



**Missouri Department of Natural Resources**  
Air Pollution Control Program

2005-05-062

Great Plains Energy, Inc.

1201 Walnut Street, Kansas City, MO 64141

Kansas City Power & Light Company– Iatan Generating Station

20250 Highway 45 North, Weston, MO 64098

Platte County, S31, T54N, R36W

Installation of a pulverized coal boiler and associated pollution control equipment (Iatan Unit 2), a fuel-oil fired auxiliary boiler, emergency fire pumps, a fuel oil storage tank and a combustion by-product landfill. Modification of an existing electrical utility steam generating unit (Iatan Unit 1) to upgrade the pollution control system and increase the heat input rate. This review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

# Draft

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within eighteen months from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within eighteen months after the effective date of this permit, or if construction or modification is suspended for one year or more.

**You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review.** Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located with 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions as provided in RSMo 643.075. If you choose to appeal, the Air Pollution Control Program must receive your written declaration within 30 days of receipt of this permit.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Department of Natural Resources has established the Outreach and Assistance Center to help in completing future applications or fielding complaints about the permitting process. You are invited to contact them at 1-800-361-4827 or (573) 526-6627, or you can write to the Outreach and Assistance Center, P.O. Box 176, Jefferson City, Missouri 65102-0176.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, attention: Construction Permit Unit.

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## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Kansas City Power & Light Company – Iatan Generating Station  
S31, T54N, R36W, Platte County, Missouri

1. Specifications, Operating Limits and Emission Limits for Coal Storage and Handling.
  - A. The coal storage pile footprint area (active and in-active storage) shall not exceed 25.3 acres.
  - B. The rail car unloading rate shall not exceed 4,000 tons of coal per hour.
  - C. Required Pollution Control Techniques and Equipment. The following conditions represent best available control technology (BACT) for coal storage and handling.
    - 1) Particulate emissions from rail car unloading shall be controlled by a baghouse.
    - 2) A water/chemical dust suppressant mixture shall be applied to the coal at a point between the rail car unloading hopper and the transfer tower.
    - 3) Kansas City Power & Light Company (KCPL) shall periodically add water and/or chemical dust suppressant to the top of the coal storage pile. A system shall be designed, constructed and operated to allow for distribution of water and/or chemical dust suppressant over the top of the coal storage pile. The use of truck-mounted pumps is acceptable provided that this method is capable of effective distribution over all areas of the storage pile.
    - 4) Coal conveyance and transfer systems shall be enclosed and vented to a baghouse. For any portions of the coal conveyance system that can not be enclosed and vented to a baghouse, KCPL must receive prior written authorization from the Air Pollution Control Program for an alternate control method prior to startup.
    - 5) A telescoping chute shall be used to drop coal from conveying equipment to the storage pile and the free fall distance from the end of the chute to the top of the coal pile shall be less than ten (10) feet.
    - 6) Particulate emissions from coal crushing and transfer operations

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- 7) shall be controlled by a baghouse.
  - 7) Particulate emissions from the pulverized coal storage silos shall be controlled by a baghouse.
  - 8) Housekeeping measures such as sweeping, water washing and vacuuming shall be used to clean equipment, structures and pavement to prevent or minimize generation of fugitive particulate emissions to the extent practicable.
- D. Coal storage, handling and processing shall be conducted in compliance with 40 CFR Part 60, Subpart Y, *Standards of Performance for Coal Preparation Plants*, as incorporated in 10 CSR 10-6.070.
- E. Coal storage, handling and processing operations shall be conducted in compliance with 10 CSR 10-6.170, *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*.
2. Specifications, Operating Limits and Emission Limits for Unit 1 (pulverized coal boiler and the associated pollution control equipment).
- A. The Unit 1 boiler shall utilize a low-sulfur (less than 1.4 lbs /MMBTU) subbituminous coal as the primary fuel. The heat input to the boiler shall not exceed 7,800 million British Thermal Units (MMBTU) per hour. No. 2 fuel oil with a sulfur content of less than 0.05 percent shall be used for light off, startup and flame stabilization. No other fuels shall be used without receiving prior written authorization from the Air Pollution Control Program.
- B. KCPL shall install and effectively operate an SCR unit for the Unit 1 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications and an operations and maintenance manual for the SCR unit to include the following:
- 1) Catalyst type, volume and pitch;
  - 2) Catalyst vendor;
  - 3) Catalyst bed elevation and layout drawings;
  - 4) Piping and instrumentation diagrams for the catalyst beds and the ammonia injection system;
  - 5) Process flow diagrams;
  - 6) Anticipated inlet NO<sub>x</sub> rate;
  - 7) Anticipated ammonia injection rate;
  - 8) Anticipated ammonia slip;
  - 9) Anticipated flue gas temperatures through the SCR unit;
  - 10) A description of catalyst monitoring and replacement procedures;

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- 11) A description of ammonia and NO<sub>x</sub> monitoring equipment and procedures; and
  - 12) A description of equipment and procedures that will be utilized to prevent or minimize masking, plugging, poisoning, accumulation of sulfates or other deterioration in catalyst performance.
- C. KCPL shall install and effectively operate a flue gas desulfurization system (wet scrubber) for the Unit 1 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications, process flow diagrams, elevation and layout drawings and an operations and maintenance manual for the flue gas desulfurization system.
- D. KCPL shall install and effectively operate a fabric filtration system (baghouse(s)) for the Unit 1 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications, process flow diagrams, elevation and layout drawings and an operations and maintenance manual for the fabric filtration system.
- E. The following emission limits apply to the stack that is associated with the Unit 1 pulverized coal boiler and associated pollution control equipment. KCPL shall not exceed the following emission limits:
- 1) Nitrogen Oxides (NO<sub>x</sub>) - 0.10 lbs/MMBTU, based on a 30 day rolling average.
  - 2) Sulfur Dioxide (SO<sub>2</sub>) - 0.10 lbs/MMBTU, based on a 30 day rolling average.
  - 3) SO<sub>2</sub> – 4,212 lbs/hr, based on a 24-hour rolling average.
  - 4) SO<sub>2</sub> – 6,630 lbs/hr, based on a 3-hour block average.
  - 5) Particulate Matter Less Than Ten Microns in Aerodynamic diameter (PM<sub>10</sub>) – 0.0244 lbs/MMBTU, based on a 30 day rolling average. This limit includes both filterable and condensable particulate matter.
  - 6) Filterable PM<sub>10</sub> – 0.014 lbs/MMBTU, based on a 3-hour rolling average.
  - 7) Filterable Particulate Matter – 0.015 lbs/MMBTU, based on a 3-hour rolling average.
  - 8) Opacity – 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent.
  - 9) Carbon Monoxide (CO) - 0.16 lbs/MMBTU, based on a 30 day rolling average.
  - 10) Volatile Organic Compounds (VOC) – 0.0036 lbs/MMBTU, based on the average of 3 test runs.

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The permittee is authorized to construct and operate subject to the following special conditions:

- 11) Mercury –  $39 \times 10^{-6}$  lbs/gross MWh, based on an annual average, or the federally established emission limitation applicable to this unit, whichever is lesser.
  - 12) Sulfuric Acid Mist ( $H_2SO_4$ ) –  $7.96 \times 10^{-3}$  lbs/MMBTU, average of 3-runs.
  - 13) Lead (Pb) –  $5.93 \times 10^{-6}$  lbs/MMBTU, average of 3-runs.
  - 14) Hydrogen Fluoride (HF) – 33.15 lbs/hr, average of 3-runs.
- F. KCPL shall maintain the pulverized coal boiler and associated air pollution control equipment in accordance with good air pollution control practices to assure proper functioning of the equipment and minimize malfunctions.
3. Specifications, Operating Limits and Emission Limits for Iatan Unit 2 (pulverized coal boiler and the associated pollution control equipment)
- A. The Unit 2 boiler shall utilize a low-sulfur (less than 1.4 lbs/MMBTU) subbituminous coal as the primary fuel. The heat input to the boiler shall not exceed 8,100 MMBTU per hour. No. 2 fuel oil with a sulfur content of less than 0.05 percent shall be used for light off, startup and flame stabilization. No other fuels shall be used without receiving prior written authorization from the Air Pollution Control Program.
  - B. KCPL shall install and effectively operate an SCR unit for the Unit 2 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications and an operations and monitoring plan for the SCR unit to include the information listed in Special Condition 2.B.
  - C. KCPL shall install and effectively operate a flue gas desulfurization system (wet scrubber) for the Unit 2 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications, process flow diagrams, elevation and layout drawings and an operations and maintenance manual for the flue gas desulfurization system.
  - D. KCPL shall install and effectively operate a fabric filtration system (baghouse(s)) for the Unit 2 boiler. At least 120 days prior to initial startup, KCPL shall submit to the Air Pollution Control Program design specifications, process flow diagrams, elevation and layout drawings and an operations and maintenance manual for the fabric filtration system.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- E. The following emission limits apply to the stack that is associated with the Unit 2 pulverized coal boiler and associated pollution control equipment. KCPL shall not exceed the following emission limits:
- 1) NO<sub>x</sub> - 0.08 lbs/MMBTU, based on a 30 day rolling average.
  - 2) SO<sub>2</sub> - 0.09 lbs/MMBTU, based on a 30 day rolling average.
  - 3) SO<sub>2</sub> - 4,374 lbs/hr, based on a 24-hour rolling average.
  - 4) SO<sub>2</sub> - 6,885 lbs/hr, based on a 3-hour block average.
  - 5) PM<sub>10</sub> - 0.0236 lbs/MMBTU, based on a 30 day rolling average.  
This limit includes both filterable and condensable particulate matter.
  - 6) Filterable PM<sub>10</sub> - 0.014 lbs/MMBTU, based on a 3-hour rolling average.
  - 7) Filterable Particulate Matter - 0.015 lbs/MMBTU, based on a 3-hour rolling average.
  - 8) Opacity - 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent.
  - 9) CO - 0.14 lbs/MMBTU, based on a 30 day rolling average.
  - 10) VOC - 0.0036 lbs/MMBTU, based on the average of 3 test runs.
  - 11) Mercury -  $39 \times 10^{-6}$  lbs/gross MWh, based on an annual average, or the federally established emission limitation applicable to this unit, whichever is lesser.
  - 12) Sulfuric Acid Mist (H<sub>2</sub>SO<sub>4</sub>) -  $7.16 \times 10^{-3}$  lbs/MMBTU, average of 3-runs.
  - 13) Lead (Pb) -  $5.93 \times 10^{-6}$  lbs/MMBTU, average of 3-runs.
  - 14) HF - 34.43 lbs/hr, average of 3-runs.
- F. KCPL shall maintain the pulverized coal boiler and associated air pollution control equipment in accordance with good air pollution control practices to assure proper functioning of the equipment and minimize malfunctions.
4. Specifications, Operating Limits and Emission Limits for Ash Handling and Disposal.
- A. Fly ash shall be conveyed pneumatically to a storage silo. Emissions from the storage silo shall be controlled by a baghouse.
  - B. A shrouded load-out spout with a vacuum return that is routed to a baghouse or fabric filter shall be used to control emissions when loading marketed fly ash from the fly ash silo to trucks that are leaving the site.
  - C. Fly ash that is destined for the landfill shall be conditioned to at least 20 percent moisture content before it is disposed of in the landfill.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- D. Bottom ash removed from the pulverized coal boilers and destined for the on-site landfill shall be conditioned to at least 20 percent moisture prior to subsequent handling.
5. Specifications, Operating Limits and Emission Limits for Limestone Handling.
- A. Particulate emissions from the limestone conveyor system (for reclamation of limestone from the storage pile) shall be controlled by a baghouse.
- B. Particulate emissions from the limestone day storage bins shall be controlled by baghouses.
- C. With regard to limestone handling, KCPL shall comply with the *New Source Performance Standard for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO, as incorporated in 10 CSR 10-6.070.
6. Specifications, Operating Limits and Emission Limits for an Auxiliary Boiler.
- A. The auxiliary boiler shall be fired with No. 2 fuel oil. The sulfur content of the fuel oil shall not exceed 0.05 percent sulfur by weight.
- B. Heat input to the auxiliary boiler shall not exceed 219.4 MMBTU/hr or 1,560 gal/hr.
- C. The auxiliary boiler shall not be operated more than 876 hours per calendar year.
- D. The following emission limits apply to the auxiliary boiler. KCPL shall not exceed the following emission limits:
- 1) NO<sub>x</sub> - 0.100 lbs/MMBTU, average of 3-runs.
  - 2) SO<sub>2</sub> - 0.052 lbs/MMBTU, average of 3-runs.
  - 3) PM<sub>10</sub> - 0.024 lbs/MMBTU, average of 3-runs. (Note: This is a BACT limit, based on good combustion practices and clean fuel.)
  - 4) Particulate Matter – 0.030, lbs/MMBTU, average of 3-runs. (Note: This is a BACT limit, based on good combustion practices and clean fuel.)
  - 5) CO - 0.04 lbs/MMBTU, average of 3-runs. (Note: This is a BACT limit and the control technology selected to meet this BACT limit is good combustion practices.)
  - 6) VOC – 0.005 lbs/MMBTU, average of 3-runs. (Note: This is a

