Appendix I

10 CSR 10-6.380 Control of NOx Emissions from Portland Cement Kilns

Title 10—DEPARTMENT OF NATURAL RESOURCES
Division 10—Air Conservation Commission
Chapter 6—Air Quality Standards, Definitions, Sampling and Reference Methods and Air Pollution Control Regulations for the Entire State of Missouri

PROPOSED RULE

10 CSR 10-6.380 Control of NO_x Emissions From Portland Cement Kilns. If the commission adopts this rule action, it will be submitted to the U.S. Environmental Protection Agency for inclusion in the Missouri State Implementation Plan. The evidence supporting the need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources' Air Pollution Control Program at the address and phone number listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources' Environmental Regulatory Agenda website, www.dnr.mo.gov/regs/regagenda.htm.

PURPOSE: This rule reduces emissions of oxides of nitrogen (NO_x) to ensure compliance with the federal NO_x control plan to reduce the transport of air pollutants. The rule establishes NO_x control equipment and NO_x emission levels for cement kilns. The evidence supporting the need for this proposed rulemaking per section 536.016, RSMo, is the U.S. Environmental Protection Agency NO_x State Implementation Plan (SIP) Call dated April 21, 2004.

(1) Applicability.

(A) This rule applies to any cement kiln located in the counties of Bollinger, Butler, Cape Girardeau, Carter, Clark, Crawford, Dent, Dunklin, Franklin, Gasconade, Iron, Jefferson, Lewis, Lincoln, Madison, Marion, Mississippi, Montgomery, New Madrid, Oregon, Pemiscot, Perry, Pike, Ralls, Reynolds, Ripley, St. Charles, St. Francois, St. Louis, Ste. Genevieve, Scott, Shannon, Stoddard, Warren, Washington and Wayne counties and the City of St. Louis that—

1. Is a long dry kiln with an actual process rate of at least twelve tons per hour (12 TPH);

2. Is a long wet kiln with an actual process rate of at least ten (10) TPH;

3. Is a preheater kiln with an actual process rate of at least sixteen (16) TPH; or

4. Is a precalciner or preheater/precalciner kiln with an actual process rate of at least twenty-two (22) TPH.

(B) Exemptions.

1. Any cement kiln meeting the applicability of subsection (1)(A) of this rule which has an approved NO_x budget opt-in permit under 10 CSR 10-6.360 is exempted from the requirements of this rule.

2. Section (3) and (4) of this rule shall not apply during start-up, shutdown or malfunction conditions as defined in 10 CSR 10-6.050.

3. Section (3) and (4) of this rule shall not apply during regularly scheduled maintenance activities.

(2) Definitions.

(A) Clinker—The product of a Portland cement kiln from which finished cement is manufactured by milling and grinding.

(B) Long-dry kiln—A kiln fourteen feet (14') or larger in diameter, four hundred feet (400') or greater in length, which employs no preheating of the feed and the inlet feed to the kiln is dry.

(C) Long-wet kiln—A kiln fourteen feet (14') or larger in diameter, four hundred feet (400') or greater in length, which employs no preheating of the feed and the inlet feed to the kiln is a slurry.

(D) Low-NO_x burners—A type of cement kiln burner (a device that functions as an injector of fuel and combustion air into kiln to produce a flame that burns as close as possible to the center line of the kiln) that has a series of channels or orifices that 1) allow for the adjustment of the volume, velocity, pressure, and/or direction of the air carrying the fuel, known as primary air, into the kiln, and 2) impart high momentum and turbulence to the fuel stream to facilitate mixing of the fuel and secondary air.

(E) Mid-kiln firing—Secondary firing in kiln systems by injecting fuel at an intermediate point in the kiln system using a specially designed fuel injection mechanism for the purpose of decreasing NO_x emissions through—

1. The burning of part of the fuel at a lower temperature; and

2. The creation of reducing conditions at the point of initial combustion.

(F) Portland cement—A hydraulic cement produced by pulverizing clinker consisting essentially of hydraulic calcium silicates, usually containing one (1) or more of the forms of calcium sulfate as an interground addition.

(G) Portland cement kiln—A system, including any solid, gaseous or liquid fuel combustion equipment, used to calcine and fuse raw materials, including limestone and clay, to produce Portland cement clinker.

(H) Preheater/precalciner kiln—A kiln where the feed to the kiln system is preheated in cyclone chambers and that utilizes a second burner to provide heat for calcination of material prior to the material entering the rotary kiln which forms clinker.

