20 full time jobs in the Shakopee area. Construction of the proposed project will require a work force of up to a hundred people onsite over the duration of the construction period. Construction jobs are anticipated to be filled by workers commuting to the site from the Twin Cities metropolitan area. The project will not have a significant effect on residential growth. No commercial growth is expected from this project.

Impacts to Soils, Vegetation, and Wildlife in the Project Site Vicinity

The city of Shakopee lies to the south and east of Koda Energy, therefore little exposure to soil and wildlife could occur in those directions due to the urban nature of the area. The Minnesota River and farmland lie to the north. The impacts due to the Koda Energy project within the significant impact area are below PSD Class II increment levels and the NAAQS. The Significant Impact Radius for all pollutants except NOx is less than 350 m from the Koda Energy's main stack (SV009). Because the area for those pollutants is small and lies within a city, impacts to soils, vegetation, and wildlife is negligible. The significant impacts due to NOx extend 1,600 meters from SV009. The maximum impact due to Koda Energy considering all of the receptors studied in the analysis is approximately 6 μg/m3. At this level, no adverse impacts are expected. Adverse impacts to soils, vegetation or wildlife are not expected due to the Koda Energy Project.

Impacts to Visibility in the Project Site Vicinity

The project is located approximately 250 km from the nearest Class I area (Rainbow Lakes National Wilderness Area). A visibility analysis using VISCREEN was carried out on this area. The results indicate that the visibility impacts due to Koda Energy are below required thresholds. An additional visibility analysis was conducted for the nearby Minnesota River Valley (MRV), which is not a class I area. There were no exceedances of Class I visual impact thresholds for the SKY during the daytime hours.

3.4 Air Emissions Risk Analysis (AERA) Analysis

MPCA policy requires an AERA for facilities with emissions increases greater than 100 tons per year. . After calculating the potential human health risks, the MPCA Risk Managers review the AERA and decide the project's feasibility. This section discusses the AERA results.

The AERA results predict that all health risks are below applicable thresholds except for the farmer cancer risk. Tables 2 and 3 show the total risk compared to the accepted health index (in **bold**) for each type of receptor.

Acute Risks

Table I summarizes the results from the 1-hr ACUTE risk from inhalation using MPCA's Equivalent Risk Emission Rate (ERER) approach: The intent is that the risk value be less than one.

Table I: Stack Height and Acute Risk Modeling

Stack Height	Combined Concentration risk value	Primary Contributing Source Group	Source Group Concentration risk value	Year
195	0.403	Koda Boiler Stack	0.401	1989
220	0.317	Rahr Kiln 7	0.317	1986
250	0.317	Rahr Kiln 7	0.317	1986

The output from the refined risk models produces a hazard quotient representing the estimated risk from all of the emitted chemicals for that averaging time. Koda Energy evaluated risks at three stack heights: 195 ft, 220 ft, and 250 ft. The analysis also included Rahr Malting sources Kiln 1&2 glycol Heaters and Kiln 7 heaters. The results from the Koda stack at 195 feet show that the total ACUTE risk is 0.40 and is being dominated in most part by the Koda Energy boiler stack. Results from the Koda stack at 220 feet show that the total ACUTE risk is 0.32; however, it is being dominated by Rahr Malting's Kiln 7 heaters. The runs with Koda's boiler stack at 250 feet yield the same ACUTE risk (0.32), which demonstrates that raising the stack above 220 feet will not significanlty impact ACUTE risk. . Based on this analysis, the permit requires a boiler stack height of 220 feet above grade.

The RASS overestimates the long term risks from Koda Energy for the following reasons:

1. HAPs were modeled at 45.23 tons per year.
2. Koda has proposed a HAP limit of 10 tpy on any individual HAP and 25 tpy of all haps.
3. Emissions estimates used conservative emission factors that include tests from old, less efficient, poorly controlled facilities and facilities burning contaminated fuels.
4. Emissions estimates assume Koda will operate at 100% capacity while utility boilers typically have a capacity factor of 80% or less.
5. Risks assume that Koda and Rahr will operate together at maximum capacity 25% of the time while this will actually occur much less frequently.
6. Subsistence farmer risks do not account for county and city comprehensive plans for the area.

The impacts on modeling HAPs at 45.23 tons per year instead of 25 tons per year, assuming a 100% capacity factor and assuming maximum operating capacity from Koda Energy and Rahr combustion sources will overestimate long term chronic and cancer risks from the Koda Energy boiler.

Koda Energy's permit application includes an extensive review of the emission factors used to predict emissions from wood-fired boilers and their appropriateness for predicting emisisons from biomass-fired boilers that burn agricultural byproducts. The review of EPA AP-42 emission factors found several boilers skewing the emission factors and identified boiler age, effiency, pollution control and contaminated fuels as causes for high test results. These high test results were especially important factors in the emisison factors for dioxins and furans and for polycyclic aromatic hydrocarbons (PAH). These chemicals of concern are produced by combustion sources such as boilers and produced high results in the Koda Energy RASS. The farmer risks accentuate the emission factors errors discussed in Koda Energy's permit application.

The farmer risks include inhalation risks and multimedia factors that multiply inhalation risks to estimate the risks to farmers from consuming home-grown vegetables, meat and dairy products. The primary chemicals of potential interests producing most of Koda Energy's long term subsistence farmer risks are dioxins and furans. The Minnesota Department of Health has indicated that ingestion rather than inhalation is the primary exposure route for dioxins and furans. Using multipliers for these chemicals of potential interest to calculate risks from consuming home-grown foods elevates the risk from nearby combustion sources. Fields within two kilometers of Koda Energy showing potential impacts currently do not grow home-grown food crops. Future development plans do not show the area as agricultural. The Carver County 2020 Plan identifies the area that is currently agricultural as park/open space. Areas beyond the 2 kilometer range currently identified as agricultural are identified as park/open space, industrial office, and single family residential. In the 2020 Scott County Comprehensive Plan, the nearest areas designated as agricultural are 6 miles or more from Koda Energy. The Scott County 2020 Comprehensive Plan identifies areas currently agricultural as commercial industrial, growth areas, urban expansion areas, and public lands. In the 2020 Scott County Comprehensive Plan, the closest areas designated as agricultural are over 5 miles from Koda Energy.

220 ft STACK - RESIDENTIAL RECEPTOR											
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks			
Acute	Subchronic Noncancer	Chronic Noncancer	Cancer	Farmer Noncancer	Farmer Cancer	Resident Noncancer	Resident Cancer	Farmer Noncancer	Farmer Cancer	Resident Noncancer	Resident Cancer
7.80E-01	5.60E-02	2.50E-01	3.00E-06	3.20E-05	8.60E-05	1.50E-06	6.70E-07	2.50E-01	8.90E-05	2.50E-01	3.60E-06
1.00E+00	1.00E+00	1.00E+00	1.00E-05	1.00E+00	1.00E-05	1.00E+00	1.00E-05	1.00E+00	1.00E-05	1.00E+00	1.00E-05
OK	OK	OK	OK	OK	REFINE	OK	OK	OK	REFINE	OK	OK
87%	35%	27%	38%	27%	34%	26%	37%	27%	34%	27%	38%
78%	6%	25%	30%	0%	860%	0%	7%	25%	890%	25%	36%

% of risk @ 180 ft
% of benchmark

220 ft STACK - FARMER											
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks				Total Multipathway Screening Hazard Indices and Cancer Risks			
Acute	Subchronic Noncancer	Chronic Noncancer	Cancer	Farmer Noncancer	Farmer Cancer	Resident Noncancer	Resident Cancer	Farmer Noncancer	Farmer Cancer	Resident Noncancer	Resident Cancer
5.9E-01	1.8E-02	7.2E-02	5.4E-07	9.4E-06	1.8E-05	4.6E-07	1.2E-07	7.2E-02	1.9E-05	7.2E-02	6.6E-07
1.0E+00	1.0E+00	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05	1.0E+00	1.0E-05
OK	OK	OK	OK	OK	REFINE	OK	OK	OK	REFINE	OK	OK
65%	11%	77%	77%	77%	77%	77%	77%	77%	77%	77%	77%
59%	2%	7%	5%	0%	182%	0%	1%	7%	187%	7%	7%

% of risk @ 180 ft
% of benchmark

The Farmer modeling was performed for only the nearby area where crops could be grown. In this area, the impacts are lower than other areas considered.

Mercury Emissions

The mercury risk assessment was performed using guidance from the Minnesota Pollution Control Agency (MPCA) entitled MPCA Mercury Risk Estimation Method (MMREM) dated December2006. Presented in this analysis are two operating scenarios. The first total mercury emission rate was determined from a 95% upper confidence level statistic test performed on a set of mercury emissions tests from boilers employing electrostatic precipitator (ESP) control technology (See Table1). The second operating scenario is identical except that the mercury emission rate of 3.00E-6 lb/MMbtu used is from the Industrial Boiler Maximum Achievable Control Technology regulations (40 CFR 63.7500, Table 1) for new, large solid fuel boilers. The boiler is assumed to operate at an annual capacity factor of 100% with no additional control efficiency from the ESP. In reality, the ESP will remove a portion of the mercury generated from the combustion of the fuel; however since the mercury emission factors are derived from post ESP data, no further reduction is assumed for this analysis. This equates to a maximum of 1.79 lb/year of total mercury emitted as air emissions from Koda for scenario 1 and 8.10 lb/yr of total mercury emitted for scenario 2. The emission rates of the particular species of mercury are based on MMREM guidance. The Rahr Malting sources operate at the same rate in both scenarios.

This analysis takes into account mercury deposition directly into Lake Riley as well as deposition onto the watershed as per MMREM guidance. The watershed chosen for analysis is the Riley Creek Watershed (RCWS) (see Figure 1). The location and area of the RCWS was obtained from GIS data downloaded from the Minnesota DNR Data Deli (http://deli.dnr.state.mn.us). Only the portion of the watershed that is expected to drain into Lake Riley is considered. Other water bodies exist that are closer than Lake Riley; however, one is the Minnesota River, which can’t accumulate toxins due to a constant flow of water, and the other water bodies are Type 4 and Type 5 wetlands along the Minnesota River that cannot sustain fish populations. The closest lake to Koda that can sustain a fish.population is Lake Riley

The results show that the Hazard Quotients (HQs) due to Koda as calculated by the MMREM are well below the ambient HQs. For scenarios 1 and 2, the incremental HQs for Subsistence Fishers due to Koda and Rahr are 0.042 and 0.113 respectively versus 16.83 due to ambient levels. The incremental HQs for Recreational Fishers for scenarios 1 and 2 due to Koda and Rahr are 0.009 and 0.024 respectively versus 3.56 due to ambient levels. Therefore, Koda poses no significant risk due to mercury emissions.

3.5Emission Calculations:

Potential emissions are calculated by using emission limits combined with full capacity operation for those pollutants with emission limits, and emission factors combined with full capacity operation for those pollutants without emission limits

Section 1.6 of AP42, Wood Residue Combustion. Some of the facilities tested had no control, cyclone control, or wet scrubbers. These facilities are not as well controlled as the proposed boiler, and thus are probably older, less efficient boilers. This makes using the average emission factors from them a very conservative estimate of the potential emissions from the Koda Energy boiler. For some of the pollutants, such as dioxins, furans, acrolein and metals, the upper 95% confidence limit was used, rather than the average. This makes the estimate of potential emissions even more conservative.

For the material handling baghouses, the emission limits were used to calculate potential particulate and PM_{10} emissions. For uncontrolled emissions; ash handling emission factors are from AP42 Table 11.17-4. The fuel handling factors are primarily from AP42 Table 9.9.1-1.

For traffic emissions, AP42 equations from Section 13.2.1, Paved Roads, were used to calculate emissions. The number of fuel delivery trucks, and ash removal trucks were determined by assuming full capacity operation of all boilers, and the resulting fuel consumption and ash generation, along with the load capacity for each truck. Employee traffic was also considered.

3.6 Endangered Species Act

The Permittee has been working with EPA to address the Endangered Species Act review.

3.7 Insignificant Activities

The Koda facility will have 2 insignificant activities (IA). One IA is the cooling tower. The cooling tower is subject to the MN Industrial Process Equipment rule. The second IA is traffic. Traffic is subject to both BACT and MN R. 7011.0150.

3.8 Testing

The following is a brief discussion of the testing requirements. In the permit, testing is being required for a number of reasons.

NSPS Db: PM and opacity testing
BACT: PM10 and NOx testing
To avoid NESHAP major source designation: acetaldehyde, acrolien, benzene, chlorine, formaldehyde, HCl, manganese, styrene, and toluene
Testing for emission factor verification/development for AERA: mercury, dioxins and furans, and PAHs

The NESHAP parameters were due to their individual PTE exceeding 1 tpy. These parameters will be tested and the test results will be used for subsequent HAPs recordkeeping purposes.

In addition, if the Permittee decides to test new biomass and/or biomass blends, all of the above parameters will be used, as emission factors, in the new RASS evaluation.

In accordance with the Clean Air Act, it is the responsibility of the owner or operator of a facility to have sufficient knowledge of the facility to certify that the facility is in compliance with all applicable requirements.

In evaluating the monitoring requirements included in the permit, the MPCA considers the following:

- The likelihood of violating the applicable requirements;
- Whether add-on controls are necessary to meet the emission limits;
- The variability of emissions over time;
- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- The technical and economic feasibility of possible periodic monitoring methods; and
- The kind of monitoring found on similar units elsewhere.

The table below summarizes the periodic monitoring requirements for those emission units for which the monitoring required by the applicable requirement is nonexistent or inadequate.

Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
EU056 Boiler	PM $\leq$ 0.030 b/mmBtu $PM_{10} \leq 0.037$ lb/mmBtu when burning biomass. PM and $PM_{10} \leq 0.010$lb/mmBtu when burning only natural gas 40 CFR § 52.21 BACT limits. Also meets the requirements of 40 CFR Part 60, subp. Db	Opacity Monitor Monitoring of the ESP power input. Inspection and maintenance of the ESP components, and periodic stack emissions testing.	The ESP is required to be operated within the same parameters as it was during stack emission testing that demonstrated compliance with the emission limits. Requirements for particulate monitoring are delineated in the CAM plan submitted as per 40 CFR Part 64. The number of stack tests and operating conditions for each shall be submitted to the MPCA for approval in the form of a test plan. Test methods used will not measure inorganic condensables as part of the PM10 limit. Operation of the ESP is not required when the boiler is burning natural gas.
	NOx $\leq$ 0.25 lb/mmBtu on a 30-day rolling average when burning biomass. NOx $\leq$ 0.18 lb/mmBtu on a 30-day rolling average when burning only natural gas. 40 CFR § 52.21 BACT limits.	CEMS and periodic stack emission testing	Permit also specifies QAQC, operation, maintenance and calibration of the CEM.
	CO $\leq$ 0.43 lb/mmBtu on a 24-hour rolling average when burning	CEM	Permit also specifies QAQC, operation, maintenance and calibration of the CEM.

Unit or Group	(basis)	Monitoring	
	0.167 lb/mmBtu on a 24-hour average when burning only natural gas. 40 CFR § 52.21 BACT limits.		
	Opacity ≤ 20 percent except for one 6-minute period of not more than 27% opacity 40 CFR Part 60, subp. Db	Opacity Monitor	Permit also specifies QAQC, operation, maintenance and calibration of the COM.
	SO2 ≤ 38 tpy as a 12 month rolling sum. Title I Condition: to limit potential emissions to less than significant under 40 CFR § 52.21	Fuel sampling and analysis, and stack emission testing.	Monthly calculation of a 12 month rolling sum based on fuel analysis results and stack testing. Stack emission testing will be used to develop the relationship between SO2 emissions and sulfur content of the fuel.
	Single HAP ≤ 9 tpy and total HAP ≤ 22.5 tpy as a 12-month rolling sum. Title I Condition: to limit potential emissions to less than major under 40 CFR Part 63	Periodic Stack testing, fuel testing and analysis.	Monthly calculation of a 12 month rolling sum based on emission factors developed during stack emission testing and monthly fuel analysis along with using calculations with AP42 factors for those pollutants without stack emission test results. Each type of fuel burned during the month shall be sampled.
	Ammonia Slip ≤ 30 ppm	Monitoring of reagent injection rate and	Also includes annual stack testing.

Unit or Group	(basis)	Monitoring	
		furnace temperature	
	Fuel Use: Natural Gas use less than 10% of annual capacity (40 CFR Subp. Db), oat hulls, wood, and RAHR by products	Monthly fuel use tracking	12 month annual sum calculated monthly for natural gas use
GP001 Fuel Handling Baghouses	PM and PM10 $\leq$ 0.005 gr/dscf 40 CFR § 52.21 BACT limits. Also meets the requirements of Minn. R. 7011.1005 and Minn. R. 7011.0715	Visible emissions check, pressure drop check during inclement weather, stack emissions testing of three of the baghouses with the highest particulate loading	Permit also specifies inspection and maintenance. Proper operation and maintenance of the baghouses should ensure that PM limits are met.
	Opacity $\leq$ 10% or 5% depending on the activity Minn. R. 7011.1005	Daily visible emissions check	The rule also specifies that spilled commodities shall be cleaned up.
GP002 Ash Handling Baghouses	PM and PM10 $\leq$ 0.002 gr/dscf 40 CFR § 52.21 BACT limits. Also meets the requirements of Minn. R. 7011.0715	Visible emissions check, pressure drop check during inclement weather, stack emissions testing of one of the baghouses with the highest particulate loading	Permit also specifies inspection and maintenance. Proper operation and maintenance of the baghouses should ensure that PM limits are met.
	Opacity $\leq$ 20% Minn. R. 7011.0715	Daily visible emissions check	

Unit or Group	(basis)	Monitoring	
FS001	Pave roads and sweep twice weekly. 40 CFR § 52.21 BACT limits	Recordkeeping of sweeping required	

3.10 Comments Received and Response

Public Notice Period: July 3 – August 1, 2007.
No public comments were received.

EPA 45-day Review Period: July 3 – August 15, 2007.
No EPA comments were received.

