

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
BUREAU OF AIR

February 2007

Responsiveness Summary for  
Public Questions and Comments on the  
Construction Permit Application from  
Ameren Energy Resources Generating Company for a  
Project at the  
Duck Creek Power Plant near  
Canton, Illinois

Site Identification No.: 057801AAA  
Application No.: 06070048

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## **INTRODUCTION**

Ameren Energy Resources Generating Company (Ameren Energy) has applied for an air pollution control construction permit to make alterations to the boiler, turbine and ancillary equipment at its coal-fired power plant located at 17751 North Cilco Road near Canton.

Upon review of comments received during the public comment period and final review of the application, the Illinois Environmental Protection Agency (Illinois EPA) has determined that the application meets the standards for issuance of a construction permit. Accordingly, on February 16, 2007, simultaneously with the issuance of this Responsiveness Summary, the Illinois EPA issued the construction permit to Ameren. The plant must be constructed and operated in accordance with applicable regulations and the terms and conditions of the issued permit.

## **DESCRIPTION OF PROPOSED PROJECT**

AmerenEnergy has applied for a construction permit for alterations to the coal-fired generating unit at its existing Duck Creek Power Station. The alterations would increase generating capacity of the station and be accompanied by improvements to the emission control equipment on the boiler. This project is intended to increase the potential steam output of the boiler to be able to consistently match the current capacity of generator, 444 MW nominal gross output. The operation of the boiler is currently physically constrained by factors such as ambient temperature so that at times the plant cannot generate more than 370 MW. The proposed alterations to the boiler include work on the superheater, economizer, soot blowers and induced draft fans. The proposed alterations to the generating unit may also include work on the steam turbine-generator and other ancillary equipment to improve efficiency and capacity, which would potentially increase the capacity of the generating unit, so that it would be able to produce about 465 MW.

This work would be accompanied by improvements to the air pollution control equipment serving the boiler, including installation of a new electrostatic precipitator (ESP) for enhanced control of particulate matter (PM) and additional catalyst in the selective catalytic reduction (SCR) system for enhanced control of nitrogen oxides (NO<sub>x</sub>). The boiler would also be served by a new wet scrubber, replacing the existing scrubber, for improved control of sulfur dioxide (SO<sub>2</sub>) and sulfuric acid mist. After the close of the public comment period, Ameren decided to expand the scope of this project to also include installation of an advanced combustion management system and related improvements to the combustion features of the boiler. Based on the supplemental material supplied by Ameren, with these additional improvements, this project will now no longer be a major project for emissions of CO, as CO emissions of the boiler will be reduced below historic levels. Ameren requested that it now be issued a state construction permit for the project, rather than a PSD permit. In light of this request, a BACT determination is not being made for the CO emissions of the boiler nor will other requirements of the PSD rules for a proposed major modification be applicable to this project. Provisions of the draft permit that were imposed pursuant to or otherwise related to the requirements of the PSD rules for a major project have not been carried over from the draft permit into the issued permit.

## **COMMENT PERIOD AND PUBLIC HEARING**

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions. An air pollution control permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of Ameren's application, the Illinois EPA Bureau of Air made a preliminary determination that the application for the proposed plant met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The public comment period began on November 25, 2006, with the publication of a notice in the Canton Daily Ledger. The notice was again published in the Canton Daily Ledger on December 2 and 9, 2006.

A public hearing was held on January 10, 2007 at Canton High School to receive oral comments and answer questions regarding the application and draft air permit. The comment period closed on January 25, 2007.

### **AVAILABILITY OF DOCUMENTS**

- The permit issued to Ameren and this responsiveness summary are available on the Illinois Permit Database at [www.epa.gov/region5/air/permits/ilonline.htm](http://www.epa.gov/region5/air/permits/ilonline.htm) (please look for the documents under All Permit Records (sorted by name), Construction Permit Records). Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document.

### **COMMENTS AND RESPONSES BY THE ILLINOIS EPA**

1. Based on a fact sheet from Hitachi, the supplier of the new SO<sub>2</sub> scrubber for the boiler, the scrubber could readily control SO<sub>2</sub> emissions by upwards of 99 percent.

**This is correct. It is reasonable to expect that the reduction in the SO<sub>2</sub> emissions of the plant achieved with the new scrubber will be much greater than the reduction conservatively assumed by Ameren in its application, which is based on achieving only 95% control, consistent with the performance guarantee provided by Hitachi.**

2. Lower CO emission rates are being achieved at existing power plants. The Wisconsin DNR is currently issuing a permit exemption for Edgewater Unit 5 premised on that unit continuing to achieve a CO emission rate of 0.065 lb/million Btu. This unit is similar to Duck Creek, i.e., both units are wall-fired boilers, rated at about 400 MW, and will be retrofitted with low NO<sub>x</sub> burners to reduce NO<sub>x</sub> emissions. Why can't the boiler at Duck Creek achieve a lower CO emission rate like that at Edgewater Unit 5, rather than 0.17 lb/million Btu as proposed in the draft permit?

**Even though these boilers are both wall-fired, there is a significant difference in their designs that affects the CO emission rates that can be achieved, particularly after the**

boilers are retrofitted with low-NOx burners. Edgewater Unit 5 is an “opposed” wall fired boiler, with burners on two opposite sides of the furnace. Duck Creek is a single wall boiler, with all the burners on the same side of the furnace. This has significant implications for the CO emission rates of the two boilers. For example, experience with two boilers operated by Southern Company showed the base NOx emission rate of the single-wall boiler was lower than that of the opposed wall boiler. When identical low-NOx burners were installed on the boilers, the CO emission rate from the single-wall boiler was several times the emission rate achieved by the opposed wall boiler.<sup>1</sup> There also likely other significant differences in these two boilers, such as the relative volumes and geometry of the furnaces, that affect the level of CO emissions that can be achieved by these boilers, even when equipped with the identical model of burners. Incidentally, the Illinois EPA has been unable to verify the actions being taken by Wisconsin DNR with respect to Edgewater Unit 5 or its CO emission rate, as represented in this comment.

3. Why won't the addition of catalyst to the SCR lead to an increase in emissions of sulfuric acid mist with this project?