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

BACT limit and the control technology selected to meet this BACT limit is good combustion practices.)

7. Specifications and Operating Limits for a Fuel Oil Storage Tank.

- A. The fuel oil storage tank shall be a vertical fixed roof tank with a maximum capacity of 500,000 gallons.
- B. The throughput shall not exceed 1,872,817 gallons per year. Fuel oil sulfur analysis must be conducted by KCPL or the fuel oil supplier for each shipment of fuel oil delivered to the storage tank.

8. BACT for Cooling Towers

The cooling towers shall be equipped with high efficiency drift eliminators that are designed to reduce drift to less than 0.001 percent.

9. Baghouses and Other Particulate Control Devices

- A. All baghouses shall be operated and maintained in accordance with the manufacturer's specifications. Each baghouse shall be equipped with a gauge that indicates pressure drop across the control device. Pressure gauges or a visual display of the pressure data (i.e., monitor or chart) shall be located such that the Department of Natural Resources' employees may easily observe them during a site visit. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
- B. KCPL shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer.
- C. KCPL shall maintain an operating and maintenance log for the baghouses which shall include the following:
  - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
  - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
- D. Bin vent filters, cyclones and other particulate control devices shall be

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The permittee is authorized to construct and operate subject to the following special conditions:

operated in accordance with manufacturer's recommendations and shall receive periodic inspection and maintenance to ensure proper operation.

### 10. Haul Roads

#### A. Paved Roads

- 1) Maintenance and/or repair of the road surface shall be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these roads.
- 2) KCPL shall periodically water, wash and/or otherwise clean all of the paved portions of the haul roads as necessary to achieve control of fugitive emissions from these roads.

#### B. Unpaved Roads and Storage Pile/Vehicle Activity Area

KCPL shall control emissions from all unpaved haul roads by **either** documented watering or the application of chemical dust suppressant.

- 1) Chemical Dust Suppressant
  - a) The suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) shall be applied in accordance with the manufacturer's suggested application rate and re-applied as necessary to achieve control of fugitive emissions from these areas.
  - b) KCPL shall keep records of the time, date, and the amount of material applied for each application of chemical dust suppressant agent on these areas. The records shall be kept on site for not less than five (5) years, and made available to Department of Natural Resources' personnel upon request.
- 2) Documented Watering
  - a) Water shall be applied in accordance with a recommended application rate of 100 gallons per day per 1,000 square feet of unpaved/untreated surface area of haul roads/vehicle active area as necessary to achieve control of fugitive emissions from these areas.
  - b) KCPL shall maintain a log that documents daily water applications. This log shall include, but is not limited to, date and volumes (e.g., number of tanker applications and/or total gallons used) of water application. The log shall also record rationale for not applying water on day(s) the areas are in use (e.g., meteorological situations, precipitation events, freezing, etc.).

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- c) Meteorological precipitation of any kind, (e.g. a quarter inch or more rainfall, sleet, snow, and/or freeze thaw conditions) which is sufficient in the amount or condition to achieve control of fugitive emissions from these areas while the areas are in use, may be substituted for water application until such time as conditions warrant application of water.
- d) Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads. KCPL shall record a brief description of such events in the same log that documents the watering.
- e) The records shall be kept on site for not less than five (5) years, and made available to Department of Natural Resources' personnel upon request.

**C. Daily Limits for Haul Roads**  
 KCPL shall not exceed the following daily tonnage-hauled limits:

<b>Description</b>	<b>Limit – Tons /Day</b>
Unit 1 Fly Ash Sold	343.3
Unit 1 Bottom Ash Sold	205.5
Unit 1 Gypsum Sold	0
Unit 1 Fly Ash to Landfill	410.9
Unit 1 Bottom Ash to Landfill	0
Unit 1 Gypsum to Landfill	592.8
Unit 1 Limestone	301.5
Unit 2 Fly Ash Sold	356.5
Unit 2 Bottom Ash Sold	213.4
Unit 2 Gypsum Sold	0
Unit 2 Fly Ash to Landfill	426.7
Unit 2 Bottom Ash to Landfill	0
Unit 2 Gypsum to Landfill	615.6
Unit 2 Limestone	330.0

If any parameters affecting the emission factors for the haul roads change, these daily limits are subject to amendment. The parameters affecting the haul road emission factors include the length of the haul road, surface material silt content (a default value of 8.3 % was used) and mean vehicle weight. If KCPL wants to sell gypsum or send bottom ash to the on-site landfill, a permit amendment will be required.

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The permittee is authorized to construct and operate subject to the following special conditions:

11. Restriction of Public Access – Fencing or Physical Barrier to Restrict Public Access to Property

- A. KCPL shall restrict public access to the generation station by building a fence, or other physical barrier around the landfill, the coal storage area and the pulverized coal boiler. Entrance to the generation station shall be through a security checkpoint. KCPL shall complete construction of the physical barrier to enclose the area prior to commencing operation of the pulverized coal boiler.

12. Compliance Testing

- A. Initial performance/certification testing shall be conducted in order to verify compliance with special conditions 2.E.(1) through (14), 3.E.(1) through (14), 6.D.(1) through (6) and to certify the accuracy of the continuous emission monitoring systems (CEMS).
- B. The performance/certification tests shall be performed within 60 days of achieving the maximum production rate, but no later than 180 days after initial startup.
- C. The date on which performance/certification tests are conducted shall be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test so that a pretest meeting may be arranged if necessary, and to assure that the test date is acceptable for an observer to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to conducting the required emission testing.
- D. During the initial performance tests KCPL shall analyze a minimum of ten (10) representative samples of as-received coal for the following parameters:
- 1) Higher Heating Value
  - 2) Ash
  - 3) Moisture
  - 4) Sulfur
  - 5) Arsenic
  - 6) Beryllium
  - 7) Cadmium
  - 8) Chlorine

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The permittee is authorized to construct and operate subject to the following special conditions:

- 9) Chromium
- 10) Fluorine
- 11) Lead
- 12) Manganese
- 13) Mercury
- 14) Nickel
- 15) Selenium

The analytical results shall be submitted with the performance test report.

- E. As part of the initial performance test, KCPL shall measure emission rates for hydrogen fluoride, arsenic, beryllium, cadmium, chromium, cobalt, manganese, nickel and selenium from the pulverized coal boilers. In the event that the measured emission rates of these HAPs exceed the emission rates used in the air quality analysis, then KCPL shall be required to submit to the Air Pollution Control Program a revised ambient air quality analysis for these pollutants.
- F. As part of the performance/certification test plan, KCPL shall include details regarding the CEMS to include the following:
  - 1) Manufacturer's specifications for the analyzers,
  - 2) A description of how the installation of sampling probes and lines was conducted to ensure compliance with applicable regulatory requirements and to ensure delivery of a properly conditioned representative sample of stack gas to the analyzer(s), and
  - 3) A description of the testing procedures and methods that will be utilized to certify the accuracy of the CEMs.
- G. Two (2) copies of a written report of the performance test results shall be submitted to the Director of the Air Pollution Control Program within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA method for at least one (1) sample run.
- H. With regard to the pulverized coal fired boilers, stack testing for VOC, sulfuric acid mist, lead and hydrogen fluoride shall be repeated at least once every 2 years and the results shall be reported to the Air Pollution Control Program. The date on which these stack tests are conducted must be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test so that a pretest meeting may be arranged if necessary, and to assure that the test date is acceptable for an observer

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The permittee is authorized to construct and operate subject to the following special conditions:

to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to conducting the required emission testing.

13. Continuous Emission Monitoring System (CEMS)/Continuous Opacity Monitoring System (COMS) – Pulverized Coal Boilers (Units 1 and 2).