4. Conclusion

Based on the information provided by Koda Energy, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. **13900114-001**, and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Bruce Braaten (permit writer/engineer)
Scot Parr (enforcement)
Paula Connell (peer reviewer)

Attachments:

- CAM Plan
-
- BACT Analyses
- Modeling analysis summary

PM and PM10 Compliance Assurance Monitoring Plan for the Koda Energy Biomass Fueled Boiler

I. Background:
Emission Unit: EU056
Description: Suspension Boiler
APC No: CE008

II. Applicable Regulation, Emission Limit and Monitoring Requirements
Emission Limits, PM and PM10: 0.03 lb/mmBtu
Control Technology: Electrostatic Precipitator

Table 1 MONITORING APPROACH

I. Indicator 1	ESP secondary voltage and current are measured for each field to determine the power to the ESP
Measurement Approach	The secondary voltage is measured using a voltmeter and the secondary current is measured using an ammeter. The total power (P) input to the ESP is the sum of the products of the secondary voltage (V) and current (I) in each field ($P = V_1I_1 + V_2I_2 \ldots VnIn$)
II. Indicator Range	An excursion is defined as an ESP power input less than the power input determined during the most recent performance test that determined compliance with emission limits. Excursions trigger an inspection, corrective action, and a reporting requirement.
III Performance Criteria	
A. Data Representativeness	The voltage and current are measured using the instrumentation the manufacturer provided with the ESP
B.QAQC	Confirm the meters read zero when the unit is not operating
C. Monitoring Frequency	The secondary voltage and current are measured continuously and used to calculate the power input every 15 minutes.
Data Collection Procedures	The hourly average power input is calculated and recorded
Averaging Period	1 hour

I. Indicator 2	Opacity is measured and compared to the limit
Measurement Approach	Six-minute opacity averages must be calculated as follows: each one-minute period, the one-minute average opacity value must be determined by summing the opacity values of the individual data points collected by the COMS and dividing that sum by the number of data points collected. This is the one-minute average opacity value. Next, the sum of the individual one-minute averages in the applicable averaging period must be determined and divided by the number of one-minute averages taken. The resulting average must be rounded to the nearest one percent opacity. The resulting value is the six-minute opacity average that shall be recorded by the monitoring

	of the clock hour and ends at the beginning of minute six of the clock hour. The second six-minute period immediately follows the first, and the pattern continues through the last of the ten six-minute periods in a clock hour.
II. Indicator Range	An excursion is defined as an opacity reading that exceeds the opacity limit for the boiler
III Performance Criteria	
A. Data Representativeness	The opacity monitor shall conform to the installation, operation and maintenance procedures specified in 40 CFR Part 60, Appendix B, Performance Specification 1, and Minn. R. 7017. Though not a direct measurement of particulate matter, higher readings of opacity generally represent higher particulate emissions.
B.QAQC	The monitor will be operated and tested in accordance with the QAQC procedures specified in Minn. R. **7017.1210**
C. Monitoring Frequency	The COMS must be designed to complete a minimum of one cycle of sampling and analyzing in each successive ten-second period and one cycle of data recording each one-minute period.
Data Collection Procedures	Each 6-minute average is calculated and recorded
Averaging Period	6 minutes

I. Background

The pollutant specific emission unit is a biomass fueled boiler with a heat input capacity of 318.18 mmBtu/hr. The boiler is subject to 40 CFR Part 60, subp. Db and to Federal New Source Review, BACT limits.

II Rationale for Selection of Performance Indicators

In an ESP, electric fields are established by applying a direct-current voltage across a pair of electrodes, a discharge electrode and a collection electrode. Particulate matter suspended in the gas stream is electrically charged by passing through the electric field around each discharge electrode. The negatively charged particles then migrate toward the positively charged collection electrodes. The particulate matter is separated from the gas stream by retention on the collection electrode. Particulate is removed from the collection plates by shaking or rapping on the plates.

As a general rule, ESP performance improves as total power increases. This relationship is true when particulate matter and gas stream properties remain stable and all equipment components operate satisfactorily. In an ESP with many fields, the power distribution also plays a key role in the performance of the ESP.

The secondary voltage drops when a malfunction, such as grounded electrodes, occurs in the ESP. When the secondary voltage drops, less particulate is charged and collected. Also, the secondary voltage can remain high but fail to perform its function if the collection plates are not cleaned or rapped appropriately. If the collection plates are not cleaned, the current drops. Thus, since the power is the product of the voltage and the current, monitoring the power input will provide a reasonable assurance that the ESP is functioning properly. In other words, problems that would be detected by monitoring other

not a direct measurement of particulate matter, rising opacity generally means rising particulate emissions.

II. Rationale for Selection of Indicator Ranges

The total power to the ESP must be the same as it was during the last performance test that demonstrated compliance with emission limits. The opacity must be maintained below the emission limit. When an excursion from this occurs, corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation.

Attachment: BACT/TECHNOLOGY REVIEW

This project constructs a major new stationary source and results in a significant net emissions increase for NO_x, PM_{10} and CO. 40 CFR § 52.21 (j) requires major stationary sources to conduct a control technology review to apply best available control technology (BACT) for each regulated pollutant that it would have the potential to emit in significant amounts. The requirement for a control technology review applies to each emissions unit at the source where a net emissions increase in the pollutant occurs. This requirement covers the boiler for NO_x, PM, PM_{10} and CO, and the fuel and ash handling systems for PM and PM_{10}.

Table J-1: PSD Applicability

Pollutant	Significant Net Emissions Increase (tpy)	Potential Net Emissions Increase (tpy)
Carbon Monoxide (CO)	100	580
Nitrogen Oxides	40	337
Sulfur Dioxide (SO_2)	40	37.78
Particulate Matter (PM)	25	51.7
Particulate Matter < 10 Microns (PM_{10})	15	50.85
Ozone (VOC)	40	22.4
Lead	0.6	0

40 CFR § 52.21 (b)(12) defines BACT as:

> *an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under Act which would be emitted from 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 for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.*

The EPA's draft *New Source Review Workshop Manual* (USEPA, 1990) describes a "top-down" process for conducting a control technology review to determine BACT for various emissions units. This process involves identifying all control technologies, eliminating technically infeasible options, ranking remaining options by control effectiveness, evaluating the most effective controls, and then selecting BACT.

EPA policy since 1987 has required a top-down process for control technology review to determine BACT. This process ranks available control technology in descending order of their effectiveness. The applicant reviews the most stringent technology first and unless the applicant can demonstrate on technological, economic, or environmental grounds that the most stringent technology is infeasible, that technology becomes BACT. If the applicant demonstrates the infeasibility of the most stringent technology, the applicant then reviews the next most stringent technology, and repeats the process until the review shows that a technology is feasible and is BACT.

To facilitate control technology review, the EPA has developed a database of control technology determinations based on the requirements of various Clean Air Act programs. Under the Clean Air Act, the EPA has established control technology requirements for criteria air pollutants through three programs:

required on existing sources in areas that fail to meet national ambient air quality standards.

Best Available Control Technology, (BACT) refers to technology required on major new or modified sources in areas that meet air quality standards.

Lowest Achievable Emission Rate (LAER) refers to technology required on major new or modified sources in non-attainment areas.

RACT/BACT/LAER Clearinghouse (RBLC) database contains case-specific information on the "Best Available" air pollution technologies that State and local permitting agencies have required to reduce the air emissions from regulated facilities.

This review is broken into two sections. The first looks at the boiler and the second looks at particulate emissions from the emission units involved in fuel and ash processing and handling.

Boiler BACT

Koda Energy searched the RBLC database on 10/14/2006 for each pollutant that exceeded PSD significance levels (NO_x, CO and PM_{10}). The search focused on two source categories for applicable determinations: 11.120 utility and large industrial-size biomass boilers (>250 MmBtu/hr) and 12.120 industrial-sized biomass boilers (>100 MmBtu/hr and ≤ 250 MmBtu/hr).

No facilities in the RBLC database burn the same types of fuels as Koda Energy. Most biomass boilers burn various types of wood waste, bagasse, and paper mill waste (bark, wood waste and clarifier sludge). One facility in the database burns sunflower hulls. Other facilities are permitted to co-fire oat hulls with other fuels – two with coal and one with wood [135, 133, 137, and 84]. No facility in the database is permitted to burn the unique fuel mix proposed for Koda Energy.

A literature review of biomass combustion and fuel issues did not identify any commercial scale facilities burning oat hulls and malt byproducts (see for example [1, 4, 8, 10, 11, 23, 28, 31, 41, 43, 49, 53, 58, 59, 72, 77, 86, 88, 98, 122, 174, 255, and 260]). Koda Energy also searched the following sources for information on boilers burning oat hulls and malt-byproducts:

Journal of the Air & Waste Management Association,
EM,
the AWMA Online Library,
EPA Technology Transfer Network,
Taylor and Francis Group,
Infotrieve,
Ingenta Connect,
Science Direct,
Business Source Premier,
Academic Search Premier,
Ebsco Metafile,
JSTOR Periodicals,
Masterfile Premier, and
Proquest Newstand Complete
Energy.sourceguides.com
http://www.bioenergynoe.org/
http://www.eeci.net/
California Air Resources Board Statewide BACT Clearinghouse
Biomass Energy Research Association

project.

The economic viability of the Koda Energy projects results from its location next to a customer for steam and a source of a significant percent of its fuel supply. Twenty of the twenty-four biomass projects in the RBLC database permitted in the past 10 years burn fuels generated onsite. All of the onsite generated fuels currently permitted contain lower levels of nitrogen than the proposed fuel mix for Koda Energy. The high nitrogen content if the malt byproducts from Rahr Malting present special challenges for the Koda Energy project

NO_x BACT Analysis for Biomass Combustion

The RBLC database lists 27 NO_x limitations for 24 facilities (Table J-2) with biomass-fired boilers. Twenty-two of these limitations are BACT limitations and five are limitations based on other factors. The majority of facilities burn wood, waste wood and/or bark. Three facilities burn bagasse, one burns sunflower hulls, and eight paper/pulp mills in the sample may burn some clarifier sludge along with wood waste. The facilities represented in the RBLC database include 2 cane sugar refineries, 1 vegetable oil processing plant, 5 primary forestry/lumber plants, 8 pulp/paper mills, and 8 electric service providers. The RBLC database indicates a wide range of NO_x control as BACT ranging from no control, combustion control, SNCR to SCR. The emission rates range from 0.075 lbs/MmBtu to 0.462 lbs/MmBtu.

Table J-2: NO_x in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	NO_x Limit	Units	Control Technology	Basis	SIC
*WA-0327	Utility	Sierra Pacific Industries-Skagit County Lumber Mill	1/25/2006	WA	Bark & Waste Wood	430.00	0.130	lb/mmBtu	SNCR	BACT-PSD	0831
MN-058	ICI	Virginia Department of Public Utilities	6/30/2005	MN	Wood	230.00	0.150	lb/MM Btu[2]	SNCR	BACT-PSD	4911
MN-0059	ICI	Hibbing Public Utilities	6/30/2005	MN	Wood	230.00	0.150		SNCR	BACT-PSD	4911
*WA-0329	Utility	Darrington Energy Cogeneration Power Plant	2/11/2005	WA	Wood Waste	403.00	0.120	lb/MM Btu (24 hr)	SNCR	BACT-PSD	4911
LA-0188	Utility	Inland Paper - Bogalusa Mill	11/23/2004	LA	Bark[3]	787.50	0.450	lb/MmBtu	Overfire air system, low Nox burners, good combustion practices	BACT-PSD, NSPS, Operating permit	2611
NH-0013	Utility	Schiller Station	10/25/2004	NH	Biomass[5]	720.00	0.075	lb/MM Btu[6]	SNCR	Other Case-by-case, NSPS Operating permit, SIP	4911
OH-0269	ICI	Biomass Energy[7]	1/5/2004	OH	Wood	175.00	0.440	lb/MM Btu	SCR	N/A	4911
FL-0257	Utility	U.S. Sugar - Clewiston Sugar Mill And Refinery	11/18/2003	FL	Bagasse	936.00	0.140	lb/MM Btu[8]	SNCR, good combustion and operating practices	BACT-PSD	2061
WA-0298	Utility	Sierra Pacific Industries Aberdeen Division	10/17/2002	WA	Waste Wood	310.00	0.150	lb/MM Btu[9]	SNCR, boiler design	BACT-PSD	2421

The RBLC database lists 27 NO_x limitations for 24 facilities (Table J-2) with biomass-fired boilers. Twenty-two of these limitations are BACT limitations and five are limitations based on other factors. The majority of facilities burn wood, waste wood and/or bark. Three facilities burn bagasse, one burns sunflower hulls, and eight paper/pulp mills in the sample may burn some clarifier sludge along with wood waste. The facilities represented in the RBLC database include 2 cane sugar refineries, 1 vegetable oil processing plant, 5 primary forestry/lumber plants, 8 pulp/paper mills, and 8 electric service providers. The RBLC database indicates a wide range of NO_x control as BACT ranging from no control, combustion control, SNCR to SCR. The emission rates range from 0.075 lbs/MmBtu to 0.462 lbs/MmBtu.

Table J-2: NO_x in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	NO_x Limit	Units	Control Technology	Basis	SIC
VA-0268	ICI	Thermal Ventures	5/12/2002	VA	Wood[10]	120.00	0.400	lb/MM Btu	Good combustion	Other Case-by-case	4961
KY-0085	Utility	Meadwestvaco Kentucky, Inc/Wickliffe	2/27/2002	KY	Bark[11]	631.00	0.400	lb/MM Btu	None	BACT-PSD	2621
ME-0021	Utility	S.D. Warren Co. - Skowhegan, Me	11/27/2001	ME	Wood Waste[12]	1300.00	0.200	lb/MmBtu	SCNR	BACT-PSD	2611
MN-0046	Utility	District Energy St. Paul, Inc	11/15/2001	MN	Wood	550.00	0.150	lb/mmBtu	SNCR	BACT-PSD	4911
NC-0092	ICI	Riegelwood Mill - Int. Paper CO	5/10/2001	NC	Wood Waste[15]	249.00	0.400	lb/MM Btu	Good combustion	BACT-PSD	2621
NC-0092	ICI	Riegelwood Mill - Int. Paper CO	5/10/2001	NC	Wood Waste[15]	249.00	0.367	lb/MM Btu	Good combustion	BACT-PSD	2621
NC-0092	ICI	Riegelwood Mill - Int. Paper CO	5/10/2001	NC	Wood Waste[16]	600.00	0.350	lb/MM Btu	Good combustion	BACT-PSD	2621
FL-0034	Utility	U.S. Sugar Clewiston Mill And Refinery	11/29/2000	FL	Bagasse[17]	633.00	0.200	lb/MM Btu	Good combustion practices	BACT-PSD	2061
FL-0248	Utility	US Sugar Corporation	11/19/1999	FL	Bagasse[18]	633.00	0.200	lb/MM Btu	Good combustion practices	BACT-PSD	2061
ME-0026	Utility	Wheelabrator Sherman Energy Company	4/9/1999	ME	Wood[19]	315.00	0.250	lb/MM Btu[20]	Good combustion practices	BACT-PSD	4911

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Table J-2: NO_x in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	NO_x Limit	Units	Control Technology	Basis	SIC
GA-0116	Utility	Tri-Gen Biopower	11/24/1998	GA	Biomass[21]	265.10	0.250	lb/	Bubbling fluidized bed combustion with inherent Nox formation control features	BACT-PSD	4931
ND-0018	ICI	ADM - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	200.00	0.200	lb/MM Btu[23]	None	BACT-PSD	2076
ND-0018	ICI	ADM - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	280.00	0.200	lb/MM Btu	None	BACT-PSD	2076
CA-0930	ICI	Sierra Pacific Industries - Quincy	5/13/1998	CA	Wood	245.30	0.230	lb/MmBtu[4]	SNCR	N/A	2421
AL-0116	Utility	Gulf States Paper Corporation	12/10/1997	AL	Bark & Clarifier Sludge	775.00	0.300	lb/MM Btu[2]	Low Nox natural gas and fuel oil burners	BACT-PSD	2611
MT-0007	ICI	Plum Creek Mfg	2/15/1997	MT	Hog Fuel	225.00	0.462	lb/MM Btu[26]		BACT-PSD	2436
OK-0038	Utility	Weyerhauser Co - Valliant	11/5/1996	OK	Bark[27]	900.00[28]	0.300	lb/MM Btu[29]	Wet scrubber and overfire air controls.	BACT-PSD	2631
SC-0045	Utility	Willamette Industries - Marlboro Mill	4/17/1996	SC	Wood waste	470.00	0.300	lb/MM Btu[30]	Good combustion control	case-by-case	2611

1 based on a calender day. Also has a 56 lb/hr NOx limit
2 30-day rolling avg
3 has different limits for fuel oil or fiber rejects
4 also has a 351.38 lb/hr and 872.11 tpy annual maximum NOx limit
5 720 mmBtu/hr on biomass. Wood fuel: includes whole tree chips, untreated byproducts or residue from forest p
stump grindings, or ground pallets. 635 mmBtu/hr on coal with maximum sulfur content of 1.5 lb/mmBtu short te
(3 month average). Coal is backup fuel, but could plant can fire coal up to 8760 h/yr. All limits except so2 are ba
6 Also has a 0.60 lb/mmBtu (30 day rolling average) NOx limit and a 1.6 lb/MW NOx limit (30 day rolling average)
7 facility never installed
8 30 day rolling average
9 24 hour average. Also has a 0.10 lb/mmBtuannual average NOx limit
10 Wood limit 70% miuxture. Wood/bark excluding any wood which contains chemical treatments or has been pain
Average heat content 5,000 Btu/lb HHV
11
fuels include: bark/wood waste, waste treatment sludge, waste oil, and natural gas. Maximum hourly heat input
mmBtu/h when firing 55% moisture content wood residue; 634 mmBtu/h when firing 30% moisture content wood
mmBtu/h when firing any optimum mixture of wood residue and natural gas. Boiler is incineration point for the N
12 Boiler fires bark, wood/wood waste, dewatered mill sludge, no. 2 fuel oil, no. 6 fuel oil, tire derived fuel,waste pa
specification and off spec waste oil.
13 NOx is also limited to 260 lb/hr and 1139 tpy
14 limit for biomass - natural gas limited to 0.11 lb/mmBtu
15 can fire coal, no. 6 fuel oil, or bark/wood fiber sludge
16 can fire bark/wood fiber sludge/fossil fuel
17 boiler limited to firing 400,000 t/yr bagasse and 500,00 gal/yr no.6 fuel oil. total heat input not to exceed 2,880,0
heat input for boiler when cofired with fuel oil is 530 mmBtu/h (255 mmBtu/h oil, 305 mmBtu/h bagasse).
18 Expand operation of existing sugar mill boiler No. 4. BACT determinations for CO, NOx, PM, SAM, SO2 and VO
as a supplement, limited to 1500 gal/h (224 mmBtu/h), and no more than 500,000 gal/y.
19 Fuel is wood waste, no.2 fuel. # 2 fuel only for start up and emergency backup.
20 30 day average limit. Also limited to 345.8 tons per year.
21
Unit capable of burning woodwaste, mill sludge, tdf, pulp mill rejects (#2 fuel oil as startup fuel). Bubbling fluidiz
22 also limited to 66.3 lb/hr NOx
23 throughput is for 2 boilers combined
24 based on a calender day
25 facility also has a 232.5 lb/hr NOx limit
26 equivalent emission rate, actual limit is 104 lb/hr
27 The bark boiler is a multiple-fuel unit; gas, oil, and a variety of solids (including wood, wood bark, OCC rejects, a
treatment sludges) can be used as fuel.
28 estimated based on lb/hr and /b/mmBtu emission limits
29 NOx also limited to 270 lb/hr and 1182.6 tpy
30 NOx also limited to 141.00 lb/hr.