As explained in the emission estimates for sulfuric acid mist in the application, there are two reasons why emissions of sulfuric acid mist will not increase with this project. First, while additional catalyst is being added to the system, this added catalyst will have lower reactivity for formation of sulfuric acid mist than the original catalyst installed in the SCR. As a result, the SCR system will convert less SO<sub>2</sub> to SO<sub>3</sub>, eventually to form sulfuric acid mist. Second, the new scrubber will be significantly more efficient at controlling emissions of sulfuric acid mist than the existing scrubber. The overall result is that the boiler is expected to experience a 25 percent decrease in emissions of sulfuric acid mist as a result of this project, even with the 18 percent increase in utilization of the boiler projected by Ameren.

4. The Illinois EPA should not issue this permit because it would allow the plant to emit CO<sub>2</sub> and nitrous oxide (N<sub>2</sub>O) (another greenhouse gas) in quantities that would cause or tend to cause air pollution, which is prohibited by 35 IAC 201.141. The term “air pollution” is defined as “the presence in the atmosphere of one or more air contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant, or animal life, to health ....” 35 IAC 201.102. The Illinois EPA may not issue a permit that will cause additional injury to human health and the health of animals and plant species.

Global warming is the most serious environmental threat facing humanity. The scientific consensus, both nationally and internationally, is that the earth's climate is getting warmer and that emissions of greenhouse gases, especially carbon dioxide (CO<sub>2</sub>), from human activity are the major cause. The extent of global warming will depend on the amount of CO<sub>2</sub> emitted into the atmosphere and the more CO<sub>2</sub> that is emitted into the atmosphere, the greater the level of warming and the impacts on the environment.

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<sup>1</sup> B. Courtemanche and others, *Reducing NOx Emissions and Commissioning Time on Southern Company Coal Fired Boilers with Low NOx Burners and CFB Analysis*, Electric Power 2003.

In 2001, the US Global Change Research Program released *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*,<sup>2</sup> (National Assessment) predicting effects of climate change for each region in the United States. According to the National Assessment, effects on Illinois are expected to be significant and severe, with increased average temperatures and net soil moisture declines, particularly in the southern part of the region. The National Assessment also observes that “Without strict attention to regional emissions of air pollutants, the undesirable combination of extreme heat and unhealthy air quality is likely to result.” National Assessment, Overview, 55. Additionally, increases in global temperature may also cause flooding, which poses both a direct and indirect threat to human health. TAR: Impacts, 762. National Assessment, Overview, 54. In summary, global warming will have a significant impact on the human environment in Illinois, as well as the rest of the global population. Unless releases of CO<sub>2</sub> and other greenhouse gases are curbed and then significantly decreased, global warming will pose significant threats to the health, welfare, and economy of Illinois.

Rebuilding the boiler and turbine at this power plant to allow continued operation for another thirty years or more, when the plant emits millions of tons of CO<sub>2</sub> per year will cause serious impacts through global warming. The Illinois EPA must prevent these dire threats by prohibiting the release of millions of tons of CO<sub>2</sub> every year from this plant.

**While global warming is a critical environmental issue, it will not be solved by denying this permit, or by piece-meal action, as recommended by these comments. Global warming is the aggregate result of human activities on a global basis, which currently release over 20 billion tons of CO<sub>2</sub> emissions annually. As such, the impacts or contribution of this power plant does not rise to the level at which they can be considered to be causing air pollution as prohibited by 35 IAC 201.141. Reducing emissions of greenhouse gases will require carefully thought out regulations and comprehensive actions. Moreover, denying this permit would do nothing to reduce CO<sub>2</sub> emissions as the plant would continue to operate as at present but without improved emissions controls. Alternatively, the electric power previously supplied by the plant would be supplied by other existing power plants in Illinois at which emissions likely are not currently as well controlled, as this plant is already equipped with a selective catalytic reduction (SCR) system and SO<sub>2</sub> scrubber. However, issuance of this permit would let this plant provide more, even better controlled electricity, acting to reduce emissions of other less efficient and less equipped plants.**

5. As shown in the recent settlement between the Sierra Club and the City of Springfield with respect to the construction of new Dallman Unit 4, it is possible to approve the construction of a new coal-fired generating unit with conditions that achieve an overall reduction in CO<sub>2</sub> emissions.

**The events in Springfield are not relevant to the project proposed by Ameren. The City of Springfield project is installing a new, well controlled coal-fired generating unit which in**

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<sup>2</sup> National Assessment Synthesis Team, *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*, US Global Change Research Program, 2000 (National Assessment Overview).

part will replace two older units that are only controlled with an ESP and are at or near the end of their useful life. A significant reduction in the rate of CO<sub>2</sub> emissions is possible because a new unit is being installed that is more efficient than the older units. Ameren is not replacing existing units but undertaking a project to make effective use of an existing generating unit that is already controlled with an SCR, ESP and scrubber and still has useful life. Accordingly, only minor improvements in the efficiency of the unit are possible, as will be achieved with the work tentatively planned by Ameren for the turbine-generator.

6. If the Illinois EPA issues a permit for the proposed changes at this power plant, the Illinois EPA, as USEPA's surrogate, must regulate emission of CO<sub>2</sub> and other greenhouse gases. This is because the USEPA is legally required to regulate emissions of CO<sub>2</sub> and other greenhouse gases as pollutants under the Clean Air Act (CAA) because CO<sub>2</sub> and other greenhouse gases fall squarely within the CAA's definition of "air pollutant." (Refer to 42 USC 7602(g).) Accordingly, USEPA is required to appropriately regulate these emissions under the CAA's various substantive regulatory programs, including the PSD program.

Moreover, in *Commonwealth of Massachusetts v. Environmental Protection Agency* the Attorney General of Illinois, Lisa Madigan, and a coalition of other attorneys general, cities and environmental groups, are arguing that CO<sub>2</sub> is a regulated pollutant.<sup>3</sup> The Illinois EPA cannot now take the opposite position and ignore the CO<sub>2</sub> emissions from this plant.