- A. KCPL shall install, certify, operate, calibrate, test and maintain CEMS for NO<sub>x</sub>, SO<sub>2</sub> and CO in accordance with all applicable regulations. If there are conflicting regulatory requirements, the more stringent shall apply.
- B. KCPL shall install, certify, operate, calibrate, test and maintain COMS for opacity in accordance with all applicable regulations. If there are conflicting regulatory requirements, the more stringent shall apply.
- C. KCPL shall install, certify, operate, calibrate, test and maintain CEMS for vapor phase mercury in accordance with the Environmental Protection Agency's regulations published in the May 18, 2005 Federal Register. See 40 CFR Part 75, Appendices A, B and K.
- D. KCPL shall install, certify, operate, correlate and maintain CEMS for particulate matter in accordance with the performance specification and quality assurance procedures of 40 CFR Part 60, Appendix B, Performance Specification 11 and Appendix F, Procedure 2.
- E. Compliance with the NO<sub>x</sub>, SO<sub>2</sub> and CO emission limits for the pulverized coal boilers shall be demonstrated through the use of the required CEMS.
- F. Compliance with the opacity limit for the pulverized coal boilers shall be demonstrated through the use of the required COMS.
- G. Compliance with the PM<sub>10</sub>, filterable PM<sub>10</sub> and filterable particulate matter emission limits for the pulverized coal boilers shall be demonstrated through the use of the required CEMS, however data gathered from the CEMS shall be adjusted as follows:

$$PM_{10} = PM_{CEM} + PM_{CONDENSIBLE} - PM_{>10}$$

$$\text{Filterable } PM_{10} = PM_{CEM} - PM_{>10}$$

Where,

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The permittee is authorized to construct and operate subject to the following special conditions:

$PM_{CEM}$  = reported value from the particulate matter CEMS.  
= Filterable particulate matter.

$PM_{CONDENSIBLE}$  = condensible particulate matter, from the stack test data.

$PM_{>10}$  = mass fraction of particulate matter greater than ten microns in diameter (from stack test data) multiplied by  $PM_{CEM}$ .

- H. Compliance with the mercury emission limits for the pulverized coal boilers shall be demonstrated through use of the required CEMS.
14. Operational Monitoring
- A. KCPL shall maintain an operational log, which shall detail each startup, shutdown, and malfunction of the pulverized coal boilers and associated pollution control systems.
- B. KCPL shall maintain an operational log, which shall detail each startup, shutdown, and malfunction of the auxiliary boiler. This operations log shall include a running total of the hours per year the auxiliary boiler is on-line.
- C. KCPL shall maintain an operational log for the emergency fire pumps that includes a running total of the hours per year the emergency fire pumps are in use; the total shall not exceed 200 hours.
- D. KCPL shall maintain inspection, maintenance, and repair log(s) for the pulverized coal boilers and associated pollution control systems.
- E. KCPL shall record the analysis of higher heating value, ash, sulfur and moisture content of every shipment of coal that is delivered to the installation, using a sample that is collected in a manner representative of the entire shipment.
- F. KCPL shall analyze a representative sample of fuel oil from the fuel oil storage tank for sulfur content and higher heating value at least once per year. As an alternative, KCPL may use analytical results from the fuel vendor.
- G. KCPL shall continuously monitor and record the following process parameters:

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### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- 1) Operating status of each major piece of equipment;
- 2) Kilowatts produced by the turbine(s) associated with the pulverized coal boilers and auxiliary boiler;
- 3) Mass feed rate of coal fed to the pulverized coal boilers;
- 4) Mass feed rate of fuel oil fed to the auxiliary boiler;
- 5) Ammonia injection rate for the SCR system;
- 6) Inlet NO<sub>x</sub> upstream of the SCR system;
- 7) Flue gas temperature in the vicinity of ammonia injection;
- 8) Flue gas temperature at the outlet of the SCR catalyst; and
- 9) Pressure drop across the SCR catalyst.

#### 15. Recordkeeping

- A. KCPL shall maintain records of the railcar unloading operations. The records will at a minimum detail the date coal is unloaded and the amount of coal unloaded each day.
- B. KCPL shall maintain daily records to document the tonnage of combustion by-products and limestone hauled to demonstrate compliance with Special Condition 10.C. of this permit.
- C. KCPL shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.

#### 16. Reporting

- A. KCPL shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the day in which emissions exceed the limits established by this permit.
- B. KCPL shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the day in which operation of equipment at this installation is not in accordance with any operational limitation or condition established by this permit.
- C. KCPL shall comply with the requirements of 10 CSR 10-6.050 with regard to Start-Up, Shutdown and Malfunction Conditions.
- D. KCPL shall report to the Air Pollution Control Program's Enforcement

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the date in which it is discovered that emission factors used in this permit (or permit application) underestimated actual emissions.

**17. Post-Construction Ambient Air Monitoring**

- A. KCPL shall conduct post-construction ambient air monitoring for mercury and PM<sub>10</sub> for a minimum of one (1) year after the pulverized coal boiler is fully operational. The monitoring period shall begin within six (6) months of the date that the pulverized coal boiler becomes fully operational. Monitoring may be discontinued upon written request and receipt of approval from the Air Pollution Control Program's Director.
- B. The monitoring shall be conducted under an approved Quality Assurance Project Plan at sites approved by the Air Pollution Control Program.
- C. The Quality Assurance Project Plan shall be submitted to the Air Pollution Control Program within six (6) months from the date of issuance of this permit.
- D. In the event that post-construction monitoring reveals a concentration of mercury, at or beyond the property boundary, in excess of 0.14 micrograms per cubic meter, 24-hour averaging time, then KCPL shall submit a corrective action plan to the Air Pollution Control Program within 20 days of receipt of such analytical results. The corrective action plan shall specify additional control measures that will be employed to control mercury emissions from combustion by-product handling and disposal.
- E. The post-construction PM<sub>10</sub> monitoring shall be evaluated along with the pre-construction monitoring data collected at this location. The purpose of this portion of the monitoring exercise is to evaluate the 24-hour PM<sub>10</sub> increment standard. If this evaluation demonstrates a contribution greater than the increment standard from the new project emissions, then KCPL shall submit a corrective action plan to the Air Pollution Control Program to address this finding. The corrective action plan shall identify alternatives to reduce particulate emissions/impacts. The corrective action plan will be due 30 days from a finding of excessive concentration.

- 18.** This project will create excess netting emissions reductions totaling approximately 3,500 tons of NO<sub>x</sub> and 12,200 tons of SO<sub>2</sub>. KCPL shall not use these excess emission reduction credits for SO<sub>2</sub> and NO<sub>x</sub> to avoid the applicability of BACT in any future permit applications to construct additional

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Project No.	2005-05-062

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

units at the Iatan Station or to modify Iatan Units 1 or 2 during the contemporaneous period (2001 to 2010).

19. In the event that there are conflicting requirements or specifications when comparing state and federal regulations and laws, the contents of the amended permit application and the conditions of this permit, the most stringent requirements or specifications shall apply.

**DRAFT**

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (8) REVIEW

Project Number: 2005-05-062  
Installation ID Number: 077-0039  
Permit Number:

Kansas City Power & Light Company  
Iatan Generating Station  
20250 Highway 45 North  
Weston, MO 64098

Complete: July 29, 2005  
Reviewed: May–October 2005

Parent Company:  
Great Plains Energy, Inc.  
1201 Walnut Street  
Kansas City, MO 64141

Platte County, S31, T45N, R36W

REVIEW SUMMARY

- Kansas City Power & Light Company (KCPL) has applied for authority to construct a new pulverized coal-fired boiler at the existing Iatan Generating Station. KCPL also intends to modify the existing Unit 1 generating unit to increase the heat input and upgrade the pollution control system. Further details about the intended new construction and modifications are presented in the Project Description.
- 40 CFR Part 60 Subpart Da, *Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced after September 18, 1978*, is applicable to the Iatan Unit 2 pulverized coal fired boiler.
- 40 CFR Part 60, Subpart D, *Standards of Performance for Fossil-Fuel Fired Steam Generators for Which Construction is Commenced after August 17, 1971*, is currently applicable to the Iatan Unit 1 pulverized coal-fired boiler. After this modification, the Subpart Da standards referenced above will apply to the Unit 1 boiler.
- 40 CFR Part 60, Subpart Y, *Standards of Performance for Coal Preparation Plants*, applies to the coal processing and conveying equipment (including the crushers), coal storage systems, and coal transfer and loading systems.
- 40 CFR Part 60, Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, applies to limestone handling processes.
- 40 CFR Part 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, applies to the auxiliary boiler.
- On May 18, 2005, the Environmental Protection Agency (EPA) published in the Federal Register a final rule entitled *Standards of Performance for New and Existing*

*Stationary Sources: Electric Utility Steam Generating Units.* This rule, otherwise known as the Clean Air Mercury Rule, established emission limitations for vapor phase mercury for new coal-fired utility units and it also created a market-based cap and trade system for mercury emissions. The cap and trade system applies to both existing and new coal-fired utility units. The vapor phase mercury emission limitation established in the Clean Air Act Mercury Rule for new coal-fired utility units burning subbituminous coal and equipped with wet scrubbing is  $42 \times 10^{-6}$  lb/gross MWh. The permit limit for both Iatan Unit 1 (existing unit) and Iatan Unit 2 (new unit) is  $39 \times 10^{-6}$  lb/gross MWh.

- On March 29, 2005 EPA published a final rule entitled *Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electrical Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electrical Utility Steam Generating Units from the Section 112(c) List*. Through this rulemaking EPA has concluded that it is no longer appropriate or necessary to regulate coal- and oil-fired utility units under section 112 of the Clean Air Act and has removed such units from the 112(c) list.
- 10 CSR 10-6.060(9) is the section of the State construction permits rule that applies to major sources of hazardous air pollutants. Before EPA's rulemaking of March 29, 2005, a Section (9) case-by-case maximum achievable control technology (MACT) analysis for hazardous air pollutants (HAPs) would have been required as part of this permitting process. However, there is an exemption at Subsection (C) of Section (9) that states the following:

*The requirements of section (9) of this rule do not apply to-*

- 1. Electrical utility steam generating units unless they are listed on the source category list established in accordance with section 112(c) of the Clean Air Act; or*
- 2. Research and development activities.*

Accordingly, a case-by-case MACT analysis is no longer required for HAPs such as mercury, hydrochloric acid and hydrogen fluoride.