Top-down BACT develops a list of potential control technologies and ranks them from the most efficient control to the least. SCR typically represents the best control for NO_x from combustion in utility and large industrial boilers. SNCR is the second best control technology and combustion control the least effective. Combustion control includes over fire air, and lo-nox burners.

NOx Control Technologies	Efficiency Range
Selective Catalytic Reduction	70-90%
Selective Noncatalytic Reduction	30-50%
Combustion Control	Up to 30%

Technical Feasibility Analysis: Selective Catalytic Reduction (SCR)

SCR has the highest NO_x reduction efficiency. SCR reduces NO_x by adding a liquid or gaseous reductant (usually ammonia or urea) to the flue gas as it passes over a catalyst bed. One facility in the database, Biomass Energy, LLC in Ohio (OH-0269), is listed with an SCR. The database lists a 27.98 lb/hr mass NO_x limit and a NO_x emission rate of 0.44 lbs/mmBtu based on the manufacturer's certification. The hourly mass limit, when the seven boilers are firing at full capacity, restricts the NO_x emission rate to 0.159 lb/mmBtu. Contact with Ohio EPA indicates that this facility was never built and that the permit has expired [134].

No operating biomass-fired boiler controls NO_x emissions with SCR due to fouling and deactivation of the catalyst. The Combustion and Harmful Emission Control Research Center [30] in a study of Swedish biomass boilers equipped with SCR, the catalyst used in biomass boilers had a much shorter useful life than the catalyst in coal fired boilers equipped with SCR. SCR catalysts in coal fired plants typically last 3 to 5 years (see also 265). In a boiler firing sawdust, the catalyst lasted less than 2,000 hours while a boiler firing forest residue exhausted the catalyst after less than 5,000 hours. The researchers expected similar results for other forms of biomass such as straw. They postulated that the higher levels of potassium in biomass as compared to coal might act to deactivate the catalyst in SCR systems. They tried doping the SCR with varying concentrations of KCl and K_2SO_4 and found that both acted as strong catalyst poisons.

Fuel analyses show higher levels of potassium in grains and other herbaceous biomass than in wood [63, 80, 129, 161, and 190]. These analyses predict even faster catalyst fouling and deactivation with the fuels planned for the Koda Energy boiler than with wood.

Technical Feasibility Analysis: Selective Noncatalytic Reduction (SNCR)

The best-controlled biomass-fired combustion sources in the RBLC database are controlled with SNCR. One facility, Schiller Station, in the RBLC database controlled by SNCR has a 0.075 lb/mmBtu NO_x limit. The remaining facilities controlled by SNCR have NO_x limits ranging from 0.12 to 0.23 lb/mmBtu.

The next section discusses Schiller Station and discusses why its limits are not representative of BACT.

Schiller Station

The lowest NO_x emission rate in the RBLC database is for Schiller Station (0.075 lb/mmBtu). The permit for Schiller Station (State of New Hampshire, 2006) modifies a 50 MW coal-fired boiler to

burn wood. The modification results in net emissions decreases for PM_{10}, SO_2 and NO_x. The project increases CO emissions beyond PSD major source significance levels and required a PSD permit. The boiler uses SNCR and the inherently lower firing method of a fluidized bed.

Schiller Station is located in Portsmouth, Rockingham County, New Hampshire and is in the Portsmouth-Dover-Rochester serious ozone nonattainment area.

The states in the Ozone Transport Commission (OTC) established the NO_x Budget Program to reduce region-wide NO_x emissions as part of each state's plan to attain ground level ozone national ambient air quality standards (NAAQS). The OTC includes Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Delaware, part of Virginia and the District of Columbia. The first phase of this program in 1994 established reasonably available control technology (RACT) for existing NO_x emissions sources. The second and third phases of the program set up a NO_x Budget Trading Program that allocates NO_x allowances to covered sources. Each Allowance permits a source to emit one ton of NO_x during the May to September control period during which it is allocated or during any later control period. Covered sources show compliance by demonstrating that actual emissions do not exceed the number of allowances held by the source at the end of the control period. The NO_x Budget Trading Program allows sources to bank allowances and also buy or sell allowances throughout the OTC region [238].

The New Hampshire NO_x Budget Trading Program requires covered facilities at 5 Public Service of New Hampshire plants (including Schiller Station) to reduce NO_x emissions from 1990 baseline emissions of 14,589 tons to 4,674 tons. The OTC budgeted New Hampshire 5,219 allowances for 1999. The State retired 100 allowances for additional environmental benefit and held 445 allowances for possible allocation to new sources. In 2003 New Hampshire's allocation dropped to 3,739 tons and in 2006 it dropped to 3,000 [229].

In Order ARD 98–001 the New Hampshire Department of Environmental Services issued to Public Service Company of New Hampshire (PSNH) on July 17, 1998 (65 FR 68082, promulgated into the New Hampshire State Implementation Plan at 40 CFR 52.1520(c)(64)(i)(A)). This order sets specific NO_x limits for one PSNH facility and orders PSNH to meet a 4,662 ton NO_x emission cap 1999-2002 control periods at six other units, including 3 (units # 4, 5, and 6) located at Schiller Station. The order drops the NO_x emission cap to 3,627 tons in 2003.

Temporary Prevention of Significant Deterioration (PSD) Permit, No. TP-B-0501 [230], allows PSNH to replace a coal-fired boiler at Schiller Station with a wood-fired boiler. This results in a 358.19 ton per year reduction in NO_x emissions. The 0.075 lb/mmBtuNO_x emission limit is more stringent than RACT (NH ENV-A 1200). NH ENV-A 1211.16 allows owners of multiple sources to "bubble" RACT requirements by accepting limitations more stringent than RACT at one unit in exchange for less stringent requirements at another. The wood fired boiler will help PSNH offset the requirements for reductions at the coal-fired boilers on site.

In a request to the New Hampshire Public Utilities Commission for approval of the Schiller Station project (PSNH, 2003), PSNH estimates an actual annual NO_x emission reduction of 200 tons per year. PSNH identifies emission reduction credits through the New Hampshire NO_x Budget Trading Program as a source of funding for the Schiller Station project. PSNH identifies NO_x Ozone emission reduction credits ranging from $2,700 to $8,000 per ton as a result of this project. They identify NO_x Non-Ozone emission reduction credits values at $250 per ton.

Renewable energy credits obtained as a result of the Schiller Station will provide another source of funding. PSNH announced in January 2004 (PSNH 2004) that the States of Connecticut and Massachusetts had both approved the Schiller Station project as a renewable energy project certified to sell renewable energy certificates in each state. The *Portsmouth Herald* quotes PSNH

officials as planning to pay for the project through the sale of 350,000 renewable energy credits worth an estimated $40 to $50 each per year (Arsenault, 2006).

The NO_x emission rates at Schiller Station pre-date the conversion of the boiler to biomass and reflect regional reductions to address ozone nonattainment issues. The NO_x emission rate limit is more stringent than RACT and allows the PSNH to bubble reductions with other sources that it owns. A regional NO_x budget trading program requires reductions at facilities across the region that creates a market for the reductions achieved by this project. NO_x emission reduction credits worth $2,700 to $8,000 per ton make low NO_x emission rates more economically viable than they are for facilities without access to NO_x emission reduction credits.

NO_x BACT

Because it does not have a catalyst, SNCR does not have the same fouling problems associated with SCR use on biomass-fired boilers. SNCR is the top control option for NO_x for biomass-fired boilers [134, 136]. NO_x emission rates at the remaining facilities controlled by SNCR range from 0.12 to 0.23 lbs/mmBtu

Table J-3: Emission Rates For Facilities Controlled by SNCR

RBLC ID	Class	Facility	Primary Fuel	Boiler Heat Input (MmBtu /hr)	NO_x Limit (lb/MmBtu)
*WA-0329	Utility	Darrington Energy Cogeneration	Waste Wood	403.00	0.120
*WA-0327	Utility	Sierra Pacific Industries- Skagit	Bark/Waste Wood	430.00	0.130
FL-0257	Utility	U.S. Sugar - Clewiston	Bagasse	936.00	0.140
MN-0046	Utility	District Energy St. Paul, Inc	Wood	550.00	0.150
WA-0298	Utility	Sierra Pacific Aberdeen Division	Waste Wood	310.00	0.150
MN-058	ICI	Virginia Public Utilities	Wood	230.00	0.150
MN-0059	ICI	Hibbing Public Utilities	Wood	230.00	0.150
ME-0021	Utility	S.D. Warren Co.	Wood Waste	1300.00	0.200
CA-0930	ICI	Sierra Pacific Industries - Quincy	Wood	245.30	0.230

At least two different mechanisms contribute to NO_x emission rates during combustion. The first, thermal NO_x, is produced by nitrogen in the combustion air and the second, fuel bound NO_x, results from nitrogen in the fuel. Boiler design, combustion conditions, and type of fuel play a major role in NO_x formation. Combustion temperature, gas residence time at the peak combustion temperature and the fuel-air ratio are among the most important variables in thermal NO_x formation. While the amount of fuel-bound organic nitrogen is small compared with nitrogen in combustion air, it is highly reactive and can make a major contribution to NO_x emissions [40, pg. 197].

Table J-4 compares the nitrogen content of selected fuels:

Table J-4: Percent Nitrogen of Selected Fuels

Sample	Mean	Min	Max	Std dev	Sample Size
Phyllis Hogged Fuel from Paper Mills	0.05	0.02	0.09	0.61	5
Phyllis fir/pine/spruce/bark	0.15	0.02	0.53	0.64	84
Phyllis Untreated Wood	0.27	0.02	1.77	0.37	263
Phyllis softwood	0.30	0.02	1.77	0.91	128
Phyllis Bark	0.33	0.02	0.81	0.94	31
NREL/Phyllis Bagasse	0.34	0.09	0.98	0.31	14
Phyllis Organic Impregnated Wood	0.35	0.27	0.48	0.91	7
NREL Urban Wood	0.39	0.17	0.53	0.15	7
NREL Wood	0.40	0.02	0.89	0.20	25
Hazen Wood	0.40	0.27	0.56	0.15	3
Phyllis Park Waste	0.61	0.20	1.32	0.49	17
Phyllis Demolition Wood	0.75	0.14	2.42	0.67	20
Phyllis Barley	0.77	0.43	1.39	0.65	8
Phyllis Sunflower husk/hull	0.79	0.34	1.46	0.39	6
NREL Grasses Straws Stalks Stems	0.86	0.09	2.43	0.80	18
Hazen Grasses Straws Stalks Stems	0.94	0.48	2.34	0.63	8
Phyllis Malt Byproducts	1.92	0.52	4.99	0.00	12
Phyllis Particle Board	2.61	0.35	5.98	0.00	17

"Phyllis" refers to the Phyllis database (Energy Research Center of the Netherlands at: http://www.ecn.nl/phyllis/) [63]. NREL refers to sources from [161] and Hazen refers fuel analyses conducted for Koda Energy by Hazen Research, Inc. [80].

With the exception of particle board, the nitrogen content of these fuels is significantly lower than the fuels provided to Koda Energy by Rahr Malting (2.92% nitrogen) and the 1.29% nitrogen content of the Koda Energy design fuel mix (33% oat hulls, 39.5% wood, and 27.5% Rahr fuels).

Table J-5 estimates the level of NO_x control based on the probable fuel nitrogen content:

Table J-5

Facility	HHV Btu/lb	Fuel Bound Nitrogen	NOx if all Fuel Bound N Converts to NOx lbs/MMBtu	Fuel Bound NOx Conversion Rate	Thermal NOx (lbs/MMBtu)	Calculated Nox (lb/mmBtu)	Tested Actual NOx lbs/MMBtu	Emission Rate (lb/MMBtu)	Removal Efficiency
Koda Energy Design - 100% load	7,437	1.29%	5.70	0.11	0.12	0.75	0.40	0.25	37.50%
Rahr Fuels - 60% load	7,592	2.94%	12.72	0.06	0.12	0.88	0.55	0.25	54.55%

NO2 molecular weight	46
NO molecular weight	30
lb NO2 per lb N	3.29

Thermal NO_x in biomass boilers ranges from 0.10 to 0.20 lb/mmBtu. Table J-5 uses 0.12 lb/mmBtu based on the tests conducted by EERC on fuels and combustion conditions anticipated for the Koda Energy boiler.

Koda Energy will control NO_x with a low NO_x burner, a secondary overfire air (SOFA) system and an SNCR. The SOFA system will be located above the burners for control of the furnace temperature through staging of combustion and control on NO_x formation. Under full load, the combustion controls will achieve a 30% NO_x reduction and the SNCR will achieve an additional 40% NO_x reduction of the remaining emissions. So, the highest control efficiency would be an overall of 58%. (0.3 + 0.4*0.7 = 0.58) The total NO_x reduction from the full load scenario exceeds those from other facilities controlled by SNCR in the RBLC database.

The 60% load scenario recognizes that at 60% capacity, steam production from Koda Energy will meet all of the Rahr Malting Company's needs for steam. Below this level existing natural gas fired heating units at Rahr can produce steam more efficiently. At 60% capacity the NO_x reduction efficiency of the combustion controls drops from 30% to 25% and the SNCR NO_x removal efficiency drops from 40% to 30%.

Under normal operating conditions, the boiler will operate between 100% and 60% load. As the boiler load decreases, the percent of the high nitrogen Rahr fuels in the fuel mix will increase and the NO_x removal efficiency of the system will decrease. The decreased NO_x removal efficiency is due in part to restrictions on reducing excess air levels. The excess air levels increase as the boiler load decreases because the primary air cannot be reduced proportionately with the fuel rate reduction due to minimum fuel line velocity requirements. The 60% load using Rahr fuels represents a worst-case scenario.

The Koda Energy boiler is designed to burn small particles. In unstaged combustion, large particles reduce NO_x emissions [182], while in staged combustion, burning fine particles reduces NO_x emissions [78, 79]. In combustion tests, coarse ground oat hulls averaged 150% higher fuel bound NO_x conversion rate than fine ground oat hulls [79].

Koda Energy proposes SOFA and SNCR with an emission limit of 0.25 lb/mmBtu as BACT for NO_x based on a 30-day rolling average. The table above shows that Koda Energy will be meeting or exceeding the control efficiency of other recently permitted facilities controlled with SNCR.

Because Koda Energy is proposing the top level technically feasible option, no cost analysis is required. (See New Source Review Workshop Manual, page B.35)

Most of the BACT determinations in the RBLC do not specify averaging time. Three specify a 24-hour or daily average. All of those three boilers are burning more consistent fuel (wood) that does not have the variability of the fuel mix Koda Energy Proposes.

Koda Energy has also consulted with the manufacturer as to whether or not this is a realistic averaging time. The limit that Koda proposes will include times of startup and shutdown. Following is the correspondence received from the manufacturer:

From: Mike Cantrell (mcantrell) [mailto:JMikeC@McBurney.com]
Sent: Wednesday, May 09, 2007 12:16 PM
To: Patrick Mulloy
Cc: Paul Kramer (E-mail)
Subject: RE: SNCR Operation

Pat,
The SNCR system will not be in service until the furnace is up to temperature. So it will be off during startup and then during shutdown as furnace cools off. Startup will take 4-6 hours and similar time for shutdown.

I have been tied up last 2 days and am now working on the other info you requested, should have it tomorrow.

Mike

As discussed above, the SNCR system does not work immediately, it can only be operational once operating temperatures have been attained, and that won't be for 4 to 6 hours. This would have a dramatic effect on a daily average, being 25% or so of the operating time in a day. A 30-day rolling average could absorb the higher emissions during this period. In response to MPCA comments, Koda Energy again reiterates its request for a BACT emission limit of 0.25 lb/mmBtu on a 30-day rolling average. This is also consistent with the averaging time used by the NSPSs that apply to boilers. On another point, the ambient standard for NOx is an annual one, which provides further justification for a longer term average.

The State of Washington was contacted regarding the daily average limits for NOx while using SCR. All of the facilities with daily or 24 hour average limits (3) are located in Washington. The facilities are Sierra Pacific Industries, using SNCR, both the Skagit County Lumber Mill and the Aberdeen Division, and Darrington Energy Cogeneration Power Plant. Of the other facilities using SNCR that specified an averaging time (5), it was 30-days rolling.

BACT Analysis for NOx While Burning Natural Gas Alone

Typically, natural gas will not be a major fuel source at Koda Energy. Its primary function is the provide a pilot (5% of heat input) when Koda is burning higher moisture fuels. It may be used during startup, and in the event of an interruption in fuel supply. If the boiler is fired solely on natural gas, the maximum heat input would be 210 mmBtu/hr.