**As observed by this comment, the Illinois EPA is acting as USEPA's surrogate or agent as the Illinois EPA is addressing the PSD program as part of the review of the application for this proposed project. As further indicated by this comment, the USEPA does not agree with the legal analyses underlying this comment and others who argue that USEPA should be addressing emissions of greenhouse gases as a pollutant under the CAA. The question of whose legal analysis is correct is now before the courts. Until a final decision is made in this case, the Illinois EPA must proceed as USEPA would proceed, because the Illinois EPA is acting as a surrogate for USEPA.**

7. Consultation under the federal Endangered Species Act (ESA) must consider global warming. With respect to endangered species, the most significant environmental issue associated with Illinois EPA's decision on application is global warming associated with the plant's emissions. In short, the issuance of this permit will cause directly and indirectly the emissions of millions of tons of CO<sub>2</sub> per year from the plant for the foreseeable future.

Greenhouse gas emissions are having a direct and indirect impact on numerous listed species. Therefore, the emissions of greenhouse gases associated with the proposed project "may affect" such species, triggering the consultation requirement. While virtually every listed species is likely to be affected to some degree by global warming, these comments focus on two listed coral species, the Elkhorn and Staghorn corals, as the

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<sup>3</sup> <http://www.abanet.org/publiced/preview/briefs/pdfs/06-07/05-120petitioners.pdf>

final rule listing these species as endangered specifically discussed the impacts of global warming on the species so that the impacts of global warming pollution and global warming on the Elkhorn and Staghorn corals are well established.. See 71 FR 26852.<sup>4</sup> As such, the USEPA and Illinois EPA cannot claim the impacts are outside of the “action area” or that such impacts are unforeseen.

**This comment is no longer relevant since a PSD permit is not being issued for this project. In addition, any comments on the appropriate scope of consultation under the ESA should be directed to the USEPA and the US Fish and Wildlife Service. Moreover, as any increases in CO<sub>2</sub> emissions from this project will not have a discernable impact on endangered species of coral, given the magnitude of global CO<sub>2</sub> emissions as compared to the CO<sub>2</sub> emissions of this plant, it is not apparent how the concerns raised in this comment would be appropriately addressed as part of ESA consultation.**

8. Irrespective of whether CO<sub>2</sub> is a regulated pollutant, Illinois EPA must consider CO<sub>2</sub> emissions under the “collateral impacts” analysis during the BACT determination. A stringent output-based emission standard would minimize emissions of both CO and CO<sub>2</sub>. This is because the rate of CO<sub>2</sub> emissions from a power plant is directly related to the thermal efficiency of the plant and the amount of coal burned per watt-hour of electricity produced. The less coal burned, the lower the emissions of CO<sub>2</sub> and regulated pollutants, including CO. As part of the new NSPS standards USEPA adopted output-based emission standards recognizing the implications of thermal efficiency in the emissions of utility boilers.

**This comment is no longer relevant since a PSD permit is not being issued for this project. However, it should be noted that Illinois’ recently adopted regulations for mercury emissions that include an output-based emission standard. In addition, Illinois’ proposed rules for implementation of the federal Clean Air Interstate Rule would allocate NO<sub>x</sub> allowances based on electrical output from generating units, rather than the heat input into units.**

9. The BACT determination must consider more efficient boiler technology, in particular, super- and ultra super-critical design boilers. The BACT determination should also consider coal and biomass gasification as an available control technology. Any permit must require that the modified generating unit at a minimum meet a heat rate of 8,500 Btu/kW-hour and maintain a net thermal efficiency at or above 42 percent, which will minimize both the emissions of CO and the collateral emissions of CO<sub>2</sub> from the plant.

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<sup>4</sup> Elkhorn and Staghorn coral were as recently as 30 years ago the dominant reef building corals in the Caribbean and Gulf of Mexico. They have subsequently declined by upwards of 90 percent. The primary drivers of the decline have been disease and temperature induced bleaching. 71 FR 26852; (Pandofi et al, 2005). The coral diseases impacting the species have also been linked to elevated water temperatures. (Harvell et al. 2002). As the National Marine Fisheries Service stated: “The major threats to these species’ persistence (i.e. disease, elevated sea surface temperatures, and hurricanes) are severe, unpredictable, have increased over the past 3 decades, and at current levels of knowledge, the threats are unmanageable.” 71 FR 26858. Each of these threats is directly linked to global warming. Moreover, CO<sub>2</sub> emissions are also causing ocean acidification, which further inhibits coral growth.

**This comment is no longer relevant since a PSD permit is not being issued for this project. Moreover, use of super- or ultra super-critical design technology or gasification technology and achievement of the efficiency limits recommended by this comment would entail installation of a new generating unit, which is clearly beyond the scope of the project that Ameren is proposing.**

10. Use of clean fuels must be considered in the BACT analysis for the proposed project. Available clean fuels include natural gas and biomass fuels, which can be co-fired with coal to reduce the emissions of regulated pollutants, including CO, and reduce CO<sub>2</sub> emissions as related to global warming. There are numerous examples of coal-fired power plants that co-fire biomass that should be considered in the BACT analysis for this project. The possible types of biomass include wood wastes, agricultural waste, switchgrass and prairie grasses.<sup>5</sup>

**This comment is no longer relevant since a PSD permit is not being issued for this project. Moreover, use of natural gas in a boiler that has been developed for and is capable of properly burning solid-fuel is a poor use of a valuable, high quality fuel. While the use of bio-mass at power plants is encouraged by state policy, the infrastructure to supply, prepare and transport bio-mass fuels is not sufficiently developed in Illinois to allow the use of bio-mass fuels to be relied upon by this plant. In addition, given the emission control equipment present on this boiler, available supplies of bio-mass fuels would be more appropriately directed toward generating units whose emissions are not as well controlled.**

11. The Illinois EPA should deny this permit on the basis that there are cleaner, safer ways to meet our nation's energy needs. Illinois EPA has failed to consider any alternative, including the "no build" alternative, to extending the life of an aging coal-fired power plant, as required by the PSD rules.