(I) Preheater kiln—A kiln where the feed to the kiln system is preheated in cyclone chambers prior to the final fusion, which forms clinker.

(J) Recoverable fuel—Fuels that have been permitted for use for energy recovery under 10 CSR 10-6.065.

(K) Renewable fuel—Renewable energy resources that include but are not limited to solar (photovoltaic), wind, and biomass. Biomass includes but is not limited to: agricultural crops and crop waste, untreated wood and wood wastes, livestock waste, wastepaper, and organic municipal solid waste.

(L) Definitions of certain terms specified in this rule, other than those defined in this rule section, may be found in 10 CSR 10-6.020.

(3) General Provisions.

(A) Beginning May 1, 2007 an owner or operator of any Portland cement kiln subject to this rule shall not operate the kiln during the period starting May 1 and ending September 30 of each year, unless the kiln installs and operates with one (1) of the following:

1. Low-NO_x burners;

2. Mid-kiln firing;

3. An alternative control technology that is approved by the staff director, and incorporated in the federally approved SIP, and is proven to achieve emission reductions of thirty percent (30%) or greater;

4. An emission rate of:

A. For long-wet kilns—6.8 pounds of NO_x per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.

B For long-dry kilns—6.0 pounds of NO_x per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.

C. For preheater kilns—4.1 pounds of NO_x per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.

D. For preheater/precalciner kilns—2.7 pounds of NO_x per ton of clinker produced, averaged over the period from May 1 through September 30 of each year; or

5. The findings of a case-by-case study committed to and conducted by the owner or operator and approved by the staff director, and incorporated into the federally approved SIP, taking into account energy, environmental, and economic impacts and other costs to determine an emission limitation that is achievable for the installation through application of production processes or available

methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of NO_x.

(B) To meet the requirements of paragraph (3)(A)3. or (3)(A)5. of this rule, the owner or operator may take into account as a portion of the required NO_x reductions, physical and quantifiable measures to increase energy efficiency, reduce energy demand, or increase use of renewable or recoverable fuels.

(4) Reporting and Record Keeping.

(A) Reporting Requirements. The owner or operator of a kiln subject to this rule shall comply with the following requirements:

1. By May 1, 2007, the owner or operator shall submit to the staff director the identification number and type of each unit subject to this rule, the name and address of the plant where the unit is located, and the name and telephone number of the person responsible for demonstrating compliance with this rule;

2. The owner or operator shall submit to the staff director by October 31 of each year an annual report documenting for that unit:

A. The emissions, in pounds of NO_x per ton of clinker produced from each affected Portland cement kiln during the period from May 1 through September 30;

B. The results of any performance testing; and

C. Cement kiln clinker production, in tons, from May 1 through September 30; and

3. If the owner or operator elects to comply with paragraph (3)(A)3. or (3)(A)5. of this rule, the owner or operator will supply, starting April 2008, the staff director with a report as specified in the compliance plan.

(B) Record Keeping Requirements.

1. Any owner or operator of a unit subject to this rule shall produce and maintain records, which shall include, but are not limited to the date, time and duration of any start-up, shutdown or malfunction in the operation of any of the cement kilns or the emissions monitoring equipment, as applicable.

2. If an owner or operator elects to use subsection (3)(B) of this rule as part of the compliance plan, the owner or operator must retain records as agreed to in the approved compliance plan.

3. All records required to be produced or maintained shall be retained on-site for a minimum of five (5) years and made available upon request.

(C) Monitoring Requirements.

1. An owner or operator complying with paragraph (3)(A)1. or (3)(A)2. of this rule shall maintain and operate the device according to the manufacturer's specifications as approved by the permitting agency. The monitoring shall:

A. Include parameters indicated in the manufacturer's specifications and recommendations for the low-NO_x burner or mid-kiln firing system as approved by the permitting agency; and

B. Identify the specific operation conditions to be monitored and correlation between the operating conditions and NO_x emission rate.

2. An owner or operator complying with paragraph (3)(A)3., (3)(A)4., or (3)(A)5. of this rule shall complete an initial performance test by May 1, 2007 and subsequent performance tests, on a tri-annual basis, consistent with the requirements of section (5) of this rule.

3. An owner or operator may comply with the requirements in paragraph (4)(C)1. through the use of an alternative compliance method approved by the staff director and incorporated in the federally approved SIP.