- This review was conducted in accordance with Sections (6) and (8) of 10 CSR 10-6.060, *Construction Permits Required*. This project is considered as a major modification to KCPL's Iatan power plant. Net emissions increases from this project are above Prevention of Significant Deterioration (PSD) significant emission rates for CO, particulate matter, PM<sub>10</sub>, and VOC.
- The Best Available Control Technology (BACT) requirements apply to the pollutants CO, particulate matter, PM<sub>10</sub>, and VOC.
- Due to the addition of selective catalytic reduction for NO<sub>x</sub> control and a wet scrubber for SO<sub>2</sub> control on the Iatan Unit 1 boiler, there will be a net emissions decrease for NO<sub>x</sub>, SO<sub>2</sub> and sulfuric acid mist for this project. See the Netting Analysis section of this permit review document for further detail.
- This installation is located in Platte County, an attainment area for all criteria air

pollutants.

- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2] Number 27 - *Fossil-fuel fired steam electric plants of more than 250 million British thermal units per hour heat input.*
- Air quality modeling for this project was performed to determine the ambient impact of air pollutants. Based upon the air dispersion modeling reviewed by the Air Pollution Control Program staff, the study submitted by KCPL is complete and demonstrates that KCPL will not contribute to any violation of the National Ambient Air Quality Standards (NAAQS) or available increment.
- There are no currently applicable State or Federal laws or regulations that allow any limitation on CO<sub>2</sub> emissions for this project.

### INSTALLATION DESCRIPTION

KCPL has applied for the authority to install a pulverized coal boiler, an auxiliary boiler, associated storage, handling and pollution control equipment, a fuel oil storage tank and a landfill, all adjacent to the existing Iatan Generating Station (Installation ID Number 165-0007). The existing installation consists of a 6,600 MMBTU/hr pulverized coal boiler with an electrostatic precipitator, coal and ash handling facilities and an ash pond. The existing boiler is a dry bottom, wall-fired unit utilizing subbituminous coal as the primary fuel. Fuel oil (Number 1, Number 2 and used oil) is used for start-up, and as back-up fuel. The installation received a permit from EPA in 1977 and began operation in 1980. A Part 70 Operating Permit (Permit Number OP1999160) was issued by the Air Pollution Control Program in October 1999. KCPL submitted a Part 70 Permit renewal application in October 2004. The application is currently awaiting technical review.

### PROJECT DESCRIPTION

KCPL plans to install a new pulverized coal boiler with a maximum heat input of 8,100 MMBTU/hr. The permit application indicates that the boiler will be either an opposed-wall-fired or tangentially-fired dry-bottom boiler combusting low sulfur subbituminous coal as the primary fuel, and Number 2 fuel oil for start-up. The steam produced as a result of fuel combustion will be routed to a turbine. The turbine/generator is expected to have a nominal gross electric output of approximately 930 megawatts. Pollution control devices for the new pulverized coal boiler will include SCR with ammonia injection for NO<sub>x</sub> control, a pulse-jet baghouse for control of particulate matter and a wet scrubber for control of SO<sub>2</sub>.

As part of this project KCPL plans to upgrade the pollution control system for the Iatan Unit 1 boiler and modify the Unit 1 turbine/generator to allow for an 18 % increase in the heat input rate. The maximum hourly design rate will increase from 6,600 MMBTU/hr to 7,800 MMBTU/hr. The pollution control upgrade to the Iatan Unit 1 boiler entails removal of the electrostatic precipitator and replacement with a pulse-jet baghouse,

installation of an SCR with ammonia injection for NO<sub>x</sub> control and installation of a wet scrubber for control of SO<sub>2</sub>.

Other emission sources for this project include the following:

- Coal Storage and Handling

Coal will be delivered to the site by rail, to the existing rail car unloading area. In order to meet the requirements of this permit, KCPL will be required to install a baghouse to control particulate emissions from the rail car unloading process. In the permit application, KCPL indicates that the coal will be a low sulfur subbituminous coal from Wyoming. A rotary rail car dumper will dump the coal into a below grade hopper. A system of conveyers, a rotary stacker/reclaimer and transfer towers will be used to deliver coal to storage, crushing and boiler operations. A combination of crushers and pulverizers will be used to pulverize the coal to a consistency similar to talcum powder.

- Ash Handling and Disposal

Fly ash from the coal-fired boilers will be conveyed pneumatically to a storage silo and will subsequently be transferred to a haul truck. Fly ash that is destined for the landfill will be conditioned by mixing with water in a pug mill. Marketable fly ash will be transferred to a haul truck via a telescoping chute.

Bottom ash from the coal-fired boilers will be placed in a storage pile and then loaded into a haul truck for delivery to off-site users (such as cement kilns), or delivered to the on-site landfill.

- Auxiliary Boiler and Fuel Oil Tank

The auxiliary boiler will use Number 2 fuel oil and will have a maximum heat input rate of 219.4 MMBTU/hr. Operation of this boiler is limited to 876 hours per year. A 500,000 - gallon capacity above ground tank will be installed for fuel oil storage.

- Limestone Handling

Limestone will be used for SO<sub>2</sub> scrubbing. Limestone will be delivered by truck or rail and will be placed in a storage pile and then conveyed to storage bins for use in the wet scrubbers.

- Haul Roads

Truck traffic will include limestone deliveries, combustion by-product hauling to the landfill and off-site and gypsum hauling.

- Cooling Towers

The cooling towers will be a source of particulate emissions.

- Emergency Fire Pumps

Two (2) emergency fire pumps will be installed as part of this project. They will utilize fuel oil and will be limited to 200 hours per year of operation. One pump will be rated at 460 horsepower and the other will be rated at 265 horsepower.

## EMISSIONS/CONTROLS EVALUATION

- Pulverized Coal-Fired Boilers

Potential particulate matter, PM<sub>10</sub>, CO and VOC emissions from the pulverized coal boiler are greater than PSD significant emission levels and above the levels that trigger a Section (8) review. Potential emissions of all pollutants were calculated based on a maximum heat input rate to the boilers (7,800 MMBTU/hr for Unit 1 and 8,100 MMBTU/hr for Unit 2) and continuous, around the clock operation (8760 hours annually).

A BACT analysis was conducted on the pulverized coal boilers for particulate matter, PM<sub>10</sub>, CO and VOC. The BACT control device for particulate matter and PM<sub>10</sub> was determined to be a pulse-jet baghouse. It is anticipated that the control efficiency for PM<sub>10</sub> will be greater than 99.5 percent. CO and VOC emissions will be minimized through the use of good combustion practices. Potential emissions for each of these pollutants were calculated based on each pollutant's BACT emission limit. The particulate matter, PM<sub>10</sub> and CO emission rates will be verified through stack testing and continuous emission monitoring. The VOC emission rates will be verified by stack testing.

Potential emissions of NO<sub>x</sub> and SO<sub>2</sub> from the pulverized coal boilers were based on the permit limits. In order to meet the permit limits KCPL will be required to install and effectively operate SCR for NO<sub>x</sub> control and wet scrubbers for SO<sub>2</sub> control. Emission rates for NO<sub>x</sub> and SO<sub>2</sub> will be verified through continuous emission monitoring.

Potential emissions of vapor phase mercury were based on the limit proposed in the application -  $39 \times 10^{-6}$  lb/gross MWh. Emission rates for vapor phase mercury will be verified through continuous emission monitoring.

- Coal Storage and Handling

PM<sub>10</sub> emissions will occur at several points in the storage and handling of coal. The emission factor for PM<sub>10</sub> from rail car unloading was taken from EPA's Factor Information Retrieval System (FIRE) Version 6.24, SCC 30501008, with control efficiencies applied due to baghouse control. Coal transfer and conveying emission factors were predicted by an empirical formula found in EPA Document AP-42, *Compilation of Air Pollution Emission Factors*, Fifth Edition, Section 13.2.4, Aggregate Handling and Storage Piles. 99 percent control efficiency was applied at the transfer towers and coal bunker emission points that have baghouses for

particulate control. The coal crushing emission factor was derived from FIRE SCC 30501010 and the AP-42 Section 13.2.4 emission factor (4 drop points) and assumed 99 percent control efficiency for the baghouse. The PM<sub>10</sub> emission factor for storage pile wind erosion comes from *Control of Fugitive and Hazardous Dusts*, Cowherd, et al (Equation 3-9), with a control efficiency applied due to the addition of water/chemical dust suppressant to the coal. The PM<sub>10</sub> emission factor for vehicular activity around the coal storage piles was obtained from AP-42, Section 11.9, *Western Surface Coal Mining* (see Table 11.9-1 for the bulldozing emission factor).

- Ash Handling and Disposal

Ash handling and disposal PM<sub>10</sub> emission factors were estimated using an empirical formula from AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (1/95).

- Auxiliary Boiler and Fuel Oil Tank

The emission factors for SO<sub>2</sub> and CO from the auxiliary boiler were taken from AP-42 Section 1.3, *Fuel Oil Combustion* (9/98), using a sulfur content of 0.05 percent and a heating value of 140 MMBTU/10<sup>3</sup> gal. The emission factors for NO<sub>x</sub>, PM<sub>10</sub> and VOC were based on the permit limits. Emission rates from the auxiliary boiler (for all pollutants discussed in this paragraph) will be verified through stack testing.

Potential emissions from the fuel oil tank were estimated by using EPA's TANKS 4.0 software.

- Limestone Handling

Limestone handling PM<sub>10</sub> emission factors were estimated using an empirical formula from AP-42 Section 13.2.4, *Aggregate Handling and Storage Piles* (1/95).

- Haul Roads

Potential emissions of PM<sub>10</sub> from the haul roads were estimated from AP-42, Section 13.2.2, *Unpaved Roads* (12/03). Emissions from unpaved haul roads will be controlled either through application of chemical surfactant or watering. Emissions from paved roads will be controlled by periodic washing.

- Cooling Towers

The cooling tower's potential PM<sub>10</sub> emissions were calculated assuming a total dissolved solids concentration of 15,000 parts per million (ppm) and a recirculation rate of 501,600 gallons per minute. The high efficiency drift eliminator will control drift to 0.001 percent, leaving a drift rate of approximately 5 gallons of water per minute lost from the cooling towers. The potential PM<sub>10</sub> emissions were assumed to be 5 percent of the total particulate matter emitted.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2004 EIQ)	Net Emissions Increase
PM <sub>10</sub>	15.0	Major	359.2	867.4
SO <sub>2</sub>	40.0	Major	19219.3	-12,198.8
NO <sub>x</sub>	40.0	Major	9694.3	-3515.0
VOC	40.0	Major	88.5	164.1
CO	100.0	Major	738.1	9710.9
HAPs	10.0/25.0	Major	91.4	N/D
H <sub>2</sub> SO <sub>4</sub> mist	7.0	N/D	587.4	-62.1
Lead	0.6	N/D	0.26	0.13
Mercury	0.1	N/D	0.16	0.16
Hydrogen Chloride	10.0	N/D	16.6	N/D
Hydrogen Fluoride	10.0	N/D	70.4	N/D

\*N/D = Not Determined

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Sections (6) and (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. This project is a major modification to KCPL's Iatan power plant. Net emissions increases from this project are above PSD significant emission rates for CO, particulate matter, PM<sub>10</sub>, and VOC.