**This comment is no longer relevant since a PSD permit is not being issued for this project. In any event, as previously explained, the "no project" alternative to the proposed project would not meet either environmental or economic objectives for Illinois. It would not reduce emissions since it would merely maintain the status quo. That is, electrical power would be supplied from coal-fired plants that are not as well controlled as this plant would be after the proposed project. It would not facilitate development of other cleaner sources of electricity. The "no project" alternative also would do nothing to maintain a reliable and affordable supply of electricity for the residents of Illinois.**

12. There are numerous options to building a new coal plant, which need to be considered before a PSD permit may be issued for this project. If a permit is issued for this project, it should require Ameren to do at least as much as the City of Springfield to cut emissions of criteria pollutants and to reduce overall CO<sub>2</sub> emissions by 25 percent below 2005 levels by 2012 (i.e., meet the reductions in CO<sub>2</sub> emissions set forth in the Kyoto Protocol).

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<sup>5</sup> [http://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=108206](http://www.nsf.gov/news/news_summ.jsp?cntn_id=108206)

**This comment is no longer relevant since a PSD permit is not being issued for this project. In any event, Ameren is not proposing to build a new coal-fired generating unit but to effectively use an existing, well controlled generating unit. Accordingly, it is not appropriate to compare this project to a project that does involve building a new generating unit**

13. Ameren has circumvented PSD by the different projects it has undertaken at this plant. The boiler began operation in 1976, with an ESP and a scrubber. In 2002 and 2003, a total of 24 low-NO<sub>x</sub> burners were added to the boiler. In 2003, an SCR began operating. In 2006, a flue-gas conditioning system was placed in service. In addition to proposing to rebuild the boiler and turbine (this project), Ameren has also submitted a permit application to build a new scrubber, a new chimney, and a new ESP. The current application also indicates that Ameren will be installing a third layer of catalyst in the SCR system. Finally, under the heading of "Possible Future Project," Ameren notes that sometime after 2008 it plans to replace the low-pressure section of the steam turbine and rewind the generator. This last change would increase the capacity of the unit from 444 to 465MW.

The record does not show that the Illinois EPA has analyzed all of these past, proposed and future-proposed projects together to determine the applicability of NSR, including whether this is a series of de-bottlenecking activities. For example, while Illinois EPA identified PM emission increases associated with the gypsum use with a new scrubber, it failed to consider the cumulative impacts of all of the proposed projects. Moreover, if there is more coal burned and more coal and coal-waste handling, then that too will increase overall PM emissions. The Illinois EPA should end this piecemeal rebuilding of the plant and reissue one draft permit for all of the reasonably foreseeable past, present and future modifications at the plant. Such a permit should require BACT for each PSD pollutant.

**This comment reflects a flawed understanding of the project that is being addressed by this permit, as well as a misunderstanding of the NSR rules. For an existing major source, NSR is triggered by a project, i.e., a physical change or change in the method of operation or a group of changes undertaken together, whose result will be a significant increase in emissions. In attainment areas, applicability of NSR is normally addressed separately for each project. Accordingly, prior projects at this plant that involved improvements in emission control equipment, such as the previous installation of low-NO<sub>x</sub> burners, the SCR system, and the flue gas conditioning system, are not relevant to the evaluation of NSR applicability for the current project, both as these prior projects were undertaken to reduce emissions and as they were separate projects. Likewise, hypothetical projects that Ameren might undertake in the future are not relevant.**

**The permit that is now being issued does comprehensively address all planned changes that are or may be taken by Ameren as part of the current project and their overall effect on emissions. This includes increases in PM emissions due to increased usage of coal and limestone and increased handling of coal by-products as a result of the changes made to the boiler and the new scrubber. The permit also addresses replacement of the ESP, as this is a**

**part of the current project. It extends to the possible changes to the turbine generator. Whether the project is a major project subject to NSR depends upon the result for emissions. With the inclusion of an advanced combustion management system in the project, as now planned by Ameren, Ameren and the Illinois EPA both expect that the overall result of the project will be a substantial decrease in emissions of most PSD pollutants and, at worst, an increase in emissions of volatile organic material that is not significant.**

**Indeed, NSR is happening “properly” for this project. In conjunction with changes to the boiler now planned by Ameren, which will restore the boiler to its original design capacity, Ameren has also planned changes to improve the control of emissions and applied for a construction permit. The improvements to the control equipment include replacing both the original ESP and scrubber, which came with the boiler, with a modern ESP and scrubber, and installing an advanced combustion management system.**

14. The netting analysis for the proposed project is in error because the emission decreases that are being relied upon will not be creditable and contemporaneous. Many of the proposed changes to the boiler are scheduled to occur during two upcoming outages in Spring 2007 (2/17 - 5/20) and Fall 2008 (9/27 – 11/2). However, the proposed emission decreases, i.e., addition of the new scrubber, the additional layer of SCR catalyst, and the new ESP are slated for 2008. “To be creditable, a contemporaneous reduction must be federally-enforceable on or after the date construction on the proposed modification begins. The actual reduction must take place before the date that the emission increase from any of the new or modified units occurs.” *NSR Manual*, A.38 (emphasis in orig.). In other words, “[a] decrease is creditable only to the extent it is federally enforceable from the moment actual construction begins on the proposed modification to the source [and] [t]he decrease must occur before the proposed emission increase occurs. *NSR Manual*, A.47.

The draft permit would not satisfy the requirement for federal-enforceability. This is because Condition 1.2(d)(i) and (ii) would only require Ameren to notify the Illinois EPA of the measures that it will be taking to ensure that emissions of PSD pollutants from the plant will not increase during the interim period until improvements to emission control equipment are completed. In addition, if Ameren stops running its existing scrubber and begins burning low-sulfur coal without a scrubber, PM emissions will likely increase. It is also not clear what constitutes “low-sulfur compliant coal” and whether the use of such coal absent a scrubber will trigger NSPS or PSD requirements.