(5) Test Methods. NO_x emission level testing shall use one (1) of the following methods as specified by 40 CFR part 60 Appendix A—Reference Methods:

(A) Method 7—Determination of Nitrogen Oxide Emissions from Stationary Sources;

(B) Method 7A—Determination of Nitrogen Oxide Emissions from Stationary Sources—Ion Chromatographic Method;

(C) Method 7C—Determination of Nitrogen Oxide Emissions from Stationary Sources—Alkaline-Permanganate/Colorimetric Method;

(D) Method 7D—Determination of Nitrogen Oxide Emissions from Stationary Sources—Alkaline-Permanganate/Ion Chromatographic Method; or

(E) Method 7E—Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure).

AUTHORITY: section 643.050, RSMo 2000. Original rule filed Feb. 14, 2005.

PUBLIC COST: This proposed rule will not cost state agencies or political subdivisions more than five hundred dollars ($500) in the aggregate.

PRIVATE COST: This proposed amendment is estimated to cost private entities $0 in fiscal year 2006, but will cost the private entities $5,552,400 during fiscal year 2007. The annualized aggregate cost of this rulemaking is estimated to be $5,552,400. The aggregate cost of this rulemaking is $55,524,000. This rulemaking will affect approximately four (4) facilities operating in the state of Missouri.

NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed rule will begin at 9:00 a.m., April 28, 2005. The public hearing will be held at the Harry S Truman Building, Room 400, 301 West High Street, Jefferson City, Missouri. Opportunity to be heard at the hearing shall be afforded any interested person. Written request to be heard should be submitted at least seven (7) days prior to the hearing to Director, Missouri Department of Natural Resources' Air Pollution Control Program, 205 Jefferson Street, PO Box 176, Jefferson City, MO 65102-0176, (573) 751-4817. Interested persons, whether or not heard, may submit a written statement of their views until 5:00 p.m., May 5, 2005. Written comments shall be sent to Chief, Operations Section, Missouri Department of Natural Resources' Air Pollution Control Program, 205 Jefferson Street, PO Box 176, Jefferson City, MO 65102-0176.

FISCAL NOTE
PRIVATE ENTITY COST

I. RULE NUMBER

Title: 10 – Department of Natural Resources

Division: 10 – Air Conservation Commission

Chapter: 6 – Air Quality Standards, Definitions, Sampling and Reference Methods and Air Pollution Control Regulations for the Entire State of Missouri

Type of Rulemaking: New rule

Rule Number and Name: 10 CSR 10-6.380 Control of NOx Emissions From Portland Cement Kilns

II. SUMMARY OF FISCAL IMPACT

Estimate of the number of entities by class which would likely be affected by the adoption of the Proposed Rule:	Classification by types of the business entities which would likely be affected:	Estimate in the aggregate as to the cost of compliance with the rule by the affected entities:
4	Portland Cement Industry	$55,524,000

III. WORKSHEET

Private Entity Control Cost

Control Technology	Number of Units	Capital Costs ($/ unit)	Annualized Capital Cost ($/ unit)	Annual Monitoring Cost ($ / unit)	Annualized Aggregate Cost ($)*
Process Modifications	2	6,500,000	946,000	25,000	2,680,110
Low-NOx Burners	1	5,400,000	1,189,000	25,000	1,923,938
Mid-Kiln Firing	1	1,600,000	713,000	25,000	948,352
Total	4				5,552,400

*Annualized Aggregate cost is based on depreciated costs (see assumption 5)

Annualized Aggregate Private Entity Cost

Affected Source	FY2005	FY2006	FY2007	FY2008
Portland Cement Industry	$ 0	$5,552,400	$5,552,400	$5,552,400

IV. ASSUMPTIONS

1. There are four Portland Cement Kilns in the control region located at four facilities; two kilns were assumed to meet the requirements of this rule by installing process modifications, one kiln was assumed to meet the requirements of this rule by installing low-NOx burners, and one kiln was assumed to comply with the requirements of this rule by installing a mid-kiln firing system. These assumptions were made based on

discussions with the Portland Cement industry during Phase 1 of the NOx SIP call.

2. Cost estimates for control technologies were taken from *NOx Formation and Variability in Portland Cement Kiln Systems Potential Control Techniques and Their Feasibility and Cost Effectiveness* (December 1998); prepared by Penta Engineering Corporation for the Portland Cement Association, American Portland Cement Alliance, and Canadian Portland Cement Association.