Section (9) of 10 CSR 10-6.060 does not apply for the reasons stated in the review summary.

### APPLICABLE REQUIREMENTS

KCPL shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations must be consulted for specific record keeping, monitoring, and reporting requirements. For a complete list of applicable requirements for your installation, please consult your operating permit.

#### GENERAL REQUIREMENTS.

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110  
The emission fee is the amount established by the Missouri Air Conservation Commission annually under § 643.079(1), RSMo. Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of*

*Origin, 10 CSR 10-6.170*

- *Restriction of Emission of Visible Air Contaminants, 10 CSR 10-6.220*
- *Restriction of Emission of Odors, 10 CSR 10-2.070*
- *Open Burning Restrictions, 10 CSR 10-2.100*
- *Start-Up, Shutdown and Malfunction Conditions, 10 CSR 10-6.050*

#### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Sulfur Compounds, 10 CSR 10-6.260*
- *Acid Rain Source Permits Required, 10 CSR 10-6.270*
- *Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400*
- *Emission Limitations and Emissions Trading of Oxides of Nitrogen, 10 CSR 10-6.350*
- *Emissions Banking and Trading, 10 CSR 10-6.410*
- *New Source Performance Regulations, 10 CSR 10-6.070*
  - ◆ *Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978, 40 CFR Part 60, Subpart Da*
  - ◆ *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60, Subpart Db*
  - ◆ *Standards of Performance for Coal Preparation Plants, 40 CFR Part 60 Subpart Y*
  - ◆ *Standards of Performance for Nonmetallic Mineral Processing Plants, 40 CFR Part 60, Subpart OOO*

## BACT ANALYSIS

### **Introduction**

Any new source or major modification subject to Section (8) of 10 CSR 10-6.060, *Construction Permits Required*, must conduct a Best Available Control Technology (BACT) analysis on any pollutant that has a net emissions increase above PSD significance levels. For this project, the net emissions increase for particulate matter, PM<sub>10</sub>, CO and VOC are greater than PSD significant emission levels. Therefore a BACT analysis is required for each of these pollutants. A BACT analysis is not required for NO<sub>x</sub>, SO<sub>2</sub> or sulfuric acid mist since there is a net emissions reduction for these

pollutants after adding controls to the Unit 1 boiler. The BACT requirements are detailed in Section 165(a)(4) of the Clean Air Act, at 40 CFR 52.21 and Section (8) of 10 CSR 10-6.060.

BACT analyses are done on a case-by-case basis and generally utilize a “top down” approach. The following steps detail the top-down approach:

1. Identify all potential control technologies – must be a comprehensive list, it may include technology employed outside the United States and must include the Lowest Achievable Emission Rate (LAER) determinations.
2. Eliminate technically infeasible options – must be well documented and must preclude the successful use of the control option.
3. Rank remaining control technologies – based primarily on control effectiveness, but also considering energy, environmental and economic impacts.
4. Evaluate the most effective controls – based on case-by-case consideration of control effectiveness, energy, environmental, and economic impacts.
5. Select BACT. The “top” performing technology (in terms of control effectiveness) is selected unless it can be ruled out due to technical unfeasibility, energy considerations, collateral environmental impacts or cost considerations. If the top performing control technology is selected the applicant does not have to provide cost and other detailed information for other control options. Selecting BACT also involves specification of an emission/limitation that relates to effective use of the BACT control technology. In some cases (such as fugitive emission sources) it is not feasible to measure emission rates, and when this is determined to be the case, certain design, equipment, work practice, operational standards, or a combination thereof, may be prescribed instead of an emission limitation.

KCPL prepared a BACT analysis as part of the permit application – see Section 5. The Air Pollution Control Program’s BACT analysis considers the information submitted by KCPL, along with additional information from various sources. The BACT analysis is summarized below.

**Particulate Matter and PM<sub>10</sub> Control Technologies – Pulverized Coal Fired Boilers**

Table 2 lists the control technologies KCPL evaluated for this review (in order of control achieved) and the emission rates each control technology can attain.

Table 2: Particulate Matter and PM<sub>10</sub> Control Technologies Considered

<b>Control Technology</b>	<b>Percent Reduction</b>
Baghouse	>99.5%
Electrostatic Precipitator (ESP)	>99%

Baghouses are commonly used for particulate control. A baghouse consists of filter bags suspended in a metal housing. Particulate matter in the flue gas collects on the filter bag surfaces. The dust that accumulates on the bags also serves as a filter. KCPL conducted an economic evaluation and concluded that a pulse-jet baghouse would be as effective as a reverse-gas baghouse and would have lower annualized costs, as compared to the reverse air baghouse. In July 2005 KCPL indicated that

pulse-jet baghouses had been selected for this project. In September 2005 KCPL asked that the permit be written to allow either pulse-jet or reverse-gas baghouses, to allow more flexibility in the bidding process.

In a pulse-jet baghouse, the bags are supported on wire cages, and the air is filtered from the outside of the bag to the inside, leaving the dust on the outside. Bag cleaning is accomplished by blasting a short pulse of high-pressure air through a venturi nozzle into the center of the bag, causing the fabric to ripple and knock off the dust from the outside. Pulse-jet baghouses are designed as one large compartment and operate continuously. A pulse of air cleans the bags every few minutes, but the baghouse is not taken off-line during cleaning.

In a reverse-air baghouse, the air is filtered from the inside of the bag to the outside, leaving dust on the inside. Bag cleaning is accomplished by reversing the flow of air, which causes the bags to flex and shake, dislodging particles.

Both pulse-jet and reverse air baghouses are capable of achieving greater than 99.5 percent reduction in filterable particulate matter and PM<sub>10</sub> emissions. In addition to controlling particulate matter and PM<sub>10</sub> emissions, baghouses will control particulate HAP emissions. KCPL proposes to install baghouses for both of the boilers. Baghouse control will be more efficient than the existing electrostatic precipitator for Unit 1 – the increased efficiency applies to particulate matter, PM<sub>10</sub> and PM<sub>2.5</sub>. Baghouses are more efficient than electrostatic precipitators with regard to PM<sub>2.5</sub>.

Baghouse control/fabric filtration represents the top control for filterable particulate matter and filterable PM<sub>10</sub> emissions. BACT emission rates were determined as 0.015 and 0.014 lbs/MMBTU for filterable particulate matter and filterable PM<sub>10</sub>, respectively. This determination was based on evaluation of information submitted by KCPL, examination of recently issued permits, review of proposed amendments to the new source performance standards and the anticipated efficiency of the pulse-jet and reverse-air baghouses.

In addition, the pulverized coal boilers have BACT emission limitations that account for the condensable fraction of PM<sub>10</sub> (primarily sulfuric acid mist). These limits are consistent with recent permitting actions.

### **CO Control Technologies – Pulverized Coal- Fired Boilers**

Table 3 lists the possible control technologies (in no particular order) for CO emissions from the pulverized coal-fired boilers.

Table 3: CO Control Technologies Considered

<b>Control Technology</b>
Catalytic Oxidation
SCONO <sub>x</sub>
Good Combustion Practice

## **Catalytic Oxidation**

Catalytic oxidation is a post-combustion technology used to oxidize CO to carbon dioxide (CO<sub>2</sub>) without the introduction of additional chemicals. The activation energy for this reaction is lowered through the use of a catalyst and the oxidation then proceeds by utilizing excess air present in the exhaust gas. An oxidation catalyst is usually precious metal (i.e. platinum) based, and operates in an optimal temperature range between 700°F and 1,100°F.

The use of oxidation catalysts with fuels containing sulfur can promote the oxidation of SO<sub>2</sub> to SO<sub>3</sub>. The SO<sub>3</sub> can react with water or ambient ammonia in the exhaust to form H<sub>2</sub>SO<sub>4</sub>. The optimal temperature range for the performance of the oxidation catalyst would require the catalyst be installed upstream of the wet scrubber and fabric filter. The ash and trace elements in the exhaust stream would foul the catalyst. In addition, catalytic oxidation has never been applied to a coal-fired unit. Thus, the use of a catalytic oxidation system for the proposed pulverized coal fired boiler is not considered technically feasible.

## **SCONO<sub>x</sub>**

The SCONO<sub>x</sub> system uses an oxidation/absorption/regeneration cycle across a catalyst bed to achieve back end reductions of CO. The technology utilizes the same principles as catalytic oxidation for CO control. Thus, SCONO<sub>x</sub> is eliminated from further consideration for the same reasons as catalytic oxidation.

## **Good Combustion Practices**

CO emissions are the result of incomplete combustion. However, reducing CO emissions can result in an increase of NO<sub>x</sub> emissions. CO and NO<sub>x</sub> emissions can be balanced through the use of good combustion practices. Good combustion practices include practices such as operating with higher flame temperatures, adequate combustion air, and proper air/fuel mixing.

## **Selection of CO Control Technology for the Pulverized Coal Fired Boilers**

As discussed above, the use of catalytic oxidation or SCONO<sub>x</sub> are not feasible control options for CO emissions resulting from a pulverized coal fired boiler. The remaining control technology for CO emissions is the implementation of good combustion practices. Thus, the utilization of good combustion practices with a CO emission limit of 0.14 lbs/MMBTU for Unit 2 and 0.16 lbs/MMBTU for Unit 1 was determined to be BACT for CO. This determination and associated emission rate is consistent with other recently permitted pulverized coal-fired boilers.

## **Selection of VOC Control Technology for the Pulverized Coal Fired Boilers**

Like CO, VOC emissions are the result of incomplete combustion of the coal. The most efficient means of controlling VOC emissions is combustion. The boiler is essentially a combustion chamber, and as such, the proper operation of the boiler through the use of good combustion practices will promote complete combustion. Good combustion practices include extended residence time, proper mixing of air and fuel, and steady high temperatures in the combustion zone. Thus, the utilization of good combustion practices with a VOC emission limit of 0.0036 lbs/mmBtu was determined to be BACT for VOC from the pulverized coal-fired boilers. This determination and emission rate is

consistent with other recently permitted pulverized coal-fired boilers.