In addition, to be creditable, the emission decreases must happen before the proposed increase. That is not occurring in this instance. The increase will occur when the boiler and turbine are rebuilt. Some of that work is proposed to begin on February 17, 2007. The reductions obviously cannot occur for PM until Illinois EPA issues a permit for a new ESP, for NO<sub>x</sub> until the additional layer of catalyst is added, and for SO<sub>2</sub> until the new scrubber is operational. Therefore, credit cannot be taken for the decreases in emissions from these actions. Without these emission decreases, the permit must include

BACT limits for emissions SO<sub>2</sub>, PM and NO<sub>x</sub> from the boiler. Further, the application states that “[m]uch of the boiler and turbine project will be completed during the outages scheduled for the spring of 2007 and the fall of 2008.” App. p. 6. The application does not state when the remainder of the work will happen. To be creditable in a netting exercise, the work on control equipment and the emission decreases must be completed and federally enforceable before the boiler restarts operation, i.e. before the end of the Spring outage.

Finally, these projects are all related – to extend the life of the proposed boiler and increase the output of the turbine. And, the projects are proposed over a short period of time. See e.g. *NSR Manual*, Example at A.36-A.37.

**The draft permit properly addresses the changes in emissions that may occur as a result of the construction activity at the plant. These comments incorrectly conclude that a “netting analysis” is required for the changes to the boiler, relying on outdated provisions of the *NSR Manual* rather than on the actual PSD rules. The cited material in the *NSR Manual*, which was issued in 1990, does not address recent changes to the PSD rules made by USEPA as part of NSR Reform. In particular, the proposed project involves physical changes to an existing boiler that could result in a modification, i.e., an increase in emissions. For purposes of the review of the permit application for these proposed changes, applicability of PSD is appropriately addressed by evaluating the change in emissions that will accompany the project comparing the baseline actual emissions and projected actual emissions of different PSD pollutants from the boiler, to determine whether a significant increase in emissions should be expected. This is what Ameren has done in its application. Ameren is not relying upon “emissions decreases” in a “netting exercise,” as those terms are used in the PSD rules, to show that a significant net emissions increase will not occur from this project. Rather, Ameren has incorporated certain elements into this project, e.g., a new SO<sub>2</sub> scrubber, that will or should ensure that significant increases in emissions do not occur.**

**These comments also assume that Ameren will be able to operate the boiler at increased capacity, with increased emissions, due to the initial work that is being done on the boiler. However, the key physical change to increase the working capacity of the boiler is the change to the induced draft fans. This change, which occurs at the end of the project, is needed to be able to pump more air through the boiler and increase the rate at which the boiler is fired. In addition, even if Ameren were able to immediately operate the boiler at increased capacity without the new induced draft fans, it can schedule the operation of the boiler so that a significant increase in emissions is not experienced, if this is even needed. The longer than normal outages of the boiler in 2007 and 2008 (12 and 5 weeks, respectively) would also act to inherently compensate for any such increase in annual emissions, as relevant for purposes of PSD applicability, during the years while construction is occurring.**

**However, the construction permit has been cautiously developed by the Illinois EPA to assure that a significant emissions increase does not occur at the plant as a result of this project. The permit requires Ameren to keep the necessary records of emissions of PSD**

**pollutants to demonstrate that actual emissions do not increase starting when work on the boiler begins and continuing for ten years<sup>6</sup> after all work is completed. It also requires notification to the Illinois EPA if events occur that would require Ameren to take extra steps to assure that significant increases in emissions do not occur. This additional step has been taken because the project involves an existing generating unit that is in day-to-day operation. Ameren is trying to maintain the electrical output of the unit with a construction schedule that has been developed to minimize the amount of time that the unit is out of service over the next two years while the project is carried out.**

15. The evaluation of the change in emissions from this project also needs to consider the emissions associated with the new diesel-fired emergency engine generator that will be installed with the new SO<sub>2</sub> scrubber.

**This is correct. However, consideration of the emissions of this new engine, which is an emergency engine and whose emissions are very small in comparison to those of the boiler, do not alter the conclusion that this project will not be accompanied by emissions increases that trigger applicability of PSD. In particular, the emissions of NO<sub>x</sub> from the boiler are expected to decrease by over 300 tons per year. The maximum emissions of NO<sub>x</sub> from this engine, which as an emergency engine may operate for no more than 500 hours per year, are only 2.5 tons per year.**

16. Any permit issued for this project must include a BACT limit for emissions for PM<sub>2.5</sub>. This is because the PSD program requires a BACT limit “for each pollutant subject to regulation under the Act that it [a major modification] would result in a significant net emissions increase at the source.” 40 CFR 52.21(j)(3). PM<sub>2.5</sub> is a pollutant regulated under the CAA. Moreover, PM<sub>2.5</sub> will be emitted from the plant in a “significant” amount because it will be emitted at “any emission rate.” 40 CFR 52.21(b)(23)(ii). Because PM<sub>2.5</sub> is PSD pollutant that will be emitted in a significant amount, a BACT limit is required for PM<sub>2.5</sub>. 40 CFR 52.21(j). This is a deficiency that must be corrected before a permit can be issued.

**The draft permit properly addresses emissions of PM from the proposed project, including emissions of PM<sub>2.5</sub>, as it relies upon this project not resulting in a significant increase in PM emissions so that it is not a major modification for emissions of PM. The PSD rules establish two criteria for whether an increase in PM emissions is significant, i.e., 25**

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<sup>6</sup> Pursuant to 40 CFR 52.21(r)(6), Ameren must assure that emissions of PSD pollutants from this plant do not increase significantly as a result of this project for a period of ten years after the project is complete. For the purpose of keeping records of emissions pursuant to 40 CFR 52.21(r)(6), the Illinois EPA has determined that there is a reasonable possibility that the project could result in a significant increase in emissions. This is because the new emissions control systems, including the advanced combustion management system, must perform as expected and be properly operated and maintained if emissions are not to increase. Also, if construction does not proceed according to Ameren’s carefully planned schedule, the operation of the boiler could have to be scheduled or otherwise managed to assure that significant increases in emissions do not occur. In addition, as this project has the general effect of increasing both the design capacity and potential emissions of the boiler, Ameren must make this showing for a period of tens years after the project is complete.