A review of BACT determinations made from 2000 to 2007 is shown below:

Table J-6

Boilers >100 mmBtu/hr and < 250 mmBtu/hr

RBLC ID	Facility	State	Primary Fuel	Boiler Heat Input mmBtu	Nox limit	Units	Control Technology	SIC	Average Time	Basis
MN-0062	HEARTLAND CORN PRODUCTS	MN	natural gas	198	0.04	lb/mmBtu	LNB	2869	not specified	BACT
NC-0101	FORSYTH ENERGY PLANT	NC	natural gas	110.2	0.137	lb/mmBtu	LNB	4911	3-hour ave.	BACT
IA-0079	KOCH NITROGEN COMPANY	IA	natural gas	240	0.6	lb/mmBtu	LNB & FGR		1-hour ave	BACT
LA-0204	PLAQUEMINE PVC PLANT Bolers A,B	LA	not specified	250.00	0.04	lb/mmBtu	LNB & FGR	2821	24 hr rolling	BACT
LA-0204	PLAQUEMINE PVC PLANT Boilers C,D	LA	not specified	250	0.012	lb/mmBtu	LNB & FGR	2821	24-hr rolling	BACT
OR-0046	TURNER ENERGY CENTER, LLC	OR	natural gas	47.7	0.011	lb/mmBtu	SCR	4911	3-hour block	BACT
WI-0228	WPS - WESTON PLANT	WI	natural gas	229.8	0.1	lb/mmBtu	LNB	4911	not specified	BACT
NE-0024	CARGILL - BLAIR PLANT	NE	natural gas	198	0.07	lb/mmBtu	LNB & FGR	2046	not specified	BACT
MS-0069	DUPONT DELISLE FACILITY Boiler 4	MS	natural gas	231.00	0.058	lb/mmBtu	LNB & FGR	2816	not specified	BACT
MS-0069	DUPONT DELISLE FACILITY Boiler 3	MS	natural gas	231.00	0.09	lb/mmBtu	LNB & FGR	2816	not specified	BACT
OH-0241	MILLER BREWING COMPANY - TRENTON	OH	natural gas also burns oil and coal	238	0.7	lb/mmBtu	over fire air	2082	not specified	BACT
ID-0015	J R SIMPLOT COMPANY - DON SIDING PLANT	ID	natural gas	175	0.04	lb/mmBtu	LNB	2874	30-day rolling	BACT

WV-0023	MAIDSVILLE	WV	natural gas	225	0.098	lb/mmBtu	good combustion	2874	3-hour rolling	BACT
OH-0282	CARGILL OILSEEDS DIVISION	OH	natural gas	185	0.035	lb/mmBtu	LNB	2075	not specified	BACT
LA-0183	TITANIUM DIOXIDE FACILITY	LA	natural gas	135	0.074	lb/mmBtu	LNB	2816	annual ave.	BACT
VA-0270	VCU EAST PLANT	VA	natural gas	150	0.1	lb/mmBtu	LNB & FGR	8062	not specified	BACT
VA-0278	VCU EAST PLANT (3 blrs)	VA	natural gas	150.6	0.08	lb/mmBtu	LNB & FGR	8062	annual ave.	BACT
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	CO	natural gas	129	0.038	lb/mmBtu	LNB and limited operation	4911	not specified	BACT
CA-1024	AES HUNTINGTON BEACH	CA	natural gas	225	5	PPMVD @3% 02	LNB, SCR, FGR	4911	1-hour ave	BACT
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	TN	natural gas	180	0.06	lb/mmBtu	N	2911	not specified	BACT
TX-0411	AMELIA ENERGY CENTER	TX	natural gas	155	0.04	lb/mmBtu	N	4911	not specified	BACT
WV-0015	E.I. DUPONT - WASHINGTON WORKS	WV	natural gas	181	0.1	lb/mmBtu	LNB & FGR	2821	not specified	BACT
FL-0251	OKEELANTA CORP-ORATION SUGAR MILL	FL	natural gas	211	0.06	lb/mmBtu	LNB & FGR	2061	not specified	BACT
NJ-0036	AES RED OAK LLC	NJ	natural gas	120	0.036	lb/mmBtu	limited operation	4911	not specified	LAER
AR-0057	TENASKA ARKANSAS PARTNERS, LP	AR	natural gas	122	0.04	lb/mmBtu	FGR	4911	not specified	BACT
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	NJ	natural gas	124.6	0.036	lb/mmBtu	LNB	4911	not specified	BACT

N = no controls feasible

Boilers > 250 mmBtu/hr

RBLC ID	Facility	Year issued	Primary Fuel	Boiler Heat Input mmBtu	NOx limit	Units	Control Technology	SIC	Average Time	Basis
OH-0307	SOUTH POINT BIOMASS GENERATION	2006	natural gas	247	0.06	lb/mmBtu	N	4911	none specified	BACT
TX-0511	BASF ETHYLENE/ PROPYLENE CRACKER	2006	natural gas	425.4	8.5 0.0.02	lb/hr lb/mmBtu	N		none specified	unknown
NV-0035	TRACY SUBSTATION EXPANSION PROJECT	2005	natural gas	159	0.037	lb/mmBtu	good combustion	4911	3-hour rolling	BACT
WA-0301	BP CHERRY POINT REFINERY	2004	natural gas	363	0.028	lb/mmBtu	FGR & ULNB	2911	none specified	BACT
AZ-0046	ARIZONA CLEAN FUELS YUMA	2005	natural gas	419	0.0125	lb/mmBtu	FGR & LNB	2911	3-hour rolling	BACT
OR-0046	TURNER ENERGY CENTER, LLC	2005	natural gas	3939	2	ppmvd	SCR*	4911	1-hour	BACT
TX-0479	DOW TEXAS OPERATIONS FREEPORT	2004	natural gas off gas syngas	410	7.64 0.0186	lb/hr lb/mmBtu	LNB & SCR	2869	none specified	BACT
OH-0271	SUNOCO INC.	2004	natural gas	281.00	0.08	lb/mmBtu	LNB & FGR	2869	none specified	BACT
NE-0024	CARGILL - BLAIR PLANT	2004	natural gas	276.67	0.05	lb/mmBtu	LNG & FGR	2046	30 day	Other
OH-0269	BIOMASS ENERGY, LLC-SOUTH POINT POWER	2004	natural gas	247	0.06	lb/mmBtu	N	4911	none specified	BACT
TX-0469	TEXAS PETRO-CHEMICALS HOUSTON FACILITY	2003	natural gas	664.00	12.10 0.018	lb/hr lb/mmBtu	good combustion	2869	none specified	BACT

MS-0075	MONTICELLO MILL	2003	natural gas	766	0.54	lb/mmBtu	N	2631	none specified	BACT
SC-0091	COLUMBIA ENERGY CENTER	2003	natural gas	550	0.04	lb/mmBtu	LNB & FGR	4911	none specified	BACT
IA-0067	MIDAMERICAN ENERGY COMPANY	2003	natural gas	429.4	0.14	llb/mmBtu	LNG	4911	none specified	BACT
VA-0255	VA POWER - POSSUM POINT	2002	ng tangentially fired	2350	0.3	lb/mmBtu	good combustion	4911	none specified	RACT
VA-0255	VA POWER - POSSUM POINT Unit 4	2002	ng tangentially fired	1150	0.61	lb/mmBtu	LNB	4911	none specified	RACT
AL-0199	WEYERHAEUSER COMPANY	2002	natural gas	300	0.05	lb/mmBtu	LNB	2621	none specified	BACT
LA-0174	PORT HUDSON OPERATIONS	2002	natural gas	987	0.1	lb/mmBtu	LNB	2611	none specified	Other
MT-0028	AGRITECHNOLOGY MONTANA LLC	2001	natural gas	358	0.08	lb/mmBtu	LNB & FGR	2869	none specified	Other
LA-0140	GAYLORD CONTAINER CORPORATION	2001	natural gas	797.60	0.329	lb/mmBtu	staged comb.	2611	none specified	BACT
PA-0186	FPL ENERGY MARCUS HOOK, L.P.	2001	natural gas	1575	0.05	lb/mmBtu	good combustion	4911	none specified	BACT
SC-0061	COLUMBIA ENERGY LLC	2001	natural gas	350	0.04	lb/mmBtu	LNB & FGR	4911	none specified	BACT
SC-0071	COLUMBIA ENERGY CENTER I-26 & US HWY 21 SOUTH	2001	natural gas	350	0.04	lb/mmBtu	LNB	4911	none specified	BACT
PA-0187	GRAYS FERRY COGEN PARTNERSHIP	2001	natural gas	1119	0.1	lb/mmBtu	LNB	4911	none specified	BACT
TX-0419	CHANNEL ENERGY FACILITY	2000	natural gas	380	0.04	lb/mmBtu	good combustion	4911	none specified	BACT

TX-0297	EXXON-MOBIL BEAUMONT REFINERY	2000	natural gas	1121	0.06	lb/mmBtu	LNB	4911	none specified	Other
MI-0259	DETROIT EDISON/ CONNORS CREEK STATION	2000	natural gas	840	0.15	lb/mmBtu	LNB & FGR	4911	none specified	BACT
TX-0371	CORPUS CHRISTI ENERGY CENTER	2000	natural gas	315	0.06	lb/mmBtu	N	4911	none specified	BACT

*Never built

N = no control feasible

Emission limits range from 0.011 lb/mmBtu to 0.6 lb/mmBtu for boilers in the Koda Energy size range (Firing capacity with natural gas is 210 mmBtu/hr) with combustion controls being the most favored control technology. All of the 55 facilities used either no controls, or combustion controls to meet BACT limits. One facility's permit specified SCR, but that facility was never built.

Koda Energy considered the following technologies for control:

Control Technology	% Control
SCR	80-90%
Low NOx Burners and Flue Gas Recirculation	60 – 90%
Low NOx Burners alone	40-85%
SNCR	25 - 40%

Source of control efficiencies: AP42 1.4

SCR is the most effective control technology, and is technically feasible for use on natural gas fired boilers.

Koda Energy submits the table J-6 with RBLC data to assert that SCR is not economically feasible for this facility as it was apparently not for the other facilities. Koda is proposing an annual input capacity for natural gas burning of 20%. With these low emissions, the SCR would be even more expensive in $/ton of pollutant removed than the other facilities.

The next effective control, Low NOx Burners and over fire air in place of flue gas recirculation will be used. Both serve a similar function. Koda will couple this control with the SNCR. It should be noted that the burners are primarily designed for biomass burning, and so minimize NOx best for that fuel type. There will not be the control efficiency of NOx by these burners that could be achieved with low NOx burners designed specifically for natural gas. Koda Energy proposes a BACT limit for natural gas combustion of 0.10 lb/mmBtu. This is not the lowest limit in the RBLC database, but it must be remembered that the burners are designed to primarily burn biomass. The SNCR, low NOx burners and over fire air (which serves the same purpose as FGR) will be necessarily used to meet the limit.

CO BACT Analysis for Biomass Combustion

The RBLC database lists 32 biomass fueled facilities regulated for carbon monoxide from 1996 through 2006. Most of the facilities list good combustion practices as control (23), nine facilities list no control and one facility lists high pressure overfire air. Carbon monoxide limits range from 0.1 lb/mmBtu to 7.36 lb/mmBtu.

Koda Energy considered the following control technologies for CO;
thermal oxidation 95%, catalytic oxidation 95%, and good combustion practices. Thermal oxidation was eliminated as an option due to the very low CO concentrations in the exhaust gas, too low to support combustion. Catalytic oxidation was also eliminated as technically unfeasible due to the difficulties associated with the technology; particulate loading can cause catalyst plugging or slagging, and contaminants in the exhaust stream, such as the silica contained in the oat hulls or other agricultural waste, could foul the catalyst and minimize effectiveness. A vendor statement to that effect is shown below. Good combustion practices were chosen as the top control technology. As with the NOx BACT analysis, because the top control technology was chosen, no economic analysis is needed.

Vendor Statement Regarding Catalyst Fouling:

FOSTER WHEELER LIMITED
509 GLENDALE AVE., NIAGARA-ON-THE-LAKE, ONTARIO L0S 1J0

TELEPHONE: (905) 688-443
FAX: (905) 688-451

January 25, 2000

CINERGY SOLUTIONS
105 East Fourth Street
Suite 1850
Cincinnati, OH
4502-4008

Attention: **Mr. Tillman Burnett**
(Fax: 513-287-1288)

REF.: CO Catalyst - St. Paul Cogeneration Project
FWL Proposal: 200-067

As per our discussion, CO catalysts are not recommended for solid fuel fired applications due to the higher levels of contaminants in the fuel, and thus in the flue gas stream. The amounts of contaminants are limited as they reduce the effective life of the catalyst.

The following contaminants are known catalyst deactivators and contribute to shortened catalyst life: siloxanes, silicone oil, silizane, heavy and base metals such as lead, mercury, arsenic, antimony, sodium, potassium, lithium, zinc, copper, tin, iron, nickel and chrome; sulfur; phosphorous and fluorine, chlorine, bromine, iodine and ash. Hence, the contents of these contaminants in the catalyst must not singularly or collectively accumulate to such a level that exceeds 350mg/m^3 of catalyst washcoat as determined by ICP-OES (Inductively Coupled Plasma - Optical Emissions Spectroscopy) or glow discharge mass spectrophotometry.

In addition, the catalyst must be located in the clean gas stream and with a minimum gas inlet temperature of 392°F. This would require the heating of the flue gas after the particulate collection equipment or having a unit with a higher gas exit temperature (i.e., lower efficiency).

Sootblowers should also be installed in the duct to ensure plugging does not take place. This would increase the particulate level leaving the stack during the sooblowing period. The catalyst should also be washed in a mild acidic solution, and can be done in tanks on site. Frequency depends on the flue gas, but once a year is typical.

Therefore, while the installation of a CO catalyst on a solid fired unit is possible, it is not commercially or technically preferred. If you have any further questions, please let me know.

Best regards,
FOSTER WHEELER LIMITED

Paul Kelso, P.Eng
Commercial Manager
Industrial Business Unit

Table J-7: CO Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit	Units	Control Technology	Basis
NH-0013	Utility	Schiller Station	10/25/2004	NH	Biomass[3]	720.00	0.100	lb/MmBtu (24 hr/above 50% load)	GCP, fluidized bed design	BACT-PSD, MACT, NSPS, Operating permit, SIP
							72.000	lb/hr (all loads)		
NC-0092	ICI	Riegelwood Mill - Int. Paper CO	5/10/2001	NC	Wood Waste[1]	600.00	0.208	lb/mmBtu	GCP	BACT-PSD
MN-0057	Utility	Fibrominn Biomass Power Plant	10/23/2002	MN	Manure[7]	792.00	0.240	lb/mmBtu (24 hr avg)	GCP	BACT-PSD
MN-0046	Utility	District Energy St. Paul, Inc	11/15/2001	MN	Wood	550.00	0.300	lb/mmBtu (biomass)	GCP	BACT-PSD
MN-0059	ICI	Hibbing Public Utilities	6/30/2005	MN	Wood	230.00	0.300	lb/MM Btu (on a 4-hour block average)	GCP	BACT-PSD
GA-0117	Utility	Tri-Gen Biopower	5/24/2001	GA	Wood Waste & Papermill Sludge[9]	302.20	0.300	lb/mmBtu	GCP	BACT-PSD
GA-0116	Utility	Tri-Gen Biopower	11/24/1998	GA	Biomass[15]	265.10	0.300	lb/mmBtu	GCP	BACT-PSD
MN-058	ICI	Virginia Department of Public Utilities	6/30/2005	MN	Wood	230.00	0.300	lb/MM Btu (on a 4-hour block average)	GCP	BACT-PSD
SC-0045	Utility	Willamette Industries - Marlboro Mill	4/17/1996	SC	Wood waste	470.00	0.300	lb/mmBtu	GCP	case-by-case
LA-0178	Utility	Deridder Paper Mill	11/14/2003	LA	Bark[5]	454.29	0.330	lb/mmBtu (annual avg)	GCP	BACT-PSD, Operating permit
*WA-0329	Utility	Darrington Energy Cogeneration Power Plant	2/11/2005	WA	Wood Waste	403.00	0.350	lb/mmBtu (24 hr)	GCP	BACT-PSD
WA-0298	Utility	Sierra Pacific Industries Aberdeen Division	10/17/2002	WA	Waste Wood	310.00	0.350	lb/mmBtu	GCP	BACT-PSD
*WA-0327	Utility	Sierra Pacific Industries- Skagit County Lumber Mill	1/25/2006	WA	Bark & Waste Wood	430.00	0.350	lb/MmBtu	None	BACT-PSD
FL-0257	Utility	U.S. Sugar - Clewiston Sugar Mill And Refinery	11/18/2003	FL	Bagasse	936.00	0.380	lb/mmBtu (12 mo rolling avg)	GCP	Other Case-by-case (netted out of CO PSD)

Table J-7: CO Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit	Units	Control Technology	Basis
ME-0021	Utility	S.D. Warren Co. - Skowhegan, Me	11/27/2001	ME	Wood Waste[8]	1300.00	0.400	lb/mmBtu	GCP	BACT-PSD
VA-0268	ICI	Thermal Ventures	5/12/2002	VA	Wood[2]	120.00	0.440	lb/mmBtu	GCP & CEM	Other Case-by-case
MT-0007	ICI	Plum Creek Mfg	2/15/1997	MT	Hog Fuel	225.00	0.450	lb/mmBtu	GCP	BACT-PSD
ME-0026	Utility	Wheelabrator Sherman Energy Company	4/9/1999	ME	Wood[12]	315.00	0.450	lb/mmBtu	GCP	BACT-PSD
LA-0188	Utility	Inland Paper - Bogalusa Mill	11/23/2004	LA	Bark (different limits for fuel oil or fiber rejects)	787.50	0.600	lb/mmBtu (annual avg)	Overfire air system, GCP	BACT-PSD, Operating permit
ND-0018	ICI	ADM - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	200.00	0.630	lb/MmBtu	none	BACT-PSD
ND-0018	Utility	Archer Daniels Midland Co. - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	200.00	0.630	lb/mmBtu	None	BACT-PSD
ND-0018	Utility	Archer Daniels Midland Co. - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	280.00	0.630	lb/mmBtu	None	BACT-PSD
AR-0072	Utility	Del Tin Fiber Llc	2/28/2003	AR	Wood Waste[6]	291.00	0.780	lb/mmBtu	GCP	BACT-PSD
CA-0930	ICI	Sierra Pacific Industries	5/13/1998	CA	Wood	245.30	1.150	lb/mmBtu	High pressure overfire air	N/A
AR-0067	Utility	Weyerhaeuser Co. - Dierks Mill	8/9/1996	AR	Wood waste[17]	169.00	1.400	lb/mmBtu	None	BACT-PSD
NC-0070	Utility	Weyerhaeuser - Plymouth Pulp And Paper Mill	11/25/1998	NC	Hog Fuel[14]	889.00	1.610	lb/mmBtu	None	BACT-PSD
NC-0070	Utility	Weyerhaeuser - Plymouth Pulp And Paper Mill	11/25/1998	NC	Hog Fuel[13]	835.00	2.670	lb/mmBtu	None	BACT-PSD
FL-0220	Utility	Sugar Cane Growers Cooperative Of Florida	6/4/1996	FL	Bagasse[18]	504.00	5.500	lb/mmBtu	GCP	BACT-PSD
FL-0034	Utility	U.S. Sugar Clewiston Mill And Refinery	11/29/2000	FL	Bagasse[10]	633.00	6.500	lb/mmBtu	GCP	BACT-PSD
FL-0248	Utility	US Sugar Corporation	11/19/1999	FL	Bagasse[11]	633.00	6.500	lb/mmBtu	GCP	BACT-PSD

Table J-7: CO Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit	Units	Control Technology	Basis
OK-0038	Utility	Weyerhauser Co - Valliant	11/5/1996	OK	Bark[16]	900.00	7.360	lb/mmBtu	None	BACT-PSD
GA-0114	Utility	Inland Paperboard And Packaging, Inc. - Rome Linerboard Mill	10/13/2004	GA	Bark[4]	856.00	368.000	PPM @ 3% 02	Staged combustion, GCP	BACT-PSD

NOTES

GCP = good combustion practices

[1]Bark/wood fiber sludge/fossil fuel

[2]Wood limit 70% mixture, excludes any wood that contains chemical treatments or has paint, finishing materials, or paper or plastic laminates, avberage heat content 5,000 Btu/lb HHV

[3]720 mmBtu/hr on biomass. Wood fuel: includes whole tree chips, untreated byproducts or residue from forest products mfg operations, stump grindings, or ground pallets. 635 mmBtu/hr on coal with maximum sulfur content of 1.5 lb/mmBtu short term and 1.0 lb

[4]Bark, wastewater sludge, tdf, fuel oil; may be used to incienrate ncg gases; new boiler

[5]Existing 454.29 mmBtu/h wood-fired boiler bark: 454.29 mm btu/h natural gas: 262.00 mm btu/h natural gas is combusted only during startup and, in order to maintain the overall btu rate, during conditions when the hog fuel moisture content causes a reduct

[6]The heat energy system is a Callidus Closed Loop Gasification System (CLGS) which gasifies biomass fuel, which is bark, sawdust, sander dust, chips, and other residual wood materials, in a rotary kiln to produce a combustible gas used as fuel in a second

[7]Fuels include turkey manure and other biomass

[8]Boiler fires bark, wood/wood waste, dewatered mill sludge, no. 2 fuel oil, no. 6 fuel oil, tire derived fuel,waste papers, reclaimed specification and off spec waste oil.