3. All cost figures from *NOx Formation and Variability in Portland Cement Kiln Systems Potential Control Techniques and Their Feasibility and Cost Effectiveness* are given in 1997 dollars that were grown from the 1992 cost estimates given in the EPA's *Alternative Control Techniques Document -- NOx Emissions from Cement Manufacturing* (March 1994) using a factor of 1.15 (1992 CPI = 140.4, 1997 CPI = 161.3).

4. Cost estimates assume that no process modification will begin before fiscal year 2006, beginning July 1, 2005.

5. Annualized Cost is based on a compounded interest depreciation factor for 15 years at 10% interest. The Annualized Cost in the year 2020 will become equal to the annualized cost plus inflation.

6. For the convenience of calculating this fiscal note over a reasonable time frame, the life of the rule is assumed to be ten (10) years although the duration of the rule is indefinite. If the life of the rule extends beyond ten years, the annual costs for the additional years will be consistent with the assumptions used to calculate annual costs as identified in this fiscal note.

Appendix J

10 CSR 10-6.390 Control of NOx Emissions from Large Internal Combustion Engines

Title 10—DEPARTMENT OF NATURAL RESOURCES
Division 10—Air Conservation Commission
Chapter 6—Air Quality Standards, Definitions, Sampling and Reference Methods and Air Pollution Control Regulations for the Entire State of Missouri

PROPOSED RULE

10 CSR 10-6.390 Control of NO_x Emissions From Large Internal Combustion Engines. If the commission adopts this rule action, it will be submitted to the U.S. Environmental Protection Agency for inclusion in the Missouri State Implementation Plan. The evidence supporting the need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources' Air Pollution Control Program at the address and phone number listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources' Environmental Regulatory Agenda website, www.dnr.mo.gov/regs/regagenda.htm.

PURPOSE: This rule reduces emissions of oxides of nitrogen (NO_x) to ensure compliance with the federal NO_x control plan to reduce the transport of air pollutants. This rule establishes emission levels for large stationary internal combustion engines. The evidence supporting the need for this proposed rulemaking, per section 536.016, RSMo, is the U.S. Environmental Protection Agency NO_x State Implementation Plan (SIP) Call dated April 21, 2004.

(1) Applicability.

(A) This rule applies to any large stationary internal combustion engine located in the counties of Bollinger, Butler, Cape Girardeau, Carter, Clark, Crawford, Dent, Dunklin, Franklin, Gasconade, Iron, Jefferson, Lewis, Lincoln, Madison, Marion, Mississippi, Montgomery, New Madrid, Oregon, Pemiscot, Perry, Pike, Ralls, Reynolds, Ripley, St. Charles, St. Francois, St Louis, Ste. Genevieve, Scott, Shannon, Stoddard, Warren, Washington, and Wayne counties and the City of St. Louis greater than one thousand three hundred (1,300) horsepower that—

1. Emitted greater than one (1) ton per day of NO_x on average during the period from May 1 through September 30 of 1995, 1996, or 1997; or

2. Begins operation after September 30, 1997.

(B) Exemptions.

1. Any source meeting the applicability requirements of subsection (1)(A) of this rule which has an approved NO_x budget opt-in permit under 10 CSR 10-6.360 is exempt from this rule.

2. Any stationary internal combustion engine that meets the definition of emergency standby engine in subsection (2)(D) of this rule is exempt from this rule.

3. The requirements of sections (3) and (4) of this rule shall not apply to either of the following operating conditions:

A. Start-up and shutdown periods and periods of malfunctions, not to exceed thirty-six (36) consecutive hours; or

B. Regularly scheduled maintenance activities.

(2) Definitions.

(A) Diesel engine—A compression ignited (CI) two- or four-stroke engine in which liquid fuel is injected into the combustion chamber and ignited when the air charge has been compressed to a temperature sufficiently high for auto-ignition.

(B) Dual fuel engine—Compression ignited stationary internal combustion engine that is capable of burning liquid fuel and gaseous fuel simultaneously.

(C) Emergency standby engine—An internal combustion engine used only when normal electrical power or natural gas service is interrupted, or for the emergency pumping of water for either fire protection or flood relief. An emergency standby engine may not be operated to supplement a primary power source when the load capacity or rating of the primary power source has been either reached or exceeded.