**tons/year in terms of particulate matter emissions and 15 tons per year in terms of PM10 emissions (40 CFR 52.21(a)(23)(i)). In recent guidance related to implementation of PSD and NSR, USEPA has specifically confirmed that it is appropriate to use the current significant emission rate for PM10 until a significant emission rate for PM expressed in terms of PM2.5 is developed and adopted by USEPA.**

**In addition, because of the improvements in control of emissions with this project, this project should also be expected to result in a decrease in emissions of PM evaluated in terms of PM2.5. The better control provided by the new ESP will act to reduce direct emissions of filterable PM2.5. The new scrubber will act to reduce direct emissions of sulfuric acid mist, which is a major component in condensable PM2.5. The new scrubber as it reduces emissions of SO<sub>2</sub>, which is a precursor to formation of the PM2.5 in the atmosphere, will also act to greatly reduce the indirect contribution of the boiler to PM2.5 emissions.**

17. The analysis of applicability of the NSPS, 40 CR 60 Subpart Da, to the boiler as a result of the proposed project must be redone to determine whether the combination of all of the projects proposed at the plant beginning in 2002 with the installation of new low NOx burners and continuing through all of the proposed projects listed in the permit application triggers the NSPS. The analysis in the application did not consider all of the projects, including the overall costs, for purposes of triggering the threshold for “reconstruction.”

**The analysis of the applicability of the “new” NSPS for utility boilers, 40 CFR 60, Subpart Da, to this boiler was properly conducted. In particular, the determination whether the boiler would be undergoing reconstruction, so that it would become a facility subject to this NSPS, was made consistent with USEPA guidance on reconstruction. The determination considered all proposed changes to the boiler that are part of the current project. The determination addressed only the boiler because that is the affected facility that is the subject of this NSPS. The determination did not consider the cost of new air pollution control equipment that will be installed because the cost of air pollution control equipment is not considered when determining whether a unit will be reconstructed. The determination also did not consider the costs associated with installation of new low-NOx burners in 2002 because that activity, which occurred over four years ago, is outside the scope of the current project, and because the replacement of existing burners with low-NOx burners likely qualifies as construction of air pollution control equipment.**

18. The draft permit does not require BACT for emissions of carbon monoxide (CO). The application performed a BACT analysis for CO, purportedly following the procedures set out in the *NSR Workshop Manual*. The Illinois EPA accepted this analysis, concluding that BACT for this boiler is a CO emission limit of 0.17 lb/million Btu. However, the BACT analysis in the application does not follow the top-down process and as a result selected the wrong CO emission limit. First, the BACT analysis failed to consider all technologies that potentially could be applied to control CO emissions of the boiler. The general evaluation of “combustion controls,” defined as “boiler design and operation or good combustion practices,” was far too broad for the analysis and specific control

measures and combinations of measures should have been thoroughly evaluated. Second, afterburner control technology was improperly eliminated as an infeasible technology. Third, the feasible control technologies were not ranked based on control effectiveness. Finally, there are a significant number of recent BACT determinations for new boilers, with CO limits that range from 0.10 to 0.15 lb/million Btu, that are lower than the proposed limit. Lower CO emission rates are also achieved at existing units. Sufficient information was not provided to show why this boiler cannot achieve these lower emission rates.

**This comment is no longer relevant since a PSD permit is not being issued for this project and a BACT determination need not be made for CO emissions from the boiler. However, it is noteworthy that, as indirectly recommended by these comments, Ameren has continued its investigation into available control techniques for CO emissions and has decided to also include an advanced combustion management system in this project, which will serve to prevent a significant increase in CO emissions.**

19. A top-down BACT analysis must be conducted for startup and shutdown of the boiler. The draft permit improperly proposes a CO BACT limit for these periods that is based on the proposed BACT limit for periods of operation other than startup and shutdown, when the boiler only burns coal. However, the boiler will also be firing oil during startup. There is no analysis indicating why CO emissions would be identical when firing oil as when firing coal. The top-down analysis must consider use of cleaner fuels, including natural gas and ultra-low sulfur diesel. This analysis should also consider the same post-combustion controls that are described for other periods of operation. If a higher CO emission limit is set for startup and shutdown, there must be a factual basis that CO emissions are higher during these periods, and for the specific amount that they are higher. Also, the BACT determination should include two parts: (1) a short term limit exclusive of startup and shutdown; and (2) a short term limit that applies during startup and shutdown. These separate limits ensure that good combustion practices are occurring during normal operation, as well as during startup and shutdown, even if “good combustion” means something different for startup and shutdown.

**This comment is no longer relevant since a PSD permit is not being issued for this project. However, the advanced combustion management system will also be effective in minimizing CO emissions that occur during startup and shutdown of the boiler.**

20. In the issued permit, the term “startup” should be defined as “the period beginning with ignition and lasting until the boiler has reached a continuous operating level and operating permit limits.” The term “shutdown” should be defined as the period beginning with the lowering of the boiler from base load and lasting until fuel is no longer added to the boiler and combustion has ceased.”

**This comment is no longer relevant since a PSD permit is not being issued for this project and a BACT determination is not being made to address startup and shutdown of the boiler.**

21. The proposed inclusion of malfunction in the CO BACT limit in the draft permit (e.g. Condition 2.1.2(b)(i) and (ii)) was improper. A BACT limit cannot include periods of malfunction and there is no such thing as a BACT limit for a malfunction. The inappropriate references to malfunction in the draft permit must not be included in any issued permit.

**This comment is no longer relevant since a PSD permit is not being issued for this project.**

22. The proposed BACT limits for CO in the draft permit, which are set as 24-hour block averages, do not protect air quality because of this averaging time. This is because the CO air quality standards apply on a one-hour and an eight-hour average. To ensure that these standards are met, the permit must set limits for a one-hour and eight-hour averaging time and the limits must be rolling, not a block average.

**The CO emissions of the boiler do not have a significant impact on air quality and do not pose a concern for ambient air quality. These emissions are limited by 35 IAC 216.121 to no more than 200 ppm, on an hourly average. Based on a short-term CO emission rate of 0.22 lb/million Btu, which is approximately 200 ppm, the air quality analysis in the application showed maximum CO impacts that were not significant. In particular, on an 8-hour average, the analysis showed a maximum modeled impact of 106 ug/m<sup>3</sup>, as compared to the significant impact level of 500 ug/m<sup>3</sup> and the ambient standard of 10,000 ug/m<sup>3</sup>. This means that the CO emissions from the boiler would have to be more than 1.0 lb/million Btu before they would significantly affect air quality and many more times that before the air quality standards would be threatened.**

23. The air quality analysis must reflect fuel and worst-case scenario during for startup. The analysis appears to have used the CO limit for burning coal and does not include the periods of startup and shutdown. The modeling must be redone to reflect the actual fuels that will be burned during start up (oil or natural gas) and consider the worst-case scenario. Such modeling must recognize that startup can last as long as 24 hours.