[9]Multifuel boiler modified to increase heat input rate from 265.1 mmBtu/hr to 302.2 mmBtu/hr

[10]boiler limited to firing 400,000 t/yr bagasse and 500,00 gal/yr no.6 fuel oil. total heat input not to exceed 2,880,000 mmBtu/yr. heat input for boiler when cofired with fuel oil is 530 mmBtu/h (255 mmBtu/h oil, 305 mmBtu/h bagasse).

[11]Expand operation of existing sugar mill boiler No. 4. BACT determinations for CO, NOx, PM, SAM, SO2 and VOC. No. 6 fuel oil used as a supplement, limited to 1500 gal/h (224 mmBtu/h), and no more than 500,000 gal/y.

[12]Fuel is wood waste, no.2 fuel. # 2 fuel only for start up and emergency backup.

[13]Fires hog fuel, no. 6 fuel oil, coal, waste oil, sludge, high volume low concentration (hvlc) gases, fired at 835 mmBtu/h max heat input from hog fuel, 617 mmBtu/h max from no. 6 fuel oil, or for combination firing; 701.2 mmBtu/h from hog fuel and 319.8

[14]Fires hog fuel, no 6 fuel oil, coal waste oil, sludge, hvlc gases - fired at 889 mmBtu/h max heat input from multiple fuels and 800 mmBtu/h max heat input from no. 6 fuel oil

[15]Unit capable of burning woodwaste, mill sludge, tdf, pulp mill rejects (#2 fuel oil as startup fuel). Bubbling fluidized bed boiler

[16]The bark boiler is a multiple-fuel unit; gas, oil, and a variety of solids (including wood, wood bark, OCC rejects, and wastewater treatment sludges) can be used as fuel.

[17]25550.00 tons wood waste per month

[18]31.5 tph bagasse fuel feed. This modification addresses the co emission limit only.

Solid fuel boilers offer limited options for carbon monoxide control. Catalysts, which can provide control in some gas or oil combustion applications, are subject to fouling, as stated above..

The boiler design begins with the available fuels and addresses several constraints:

1. Combustion of a dry, fine, granular fuel,
2. Combustion of fuels containing higher fuel bound nitrogen than other forms of biomass such as wood,
3. Combustion of fuels containing higher alkali metals and silica than other biomass fuels such as wood.

These fuel constraints and the goal of minimizing NO_x emissions restrict the ability to limit CO emissions.

Koda Energy evaluated several boiler designs. The dry, fine, granular fuel is not suitable for feeding typical spreader-stoker fuel spouts. The project engineering study found suspension burners achieve better burnout to minimize unburned carbon losses. The suspension burner combustion efficiency provides more flexibility in achieving the required NO_x emission reductions when firing high nitrogen fuels. The project engineering study evaluated several grate systems. Two were viable but did not perform as well environmentally or economically with the design fuels as the proposed suspension burners firing dry, ground fuel.

The EERC tests [78, 79] looked at three variables – fuel type, swirl setting and excess air level. Previous tests had looked at primary and secondary air temperatures and had noted that higher primary air temperatures produce higher NO_x emissions. Increasing swirl settings decreased NO_x emissions and increased CO emissions. Increased excess air increased NO_x emissions and tended to decrease CO emissions. Previous tests showed NO_x emissions increasing with increasing temperature [78]. Lower flame temperatures can increase CO emissions.

Swirl refers to the use of secondary air to increase turbulence in the near-burner zone to set up an internal recirculation zone (IRZ) within the flame to improve mixing of combustion air and the pulverized fuel [79]. The proper swirl setting stabilizes the flame, preventing the loss of flame and diminishing the risk of dust explosion. Applying swirl to combustion air entrains fuel particles in the combustion air, increasing the release of volatiles and char combustion. The flame stability and increased carbon conversion associated with swirl also affects NO_x formation. Increased swirl increases flame temperatures and improves fuel-air mixing which create ideal conditions for NO_x formation. The EERC tests identified the swirl settings to produce optimum combustion conditions and then identified swirl conditions that maintain the flame stability while minimizing NO_x emissions from high nitrogen fuels. These conditions also elevate CO emissions.

The high alkalinity and silica content of the Koda Energy fuels helped determine the choice of a suspension burner as opposed to a spreader stoker of fluidized bed combustor. Increasing alkalinity and silica in the fuel can promote fouling and slagging inside the boiler. While silica alone melts at 3100 F, alkali metals (potassium and sodium) react with silicates to produce compounds that melt at 1400 F or lower [129, pg. 23]. Deposition rates increase with increasing temperatures and as chlorine content increases [14, pg. 49]. Baxter *et. al.* [14, p 76] find that potassium is the alkali species of concern in problematic biomass fuels. Chlorine is an important facilitator, forming potassium chloride, which deposits on surfaces and often reacts with sulfur oxides to form potassium sulfate. Potassium sulfate forms a sticky coating on surfaces and collects particles. Table J-7 compares the silicone dioxide and potassium oxide levels found in various fuels:

Table J-8: Fuel Silicone Dioxide and Potassium Oxide Content

Fuel/Fuel Mix	SiO_2 % in ash	K_2O % in ash

Oat Hulls	62.55	11.30
Wood	7.69	10.40
Barley Needles	31.84	22.10
Barley Dust and Chaff	65.12	12.53
Malt Sprouts	22.76	28.90
Design Fuel	**33.28**	**14.14**
60% load fuel mix	**49.97**	**16.58**
Worst case fuel mix	**55.00**	**14.47**

Fuel studies from various sources ([42], [55], [63], [73], [80], [86], [91], [129], [139], [161], [189], and [190]) confirm higher alkali contents in wood fuels than in coal and higher alkali concentrations in biomass fuels such as grains and grasses than in wood.

Boilers designed for high alkali and silica fuels typically "…have high waterwall surface areas, ample volume, low gas velocities, and low furnace exit gas temperatures." Miles *et. al.* [129, p. ii] also recommend combustion air control to control gas temperatures. They caution that when high alkaline fuels are burned alone, they require low temperature furnace conditions and frequent flyash removal. The Koda Energy furnace provides low temperature furnace conditions and ample volume to discourage fouling and slagging to which the design fuels are prone.

The Koda Energy fuel in terms of its size, alkalinity and silica content, requires a boiler design that increases the challenges of reducing NO_x emissions. High fuel nitrogen content increases this challenge. FuelTech, the supplier of the SNCR system, has specified a CO limit of 350 ppm in the upper furnace in order to optimize the SNCR performance. Under full load at 7% oxygen, the 350 ppm CO concentration translates to 0.37 lbs/mmBtu. At 60% load, the amount of excess air increases, the furnace combustion efficiency decreases, and fuel nitrogen content increases. At 60% load the position of the combustion zone relative to the SNCR nozzles changes and reduces their efficiency. The 60% load scenario will address increased NO_x by changing the combustion conditions to reduce NO_x emissions. At 60% load the CO concentration at 7% oxygen will increase to 400 ppm. This will translate to 0.43 lb/mmBtuCO emissions.

The relationship between the combustion controls necessary to reduce CO and controlling NOx emissions from fuels with high nitrogen contents is important in understanding CO BACT for the Koda Energy boiler. Table J-8 compares the RBLC database CO limits with NO_x limits:

Table J-9: RBLC CO limits Compared with NO_x Limits

RBLC ID	Facility	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit (lb/mmBtuMmBtu)	CO Rank	NOx Limit (lb/mmBtuMmBtu)	NOx Rank
NH-0013	Schiller Station	Wood3	720.00	0.100	1	0.075	1
NC-0092	Riegelwood Mill - Int. Paper CO	Wood Waste[1]	600.00	0.208	2	.350 -.400	20-21
MN-0046	District Energy St. Paul, Inc	Wood	550.00	0.300	3	0.150	5
MN-0059	Hibbing Public Utilities	Wood	230.00	0.300	3	0.150	5
GA-0117	Tri-Gen Biopower	Biomass[9]	302.20	0.300	3	0.250	14
GA-0116	Tri-Gen Biopower	Biomass[15]	265.10	0.300	3	0.250	14

RBLC ID	Facility	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit (lb/mmBtuMmBtu)	CO Rank	NOx Limit (lb/mmBtuMmBtu)	NOx Rank
MN-058	Virginia Department of Public Utilities	Wood	230.00	0.300	3	0.150	5
SC-0045	Willamette Industries - Marlboro Mill	Wood waste	470.00	0.300	3	0.300	19
*WA-0329	Darrington Energy Cogeneration Power Plant	Wood Waste	403.00	0.350	9	0.120	2
WA-0298	Sierra Pacific Industries Aberdeen Division	Waste Wood	310.00	0.350	9	0.150	5
*WA-0327	Sierra Pacific Industries- Skagit County Lumber Mill	Bark & Waste Wood	430.00	0.350	9	0.130	3
FL-0257	U.S. Sugar - Clewiston Sugar Mill And Refinery	Bagasse	936.00	0.380	12	0.140	4
ME-0021	S.D. Warren Co. - Skowhegan, Me	Wood Waste[8]	1300.00	0.400	13	0.200	9
VA-0268	Thermal Ventures	Wood[2]	120.00	0.440	14	0.400	22
MT-0007	Plum Creek Mfg	Hog Fuel	225.00	0.450	15	0.462	23
ME-0026	Wheelabrator Sherman Energy Company	Wood[12]	315.00	0.450	15	0.250	14
LA-0188	Inland Paper - Bogalusa Mill	Bark	787.50	0.600	17	0.250	14
ND-0018	Archer Daniels Midland Co. - Northern Sun Veg. Oil	Hulls	200.00	0.630	18	0.200	9
ND-0018	Archer Daniels Midland Co. - Northern Sun Veg. Oil	Hulls	280.00	0.630	18	0.200	9
CA-0930	Sierra Pacific Industries	Wood	245.30	1.150	20	0.230	13
AR-0067	Weyerhaeuser Co. - Dierks Mill	Wood waste[17]	169.00	1.400	21	0.200	9
FL-0220	Sugar Cane Growers Cooperative Of Florida	Bagasse[18]	504.00	5.500	22	0.492	24
FL-0034	U.S. Sugar Clewiston Mill And Refinery	Bagasse[10]	633.00	6.500	23	0.200	9
FL-0248	US Sugar Corporation	Bagasse[11]	633.00	6.500	24	0.280	18

RBLC ID	Facility	Primary Fuel	Boiler Heat Input (MM Btu/hr	CO Limit (lb/mmBtuMmBtu)	CO Rank	NOx Limit (lb/mmBtuMmBtu)	NOx Rank
OK-0038	Weyerhauser Co - Valliant	Bark[16]	900.00	7.360	25	0.300	19

As can be seen from the table above, there is generally and inverse relationship betweem CO and NOx emission limits.

As discussed in the section on NO_x BACT, Schiller Station is a special case, operating a fluidized bed combustor. The facility is permitted to burn wood from whole trees, forest product manufacturing operations, stump grindings and pallets. This material is primarily burning wet wood. Wet wood has a lower CO emission rate (0.22 lb/mmBtu than dry wood (0.49 lb/mmBtu) [240]. The fuel is larger sized (which affects CO emissions). The fuel also has a lower nitrogen content.

Several of the larger boilers (greater than 300 mmBtu/hr heat input) in the RBLC database are either at sources that are a major source of hazardous air pollutants or are a major source of air pollutant due to the fuels they are permitted to burn. These facilities are covered by the Industrial/Commercial/Institutional Boilers and Process Heaters National Emission Standards for Hazardous Air Pollutants (40 CFR Part 63 Subpart DDDDD) which includes CO emission limits. These facilities compensate for lower CO emission limits with higher NO_x limits. An example of this is the International Paper Company Riegelwood Mill. It is a 600 mmBtu/hr. boiler burning bark, wood fiber, sludge, and fossil fuel. It has a CO limit of 0.208 lb/mmBtuand a NOx emission limit of 0.350 to 0.400 lb/mmBtu. A Phyllis database sample with 13 references identifies a 0.95% by weight mean nitrogen content for papermill sludge [63]. The mean nitrogen content for the North American wood references in the database is 0.40%. The mean nitrogen content for the best case Koda Energy fuel mixture is 1.29% and the worst-case fuel nitrogen content is 2.94%. Koda Energy will need to make combustion adjustments to meet the proposed NO_x emission limits and these adjustments will emit higher rates of CO.

There are five sources in the RBLC database with 0.300 lbs/mmBtu CO emission rate limits. These boilers range from 230 mmBtu/hr to 550 mmBtu/hr. Four of the facilities burn wet wood. Three of these sources have NO_x emission rate limits of 0.150 lb/mmBtu and one has a 0.300 lb/mmBtu NO_x emission rate limit. As discussed above, wet wood has a lower CO emission rate (0.22 lb/mmBtu) than dry wood (0.49 lb/mmBtu) [240]. The Koda Energy fuel more closely resembles dry wood. The fuel is larger sized which decreases the CO emission rate in boilers without secondary overfire air. The fuel also has a lower nitrogen content (0.40 % as opposed to the Koda Energy worst case fuel nitrogen content of 2.94%). Meeting Koda Energy worst case fuel NO_x emission limits will require combustion adjustments that will increase CO emission rates.

Tri-Gen Biopower is listed twice in the group of facilities with a 0.300 lbs/mmBtu CO emission rate limit. The source also has a 0.250 lb/mmBtu NO_x emission limit. This is one source originally permitted at 265.1 mmBtu/hr and then later increased to 302.2 mmBtu/hr. The source is a bubbling fluidized bed combustor permitted to burn woodwaste, papermill sludge, tire derived fuel, pulp mill rejects and #2 fuel oil. The Phyllis database includes references for six tests on waste tires and gives a mean nitrogen content of 0.41% [63]. Papermill sludge nitrogen averages 0.95% by weight and wood's nitrogen content averages 0.40% by weight. The nitrogen content of the fuel for this facility is well below that for the worst-case Koda Energy fuel (2.94%). Meeting Koda Energy worst-case fuel NO_x emission limits will require combustion adjustments that will increase CO emission rates.

The next group of fifteen sources in the RBLC database have CO emission rate limits ranging from 0.350 lb/mmBtu to 7.63 lb/mmBtu and NO_x emission rate limits ranging from 0.120 lb/mmBtu to 0.300 lb/mmBtu. Eight of these sources burn wet waste wood. Four of these sources burn bagasse, two sources burn sunflower hulls and one source is permitted to burn bark, wood, wood waste, papermill sludge, number 2 fuel oil, number 6 fuel oil and tire derived fuels. Four of the sources burning wood have CO and NO_x emission limits greater than those requested for Koda Energy.

Three of the wet wood fired boiler sources have 0.350 lb/mmBtuCO emission rate limits and NO_x emission rate limits ranging from 0.120 to 0.150 lb/mmBtu. Considering the differences in the fuel nitrogen content (0.40% versus 2.94%), Koda Energy is achieving a much higher NO_x removal rate than these sources at the expense of a somewhat higher CO emission rate.

Two additional sources that burn wet wood have CO emission rate limits of 1.15 and 1.40 lb/mmBtu and NO_x emission rate limits of 0.23 and 0.20 lb/mmBtu. Considering the differences in the fuel nitrogen content (0.40% versus 2.94%), Koda Energy is achieving a much higher NO_x removal rate than these sources and a much lower CO emission rate.

The four sources burning bagasse have 0.380 to 6.50 lb/mmBtu CO emission rate limits. They have NO_x emission rate limits ranging from 0.140 to 0.492 lb/mmBtu. The best controlled source has a 0.380 lb/mmBtu CO emission rate limit and a 0.140 lb/mmBtuNO_x emission rate limit. A Phyllis database sample with 13 references for bagasse gives a mean nitrogen content of 0.60%. Considering the differences in the fuel nitrogen content (0.60% versus 2.94%), Koda Energy is achieving a much higher NO_x removal rate than these sources at the expense of a somewhat higher CO emission rate.

An Archer Daniels Midland facility in North Dakota has two sources permitted to burn sunflower hulls. This facility now processes soybeans and processes sunflowers on a limited bases. It has replaced sunflowers with wet wood waste. The two Archer Daniels Midland sources have 0.630 lb/mmBtu CO emission rate limits and 0.20 lb/mmBtu NO_x emission rate limits. A Phyllis database sample with 7 references gives the nitrogen content for sunflower hulls as 0.88% by weight. Considering the differences in the fuel nitrogen content, Koda Energy is achieving a much higher NO_x removal rate than these sources and a lower CO emission rate.

Based on the discussion of boiler requirements specified by the proposed fuels for this project, Koda Energy proposes the use of a suspension burner with good combustion controls as CO BACT for this project with an emission limit of 0.43 lb/mmBtu on a 30 day rolling average. A 30-day rolling average was chosen to be consistent with the averaging time in 40 CFR Part 63, Subp. DDDDD, the most recent boiler standard promulgated.