(D) Engine rating—The output of an engine as determined by the engine manufacturer and listed on the nameplate of the unit, regardless of any derateing.

(E) Higher heating value (HHV)—The total heat liberated per mass of fuel burned in British thermal units (Btu) per pound, when fuel and dry air at standard conditions undergo complete combustion and all resultant products are brought to their standard states at standard conditions. If certification of the HHV is not provided by the third party fuel supplier, it shall be determined by one of the following test methods: ASTM D2015-85 for solid fuels; ASTM D240-87 or ASTM D2382-88 for liquid hydrocarbon fuels; or ASTM D1826-88 or ASTM D1945-81 in conjunction with ASTM D3588-89 for gaseous fuels. These methods are all incorporated by reference as specified at 40 CFR 52.3002.

(F) Lean-burn engine—Any two-or four-stroke spark ignited (SI) engine with greater than four percent (4%) oxygen in the engine exhaust.

(G) Maintenance operation—Normal routine maintenance on any stationary internal combustion engine subject to this rule or the use of an emergency standby engine and fuel system during testing, repair and routine maintenance to verify its readiness for emergency standby use.

(H) Output—The shaft work output from any engine plus the energy reclaimed by any useful heat recovery system.

(I) Peak load—The maximum instantaneous operating load.

(J) Permitted capacity factor—The annual permitted fuel use divided by the manufacturers specified maximum fuel consumption times eight thousand seven hundred sixty (8,760) hours per year.

(K) Rich-burn engine—A two- or four-stroke SI engine where the oxygen content in the exhaust stream before any dilution is one percent (1%) or less measured on a dry basis.

(L) Stationary internal combustion engine—Internal combustion engine of the reciprocating type that is either attached to a foundation at a facility or is designed to be capable of being carried or moved from one (1) location to another and remains at a single site at a building, structure, facility, or installation for more than twelve (12) consecutive months. Any engine or engines that replace an engine at a site that is intended to perform the same or similar function as the engine replaced is included in calculating the consecutive time period. Nonroad engines and engines used solely for competition are not stationary internal combustion engines.

(M) Stoichiometric air/fuel ratio—The air/fuel ratio where all fuel and all oxygen in the air/fuel mixture will be consumed.

(N) Unit—Any diesel, lean-burn, or rich-burn stationary internal combustion engine as defined in this section.

(O) Utilization rate—The amount of an engine's capacity reported in horsepower-hours that is utilized.

(P) Definitions of certain terms used in this rule, other than those specified in this rule, may be found in 10 CSR 10-6.020.

(3) General Provisions.

(A) An owner or operator of a large stationary internal combustion engine meeting the applicability of paragraph (1)(A)1. of this rule shall calculate the allowable NO_x emission rate for each applicable engine using:

$$ER=(NOx_{act}/UR) \times 1.102 \times 10^{-6} \times 0.1$$

where,

ER= the allowable emission rate for each engine in grams per horsepower-hour;

NOx_{act}= the highest actual NO_x emissions, reported in tons per control period, for the period from May 1 through September 30 for one of the years 1995, 1996, or 1997 based on the best available emission information for each engine; and

UR= the utilization rate in horsepower-hours during the same period as NOx_{act}

(B) An owner or operator of a large stationary internal combustion engine meeting the applicability of paragraph (1)(A)2. of this rule shall not operate an engine to exceed the permitted emission rate or the following emission rate, whichever is more stringent:

1. For rich-burn SI engines 3.0 grams per horsepower-hour;
2. For lean-burn SI engines 3.0 grams per horsepower-hour;
3. For diesel CI engines 8.3 grams per horsepower-hour; and
4. For dual fuel engines 4.3 grams per horsepower-hour.

(C) An owner or operator of a large stationary internal combustion engine may choose to establish a facility-wide NO_x emissions cap in lieu of compliance with subsection (3)(A) of this rule. If the owner or operator elects to comply with the requirements of subsection (3)(A), the owner or operator shall submit a commitment in writing no later than May 1, 2005, to the director stating the intent to comply with that subsection. If the owner or operator commits to comply with this subsection rather than subsection (3)(A) of this rule, the owner or operator shall submit the following to the director:

1. The facility-wide NO_x emissions from the year of data that would be used in paragraph (3)(A)1. of this rule on a unit-by-unit basis;
2. The number of tons of NO_x emission reductions that would be required in paragraph (3)(A)1. of this rule on a unit-by-unit basis;
3. A detailed inventory of all engines being used to comply with the NO_x emission cap including the:
   A. Uncontrolled emission rate of all engines at the facility;
   B. Controlled emission rate for all engines being controlled under the NO_x emissions cap;
   C. Capacity of each engine at the facility; and
   D. Utilization rate of each engine at the facility; and
4. The controlled NO_x emissions from the facility during the control period, May 1 through September 30.