**The air quality analysis in the application included a separate evaluation for startup of the boiler. This evaluation was based on operational data for the existing boiler during an actual startup that took 17 hours.<sup>7</sup> The evaluation showed maximum CO impacts during the startup on both a 1-hour and 8-hour average that were less than the impacts during normal operation of the boiler. Given these results, periods of startup and shutdown of the boiler do not pose any greater concern for effects on CO air quality than normal operation of the boiler.**

24. Any permit issued for this project should address the adopted state regulations for control of mercury emissions from coal-fired power plants, 35 IAC Part 225, Subpart B. While

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<sup>7</sup> The fact that startup took only 17 hours, rather than 24 hours, is not a factor in this analysis as the CO emission standards apply on a 1-hour and 8-hour average. Accordingly this analysis addressed each hour during the startup and the each eight hour period during the startup to identify maximum impacts that occurred during the startup period.

these regulations were only proposed when the draft permit was distributed, the Pollution Control Board adopted these regulations on December 21, 2006.

**The issued permit addresses the adopted regulations for control of mercury emissions. (See Condition 2.1.3(b).)**

25. The permit should require CEMS to be operated during startup and shutdown. In addition, the permit should require Ameren to record the time, date and duration of each startup and shutdown. The records must include calculation of emissions during events based on CEMS data. Finally, all emissions during these events shall be included in all calculations of hourly and annual mass emission rates, as required by the permit.

**The permit requires recordkeeping for each startup and shutdown of the boiler (Refer to Condition 2.1.11(a)(i)). Recordkeeping for startup and shutdown of the boiler is also required as the boiler is subject to the NSPS, 40 CFR 60, Subpart D.**

**Applicable regulations for continuous monitoring systems generally require operation of such systems at all times that the associated emission unit is in operation. General requirements for recordkeeping and related reporting of emissions are also established by rule, so it is neither appropriate nor necessary for the permit to establish special requirements related to emission data collected during startup or shutdown of the boiler. Similarly, it is not necessary for the permit to specify that emissions during startup and shutdown “are emissions” as this is appropriately addressed by regulation.**

26. The permit should require that the CO emissions from the boiler be continuously monitored during all periods of operation, including startup and shutdown of the boiler. In its comments on the draft PSD permit for the proposed Sunflower power plant, USEPA Region 7 recommended continuous emissions monitoring for CO, rather than period emissions monitoring, because it would provide “... valuable information which allows Sunflower to certify annual compliance under its Title V permit. CO data can often also assist the boiler operator to optimize combustion and maximize fuel efficiency.”

**The draft permit required continuous emissions monitoring for CO, as requested by this comment. (See Condition 2.1.9(b).) This requirement has been carried over into the issued permit. The permit does allow this monitoring system to be converted to an operational monitoring system after two years of operation, subject to approval by the Illinois EPA, if CO emissions from the boiler are normally no more than 0.12 lb/million Btu. Operation of the monitoring system as an operational monitoring system for CO would still provide the necessary data for effective management of the combustion efficiency of the boiler. The additional effort for Ameren and the Illinois EPA associated with continued operation of an emissions monitoring system, as compared to an operational monitoring system, would likely not be warranted if the new combustion management system for the boiler achieves a CO emission rate that is no more than 0.12 lb/million Btu during normal operation of the boiler.**

27. The draft permit requires the use of CEMS on the boiler for NO<sub>x</sub> and SO<sub>2</sub> emissions but is silent on the use of data collected by the CEMS to verify compliance with the emission limits in the permit. The permit should specify that data from these CEMS shall be used to verify compliance with each of the emission limits in the permit. This would help meet the compliance assurance monitoring requirements under Title V of the CAA, allow Ameren to prepare its annual compliance certification, provide the public with direct compliance information, and minimize any future confusion about the use of CEMS data.

**The permit requires that the data management system associated with the NO<sub>x</sub> and SO<sub>2</sub> CEMS have the ability to appropriately handle collected data to determine emissions as needed to verify compliance with all applicable requirements. (See Condition 2.1.9(c).) As CEMS generally provide the most authoritative data available for NO<sub>x</sub> and SO<sub>2</sub> emissions, it is also reasonable to assume that this data would in actual practice be used to determine emissions of the boiler. However, for the permit to state that data from these CEMS must be used to determine compliance with all applicable requirements would be inappropriate as it could be inconsistent with or contrary to particular regulatory requirements or appear to prohibit the use of credible evidence as a means to show either compliance or noncompliance.**

28. The permit should require that a continuous emissions monitoring system (CEMS) be used for emissions of particulate matter (PM) from the boiler. Coal-fired power plants can emit large amounts of PM if PM control devices do not function properly and PM CEMS can help prevent such occurrences.

**The continuous monitoring system on the boiler for opacity (which is required by federal rules that apply to the boiler) readily provides reliable data that, together with operational data, can be used to verify that the control systems on the boiler are properly operated and maintained to comply with the applicable PM emission standards. In comparison, continuous emissions monitoring for PM is a new development (e.g., the performance specification for such systems was not adopted by USEPA until 2004) and is not yet required by rule. Equipment and procedures for continuous PM monitoring are still being refined. In these circumstances, it is not appropriate to mandate use of a continuous PM monitoring system in conjunction with this project, which involves changes to an existing boiler that will result in a reduction in PM emissions.**

29. The permit should require Ameren to make compliance information for this plant available to the public in an accessible and usable format. This is because information on CO emissions is not available at the Internet site maintained by the USEPA's Clean Air Markets Division.