CO BACT Analysis for Natural Gas Combustion

As stated above, typically, natural gas will not be a major fuel source at Koda Energy. Its primary function is the provide a pilot (5% of heat input) when Koda is burning higher moisture fuels. It may be used during startup, and in the event of an interruption in fuel supply. If the boiler is fired solely on natural gas, the maximum heat input would be 210 mmBtu/hr.

A review of BACT determinations made from 2000 to 2007 is shown below:

Table J-10

BACT Determinations for Boilers >100 mmBtu/hr and < 250 mmBtu/hr

RBLC ID	Facility	Year issued	Primary Fuel	Boiler Heat Input mmBtu	CO limit	Units	Control Technology	SIC	Average Time	Basis
MN-0066	NORTHERN STATES POWER CO. DBA XCEL ENERGY - RIVERSIDE PLANT	2006	natural gas	160	0.08	lb/mmBtu	good combustion	4911	3 hour ave.	BACT
MN-0062	HEARTLAND CORN PRODUCTS	2005	natural gas	198	0.04	lb/mmBtu	N	2869	not specified	BACT
NC-0101	FORSYTH ENERGY PLANT	2005	natural gas	110.2	0.0824	lb/mmBtu	good combustion	4911	3-hour ave.	BACT
LA-0204	PLAQUEMINE PVC PLANT Blrs A,B	2005	not specified	250.00	0.036	lb/mmBtu	good combustion	2821	3-hour test	BACT
LA-0204	PLAQUEMINE PVC PLANT Blrs C,D	2005	not specified	250.00	0.036	lb/mmBtu	good combustion	2821	3-hour test	BACT
OR-0046	TURNER ENERGY CENTER, LLC	2005	natural gas	47.7	0.038	lb/mmBtu	catalyst	4911	3-hour block	BACT
WI-0228	WPS - WESTON PLANT	2004	natural gas	229.8	0.08	lb/mmBtu	good combustion	4911	not specified	BACT
OH-0241	MILLER BREWING COMPANY - TRENTON	2004	natural gas also burns oil and coal	238	0.084	lb/mmBtu	N	2082	not specified	BACT
WV-0023	MAIDSVILLE	2004	natural gas	225	0.04	lb/mmBtu	good combustion	2874	3-hour rolling	BACT
OH-0282	CARGILL OILSEEDS DIVISION	2003	natural gas	185	0.037	lb/mmBtu	N	2075	not specified	BACT
LA-0184	TITANIUM DIOXIDE FACILITY	2003	natural gas	135	0.091	lb/mmBtu	good combustion	2816	annual ave	BACT

VA-0270	VCU EAST PLANT	2003	natural gas	150	0.1	lb/mmBtu	good combustion	8062	not specified	BACT
VA-0278	VCU EAST PLANT (3 blrs)	2003	natural gas	150.6	0.1	lb/mmBtu	good combustion	8062	not specified	BACT
CO-0052	ROCKY MOUNTAIN ENERGY CENTER, LLC.	2002	natural gas	129	0.039	lb/mmBtu	good combustion	4911	not specified	BACT
CA-1024	AES HUNTINGTON BEACH	2002	natural gas	225	5	PPMVD @3% 02	catalyst	4911	1-hour ave	BACT
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	2002	natural gas	180	0.18	lb/mmBtu	N	2911	not specified	BACT
NJ-0036	AES RED OAK LLC	2001	natural gas	120	0.05	lb/mmBtu	good combustion	4911	not specified	BACT
AR-0057	TENASKA ARKANSAS PARTNERS, LP	2001	natural gas	122	0.11	lb/mmBtu	good combustion	4911	not specified	BACT
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	2001	natural gas	124.6	0.082	lb/mmBtu	good combustion	4911	not specified	BACT

Emission limits range from 0.036 lb/mmBtu to 0.18 lb/mmBtu. 16 of the 18 facilities use either no control or combustion controls.

Koda Energy considered the following control technologies:

Control Technology	Reduction Efficiency
CO Oxidation Catalyst	95%
Good Combustion Practices	variable

CO Catalyst control efficiency from "Computer Simulated Plant Design for Waste Minimization/Pollution Prevention"

It is technically feasible to install a separate exhaust stream, bypassing the main flue gas route, and to install a CO catalyst for CO control when only natural gas is being burned. This would probably require a separate stack. Koda Energy is waiting for information from the vendor as to the cost of such a measure. However, Koda Energy is willing to take a 20% annual limit on natural gas burning alone. Coupled with that limit Koda believes that the end result will be prohibitively expensive, and in the interim proposes a CO limit of 200 ppm @3% O2 which roughly equates to 0.167 lb/mmBtu. This is within the range of the most recent BACT determinations in the RBLC. It is on the high end, and as with the NOx limit, needs to be set higher because the boiler and burners are primarily designed to burn biomass.

PM/PM_{10} Biomass BACT Determination

The RBLC database lists 24 sources regulated for PM/PM_{10} from 1996 through 2006. Most of the sources list ESP as control (17) either alone or with mechanical dust collection, two sources are controlled with fabric filters, three with wet scrubbers, one with wet impingement and one with good combustion practices. Seventeen of the sources burn wood, wood waste and/or bark. Six of the sources that burn wood also burn sludge and other fuels. None of the sources in the RBLC database is a suspension burner burning the kinds of fuels proposed for Koda Energy. One source burns poultry manure, three sources burn bagasse, and two sources burn sunflower hulls. PM_{10} emission rates range from 0.01 lb/mmBtu to 0.250 lb/mmBtu.

Table J-9: PM Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr)	PM_{10} Limit	Units	Control Technology	Basis
NH-0013	Utility	Schiller Station	10/25/2004	NH	Biomass[3]	720.00	0.025 0.010 0.030	lb/mmBtu (no averaging) lb/hr (24 hour avg) lb/mmBtu (30 day rolling)	Fabric filter	MACT, NSPS, Operating permit, SIP
*WA-0329	Utility	Darrington Energy Cogeneration Power Plant	2/11/2005	WA	Wood Waste	403.00	0.020	lb/mmBtu (24 hr)	Dry ESP	BACT-PSD
MN-0057	Utility	Fibrominn Biomass Power Plant	10/23/2002	MN	Manure[5]	792.00	0.020	lb/mmBtu (3-hr test)	Fabric filter	BACT-PSD, NSPS
WA-0298	Utility	Sierra Pacific Industries Aberdeen Division	10/17/2002	WA	Waste Wood	310.00	0.020	lb/mmBtu	ESP	BACT-PSD
*WA-0327	Utility	Sierra Pacific Industries- Skagit County Lumber Mill	1/25/2006	WA	Bark & Waste Wood	430.00	0.020	lb/mmBtu24 hr)	ESP	BACT-PSD
MN-0059	ICI	Hibbing Public Utilities	6/30/2005	MN	Wood	230.00	0.025	lb/MM Btu	ESP	BACT-PSD
GA-0114	Utility	Inland Paperboard And Packaging, Inc. - Rome Linerboard Mill	10/13/2004	GA	Bark[4]	856.00	0.025	lb/mmBtu	ESP	BACT-PSD, MACT, NESHAP, NSPS, SIP
MN-058	ICI	Virginia Department of Public Utilities	6/30/2005	MN	Wood	230.00	0.025	lb/MM Btu	ESP	BACT-PSD
GA-0117	Utility	Tri-Gen Biopower	5/24/2001	GA	Wood Waste & Papermill Sludge[7]	302.20	0.030	lb/mmBtu	ESP and wet scrubber	BACT-PSD, Other
FL-0257	Utility	U.S. Sugar - Clewiston Sugar Mill And Refinery	11/18/2003	FL	Bagasse	936.00	0.026	lb/mmBtu	Wet Cyclone & ESP	BACT-PSD
MN-0046	Utility	District Energy St. Paul, Inc	11/15/2001	MN	Wood	550.00	0.030	lb/mmBtu	cyclone, ESP	BACT-PSD
ME-0021	Utility	S.D. Warren Co. - Skowhegan, Me	11/27/2001	ME	Wood Waste[6]	1300.00	0.030	lb/mmBtu	Mechanical dust collector, ESP	BACT-PSD

Table J-9: PM Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr)	PM_{10} Limit	Units	Control Technology	Basis
GA-0116	Utility	Tri-Gen Biopower	11/24/1998	GA	Biomass[10]	265.10	0.030	lb/mmBtu	ESP and wet scrubber	BACT-PSD
CA-0930	ICI	Sierra Pacific Industries - Quincy	5/13/1998	CA	Wood	245.30	0.035	lb/MM Btu	multicyclones and ESP	N/A
ME-0026	Utility	Wheelabrator Sherman Energy Company	4/9/1999	ME	Wood[9]	315.00	0.036	lb/mmBtu	ESSP, Cyclone	BACT-PSD
SC-0045	Utility	Willamette Industries - Marlboro Mill	4/17/1996	SC	Wood waste	470.00	0.050	lb/mmBtu	ESP	case-by-case
AR-0067	Utility	Weyerhaeuser Co. - Dierks Mill	8/9/1996	AR	Wood waste[12]	169.00	0.060	lb/mmBtu	Multiclone &y ESP	BACT-PSD
OK-0038	Utility	Weyerhauser Co - Valliant	11/5/1996	OK	Bark[11]	900.00	0.100	lb/mmBtu	Wet scrubber	BACT-PSD
VA-0268	ICI	Thermal Ventures	5/12/2002	VA	Wood[2]	120.00	0.140	lb/MM Btu	GCP & CEM	Other Case-by-case
LA-0188	Utility	Inland Paper - Bogalusa Mill	11/23/2004	LA	Bark (different limits for fuel oil or fiber rejects)	787.50	0.150	lb/mmBtu (24 hr)	Wet scrubber	BACT-PSD, NSPS, Operating permit
FL-0034	Utility	U.S. Sugar Clewiston Mill And Refinery	11/29/2000	FL	Bagasse[8]	633.00	0.150	lb/mmBtu	wet impingement	BACT-PSD
ND-0018	ICI	Archer Daniels Midland Co. - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	200.00	0.240	lb/MM Btu	ESP	BACT-PSD
ND-0018	Utility	Archer Daniels Midland Co. - Northern Sun Veg. Oil	7/9/1998	ND	Hulls	280.00	0.240	lb/mmBtu	ESP	BACT-PSD
NC-0092	ICI	Riegelwood Mill - Int. Paper CO	5/10/2001	NC	Wood Waste[1]	600.00	0.250	lb/MM Btu	multicyclone and variable throat venturi-type wet scrubber	BACT-PSD

GCP = good combustion practices

[1]Bark/wood fiber sludge/fossil fuel

[2]Wood limit 70% mixture, excludes any wood that contains chemical treatments or has paint, finishing materials, or paper or plastic laminates,

Table J-9: PM Limits in the RBLC Database

RBLC ID	Class	Facility	Year Issued	State	Primary Fuel	Boiler Heat Input (MM Btu/hr)	PM_{10} Limit	Units	Control Technology	Basis

average heat content 5,000 Btu/lb HHV

[3]720 mmBtu/hr on biomass. Wood fuel: includes whole tree chips, untreated byproducts or residue from forest products mfg operations, stump grindings, or ground pallets. 635 mmBtu/hr on coal with maximum sulfur content of 1.5 lb/mmBtuu short term and 1.0 lb

[4]Bark, wastewater sludge, tdf, fuel oil; may be used to incienrate ncg gases; new boiler

[5]Fuels include turkey manure and other biomass

[6]Boiler fires bark, wood/wood waste, dewatered mill sludge, no. 2 fuel oil, no. 6 fuel oil, tire derived fuel,waste papers, reclaimed specification and off spec waste oil.

[7]Multifuel boiler modifed to increase heat input rate from 265.1 mmBtu\/hr to 302.2 mmBtu/hr

[8]boiler limited to firing 400,000 t/yr bagasse and 500,00 gal/yr no.6 fuel oil. total heat input not to exceed 2,880,000 mmBtummBtu/yr. heat input for boiler when cofired with fuel oil is 530 mmBtu/h (255 mmBtu/h oil, 305 mmBtummBtu/h bagasse).

[9]Fuel is wood waste, no.2 fuel. # 2 fuel only for start up and emergency backup.

[15]Fires hog fuel, no. 6 fuel oil, coal, waste oil, sludge, high volume low concentration (hvlc) gases, fired at 835 mmBtu/h max heat input from hog fuel, 617 mmBtu/h max from no. 6 fuel oil, or for combination firing; 701.2 mmBtu/h from hog fuel and 319.8

[10]Unit capable of burning woodwaste, mill sludge, tdf, pulp mill rejects (#2 fuel oil as startup fuel). Bubbling fluidized bed boiler

[11]The bark boiler is a multiple-fuel unit; gas, oil, and a variety of solids (including wood, wood bark, OCC rejects, and wastewater treatment sludges) can be used as fuel.

[12]25550.00 tons wood waste per month

Table J-10 shows the particulate control efficiency range used by EPA for AP-42 emission factors for solid fuel boilers:

Table J-11: Particulate Control Efficiencies

Control Technology	EPA Control Efficiency Range (%)
Multicyclone + Fabric Filter	99.9+
Multicyclone + ESP	99
Fabric Filter	95-99.9
ESP	90-99
Mulicyclone	30-99

Two sources in the RBLC database are controlled with fabric filters. Schiller Station (NH-0013) is a utility boiler permitted to fire up to 720 mmBtu/hr of wood or 635 mmBtu/hr of bituminous coal. To control SO_2 and acid emissions the system has a limestone injection system, which would interfere with the operation of an ESP but also reduces the risk of fires in the fabric filter. The Fibrominn Biomass Power Plant in Minnesota also has a fabric filter with a spray dryer (limestone injection) to control particulates, sulfur dioxide, sulfuric acid mist and hydrochloric acid.. Fabric filters are generally considered unacceptable for the control of biomass combustion due to the danger of fires unless there is some acid gas control preceding the fabric filter..

A facility from Ohio (OH-0269) is also listed with a baghouse but Ohio EPA indicates that this facility was never built and the permit has expired [134, 136, 209]. The remaining best-controlled facilities in the RBLC database are controlled with ESP or ESP and multicyclone.

In the wood products industry the dry electrostatic precipitator preceded by multicyclones is now normally considered the best available control technology for wood fired boiler emissions [76]. Jenkins, *et. al.,* [88] in a study of the combustion of leached rice straw for power generation, observed that ESPs maintained effective control of particulate mater emissions while baghouse performance did not achieve the same results. In the RBLC database, with the exception of short-term limits at Schiller Station, ESPs and ESP-multicyclone combinations achieve the same level of control as fabric filters. NCASI [151] in their comments on the EPA AP-42 factors for wood residue combustion note that fabric filters are rarely used or even considered when high efficiencies are necessary.

Fire issues from carbonaceous ash question the feasibility of fabric filters for particulate control for biomass boilers [134, 135, 136]. The Technical Support Documents for the City of Virginia [134, pg. 20] and Hibbing Public Utilities [136, pg. 20] indicate that the applicants solicited bids for fabric filters and were informed by vendors that the threat of fire made fabric filters infeasible for biomass boilers. Therefore, Koda Energy proposes a multiclone followed by an ESP as the top technically feasible control technology. Because the top technically feasible control technology is begin specified, a cost analysis is not necessary

ESP and Multicyclones

The Koda Energy ESP is designed for an inlet gas volume of 125,000 acfm and an inlet gas temperature of 350 F. The treatment time will be 11.9 seconds. The ESP will have 4 fields and a collecting area of 49,613 square feet (397 sq.ft./acfm). An advanced electrical control system with an automatic control circuit regulates the high voltage power supply output for maximum precipitator efficiency regardless of the variations in fuel characteristics. Automatic electromagnetic uplift-gravity impact rappers will minimize particulate re-entrainment.

The Electrostatic Precipitator has a manufacturer's performance and testing guarantee to not emit more than 0.020 lbs of particulate per mmBtu or to remove 99.41% by weight of the inlet particulate load. If the inlet load is greater than the design conditions the efficiency of 99.41% is guaranteed. If the inlet particulate load is equal to or less than the design conditions a residual of 0.020 lbs of particulate per mmBtu is guaranteed.

Based on inlet concentrations (4.8226 lbs/mmBtu) calculated from the ash content of the worst-case fuel (oat hulls and Rahr fuels), and assuming 99.41% removal efficiency by weight, Koda Energy will achieve a controlled 0.030 lb/mmBtu PM_{10} emission rate. Koda Energy proposes the following limit:

40 CFR Section 52.21(j) BACT limit and Minn. R. 7007.3000. Also meets the requirements of 40 CFR 60, subp. Db.	PM: less than or equal to 0.02 lbs/million BTU heat input using a 3 hour average Or A removal efficiency of 99.4% by weight if the inlet loading is greater than the ESP design rate, but not to exceed 0.03 lb/mmBtu. This limit applies when the boiler is burning biomass.

The vendor will guarantee the above for PM as measured by Method 5. Due to the operation of the SNCR, the high alkalinity of the fuel, and the presence of chlorides and sulfates present in the fuel, there is the potential to generate more aerosols than when burning other types of fuel. As such, Koda Energy proposes the following limit for PM10 which includes organic and inorganic condensables:

40 CFR Section 52.21(j) BACT limit and Minn. R. 7007.3000.	PM10 : less than or equal to 0.037 lbs/million BTU heat input using a 3 hour average This limit applies when the boiler is burning biomass.

The manufacturer also guarantees the one-hour average opacity of the flue gas when operating at design conditions to be less than 10%.

Five sources in the RBLC database achieve a better control efficiency than the proposed Koda Energy PM_{10} emission rate. One is a wood fired boiler (Schiller Station) controlled with a fabric filter and limestone injection, one is a manure fired boiler controlled with fabric filters and limestone injection, and three are wood-fired boilers controlled with ESPs.

The ash content of Koda Energy fuels ranges from 3.92% to 4.95%. The ash content of wood samples used in the Koda Energy combustion tests was 2.51%. A Phyllis database [63] sample with 330 references has a mean value ash content of 1.1% for untreated wood. Considering the higher ash content of the fuel, Koda Energy is achieving particulate control equivalent to the best-controlled sources in the RBLC database.

PM/PM10 BACT Analysis for Natural Gas Combustion Only

Koda Energy considered the following control technologies for particulate emissions control while burning natural gas:

Table J-12: Particulate Control Efficiencies

Control Technology	EPA Control Efficiency Range (%)
Multicyclone + Fabric Filter	99.9+
Multicyclone + ESP	99
Fabric Filter	95-99.9
ESP	90-99
Mulicyclone	30-99

The boiler will be fitted with a multicyclone and ESP for the reasons given above in the biomass BACT PM/PM10 discussion.