(D) To meet the requirements of subsection (3)(A) or (3)(B) of this rule, the owner or operator may take into account as a portion of the required NO_x reductions, physical and quantifiable measures to increase energy efficiency, reduce energy demand, or increase use of renewable fuels.

(E) Monitoring Requirements.

1. Any owner or operator meeting the applicability of section (1) of this rule shall not operate such equipment unless it is equipped with one (1) of the following:
   A. A continuous emissions monitoring system (CEMS), which meets the applicable requirements of 40 CFR part 60, subpart A, Appendix B, and complies with the quality assurance procedures specified in 40 CFR part 60, Appendix F. The CEMS shall be used to demonstrate compliance with the applicable emission limit; or
   B. A calculational and record keeping procedure based upon actual NO_x emissions testing and correlations with operating parameters. The installation, implementation and use of such an alternate calculational and record keeping procedure must be approved by the director in writing prior to implementation.
2. The CEMS or approved alternate monitoring procedure shall be operated and maintained in accordance with an on-site CEMS or alternate monitoring plan approved by the director.

(4) Reporting and Record Keeping.

(A) Reporting Requirements. The owner or operator subject to this rule shall comply with the following requirements:

1. The owner or operator shall submit to the director the identification number and type of each unit subject to this rule, the name and address of the plant where the unit is located, and the name and telephone number of the person responsible for demonstrating compliance with this rule before May 1, 2007;
2. The owner or operator shall submit an annual report documenting for each controlled unit the total NO_x emissions from May 1 through September 30 of each year to the director by November 1 of that year, beginning in 2007; and
3. The owner or operator of a unit subject to this rule and operating a CEMS shall submit an excess emissions monitoring systems performance report, in accordance with the requirements of 40 CFR 60.7(c) and 60.13.

(B) Record Keeping Requirements. Any owner or operator of a unit subject to this rule shall maintain all records necessary to demonstrate compliance with this rule for a period of five (5) years at the plant at which the subject unit is located. The records shall be made available to the director upon request. The owner or operator shall maintain records of the following information for each day of the control period the unit is operated:

1. The identification number of each unit and the name and address of the plant where the unit is located for each unit subject to the requirements of this rule;
2. The calendar date of record;
3. The number of hours the unit is operated during each day including start-ups, shutdowns, malfunctions, and the type and duration of maintenance and repair;
4. The date and results of each emissions inspection;
5. A summary of any emissions corrective maintenance taken;
6. The results of all compliance tests; and
7. If a unit is equipped with a CEMS—
   A. The identification of time periods during which NO_x standards are exceeded, the reason for the exceedance, and action taken to correct the exceedance and to prevent similar future exceedances; and
   B. The identification of the time periods for which operating conditions and pollutant data were not obtained including reasons for not obtaining sufficient data and a description of corrective actions taken.

(5) Test Methods. *(Not Applicable)*

AUTHORITY: section 643.050, RSMo 2000. Original rule filed Feb. 14, 2005.

PUBLIC COST: This proposed rule will not cost state agencies or political subdivisions more than five hundred dollars ($500) in the aggregate.

PRIVATE COST: This proposed rule will not cost private entities more than five hundred dollars ($500) in the aggregate.

NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed rule will begin at 9:00 a.m., April 28, 2005. The public hearing will be held at the Harry S Truman Building, Room 400, 301 West High Street, Jefferson City, Missouri. Opportunity to be heard at the hearing shall be afforded any interested person. Written request to be heard should be submitted at least seven (7) days prior to the hearing to Director, Missouri Department of Natural Resources' Air Pollution Control Program, 205 Jefferson Street, PO Box 176, Jefferson City, MO 65102-0176, (573) 751-4817. Interested persons, whether or not heard, may submit a written statement of their views until 5:00 p.m., May 5, 2005. Written comments shall be sent to Chief, Operations Section, Missouri Department of Natural Resources' Air Pollution Control Program, 205 Jefferson Street, PO Box 176, Jefferson City, MO 65102-0176.