**Ameren is already required by rule to submit information on its emissions and compliance status to the Illinois EPA in its NSPS Excess Emission Reports, Annual Air Quality Report and Annual Compliance Certification. Copies of these submissions can be readily obtained from the Illinois EPA by the public with a request under the Freedom of Information Act.**

30. The meaning of the phrase “the first improvement to the boiler” in Condition 1.2(b) in the draft permit is unclear. Which “improvement” is being referred to, e.g., the low-NOx burners installed in 2002?

**The wording of Condition 1.2(b) has been clarified in the issued permit, i.e., it refers to the first alteration of the boiler that is addressed by this permit. The alterations to the boiler that are addressed by the permit are identified in the application and summarized in Finding 1 of the permit. Condition 1.2(b) does not refer to prior projects, such as the upgrade of the low-NOx burners in 2002, which was the subject of a separate permit, Construction Permit 02020038, issued in 2002.**

31. The meaning of the phrase “as soon as practicable” in Condition 2.1.6(b)(iii) in the draft permit is unclear. Why is this phrase used?

**The phrase “as soon as practicable” is used in federal regulations, 40 CFR 63.6(e) to describe how quickly corrective actions must be taken for an emission unit in the event of a malfunction with excess emissions. This is also the manner in which this phrase is used in this permit. This phrase is used because it is not possible to specify in advance, in a rule or permit, explicit time-frames by which corrective actions must be taken in the event of a malfunction since it is not possible to know in advance the precise nature of malfunctions and the circumstances in which they occur. However, this phrase clearly expresses the obligation on the owner and operator of a unit to complete corrective action as quickly as possible.**

32. The permit should not state that the Illinois EPA may extend the permit if Ameren fails to commence construction of this project within 18 months, as would be provided by Condition 1.3 of the draft permit. Rather, the permit should specify that if Ameren does not commence construction within 18 months, Ameren must submit a request to Illinois EPA for extension of the permit, with an updated BACT and modeling analysis, and that there will be an opportunity for public review and comment prior to Illinois EPA acting on the extension request.

**This comment is no longer relevant since a PSD permit is not being issued for this project. The issued permit is subject to Standard Condition 1, which provides Ameren with only 12 months to commence construction, rather than 18 months as provided under the PSD rules, whose provisions were being addressed in Condition 1.3 of the draft permit. Any extension or reissuance of the permit would now be governed by state practices.**

33. The Illinois EPA should let USEPA complete the consultation on this project required under the federal Endangered Species Act process and provide an opportunity for public comment upon the findings of that consultation before closing the comment period. The USEPA’s Environmental Appeals Board (EAB) has stated that it expects that “...ESA consultation would ordinarily be completed, at the very latest, prior to the issuance of the permit and, optimally, prior to the comment period on the permit, where the flexibility to address ESA concerns is the greatest.” See Indeck (EAB, 2006). However, the Illinois EPA is proposing to issue this PSD permit without providing any of these procedural

safeguards and without finalizing the ESA consultation prior to the issuance of the draft permit.

**This comment is no longer relevant since a PSD permit is not being issued for this project.**

34. The Illinois EPA's administrative rules and past practice require at least 30 days after a public hearing before the comment period is closed. For reasons that we cannot understand, the Illinois EPA unlawfully shortened the public comment period for this project and then refused our request for additional time to prepare comments. We reviewed a total of 26 public hearings held by the Illinois EPA between 2002 and 2007 (excluding hearings on Title V permits). In each case, the Illinois EPA provided at least 30 days after the hearing to submit written comments. We could not find a single case when a timely request for extension of the comment period was refused.

**The public comment period for this project satisfied applicable regulatory requirements and was reasonable. The total duration of the public comment period was 60-days, as stated in the notice announcing the public comment period. A public hearing was held on the "45<sup>th</sup> day." After the hearing, 15 more days were provided for the submittal of written comments, giving 60 days, ample time, to prepare and submit written comments on this project. The Illinois EPA's procedural rules for public hearings do not require that 30 days be provided after a hearing for submittal of written comments.<sup>8</sup>**

**It is not appropriate to compare the timing of the public comment period for this project to the timing of typical comment periods with hearings. Typically, public comment periods for construction permits address proposed major new sources or major new emission units. This project involves an existing emission unit at which changes are proposed that should greatly reduce emissions. Moreover, the unit is a key element of the electrical power supply for the people of Illinois so that the scheduling of the project is important to maintaining both a reliable and reasonably affordable power electrical power.**

35. The limited duration of the public comment period restricted our ability to complete our review of the draft permit. In particular, as noted in our request for an extension of the comment period, there is a pending investigation into prior construction activities at this plant. With additional time, we were planning to compile additional information about the scope and number of potential NSR violations. Lacking additional time, we have not done so. By rushing to issue this permit prior to completing this investigation, the Illinois EPA is potentially closing the door on the possible remedies that are available to the United States and the residents of Illinois if it is determined that Ameren violated NSR. For example, if Ameren were required to undertake a BACT analysis for PSD pollutants other than CO, the conclusion may be that the appropriate action is to build a different size plant, a different type of plant such as an IGCC plant, or retire the aging plant because the cost of complying with BACT is more costly than other options.

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<sup>8</sup> The Illinois EPA's procedures for hearings specify that the record for an informational public hearing will close 30 days after the hearing only if another date is not specified. "Unless the Hearing Officer provides otherwise, the hearing record shall be closed 30 days after the date of the last hearing." 35 IAC 166.191.

**The public comment period provided ample time to conduct the investigation contemplated by this commenter and to submit comments on the draft permit for the proposed project. As the commenter is well aware, documentation of NSR violations at a coal-fired power plant, much less resolution of any violations that are identified, is a protracted and potentially uncertain undertaking. Accordingly, given the improvements in emission control that are part of this project and the emission reductions that are expected to occur at the plant, it would be both improper and inappropriate for the Illinois EPA to delay action on the application for this project, in anticipation that at some future time an NSR violation might be identified whose resolution might ultimately lead to greater environmental benefits. Moreover, such action would be particularly troubling as Ameren has appropriately applied for a construction permit for this project, in accordance with applicable requirements of the NSR rules.**

#### **FOR ADDITIONAL INFORMATION**

Questions about the public comment period and permit decision should be directed to:

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