The following BACT determinations from 2000 through present are shown below:

Table J-13

RBLC ID	Facility	Year issued	Primary Fuel	Boiler Heat Input mmBtu	PM limit	Units	Control Technology	SIC	Average Time	Basis
NC-0101	FORSYTH ENERGY PLANT	2005	natural gas	110.2	0.007	PM10 lb/mmBtu	N	4911	not specified	BACT
LA-0204	PLAQUEMINE PVC PLANT Boilers A,B	2005	not specified	250.00	0.005	PM10 lb/mmBtu	good combustion	2821	not specified	BACT
LA-0204	PLAQUEMINE PVC PLANT Blrs C,D	2005	not specified	250.00	0.005	PM10 lb/mmBtu	good combustion	2821	not specified	BACT
OR-0046	TURNER ENERGY CENTER, LLC	2005	natural gas	47.7	use of natural gas considered BACT, no limit					
WI-0228	WPS - WESTON PLANT	2004	natural gas	229.8	0.0075	PM10 lb/mmBtu	good combustion	4911	not specified	BACT
MS-0069	DUPONT DELISLE FACILITY Boiler 4	2004	natural gas	231.00	0.0076	PM10 lb/mmBtu	fuel type	2816	not specified	BACT
MS-0069	DUPONT DELISLE FACILITY Boiler 3	2004	natural gas	231.00	0.0076	PM10 lb/mmBtu	fuel type	2816	not specified	BACT
OH-0241	MILLER BREWING COMPANY - TRENTON	2004	natural gas also burns oil and coal	238	0.02	PM10 lb/mmBtu	baghouse	2082	not specified	BACT
WV-0023	MAIDSVILLE	2004	natural gas	225	0.0022	lb/mmBtu	good combustion	2874	not specified	BACT
OH-0282	CARGILL OILSEEDS DIVISION	2003	natural gas	185	0.0019	PM & PM10 lb/mmBtu	N	2075	not specified	BACT
VA-0270	VCU EAST PLANT	2003	natural gas	150	0.01	PM & PM10 lb/mmBtu	good combustion	8062	not specified	BACT

VA-0278	VCU EAST PLANT (3 blrs)	2003	natural gas	150.6	0.008	PM10 lb/mmBtu	N	8062	not specified	BACT
CA-1024	AES HUNTINGTON BEACH	2002	natural gas	225	0.01	gr/dscf	N	4911	not specified	BACT
TN-0153	WILLIAMS REFINING & MARKETING, L.L.C.	2002	natural gas	180	0.0075	PM/PM10 lb/mmBtu	N	2911	not specified	BACT
FL-0251	OKEELANTA CORP-ORATION SUGAR MILL	2002	natural gas	211	fuel type is considered BACT			2061		
NJ-0036	AES RED OAK LLC	2001	natural gas	120	0.0066	lb/mmBtu	good combustion	4911	not specified	BACT
AR-0057	TENASKA ARKANSAS PARTNERS, LP	2001	natural gas	122	0.005	PM10 lb/mmBtu	good combustion	4911	not specified	BACT
IN-0085	PSEG LAWRENCEBURG ENERGY FACILITY	2001	natural gas	124.6	0.007	lb/mmBtu	good combustion	4911	not specified	BACT
MN-0039	MINNESOTA CORN PROCESSORS	2000	natural gas	237.4	0.0084	PM & PM10 lb/mmBtu	fuel type	2046	not specified	BACT

N=no controls feasible.

Results are all PM unless specified PM10 alone or both PM and PM10. Emission limits range from 0.0022 lb/mmBtu to 0.02 lb/mmBtu. In all cases control was considered infeasible, or good combustion or fuel type was considered BACT. Koda Energy asserts that this is proof that the addition of a baghouse collector and additional ducting would be prohibitively expensive.

The source will have an existing multicyclone and ESP. The vendor does not recommend opereation of the ESP when there is so little PM in the flue gas. The transformer-rectifier sets will apply maximum power since there will be no sparking detected. This will consume power with no benefit, and actually break down air to make ozone. Also, the vendor states that it is not good operating practice to combine natural gas firing with the potential for an ignition souce in the ESP should it spark.

Koda Energy proposes the use of natural gas with a cyclone as BACT technology and an emission limit of 0.01 lb/mmBtu. Again, the limit that is in the upper range of those found in the RBLC database is necessary because natural gas is a secondary fuel, and the boiler is not designed for optimal operation on that fuel.

Other Particulate Emissions

Air Pollution Control Equipment

Baghouses will control dust from the fuel handling and processing system and the ash handling system. Truck traffic areas will be paved.

BACT for Fuel Handling

Material handling for the wood fired boilers in the RBLC database primarily addresses emissions from handling wet wood which may be either stored outside or covered and is then chipped prior to combustion. The only biomass combustion source, the Archer Daniels Midland – Northern Sun Vegetable Oil (ADM) facility in North Dakota, handles fuels similar to Koda Energy. The ADM facility controls seed storage, hull storage bin vents, hammermills, and truck meal loadout with fabric filters. Elevators and conveying are controlled with cyclones.

Koda Energy searched the RBLC database on 5/13/07 and listed facilities permitted with BACT limits from 2000 to present under the categories 70.230 Grain Loading and Unloading and 70.290 Grain Handling. Most of these involved soybeans or corn. Three facilities – Golden Grain Energy in Iowa, Red Tail Energy in North Dakota, and the Anheuser-Busch Houston Texas Brewery handle grain. The best handled facility for grain receiving has an enclosed receiving pit controlled by a fabric filter. The best-controlled sources for other processes (conveying, storage, and grinding) are controlled by fabric filters.

Table J-14

Table J-14

RBLC ID	Facility	Year issued	throughput	PM limit	Units	Control Technology	Average Time	Basis
IA-0082	GOLDEN GRAIN ENERGY Gran receiving	2006	4000.00 T/D	0.0012	PM10 & PM gr/dscf	baghouse	3-hour	BACT
ND-0020	RICHARDTON PLANT unloading	2004	420 tph	0.004	PM10 gr/dscf	baghouse	none specified	BACT
IN-0097	CARGILL, INC Grain receiving	2001	750.t/hr	0.005	PM10 & PM gr/dscf	baghouse	none specified	BACT
OH-0251	CENTRAL SOYA COMPANY INC. unloading	2001	300000 t/yr	0.0025	PM10 gr/dscf	baghouse	none specified	BACT
OH-0251	CENTRAL SOYA COMPANY INC. (transfer)	2001	610000 t/yr	0.0025	PM10 gr/dscf	baghouse	none specified	BACT
	Central Soya has many grain handling process controlled by baghouse. Most with an emission limit of 0.0025 gr/dscf							
IA-0082	GOLDEN GRAIN ENERGY hammermills	2006	10000.00 units/H	0.003	PM10 & PM gr/dscf	baghouse	3-hour	BACT
IL-0102	AVENTINE RENEWABLE ENERGY, INC., grain hammermill	2005		0.005	gr/dscf	baghouse	none specified	BACT

IL-0102	AVENTINE RENEWABLE ENERGY, INC., feed transfer	2005		0.005	gr/dscf	baghouse	none specified	BACT
ND-0020	RICHARDTON PLANT milling	2004	76.00 T/H	0.004	gr/dscf	baghouse	3-hour	BACT
WI-0207	ACE ETHANOL - STANLEY, corn dump pit, auger, elevator	2004		0.004	gr/dscf	baghouse	none specified	BACT
WI-0207	ACE ETHANOL - STANLEY, ddgs dump pit, auger, elevator	2004		0.004	gr/dscf	baghouse	none specified	BACT
WI-0207	ACE ETHANOL - STANLEY, surge bin, milling	2004	2200.00 BU/H	0.004	gr/dscf	baghouse	none specified	BACT
WI-0207	ACE ETHANOL - STANLEY, storage	2004		none		good operating practices		
IN-0097	CARGILL, INC screening	2003	750 t/hr	0.0014	PM & PM10 gr/dscf	baghouse	none specified	BACT

Emission limits ranged from 0.0012 gr/dscf to 0.005 gr/dscf. In almost all cases, baghouses were chosen as the control option. Koda Energy proposes to select the top control option, a fabric filter for each vented emission point in the fuel handling system. This includes the truck unloading building, Rahr by-products blow lines, the fuel storage bins, the grinder blow lines and the day/metering bin.

Koda Energy proposes a BACT limit of 0.005 gr/dscf on the fuel handling and storage baghouses, due to the diversity of materials, and the lack of experience in dealing with them. Koda has obtained a statement from the vendor that says that due to the unusual nature of the materials being handled, they are unwilling to guarantee a lower emission limit than 0.005 gr/dscf. Because the ash is a more consistent material, the vendor is comfortable with the lower limit of 0.002 gr/dscf for the ash handling baghouses as is discussed below.

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Phone: 913-831-0740
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Web Site: www.camcorpinc.com

May 11, 2007

Mr. Luke Anderson
Engineering America Inc.
647 Hale Avenue N.
Oakdale, MN 55128

RE: Emission Statement

Mr. Anderson,

In regards to your recent e-mail inquiring why CAMCORP will not guarantee a better emission rate than 0.005 gr/dscf. It is our understanding a wide variety of materials will be filtered with our equipment ranging from Wood Shaving, Sawdust and various Agricultural Grains. Not knowing the particle size distribution and percentages of each material we are not able to improve on the 0.005 gr/dscf emission guarantee.

Best Regards,

Craig Kauffman
Product Development \ Sales

BACT for Ash Handling

Koda Energy searched the RBLC database on 11/6/06 under the category 99.120 Mineral Products: Ash Handling, Storage and Disposal for sources of ash handling and disposal. The RBLC database included 20 facilities and 31 sources. Included in the table below are the facilities that standardized their emission limits to gr/dscf; there was no comparison values for the lb/hour limits. Also included are the ash loadout sources.

The best controlled facilities for ash storage used a storage silo with a bin vent controlled by a fabric filter. The best controlled facilities for ash handling used a fabric filter to control the process. The best controlled facilities for truck loading used an enclosed building and either truck unloading chutes that seal to the truck with negative pressure (vacuum pressure system) or a waterspray system. The results from the RBLC search are shown below.

Table J-15

RBLC ID	Facility	Year issued	Unit	throughput	PM limit	Units	Control Technology	Basis
IA-0086	UNIVERSITY OF NORTHERN IOWA	2007	ash silo	12.00 tons/hr	0.005	PM & PM10 gr/dscf	baghouse	BACT
IA-0086	UNIVERSITY OF NORTHERN IOWA	2007	ash load	650 t/hr	95	%	Wetting ash	BACT
IA-0086	UNIVERSITY OF NORTHERN IOWA	2007	ash convey	99.12 t/hr	0.005	gr/dscf	baghouse	BACT
LA-0202	RODEMACHER BROWNFIELD UNIT 3	2006	ash load	100 t/hr	0.07	lb/hr	chute seals	BACT
WV-0024	WESTERN GREENBRIER CO-GENERATION, LLC	2006	ash handl	105.00 T/H	0.01	gr/dscf	baghouse	BACT
CO-0057	COMANCHE STATION	2005	ash silo		0.01	PM & PM10 gr/dscf	baghouse	BACT
NV-0036	TS POWER PLANT	2005	ash silo		0.02	gr/dscf	baghouse	BACT
AR-0074	PLUM POINT ENERGY	2003	mat. Handl.		0.6	lb/hr	water spray	BACT
MT-0022	BULL MOUNTAIN, NO. 1, LLC - ROUNDUP POWER PROJECT	2003	ash handl		0.01	gr/dscf	baghouse	BACT
IA-0067	MIDAMERICAN ENERGY COMPANY	2003	ash transsfer	40.44 t/hr	0.005	PM & PM10 gr/dscf	baghouse	BACT
IA-0067	MIDAMERICAN ENERGY COMPANY	2003	ash silo	2000 t	0.005	PM & PM10 gr/dscf	baghouse	BACT

MT-0027	HARDIN GENERATOR PROJECT	2002	mat. Transf.		0.01	PM10 gr/dscf	baghouse	BACT
LA-0122	MANSFIELD MILL	2001	mat. Transf.	28.00 T/H	0.96	lb/hr	water spray	BACT
TX-0342	LIMESTONE ELECTRIC GENERATING STATION	2001	ash load		0.94	lb/hr	Wetting ash	BACT

Koda Energy proposes to use a storage silo controlled with a fabric filter bin vent, an enclosed truck loading facility and a dustless loading system, which is the best level of control found in the RBLC database. . A pneumatic dense phase conveying system will transport 2000 lbs per hour of ash from the boiler bottom ash hoper, the dust collector (multi-cyclone) ash hoppers and the electrostatic precipitator ash hoppers to an ash storage bin located on top of the truck receiving building. The low air flow per volume of material used by the conveying system will reduce air emissions. A dustless ash unloader will use a fine water mist to condition the ash. Displacement air from the ash bin will discharge through a 30 scfm bin vent. A baghouse controls dust emissions in the ash unloading station and ensures negative pressure to prevent fugitive dust.

Koda has received a statement from its vendor that guarantees an ash grain loading of 0.002 gr/dscf and proposes this limit as BACT.

BACT for Traffic

All access roads on the Koda Energy site will be paved. Traffic on property leased by Koda Energy is limited. Fuel deliveries travel on public streets or property owned and controlled by the Rahr Malting Company. The fuel receiving building is on the property line. Fuel delivery trucks will travel less than 7 feet on access road on property leased by Koda Energy before entering the unloading building and will travel less than 27 feet on property controlled by Koda Energy after unloading and leaving the building. At full capacity, fuel delivery will require 13.5 trucks per day for a total of 6.5 miles annually full and 25 miles empty on property leased by Koda Energy.

Trucks removing ash enter the site from the south on West Third Avenue. Trucks travel north and west 113 feet to the ash storage building. After loading, trucks travel 170 feet (0.03 miles) south and west to West Third Avenue and leave the site. At full capacity ash removal will require 265 trucks (one truck every 33 hours), which will travel an annual total of 5.7 miles full and 8.5 miles empty on property leased by Koda Energy.

When traffic from Koda Energy and Rahr Malting are considered together, emissions will decrease. Currently raw material delivery trucks travel on 527 feet of unpaved road prior to delivery. This delivery road will be paved and PM_{10} emissions from traffic will decrease as a result of this project:

	Post Project PM_{10} Emissions (tpy)
Rahr Car & Truck Paved	0.1397

Rahr Truck Unpaved	0
Koda Energy	0.1189
Total	0.2586

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A review of the RBLC from 2003-2007 was done and produced the following results:

Table J-16

RBLC ID	Facility	Year issued	Control Technology	Basis
LA-0213	ST. CHARLES REFINERY	2007	Pave all roads	BACT
LA-0211	GARYVILLE REFINERY	2006	Water Sprays	BACT
WV-0024	WESTERN GREEN BRIER CO-GENERATION, LLC	2006	Vacuum sweeper, water, reduced speed	BACT
IL-0102	AVENTINE RENEWABLE ENERGY, INC.	2005	Pave all roads	BACT
LA-0204	PLAQUEMINE PVC PLANT	2005	Pave all roads as much as practicable	BACT
CO-0057	COMANCHE STATION	2005	Paved roads to be swept and watered as necessary	BACT
MN-0061	ERIE NUGGET	2005	Fugitive Dust Control Plan	BACT
LA-0203	OAKDALE OSB PLANT	2005	N	BACT
IN-0119	AUBURN NUGGET	2005	Fugitive Dust Control Plan	BACT
WI-0228	WPS - WESTON PLANT	2004	Pave all roads where possible	BACT
TX-0447	CARHAGE ORIENTED STRANDBOARD MILL	2004	N	BACT
NE-0029	ABENGOA BIOENERY CORPORATION - YORK	2004	All haul roads must be paved	BACT
NC-0103	TOBACCOVILLE FACILITY	2003	Pave all roads	BACT
IA-0067	MIDAMERICAN ENERGY COMPANY	2003	Water flushing and sweeping	BACT

N = no controls feasible

The most frequently specified control measure is pavement of the roads. For many unpaved roads, watering and chemical suppressants are specified. Koda Energy will be required by its permit to develop a fugitive dust control plan, as two of the sources are above. It will also be required to pave unpaved areas. Koda Energy will sweep the paved roads twice per week. Koda proposes this as BACT.

Summary of BACT Results

The Koda Energy project is a significant net emissions increase for carbon monoxide, nitrogen oxides, particulate matter and particulate matter under 10 microns. Koda Energy has conducted a BACT analysis and proposes the following controls as BACT:

NO_x:	SOFA and SNCR with an emission limit of 0.25 lb/mmBtu based on a 30-day rolling average.
CO:	*A suspension burner with good combustion controls as BACT for this project with an emission rate of 0.43 lb/mmBtu based on a 30-day rolling average..*
Boiler PM/PM_{10}:	ESP with a multicyclone with a controlled 0.2 to 0.3 lb/mmBtu PM and PM_{10} emission rate

Fuel Handling, Storage and Processing PM:
BACT limit for PM/PM_{10} of 0.005 gr/dscf

Truck Unloading:	Enclosed building, fabric filter
Rahr By-product Blow Lines:	Fabric filter
Fuel Conveying and Storage:	Fabric filter
Fuel Conveying and Processing:	Fabric filter
Ground Fuel Transport and Metering:	Fabric filter

Ash Handling PM: Bact limit for PM/PM_{10} of 0.002 gr/dscf

Enclosed Ash unloading building
Ash storage silo with fabric filter controlled bin vent
Dustless (water spray) ash loadout

Truck traffic: *Paved haul roads and street sweeping*

EXCERPTS FROM THE

AIR MODELING IMPACT ASSESSMENT

OF PROPOSED KODA ENERGY COGENERATION FACILITY

KODA ENERGY
SHAKOPEE, MINNESOTA

August 2007 **053-2443**

INTRODUCTION

Golder Associates Inc. (Golder) performed an air modeling assessment to determine the maximum air quality impacts from the proposed Koda Energy Cogeneration facility (Koda) in Shakopee, Minnesota. Koda will be a major source (over 250 tpy) for NO_x and CO. Koda's primary purpose is to provide steam and power to the Rahr Malting facility and secondary purpose is to provide base-load power to the local power grid. Due to the close proximity to the Rahr Malting facility, the emissions and downwash effects from that facility were also included in the modeling analysis.

A demonstration of compliance with the National Ambient Air Quality Standards (NAAQS) and allowable Prevention of Significant Deterioration (PSD) Class II increments for particulate matter having diameters of 10 microns or less (PM_{10}), Nitrogen Oxides (NO_x) and Carbon Monoxide (CO).
A copy of the air modeling protocol and a summary of Agency comments on the protocol are include in Appendix A.