### **PM<sub>10</sub> Control Technologies – Cooling Towers**

Particulate emissions occur from the cooling tower as a result of the solids in the water being entrained in the air stream. These droplets of water are known as drift. The most efficient way to remove drift from cooling towers is by installing drift eliminators. Thus, BACT for PM<sub>10</sub> from the cooling tower was determined to be high efficiency drift eliminators with a 0.001 percent drift.

### **PM<sub>10</sub> Control Technologies – Haul Roads**

BACT for the haul roads, with the exception of the landfill haul road, was determined to be the paving and periodically washing the roads. This represents the highest level of PM<sub>10</sub> control, and as such no further evaluation was conducted for other control technologies.

The haul road running from the edge of the landfill onto the landfill itself will not be paved. Paving of the landfill haul road is not feasible in that the road changes as the landfill utilization changes. Thus, BACT for the landfill haul road was determined to be either the application of chemical surfactant or documented watering to achieve a control efficiency of 90 percent.

### **PM<sub>10</sub> Control Technologies – Coal Storage Piles**

The size of the storage piles makes capture of particulate matter emissions from the storage piles by mechanical devices infeasible. Thus, it is not possible to control the storage pile emissions through the use of a baghouse. BACT for the coal storage piles was determined to be application of water and/or a chemical surfactant.

### **PM<sub>10</sub> Control Technologies – Coal Handling Operations**

The only pollutant that will be emitted from the coal handling equipment is PM<sub>10</sub>. The coal handling operations include the railcar unloading system, transfer towers, coal unloading and reclamation system and coal crushing. The following control methods represent BACT for coal handling:

- ◆ Particulate emissions from rail car unloading will be controlled by a baghouse.
- ◆ A water/chemical dust suppressant mixture will be applied to the coal between the rail car unloading hopper and the transfer tower.
- ◆ Coal conveyance and transfer systems will be enclosed and vented to a baghouse.
- ◆ A telescoping chute will be used to drop coal from conveying equipment to the storage pile and the free fall distance from the end of the chute to the top of the coal pile will be less than ten (10) feet.
- ◆ Coal crushing and transfer operations will be controlled by a baghouse.
- ◆ The pulverized coal storage silos will be controlled by a baghouse.
- ◆ Housekeeping measures such as sweeping, water washing and vacuuming will be used to clean equipment, structures and pavement to prevent or minimize generation of fugitive particulate emissions to the extent practicable.

### **PM<sub>10</sub> Control Technologies – Limestone Handling Operations**

Particulate emissions from limestone reclaim operations and the limestone day storage bins will be controlled by baghouses. BACT for the limestone handling, transfer, and preparations points was determined to be the use of baghouses at these two points.

### **PM<sub>10</sub> Control Technologies – Combustion By-Product Handling Operations**

Particulate emissions from combustion by-product transfer sources, except fly ash that is sold, will be minimized by adding water to the material prior to transfer. Fly ash collected in the baghouse will be pneumatically transferred to storage silos and will be controlled through the use of a baghouse. A shrouded load-out spout with a vacuum return that is routed to a baghouse or fabric filter will be used to control emissions when loading marketed fly ash from the fly ash silo to trucks that are leaving the site.

### **BACT for the Auxiliary Boiler**

Particulate control devices are not typically installed on units firing No. 2 fuel oil due to the relatively small amount of particulate emissions and the economic infeasibility of adding control. KCPL estimated that controlling particulate emissions from the auxiliary boiler would cost \$17,758 and \$19,797 per ton of pollutant removed for a fabric filter and ESP, respectively.

KCPL proposed a BACT emission limit for PM<sub>10</sub> of 0.03 lbs/MMBTU. The applicable 40 CFR Part 63, Subpart DDDDD limit for particulate matter is 0.03 lbs/MMBTU. Note that one limit is for PM<sub>10</sub> and the other is for total particulate matter. Table 1.3-6 of AP-42, Section 1.3, *Fuel Oil Combustion* indicates that approximately half of the filterable particulate matter emitted will be PM<sub>10</sub>. Table 1.3-1 has a filterable particulate matter emission factor of 0.002 lbs/gallon. So the emission factor for filterable PM<sub>10</sub> is 0.001 lbs/gallon. Table 1.3-2 has a condensable particulate matter emission factor of 0.0013 lbs/gallon, all PM<sub>10</sub>. The combined emission factor for filterable and condensable PM<sub>10</sub> is 0.0023 lbs/gallon. For a heating value of 140,000 BTU/gallon, the calculated emission factor for PM<sub>10</sub> is 0.016 lbs/MMBTU.

It appears appropriate to eliminate add-on controls for particulate matter and PM<sub>10</sub> due to economic considerations; however, it also appears appropriate to adjust the BACT PM<sub>10</sub> emission limitation downward from what KCPL proposed and to add a particulate matter BACT emission limit consistent with 40 CFR Part 63, Subpart DDDDD. KCPL indicated that they have not been able to obtain vendor guarantees for a 0.020 lb/MMBTU emission rate, which was the emission rate proposed in first-cut, rough draft of this permit. A search of EPA's RACT/BACT/LAER database (see <http://cfpub.epa.gov/RBLC/htm/bl02.cfm>) found emission limits as low as 0.024 lbs/MMBTU for this type of boiler. With the above discussion in mind, BACT for PM<sub>10</sub> is use of a clean, low sulfur fuel and an emission limit of 0.024 lbs/MMBTU.

With regard to CO and VOC, BACT was determined to be the use of good combustion practices and the CO limit was adjusted downward from what KCPL proposed after consideration of the emission factors published in AP-42, Section 1.3, *Fuel Oil Combustion* and examination of EPA's RACT/BACT/LAER database.

## NETTING ANALYSIS

Emissions netting is a term that refers to the process of considering historical and prospective emissions to determine if a “net emissions increase” of a pollutant will result from proposed modifications and/or new construction at an installation. If there is a net emissions increase above PSD significance levels and the source is classified as a “major” source then PSD requirements, including the BACT analysis requirements and ambient air quality analysis requirements, apply.

For this installation, the netting analysis involved looking at the difference between potential future emissions (after all modifications and new construction is complete) and representative historical emissions (2003 and 2004 emissions from the entire installation). The most significant emissions reductions associated with this project come as a result of adding NO<sub>x</sub> and SO<sub>2</sub> controls to the Unit 1 boiler. Creditable emissions increases and decreases entered into the net emissions increase calculations came from examination of this project only; there were no other creditable emissions increases or decreases entered into the netting analysis for the contemporaneous period. The contemporaneous period is defined as the period that starts 5 years before the anticipated construction start-up date and extending until the modifications are complete and the new equipment is operational. For this installation, it is anticipated that construction will begin in early 2006 and that the modifications and new construction will be complete and ready to go on-line by 2011. Therefore, the projected contemporaneous period is 2001 through 2010.

The results of the netting analysis indicate that there will be a net emissions decrease for NO<sub>x</sub>, SO<sub>2</sub> and sulfuric acid mist. For particulate matter, PM<sub>10</sub>, VOC and CO there will be a net emissions increase above PSD significance levels. Refer to the Table 1 *Emissions Summary* and the Appendix A *Net Emission Increase Spreadsheets* for further detail.

## AMBIENT AIR QUALITY IMPACT ANALYSIS

The ambient air quality impact analysis indicates that this project will not cause ambient air concentrations above acceptable levels. The results of a preliminary impact analysis indicate that ambient air concentrations for CO will be below the modeling significance levels listed in Table 4 of 10 CSR 10-6.060(11), therefore additional analysis was not required. Ambient air concentrations for PM<sub>10</sub> are predicted to be greater than modeling significance levels but below levels that would present a problem with regard to the national ambient air quality standard or PSD increment consumption. Please refer to the incorporated air dispersion modeling memo for additional information.

Note: The 3-hour and 24-hour SO<sub>2</sub> emission limitations for the Unit 1 and Unit 2 pulverized coal boilers are subject to modification dependent upon the results of an on-going ambient air quality analysis for SO<sub>2</sub>. If modified, these emission limitations will be decreased, not increased.

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Sections (6) and (8) of 10 CSR 10-6.060, *Construction Permits Required*, I recommend permit issuance, with special conditions.

\_\_\_\_\_  
Steve Jaques, P.E.  
Environmental Engineer

\_\_\_\_\_  
Date

#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct, dated May 2005 and received May 16, 2005, designating Kansas City Power & Light Company as the owner and operator of the installation.
- Air Pollution Control Program Internal Memorandum, dated November 2, 2005, from Kelly Robson to Steve Jaques regarding Kansas City Power & Light – Prevention of Significant Deterioration (PSD) Air Dispersion Modeling (Iatan I and II).
- Letter, with attachments, dated July 11, 2005 and transmitted by electronic mail July 13, 2005, from KCPL (Terry Eaton) to the Air Pollution Control Program (Steve Jaques) regarding Construction Permit Application for Kansas City Power & Light – Iatan Unit 2. Attachment 1 – Wet and Dry FGD Technology Description; Attachment 2 – Technical Paper – In-Stack Condensible Particulate Matter Measurements and Issues; Attachment 3 – Intermountain Power Generating Station Approval Order.
- Letter, with attachment, dated July 26, 2005, from KCPL (Terry Eaton) to the Air Pollution Control Program (Steve Jaques) regarding KCPL Iatan Unit 2 Application. Attachment A - Permit Application BACT Determination for Particulates.
- KCPL's Economic Evaluation for PM<sub>10</sub>, transmitted by electronic mail July 29, 2005, from KCPL (Terry Eaton) to the Air Pollution Control Program (Steve Jaques).
- Letter dated August 9, 2005 and transmitted by electronic mail August 9, 2005, from KCPL (Terry Eaton) to the Air Pollution Control Program (Steve Jaques) regarding Construction Permit Application for Kansas City Power & Light – Iatan Unit 2. Subjects: 1) Coal Train Unloading, and 2) Sulfuric Acid Mist Net Emission Increase Analysis.
- Electronic mail, with attachments, transmitted September 8, 2005, from Trinity Consultants (Michael Burkhart) to the Air Pollution Control Program (Steve Jaques) regarding Revised Process Flow Diagrams. Attachment 1 – Process Flow Diagram for Unit 2; Attachment 2 – Process Flow Diagram for Unit 1; Attachment 3 – Revised TANKS 4.0 Emissions Report.
- Electronic mail, with attachment, transmitted September 20, 2005, from KCPL (Paul Ling) to the Air Pollution Control Program (Steve Jaques) regarding Iatan PSD Rough Draft Permit. Attachment - Revised TANKS 4.0 Emissions Report.