Title 11—DEPARTMENT OF PUBLIC SAFETY
Division 80—Missouri State Water Patrol
Chapter 9—Mandatory Boater Safety Education Program

PROPOSED RULE

Appendix K

Ozone Transport Assessment Group – Executive Summary

Ozone Transport Assessment Group – Executive Summary

For more than a quarter of a century, states in the eastern United States have been designing and implementing programs to attain the air quality standard for ground-level ozone, a prime ingredient of smog. Although much progress has been made to improve air quality, many areas have yet to attain the 1-hour ozone standard. However, progress in attaining the health-based ozone standard has been limited by the fact that ozone and the pollutants that form ozone can be carried significant distances by the wind. Traditional programs that primarily focus on controls in the vicinity of the ozone standard violation are not adequate for many areas. It has become apparent that, to attain the standard, it is necessary to also develop control programs that reduce ozone-forming pollutants that are emitted many miles upwind of the area of violation. These findings led to the formation of the 37-state Ozone Transport Assessment Group (OTAG).

OTAG was charged with assessing the significance of pollutant transport and with recommending control strategies for reducing that transport. OTAG improved the level of air pollution science and information by an order of magnitude and, even more important, established a new standard for the use of a multi-state, multi-stakeholder process to assess a regional problem and design a solution. The technical knowledge gained through OTAG will likely serve as the foundation upon which ozone control programs will be built for the next decade. The OTAG process will almost certainly set the standard by which all regional air pollution problems are addressed, including future fine particulate matter and regional haze programs. OTAG was a true innovation in the control of air pollution.

Although ozone acts as a protective layer high above the earth, ground-level ozone can be harmful for humans to breathe. Ozone is generally not emitted directly into the atmosphere but rather is formed by some gases, most notably nitrogen oxides (NOx) and volatile organic compounds (VOCs). In the presence of strong sunlight, these gases react with oxygen in the atmosphere to form high ozone concentrations that can remain over large regions and for an extended period of time.

Some urban areas tend to have high ozone levels. Areas downwind of urban settings are also subject to high ozone exposure because winds carry VOCs and NOx, as well as ozone itself, from their original sources. Moreover, ozone precursors are emitted in less urbanized and rural areas and carried to downwind areas to form ozone, thus often exacerbating ozone levels. The process of ozone and ozone precursors traveling to these downwind areas is referred to as ozone transport. It is especially significant in certain areas of the eastern United States, including the "Northeast Corridor" (roughly, from Washington, D.C., to Boston) and in portions of the Midwest, especially in the vicinity of Lake Michigan. Urban areas in the Southeast, especially Atlanta, also experience high ozone levels, although transport distance appears to be somewhat less in the Southeast.

Ground-level ozone can be harmful to people and the environment. Ozone levels above the health-based standards established by the EPA are known to cause chest pain, coughing, throat irritation, and congestion, and may also worsen bronchitis, heart disease, emphysema, and asthma. Healthy people as well as those with respiratory problems can experience breathing problems when exposed to elevated levels of ozone. EPA has established a health-based standard

the advantage, however, of hearing from numerous constituencies prior to making final decisions.

Technical data and policy positions were first developed in the Workgroups, co-chaired by state or state regional organization representatives and a representative from EPA. In many cases, the Workgroups created subcommittees, often chaired by non-government stakeholders, to address specific issues. When the issues were resolved, the subcommittees were dissolved. The nature of the work and interaction of participants in the Workgroups was the heart of OTAG. It was here that stakeholders were able to use their technical expertise in a development process rather than in the responsive process they normally experience when dealing with environmental agencies. The tangible and intangible contributions of all Workgroup participants formed the flavor and dynamism that radiated through the Subgroups to the Policy Group.

The Workgroups reported their data and policy positions to their respective Subgroups, where debate was robust because of the inclusion of participants who had not worked within a particular Workgroup. The Subgroups provided the forum for all participants to express their positions, discuss the pros and cons from all points of view, and develop the compromises that became an inherent gelling factor for OTAG.

The Subgroups reported directly to the Policy Group. Minority views were also reported when expressed. Debate in the Policy Group occurred, for the most part, among participants of that group, although others were recognized and their views included in the Policy Group's deliberations.