This analysis was originally completed in November 2006 and was submitted to the Minnesota Pollution Control Agency (MPCA). Because of the Best Achievable Control Technology (BACT) limits that will apply to the various emission units at Koda, the modeling analysis was redone in June 2007. Changes made since the analysis in 2006 include:

- Increased maximum emission rates for many stacks at Koda Energy;
- Change in orientation from horizontal to up with no cap for Koda Energy SV 001, 005 and 006 as well as for Rahr Malting SV14_R and SV28_R;
- Change in stack diameter for Koda Energy SV001 to 2.0 ft;
- AERMOD version 07026 was used along with the MPCA preprocessed meteorological data and
- A limitation of 22 hours per day for SV001 at Koda.

Remodeling was performed for PSD and NAAQS demonstration for PM10 (Scenarios A & B) as well as for NOx (Scenario B). Remodeling was not conducted for CO because the emission rate modeled in 2006 was greater than the BACT limit that will apply to the boiler. The emission rate modeled in 2006 for NOx Scenario A, was greater than the limit that will apply to the boiler, thus that case was not modeled in the new analysis.

The following sections describe the methodology and assumptions used for the air modeling analyses and provide a summary of the air modeling results.

Modeling methodology

facility information

A summary of the emission rates and source parameters used for the modeling analysis is presented in Tables 2-1, 2-2, 2-3, and 2-4.

Stack and building locations, building heights, and a facility property line were determined from information provided by Koda Energy and Rahr Malting. Rahr Malting had a laser scan conducted at their facility to determine their building heights. There is not a continuous fence surrounding the property; therefore, the entire site is considered ambient air. Several sets of train tracks run through the property. The only set of tracks that is not used exclusively for Rahr Malting deliveries and shipments is the

southernmost set (see Figure B-1). A detailed layout of the Koda Energy buildings is located in Figure B-2. A 3D rendering of both Rahr Malting and Koda Energy is located in Figures B-13 & B-14.

A facility elevation of 229.5 meters (753 feet) above mean sea level was used in the analysis.

air model selection

The latest available version of the AMS/EPA Regulatory Model (AERMOD, version 07026), was used for the modeling analysis. In this analysis, the EPA regulatory default options were used to predict all maximum impacts.

building downwash processing

The latest version of the EPA Building Profile Input Program with Plume Rise Enhancement (BPIP-PRIME, Version 04300), was used for this analysis.

Several plots, that show the location of stacks and key building structures at Koda Energy and Rahr Malting, are included in Appendix B. The BPIP model input and output files for the project are included in Appendix C.

Meteorological data processing

Meteorological data consists of Stage III input data provided by the Minnesota Pollution Control Agency (MPCA). The period of record is 1986 to 1990. The land use is pre-processed into the Stage III input files for use with the current version of AERMOD. The latitude and longitude used for the land use was 45.0°N latitude and 93.5°W longitude.

Receptors

A grid consisting of polar discrete receptors was used for the modeling analysis. Receptors were located as follows:

- Discrete receptors every 25 m along the Rahr Malting Facility property line;
- Discrete receptors every 10 m along public railroad tracks;
- Polar discrete receptors in 36 directions centered at Koda Energy SV009 using the following spacing;
    - 25 m from 25 m to 250 m;
    - 50 m from 300 m to 500 m;
    - 100 m from 600 m to 1,000 m;
    - 200 m from 1,200 m to 2,000 m;
    - 500 m from 2,500 m to 4,500 m;

The only deviation from the above receptor spacing is for the PM_{10} 24-hour averaging time model runs. These model runs use a receptor field identical to the above, but extending out to 350 m from Koda Energy's main stack (SV 009). The significant impact radius from Koda Energy for PM_{10} on a 24-hour basis is 300 meters.

Receptor elevations and hill scale heights were determined for all receptors using AERMOD's terrain preprocessor program, AERMAP, Version 04300. The elevations were extracted from 7.5-minute USGS Digital Elevation Model (DEM) data, which was in UTM NAD83 (zone 15). Plots showing receptors along the property line, railroad tracks, and ambient air used for the air modeling analysis are included in Appendix B Figures B-10, B11, and B-12.

SOURCES

Emissions from most stacks/vents were modeled as point sources. A value of 0.001 m/s was assigned as the exit velocity for any stack with a rain cap or a stack that was not vertical. Emissions from the 7 kilns at the Rahr Malting facility vent through long rectangular vents. These emission points were modeled as line sources with the sigma y value set at (center to center distance between sources / 2.15) and the sigma z value set at (height of building / 2.15). This is consistent with the AERMOD Users Guide (September 2004, Table 3-1). Fugitive PM_{10} emissions from vehicle traffic at Koda Energy and Rahr Malting were based on the methods set forth in AP-42 Section 13.2.1. A value of 0.6 g/m^2 for eight summer months and 4.4 g/m^2 for 4 winter months was used for the silt loading factor. A "k" value of 0.016 lb/VMT and a "C" value of 0.00047 lb/VMT were used to calculate the emission factor. No scalar was used to allow for a reduction due to precipitation. A release height of 2.29 m and length of side equal to 8.0 m was used for the fugitive truck traffic line sources. See Tables 2-5 and 2-6 for information on fugitive emissions. Figure B-3 gives an overview of the vehicle routes for both facilities. Figure B-4 gives an overview of the point source locations for both facilities. Figure B-5 shows detailed locations about Koda Energy's point and line sources used in the model. Figures B-6, 7, 8, & 9 show detailed locations of Rahr Malting's line and point sources used in the model.

significant impact analysis

The Koda Energy Project will exceed the Significant Emission Rate (SER) for NO_x, PM_{10}, and CO. See Table 2-7 for details. A Significant Impact Analysis (SIA) was performed for each pollutant that exceeded the SER. Only the proposed Koda Energy sources were included in this analysis; however, due to the close proximity to the Rahr Malting facility, building downwash due to both Koda Energy and Rahr Malting buildings was considered in the SIA models. Maximum predicted concentrations were compared to the Significant Impact Levels established by the EPA.

The Significant Impact Radius (SIR) is the circular area that circumscribes all predicted impacts over the Significant Impact Level (SIL) for each pollutant and averaging time. The SIR was determined using the results from the SIA.

psd cLASS II INCREMENT ANALYSIS

A PSD Class II increment analysis was performed on the Koda Energy facility. Due to their close proximity, building downwash from the Koda Energy and the Rahr Malting Facility were considered in the models. The predicted highest annual and highest second high (H2H) short term modeled impacts were compared to the PSD Class II increments. The minor source baseline date has not been tripped in Scott County where the project is located. Therefore; the only increment consuming source considered in this analysis was the Koda Energy Facility.

NAAQS/MAAQS Analysis

A NAAQS/MAAQS analysis was performed to demonstrate compliance with the EPA and State of Minnesota established NAAQS/MAAQS limits. The analysis included all relevant Koda Energy sources. The background consisted of all of Rahr Malting's sources in addition to over 800 background sources provided by the MPCA as First Approximation Run (FAR) sources. In addition, a countywide source that represents the background from sources other than permitted sources was used to establish a background.

The analysis process included running a model with a receptor grid covering the entire SIA with 5 years of data and any key background sources. Key background sources show a maximum impact at a receptor placed at Koda Energy's main boiler stack (SV009) of over the corresponding SIL value. Background sources that were not designated as key as well as the countywide source were not included in the full receptor grid runs. Although the countywide source did produce an impact above the SIL for some averaging times, the gradient over the SIR was well below the SIL and for this reason would not help to locate the target receptor. The highest impacted receptor in these runs was designated the target receptor for that averaging period and pollutant.

The final impact was found by running the same 5 years of data on the target receptor, but including all of the background sources as well as the countywide source in the models. The predicted impact was determined from the results from the runs on these target receptors.

impacts upon psd class i areas

The Federal Land Managers generally require that all PSD projects located within 200 km of PSD Class I areas be evaluated for their potential to impact the existing air quality and Air Quality Related Values (AQRV) at those areas. The nearest PSD Class I area to the Koda Energy facility, the Rainbow Lake National Wilderness Area (NWA) in Wisconsin, is approximately 250 km from the proposed project. Since the project is more than 200 km from the PSD Class I area, an assessment of the proposed project's emissions upon that area has not been performed.

ambient monitoring analysis

According to federal regulations, ambient air monitoring may be required for a project if the increase in air quality impacts exceeds the *de minimis* impact level for a specific pollutant. This will not be required for this project.

additional impact analysis

The additional impact analysis required under PSD review entails analysis of the impacts of emissions from the proposed project due to industrial, commercial, and residential growth in the area as well as effects upon nearby soils, vegetation, and visibility

The proposed project's impact on visibility levels in the Minnesota River Valley and the nearest Class I area (Rainbow Lakes National Wilderness Area) are addressed using the EPA VISCREEN model. Worst-case meteorological conditions (indicative of nighttime atmospheric conditions) and a conservative background visual range are used.

air modeling results

significant impact analysis

The results from the SIA show that the air quality impact from Koda Energy is above the SIL's for PM_{10} and NO_x. The project is not above the SIL's for CO. Therefore, the impacts due to PM_{10} and NOx are required to demonstrate compliance with the PSD Class II increments. CO does not have a PSD increment, nor was it above the SIL and therefore is not required to demonstrate compliance with PSD Class II increments. See Table 3-1 for detailed results. From the SIA data, a Significant Impact Radius is determined for each pollutant and averaging time. See Table 3-2 for detailed results.

PSD Class II increment analysis

Impacts due to Koda Energy were modeled for comparison to the PSD Class II increments. The minor source baseline date has not been tripped in Scott County as of the date of this report; therefore, Koda Energy is the only increment consuming source and no other background was required to be modeled in the PSD increment demonstration.

There are two operating scenarios that Koda Energy can operate under. Scenario A is defined as operation at a baseload rate, which is approximately 60% load. Scenario B is defined as operation at maximum capacity, which is 100%. Different blends of fuel are used for each scenario and the worst case emissions for each pollutant and fuel are used in the modeling analysis. Operation may also take place at any point in between these two scenarios; however, modeling at scenarios A & B captures the worst possible emissions and dispersion.

Emission rates and stack parameters used in this analysis appear in Tables 2-1 and 2-3. Fugitive emission calculations appear in Tables 2-5 & 2-6.

After modeling Koda Energy and comparing predicted impacts to the PSD Class II increments, the proposed project will not violate PSD Class II increment consumption. See Table 3-1 for results.

NAAQS/MAAQS Analysis

A NAAQS/MAAQS analysis was performed for the following pollutants:

- NO_x;
- PM_{10}; and
- CO.

Operating scenarios A & B (mentioned in section 3-2) are used in the NAAQS/MAAQS analysis. The following is a breakdown of how each scenario differs for each pollutant and averaging time.

Scenario A
Under this scenario, Koda Energy is operational at approximately 60% load. Rahr Malting will not normally operate any of their combustion sources under scenario A since Koda will supply Rahr with the needed steam for use as process heat. Rahr Malting sources operate at the same rate in scenario A as they do in scenario B.

Scenario B
Under this scenario, Koda Energy is operational at 100% load. Rahr Malting will also operate all or some of their combustion sources at the same time as Koda Energy. Operation will take place under this scenario for a maximum of 4 months per calendar year. For this reason, emission scalars are used in the PM_{10} annual averaging period to account for this limit. This can be applied to the NOx and CO emissions from those units; however for simplicity, it was not used in this analysis.

NO_x Models
The NO_x annual modeling parameters for scenarios A and B are identical except for that Koda Energy's boiler stack (SV009) has a different emission rate, exit temperature and exit velocity due to differing loads. Tables 2-1 & 2-3 detail the differences. Table 3-3 depicts the background sources used in the model with the receptor grid covering the SIR to find the target receptor.

The greatest impacted receptor is UTM NAD83 457,247E 4,960,323N for both scenarios A & B. This receptor is the target receptor. After adding in all of the FAR sources and the constant background, the

maximum predicted impact at the target receptor is 82.8 µg/m3 for both scenarios, which is below the NAAQS limit of 100 µg/m3. See Table 3-4 for detailed information.

CO Models
The CO 1-hour and 8-hour modeling parameters for scenarios A and B are identical except for that Koda Energy's boiler stack (SV009) has a different emission rate, exit temperature and exit velocity due to differing loads. Tables 2-1 & 2-3 detail the differences. No modeled background is required for CO. A monitored CO value from a monitor in Fridley, MN (station ID 270030600) was used as a constant background for each averaging period. After adding the constant background to the modeled background, the highest, second high (H2H) values for either scenario are 4,060 µg/m3 and 4,756 µg/m3 for the 8-hour and 1-hour averaging periods respectively. These fall under the NAAQS limits of 10,000 µg/m3 and 40,000 µg/m3 respectively. See Table 3-4 for detailed information.

PM_{10} Annual Models

Operation
The PM_{10} annual averaging period models for scenarios A and B differ only in the Koda Energy emission parameters from SV009. In reality, the combustion sources will not operate at Rahr Malting under scenario A; however to allow for operational flexibility, Rahr's combustion sources are set to operate in both scenarios for a maximum of 4 months per calendar year. This is modeled by subtracting out (from each source) the portion of PM_{10} from combustion and using a time weighted average between the PM_{10} emission rate with combustion (4 months) and without combustion (8 months) to come up with an average annual emission rate. An emission scalar is used to scale the emissions from those sources down to the modeled levels. See Table 3-5 for the scalars. The vehicle traffic at Rahr Malting takes place between the hours of 06:00 and 16:00 and scalars are also used to model this. See Tables 2-5 & 2-6 for detailed information about fugitive emission rates. Rahr Malting is limited in the amount of product that can be produced on an annual basis. This limit is applied to the grain elevators and conveyors to determine an annual limited PM_{10} emission rate from the baghouses. Emission rates and parameters used in these model runs are shown in Table 2-2 & 2-4.

Background
The location data provided for the Continental Grain Company listed in the FAR data files are incorrect. The old location and emission factor scalar based on the location are commented out; Corrected values have been included in the electronic submittal.

Results
The model predicts that the highest impacted receptor for both scenarios is located at UTM NAD83 457,453E 4,960,408N. After all the FAR background was re-run on this target receptor, the highest predicted impact for either scenario is 43.3 µg/m3, which is below the NAAQS limit of 50 µg/m3. See Table 3-4 for detailed results.

PM_{10} 24-hour Models

Operation
The PM_{10} 24-hour models for scenarios A and B differ only in the Koda Energy emission parameters from SV009. As in the annual models, Rahr Malting's traffic operates between 06:00 and 16:00 and an emission scalar is used to model this.

Background
Several of the FAR background sources were refined for use in these models. Anchor Glass has an unrestricted potential to emit of 365.18 tpy of PM_{10} based on each emission unit operating 8,760 hours per year, which equals a rate of 10.50 g/s. The emission rate in the FAR data is changed to match this and the emission scalar for Anchor Glass is commented out. Two quarries owned by Bryan Rock

Products as well as the Commercial Asphalt #911 (CA911) and William Mueller & Sons (WMS) facilities only operate March to December. The emission scalars for these four facilities are changed to reflect the fact that they do not operate during January or February. Further refinement was done to WMS based on verbal information received from Mr. Richard Smith, who is a manager and part owner of WMS. According to Mr. Smith, if they operated all of their emission units all year long, they could produce a maximum of 250,000 tons of product per year. Using emission factors from their registration permit, this equates to a maximum hourly potential of 0.254 g/s. A conservative estimate that they operate 8 months of the year scales this rate up to 0.254 * 12 / 8 = 0.382 g/s. The location data provided for CA911, WMS, and Continental Grain in the FAR data files are incorrect. The old location and emission factor scalar based on the location are commented out and new values have been included. Gravitational settling is applied to the countywide background source (CWE_1999) using particle distributions agreed upon by the MPCA.

Results

The model predicts that the highest impacted receptor for both scenarios is located at UTM NAD83 457,332E 4,960,493N. After all the FAR background was re-run on this target receptor, the highest sixth high impact for either scenario is 142.0 µg/m3, which is below the NAAQS limit of 150 µg/m3. See Table 3-4 for detailed results.

additional impacts analysis

impacts due to associated direct growth

The proposed project is not expected to have a significant impact on industrial, commercial, and residential growth in the area. Biomass fuel will be purchased from various sources within an approximately 50 mile radius of the facility. These sources will be primarily industrial byproducts from existing sources and potentially agricultural products; therefore, minimal industrial growth is expected. The project is expected to create approximately 25-30 full time jobs in the Shakopee area. Construction of the proposed project will require a work force of up to several hundred people onsite over the duration of the construction period. Construction jobs are anticipated to be filled by workers commuting to the site from the Twin Cities metropolitan area. The project will not have a significant effect on residential growth. No commercial growth is expected from this project.

impacts tO SOILS, VEGETATION, AND WILDLIFE IN THE project site VICINITY

The city of Shakopee lies to the south, and east of Koda Energy, therefore little exposure to soil and wildlife could occur in those directions due to the urban nature of the area. The Minnesota River and farmland lie to the north. The impacts due to the Koda Energy project within the significant impact area are below PSD Class II increment levels and the NAAQS. The Significant Impact Radius for all pollutants except NOx is less than 350 m from Koda Energy's main stack (SV009). Because the area for those pollutants is small and lies within a city, impacts to soils, vegetation, and wildlife is negligible. The significant impacts due to NOx extend 1,600 meters from SV009. The maximum impact due to Koda Energy considering all of the receptors studied in the analysis is approximately 6 µg/m^3. At this level, no adverse impacts are expected. Adverse impacts to soils, vegetation or wildlife are not expected due to the Koda Energy Project.

impacts tO visiblity in the project site VICINITY

This project is located approximately 250 km from the nearest Class I area (Rainbow Lakes National Wilderness Area). A visibility analysis using VISCREEN was carried out on this area. The results indicate that the visibility impacts due to Koda Energy are below required thresholds. An additional visibility analysis was conducted for the nearby Minnesota River Valley (MRV), which is not a class I area. Assumptions used in this analysis include:

- Visibility impacts on terrain were not considered since the MRV is at a lower elevation than the surroundings;
- Visibility impacts at night were not considered since a plume would not be visible at nighttime; and
- A stability class of "D" was considered representative of daytime conditions since the nighttime visibility was not studied.

The background visual range of 180 km was used in accordance with the Federal Land Manager's Air Quality Workgroup. The closest point to the MRV from Koda is 0.4 km and the furthest point in that direction is 1.0 km. The model assumes the viewer stands at a point 0.75 km from Koda in Riverside Park. Using these assumptions, there are no exceedances of Class I visual impact thresholds for the SKY during the daytime hours. The VISCREEN summary and output files are included with the electronic submittal.