**Kansas City Power & Light - Iatan Project Number 2005-05-062**

**Appendix A.1 - Net Emissions Increase Calculations for PM10**

EP ID	Model ID	Description	Status	Max. Hourly Design Rate (existing)	Max. Hourly Design Rate (future)	Max. Hourly Design Rate Units	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	EF Units	Approx. Hrs/Yr (historical)	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
EP-01	IAT1	Railcar Unloading	Existing	4000	4000	tph	2946685	8492927	4.36E-03	1.09E-03	lbs/ton	737	1.74E+01	6.42E+00	4.36E+00	4.63E+00	-1.31E+01	-1.80E+00
EP-02	IAT2A	West Coal Storage (Wind)	Existing	20.66	20.66	acres			8.09E-02	8.09E-02	lbs/acre-hr	8760	1.67E+00	7.32E+00	1.67E+00	7.32E+00	0	0
EP-02	IA2B	West Coal Storage (Activity)	Existing	1	1	dozer-hr			4.49E-01	4.49E-01	lbs/hr	8760	4.49E-01	1.97E+00	4.49E-01	1.97E+00	0	0
EP-03A	IAT3A	Transfer Tower # 1	Existing	4000	4000	tph	2946685	8492927	7.16E-07	7.16E-07	lbs/ton	737	2.86E-03	1.05E-03	2.86E-03	3.04E-03	0	1.99E-03
EP-03B	IAT3B	Stacker/Reclaimer - Stackout	Existing	4000	4000	tph	2946685	4166341	1.43E-04	1.43E-04	lbs/ton	737	5.72E-01	2.11E-01	5.72E-01	2.98E-01	0	8.72E-02
EP-03C	IAT3C	Stacker/Reclaimer - Reclaim	Existing	1750	3500	tph	2904248	4166341	1.43E-04	1.43E-04	lbs/ton	1660	2.50E-01	2.08E-01	5.01E-01	2.98E-01	2.50E-01	9.02E-02
EP-03D	IAT3D	Transfer Tower # 2	Existing	1750	3500	tph	2904248	8492927	7.16E-07	7.16E-07	lbs/ton	1660	1.25E-03	1.04E-03	2.51E-03	3.04E-03	1.25E-03	2.00E-03
EP-03E	IAT3E1	Iatan 1 East Coal Bunker	Existing	750	750	tph	1452124	4166341	3.58E-06	3.58E-06	lbs/ton	1936	2.69E-03	2.60E-03	2.69E-03	7.46E-03	0	4.86E-03
EP-03E'	IAT3E2	Iatan 1 West Coal Bunker	Existing	750	750	tph	1452124	4166341	5.01E-06	5.01E-06	lbs/ton	1936	3.76E-03	3.64E-03	3.76E-03	1.04E-02	0	6.80E-03
EP-04	IAT4	Coal Crusher	Existing	1750	3000	tph	2904248	8492927	6.29E-05	6.29E-05	lbs/ton	1660	1.10E-01	9.13E-02	1.89E-01	2.67E-01	7.86E-02	1.76E-01
EP-06	IAT6	Iatan Unit 1 Boiler (Coal)	Existing	6600	7800	MMBTU/HR	47629667	68328000	3.50E-02	2.44E-02	lbs/MMBTU	7217	2.31E+02	8.34E+02	1.90E+02	8.34E+02	-4.07E+01	8.24E-02
EP-07A	IAT7a	Iatan Fly Ash to Trucks	Existing	40	40	tph	115543	275291	5.07E-02	5.07E-02	lbs/ton	2889	2.03E+00	2.93E+00	2.03E+00	6.98E+00	0	4.05E+00
EP-07B	IAT7b	Iatan Fly Ash Bin Baghouse	Existing	40	40	tph	115543	249980	5.07E-04	5.07E-04	lbs/ton	2889	2.03E-02	2.93E-02	2.03E-02	6.34E-02	0	3.41E-02
EP-08	IAT8	Iatan 1 - Fly Ash to Pond	Removed	12	N/A	tph	27684	0	5.07E-02		lbs/ton	2307	6.08E-01	7.02E-01	0	0.00E+00	-6.08E-01	-7.02E-01
EP-09	IAT9	Haul Road - Plant to Ash Pond	Removed	1.8	N/A	VMT/Hr	4387	0	1.14E+00		lbs/VMT	2437	2.04E+00	2.49E+00	0	0.00E+00	-2.04E+00	-2.49E+00
EP-10	IAT10	Transfer Tower # 1A	New		4000	tph		4326585		7.16E-07	lbs/ton				2.86E-03	1.55E-03	2.86E-03	1.55E-03
EP-11	IAT11	Transfer to Active Storage Pile	New		4000	tph		4326585		7.16E-05	lbs/ton				2.86E-01	1.55E-01	2.86E-01	1.55E-01
EP-12	IAT12	Active Coal Storage-Wind	New		1.3	acres				8.09E-02	lb/acre-hr				1.05E-01	4.61E-01	1.05E-01	4.61E-01
EP-13A	IAT13A	East Coal Storage (Wind)	New		3.34	acres				8.09E-02	lb/acre-hr				2.70E-01	1.18E+00	2.70E-01	1.18E+00
EP-13B	IAT13B	East Coal Storage (Activity)	New		1	dozer-hr				4.49E-01	lbs/hr				4.49E-01	1.97E+00	4.49E-01	1.97E+00
EP-14	IAT14	Transfer to Reclaim	New		1750	tph		4326585		1.43E-04	lbs/ton				2.50E-01	3.09E-01	2.50E-01	3.09E-01
EP-15	IAT15	Transfer Tower & Coal Bunker	New		1750	tph		4326585		7.88E-06	lbs/ton				1.38E-02	1.70E-02	1.38E-02	1.70E-02
EP-16	IAT16	Limestone Unloading - Fugitive	New		1000	tph		236439		3.82E-04	lbs/ton				3.82E-01	4.52E-02	3.82E-01	4.52E-02
EP-17	IAT17	Limestone Unloading - Stack	New		1000	tph		236439		3.82E-06	lbs/ton				3.82E-03	4.52E-04	3.82E-03	4.52E-04
EP-18	IAT18	Limestone Transfer to Pile	New		1000	tph		236439		7.65E-04	lbs/ton				7.65E-01	9.04E-02	7.65E-01	9.04E-02
EP-19	IAT19	Limestone Storage Pile	New		0.72	acres				1.11E-01	lb/acre-hr				8.03E-02	3.52E-01	8.03E-02	3.52E-01
EP-20	IAT20	Limestone Reclaim-Fugitive	New		1000	tph		236439		3.82E-04	lbs/ton				3.82E-01	4.52E-02	3.82E-01	4.52E-02
EP-21	IAT21	Limestone Reclaim-Stack	New		1000	tph		236439		3.82E-06	lbs/ton				3.82E-03	4.52E-04	3.82E-03	4.52E-04
EP-22	IAT22A	Limestone Day Bin 1	New		1000	tph		236439		3.82E-06	lbs/ton				3.82E-03	4.52E-04	3.82E-03	4.52E-04
EP-22	IAT22B	Limestone Day Bin 2	New		1000	tph		236439		3.82E-06	lbs/ton				3.82E-03	4.52E-04	3.82E-03	4.52E-04
EP-23	IAT23	Fly Ash Bin Baghouse	New		30	tph		259595		5.07E-04	lbs/ton				1.52E-02	6.58E-02	1.52E-02	6.58E-02
EP-24	IAT24	Fly Ash Bin Transfer to Trucks	New		40	tph		279291		1.16E-02	lbs/ton				4.64E-01	1.62E+00	4.64E-01	1.62E+00
EP-25	IAT25	Bottom Ash Handling	New		20	tph		152873		2.20E-04	lbs/ton				4.40E-03	1.68E-02	4.40E-03	1.68E-02
EP-26	IAT26	Bottom Ash Storage Pile	New		0.15	acres				4.18E-02	lbs/ton				6.27E-03	2.75E-02	6.27E-03	2.75E-02
EP-27	IAT27	Gypsum Handling	New		55	tph		441078		2.20E-04	lbs/ton				1.21E-02	4.85E-02	1.21E-02	4.85E-02
EP-28	IAT28	Gypsum Storage Pile	New		0.21	acres				1.11E-01	lb/acre-hr				2.34E-02	1.03E-01	2.34E-02	1.03E-01
EP-29	IAT29A-R	Cooling Tower Fans (All 18)	New												1.88E+00	8.25E+00	1.88E+00	8.25E+00
EP-30	IAT30100	Iatan Unit 2 Boiler (Coal)	New		8100	MMBTU/Hr		70956915		2.36E-02	lbs/MMBTU				1.91E+02	8.37E+02	1.91E+02	8.37E+02
EP-31	IAT31	Aux. Boiler	New		219.4	MMBTU/Hr		192194		2.40E-02	lbs/MMBTU	876			5.27E+00	2.31E+00	5.27E+00	2.31E+00
EP-32	IAT32	Fire Pump # 1	New		460	hp				2.20E-03	lbs/hp-hr	200			1.01E+00	1.01E-01	1.01E+00	1.01E-01
EP-33	IAT33	Fire Pump # 2	New		265	hp				2.20E-03	lbs/hp-hr	200			5.83E-01	5.83E-02	5.83E-01	5.83E-02
EP-35A	IAT35A	Landfill - Unloading	New		85.3	tph		746823		1.10E-04	lbs/ton				9.38E-03	4.11E-02	9.38E-03	4.11E-02
EP-35B	IAT35B	Landfill - Traffic	New		0.9	VMT/Hr		8034		1.63E+00	lbs/VMT				1.47E+00	6.55E+00	1.47E+00	6.55E+00
EP-37		Unit 1 Fly Ash Sold	Existing		3.69	VMT/Hr		10754		1.06E-01	lbs/VMT				3.91E-01	5.70E-01	3.91E-01	5.70E-01
		Haul Roads (All)													2.12E+00	6.75E+00	1.94E+00	6.15E+00
<b>TOTALS</b>													<b>855.9</b>	<b>1723.9</b>	<b>867.4</b>			
PSD Significance Level																<b>40</b>		