With the exception of the final recommendations, the Policy Group proceeded on a consensus basis. Where issues were particularly vital and not all participants at a Policy Group meeting agreed, objections were noted. For the final recommendations, the Policy Group developed a process by which each state cast a vote. Only a state's environmental commissioner or his/her designee could cast votes. In cases where a designee was called upon to vote, the commissioner provided a written proxy. Subsequent to approval of a recommendation, any stakeholder could submit written comments within 10 days; such comments were included in the package of recommendations forwarded to EPA. Votes were cast first on each recommendation and then on the final package of recommendations. Regarding the total package of recommendations, in some instances the states provided caveats to their votes; written comments explaining the caveats were also included with the final package of recommendations.

Among the major conclusions reached by OTAG are that—

- Regional NOx reductions are effective in producing ozone benefits; the more NOx reduced, the greater the benefit.
- Ozone benefits are greatest in the subregions where emissions reductions are made; the benefits decrease with distance.
- Both elevated (from tall stacks) and low-level NOx reductions are effective.
- VOC controls are effective in reducing ozone locally and are most advantageous to urban nonattainment areas.
- Air quality data indicate that ozone is pervasive, that ozone is transported, and that ozone aloft is carried over and transported from one day to the next.

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Table 1: Comparison of Non-Electric Generating Boilers

									Seasonal NOx Emissions (Tons)		
FIPSST	**State**	**FIPSCNTY**	**County**	**PLANTID**	**Plant**	**POINTID**	**Type**	**Size**	**1995**	**2007 Base**	**2007 Control**
29	Missouri	093	Iron Co	0009	DOE RUN - BUICK RESOURCE RECOVERY CENTER	036	Boiler	L	2.20	2.58	1.03
29	Missouri	099	Jefferson Co	0002	RIVER CEMENT COMPANY	094	Boiler	L	46.30	47.22	18.89
29	Missouri	510	St. Louis	0003	ANHEUSER BUSCH INC. ST.LOUIS	002	Boiler	L	29.07	33.14	13.26
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	002	Boiler	L	0.00	0.00	0.00
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	003	Boiler	L	163.95	145.92	58.37
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	004	Boiler	L	0.00	0.00	0.00
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	005	Boiler	L	52.69	46.90	18.76
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	006	Boiler	L	202.48	180.21	72.08
					Total				496.70	455.97	182.39
29	Missouri	510	St. Louis	0003	ANHEUSER BUSCH INC. ST.LOUIS	002	Boiler	L	29.07	33.75	13.50
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	005	Boiler	L	52.69	46.89	18.76
29	Missouri	510	St. Louis	0038	ASHLEY STREET STATION	006	Boiler	L	202.48	180.20	72.08
					Total				284.24	260.84	104.34

Table 2: Comparison of Cement Kiln Budgets

									Seasonal NOx Emissions (Tons)		
FIPSST	**State**	**FIPSCNTY**	**County**	**PLANTID**	**Plant**	**POINTID**	**Type**	**Size**	**1995**	**2007 Base**	**2007 Control**
29	Missouri	099	Jefferson Co	0002	RIVER CEMENT COMPANY	017	Cement	L	3,211	3,276	2,293
29	Missouri	163	Pike Co	0001	HOLNAM INC	005	Cement	L	3,631	3,704	2,593
29	Missouri	173	Ralls Co	0001	CONTINENTAL CEMENT COMPANY INC	030	Cement	L	914	932	932
29	Missouri	173	Ralls Co	0001	CONTINENTAL CEMENT COMPANY INC	032	Cement	L	1,096	1,117	782
					Total				8,852	9,029	6,600
29	Missouri	031	Cape Girardeau	0021	LONE STAR INDUSTRIES INC	048	Cement	L	1,466	1,496	1,047
29	Missouri	099	Jefferson Co	0002	RIVER CEMENT COMPANY	017	Cement	L	3,316	3,383	2,368
29	Missouri	163	Pike Co	0001	HOLNAM INC	005	Cement	L	4,408	4,496	3,147
29	Missouri	173	Ralls Co	0001	CONTINENTAL CEMENT COMPANY INC	032	Cement	L	1,290	1,316	921
					Total				10,480	10,690	7,483

Table 3: Summary of the Budget Demonstration

Source Category	2007 budget emissions (tpos)
EGUs	13,400
Non EGUs	5,903
Non EGU boilers (>250mmbtu/hr)	104
Cement Manufacturing Kiln	7,483
Area	2,199
On Road Mobile	21,318
Off-Road Mobile	9,632
Total	60,040