## Kansas City Power & Light - Iatan Project Number 2005-05-062

### Appendix A.2 - Net Emissions Increase Calculations for Sulfur Dioxide

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	6600	7800	47629667	68328000	7.90E-01	1.00E-01		5.21E+03	1.88E+04	7.80E+02	3.42E+03	-4.43E+03	-15397.318
		MMBTU/HR				lbs/MMBTU							
Iatan Unit 2 Boiler (Coal)		8100		70956000		9.00E-02				7.29E+02	3.19E+03	7.29E+02	3193.020
		MMBTU/HR				lbs/MMBTU							
Aux. Boiler		219.4		109700		5.61E-02	876			1.23E+01	5.39E+00	1.23E+01	5.391
		MMBTU/HR				lbs/MMBTU							
Iatan 2 Firepump # 1		460				2.00E-03	200			9.20E-01	9.20E-02	9.20E-01	0.092
		bhp				lbs/hp-hr							
Iatan 2 Firepump # 2		265				2.00E-03	200			5.30E-01	5.30E-02	5.30E-01	0.053
		bhp				lbs/hp-hr							
<b>TOTALS</b>									18813.7		6615.0		-12198.8

Abbreviations

MHDR	Maximum Hourly Design Rate
EF	Emission Factor
TPY	Tons Per Year
NEI	Net Emissions Increase

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### Appendix A.3 - Net Emissions Increase Calculations for Oxides of Nitrogen

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	6600	7800	47629667	68328000	4.11E-01	1.00E-01		2.71E+03	9.78E+03	7.80E+02	3.42E+03	-1.93E+03	-6365.067
		MMBTU/HR				lbs/MMBTU							
Iatan Unit 2 Boiler (Coal)		8100		70956000		8.00E-02				6.48E+02	2.84E+03	6.48E+02	2838.240
		MMBTU/HR				lbs/MMBTU							
Aux. Boiler		219.4		109700		1.00E-01	876			2.19E+01	9.61E+00	2.19E+01	9.610
		MMBTU/HR				lbs/MMBTU							
Iatan 2 Firepump # 1		460				3.10E-02	200			1.43E+01	1.43E+00	1.43E+01	1.426
		bhp				lbs/hp-hr							
Iatan 2 Firepump # 2		265				3.10E-02	200			8.22E+00	8.22E-01	8.22E+00	0.822
		bhp				lbs/hp-hr							
<b>TOTALS</b>									9781.5		6266.5		<b>-3515.0</b>

Abbreviations

MHDR	Maximum Hourly Design Rate
EF	Emission Factor
TPY	Tons Per Year
NEI	Net Emissions Increase

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### Appendix A.4 - Net Emissions Increase Calculations for Volatile Organic Compounds

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	402.44 tons/hr	7800 MMBTU/HR	2904248	68328000	6.00E-02 lbs/ton	3.60E-03 lbs/MMBTU		2.41E+01	8.71E+01	2.81E+01	1.23E+02	3.93E+00	35.863
Iatan Unit 2 Boiler (Coal)		8100 MMBTU/HR		70956000		3.60E-03 lbs/MMBTU				2.92E+01	1.28E+02	2.92E+01	127.721
Aux. Boiler		219.4 MMBTU/HR		192194		5.00E-03 lbs/MMBTU	876			1.10E+00	4.80E-01	1.10E+00	0.480
Fuel Oil Tank										1.04E-02	4.55E-02	1.04E-02	0.046
<b>TOTALS</b>									<b>87.1</b>		<b>251.2</b>		<b>164.1</b>
PSD Significance Level													40

Abbreviations

- MHDR Maximum Hourly Design Rate
- EF Emission Factor
- TPY Tons Per Year
- NEI Net Emissions Increase

## Kansas City Power & Light - Iatan Project Number 2005-05-062

### Appendix A.5 - Net Emissions Increase Calculations for Carbon Monoxide

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	402.44 tons/hr	7800 MMBTU/hr	2904248 tons	68328000 MMBTU/hr	5.00E-01 lbs/ton	1.60E-01 lbs/MMBTU		2.01E+02	7.26E+02	1.25E+03	5.47E+03	1.05E+03	4740.2
Iatan Unit 2 Boiler (Coal)		8100 MMBTU/hr		70956000 MMBTU/hr		1.40E-01 lbs/MMBTU				1.13E+03	4.97E+03	1.13E+03	4966.9
Aux. Boiler		219.4 MMBTU/hr		192194 MMBTU/hr		4.00E-02 lbs/MMBTU	876			8.78E+00	3.84E+00	8.78E+00	3.8
<b>TOTALS</b>									726.1		10437.0		<b>9710.9</b>
PSD Significance Level													100

Abbreviations

- MHDR Maximum Hourly Design Rate
- EF Emission Factor
- TPY Tons Per Year
- NEI Net Emissions Increase

## Kansas City Power & Light - Iatan Project Number 2005-05-062

### Appendix A.6 - Net Emissions Increase Calculations for Sulfuric Acid Mist

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	402.44	7800	2904248	68328000	4.05E-01	7.96E-03		1.63E+02	5.88E+02	6.21E+01	2.72E+02	-1.01E+02	-316.165
	tons/hr	MMBTU/HR			lbs/ton	lbs/MMBTU							
Iatan Unit 2 Boiler (Coal)		8100		70956000		7.16E-03				5.80E+01	2.54E+02	5.80E+01	254.022
		MMBTU/HR				lbs/MMBTU							
Aux. Boiler		219.4		192194		2.04E-05	876			4.48E-03	1.96E-03	4.48E-03	0.002
		MMBTU/HR				lbs/MMBTU							
<b>TOTALS</b>									588.1		526.0		<b>-62.1</b>

Abbreviations

- MHDR Maximum Hourly Design Rate
- EF Emission Factor
- TPY Tons Per Year
- NEI Net Emissions Increase

## Kansas City Power & Light - Iatan Project Number 2005-05-062

### Appendix A.7 - Net Emissions Increase Calculations for Lead

Description	MHDR (existing)	MHDR (future)	Annual Throughput (historical)	Annual Throughput (future)	EF (historical)	EF (future)	Hrs/Yr limit	Lbs/Hr (historical)	TPY (historical)	Lbs/Hr (future)	TPY (future)	NEI (lbs/hr)	NEI (tpy)
Iatan Unit 1 Boiler (Coal)	6600	7800	47629667	68328000	1.19E-05	5.93E-06		7.85E-02	2.83E-01	4.63E-02	2.03E-01	-3.23E-02	-0.081
		MMBTU/HR				lbs/MMBTU							
Iatan Unit 2 Boiler (Coal)		8100		70956000		5.93E-06				4.80E-02	2.10E-01	4.80E-02	0.210
		MMBTU/HR				lbs/MMBTU							
<b>TOTALS</b>									0.283		0.413		<b>0.130</b>

PSD Significance Level

0.6

Abbreviations

- MHDR Maximum Hourly Design Rate
- EF Emission Factor
- TPY Tons Per Year
- NEI Net Emissions Increase



**Missouri Department of Natural Resources**  
Air Pollution Control Program  
Notice of Public Hearing

A Prevention of Significant Deterioration (PSD) application from Kansas City Power & Light in Platte County has been reviewed by the Missouri Department of Natural Resources' Air Pollution Control Program and a preliminary determination to approve the application has been made. The application requests authority to construct a coal-fired boiler (Iatan Unit 2), a fuel oil-fired auxiliary boiler, associated storage, handling and pollution control equipment, a fuel oil storage tank and a landfill, all adjacent to Kansas City Power & Light's existing power plant, near Iatan, Missouri. Kansas City Power & Light also intends to modify the existing coal-fired generating unit (Iatan Unit 1) to increase the heat input and upgrade the pollution control system.

Net emissions increases from this project are above PSD significant emission rates for carbon monoxide (CO), particulate matter with an aerodynamic diameter less than 10 microns (PM<sub>10</sub>), and volatile organic compounds (VOC). Due to the planned addition of selective catalytic reduction for control of nitrogen oxides (NO<sub>x</sub>) and a wet scrubber for control of sulfur dioxide (SO<sub>2</sub>) on the Iatan Unit 1 boiler, there will be a net emissions decrease of emissions of NO<sub>x</sub>, SO<sub>2</sub> and sulfuric acid mist for this project.

The ambient air quality impact analysis indicates that this project will not cause ambient air concentrations above acceptable levels. The results of a preliminary impact analysis indicates that ambient air concentrations for CO will be below the modeling significance levels listed in Table 4 of 10 CSR 10-6.060(11), therefore additional analysis was not required. Ambient air concentrations for PM<sub>10</sub> are predicted to be greater than modeling significance levels but below levels that would present a problem with regard to the National Ambient Air Quality Standard or PSD increment consumption.

A public hearing on the preliminary determination is scheduled from 6:30 – 8:30 p.m. on December 5, 2005 at the West Platte R-II School District, High School Gymnasium, 935 Washington Street, Weston, Missouri. Citizens are invited to submit in writing any relevant information, materials and opinions, in support of or in opposition to the proposed construction by 5 p.m. on December 5, 2005. Written comments on the preliminary determination should be sent to the attention of Mr. James L. Kavanaugh, Interim Director, at P.O. Box 176, Jefferson City, MO 65102-0176.

Requests to speak at the hearing may be submitted the night of the hearing or sent to the attention of Mr. James L. Kavanaugh at the address listed above or by fax to (573) 751-2706. For more information concerning the hearing, please call the Air Pollution Control Program's New Source Review unit at (573) 751-4817.

A copy of the application, the preliminary determination, and other related materials are available starting Thursday November 3, 2005 for public review at the locations listed below:

Missouri Department of Natural Resources  
Air Pollution Control Program  
1659 E. Elm Street  
Jefferson City, MO 65101  
Phone No. (573) 751-4817  
Hours: 8:00 a.m. - 4:30 p.m., Monday through Friday.

Missouri Department of Natural Resources  
Kansas City Regional Office  
500 NE Colbern Rd  
Lee's Summit, MO 64086-4710  
Phone No. (816) 622-7000  
Hours: 8:00 a.m. - 4:30 p.m., Monday through Friday.

Mid-Continent Public Library  
Weston Branch  
18725 Highway 45 North  
Weston, Missouri 64098-0006

In addition, a copy of the preliminary determination is available on the Internet at:  
<http://www.dnr.state.mo.us/alpd/apcp/PermitPublicNotices.htm>