Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois

Project Summary for a Construction Permit Application from City Water Light and Power for Dallman Unit 4 Springfield, Illinois

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I. INTRODUCTION

City Water, Light and Power (CWLP), the municipal utility of the City of Springfield, has applied for a permit to construct a new coal-fired electrical generating unit (Dallman Unit 4) at its existing power plant adjacent to Lake Springfield. The new unit would have a nominal electrical capacity of 250 megawatts (gross output). It would replace the two Lakeside Units at the plant, which are the oldest units now at the plant.

The Illinois EPA, Bureau of Air reviews applications for air pollution control permits. The Illinois EPA has reviewed CWLP's application and made a preliminary determination that the project, as set forth by CWLP, in the application meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the air pollution control construction permit that it would propose to issue for this project. The permit is intended to identify the applicable rules governing emissions from the proposed project and to set limitations on those emissions. The permit is also intended to establish appropriate compliance procedures for the project, including requirements for emissions testing, continuous monitoring, recordkeeping, and reporting.

II. PROJECT DESCRIPTION

The proposed generating unit would have one coal-fired boiler, which would produce steam that would be used in a new steam turbine-generator to produce electricity. The nominal rated heat input capacity of the boiler would be about 2,440 million Btu/hr. The boiler would be designed to use Illinois coal as its principal fuel, which would continue to be delivered by truck like the coal supply for the existing units at the plant. Natural gas would be the auxiliary fuel for the boiler, used during startup to bring the boiler system up to normal operating temperature prior to firing of coal and during shutdown of the boiler after coal firing has been discontinued.

The boiler would be a pulverized coal boiler. The coal would be pulverized or ground into a fine powder before being blown into the furnace section of the boiler with part of the combustion air through a number of burners. The remainder of the combustion air, the secondary air, would be blown into the boiler through ports or nozzles to complete combustion.

The boiler would be equipped with a multi-stage system to minimize and control emissions. The boiler would be equipped with low NO_x burners and use good combustion practices to minimize emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic material (VOM). The add-on control train for the boiler would include a selective catalytic reduction (SCR) system for control of NOx, a fabric filter or baghouse for control of particulate matter (PM), wet flue gas desulfurization (WFGD) or scrubber for control of sulfur dioxide (SO_2), and a wet electrostatic precipitator (WESP) for control of sulfuric acid mist and condensable particulate matter. The exhaust from the boiler would then be vented out through a 450-foot high stack.

Other emission units to be constructed as part of the project would include: storage, processing and handling equipment for coal, limestone, ash and other materials; a cooling tower; various roads and parking areas; and diesel engines for emergency power.

III. EMISSIONS

A. Project Emissions

The potential emissions of the proposed boiler are listed below. Potential emissions are calculated based on continuous operation at the maximum load. Actual emissions will be significantly less to the extent that the boiler would operate at less than its maximum capacity and with a compliance margin for applicable emission limits.

Pollutant	Potential Emissions (Tons Per Year)
Particulate Matter Filterable	160
Particulate Matter 10 (Total PM)	374
Sulfur Dioxide (SO_2)	2,135
Nitrogen Oxides (NO_x)	1,067
Carbon Monoxide (CO)	1,281
Volatile Organic Material (VOM)	38.4
Fluorides	2.6
Sulfuric Acid Mist	53
Mercury	0.023
Hydrogen Chloride	76.5
Lead	0.22

Particulate matter will also be emitted from the ancillary operations that support the operation of the new boiler. These include the facilities for storage and handling of coal, limestone, ash and gypsum, a cooling tower, and roadways. The potential particulate matter emissions of these ancillary operations are about 27.4 tons per year.

B. Net Change In Emissions

The net change in annual emissions from this project is shown below. The emission decreases for the shutdown of the two existing Lakeside units, Units 7 and 8, are based on data for the actual emissions of these units, calculated as the average of emissions in 2002 and 2003. Emissions of SO_2 and NOx were determined by continuous emission monitoring conducted under the federal Acid Rain Program. This monitoring data is collected from sources by the Clean Air Markets Division of USEPA's Air and Radiation Branch and posted on the Internet. Emissions of other pollutants were estimated using operating data and appropriate factors from USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42.

The determination of the net change in emissions from this project also considers increases in emissions from contemporaneous projects that occurred within the last five years. The first such project is three diesel engines installed by CWLP in 2002 pursuant to Construction Permit 01070019. The emission increases from this project was determined as the permitted emissions of these new emission units, as set by the applicable construction permit. The other contemporaneous project is a spray dryer system for treatment of certain wastewater streams from the plant, for which an application for a construction permit is pending, Application 05030023. The emission increases from this proposed project was determined as the permitted emissions of the new emission units, as currently requested by CWLP in the construction permit application.

After considering the contemporaneous decreases in emissions from the permanent shut down of the Lakeside Units and the increases in emissions from other contemporaneous projects, this project is accompanied by a net decrease in emissions of SO_2 and NOx.

Summary of Net Changes in Annual Emissions of PSD Pollutants (Tons)

Pollutant	Project Emissions	Contemporaneous Emissions Increases and Decreases			Net Change in Emissions
		Decrease: Shutdown of Lakeside	Increases		
			New Diesel Engines	Prop. Spray Dryer Sys.	
NO_x	1070	1,262	39.4	14.0	-138
SO_2	2135	7,741	0.8	0.1	-5605
CO	1282	32.1	4.7	21.1	1276
VOM	38	7.03	1.0	11.6	43.6
PM (Filterable)	187	6.36	1.1	13.7	195
PM (Total)	401	6.36	1.1	13.7	409
Sulfuric Acid Mist	53	32.2	-	-	20.8
Fluorides	2.6	*	-	-	2.6
Lead	0.22	*	-	-	0.22

*CWLP did not evaluate the decrease in emissions of this pollutant.

IV. APPLICABLE EMISSION STANDARDS

All emission units in Illinois must comply with Illinois Pollution Control Board emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The various emission units in the proposed project should readily comply with applicable Board standards.

The proposed boiler is also subject to the federal New Source Performance Standards (NSPS), 40 CFR 60 Subpart Da, for electric utility steam generating units. The NSPS sets emission limits for NOx, SO_2, PM and mercury emissions from the boiler. Requirements for testing, continuous emissions monitoring, record keeping, and reporting are also specified. Coal handling operations and limestone handling operations associated with the new boiler are also subject to other NSPS. The Illinois EPA administers NSPS in Illinois on behalf of the USEPA under a delegation agreement.

V. OTHER APPLICABLE REGULATIONS

A. Prevention of Significant Deterioration (PSD)

Under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21, the proposed project is a major project for emissions of PM, CO and sulfuric acid mist.

The PSD program addresses emissions of certain pollutants regulated under the Clean Air Act, i.e., PSD pollutants. PSD pollutants are regulated under the Clean Air Act not including hazardous air pollutants and any pollutants for which local air quality is designated nonattainment, which is not of concern for the proposed project. Since the existing CWLP power plant is already a major source for purposes of the PSD rules, with permitted annual emissions of more than 100 tons for a number of pollutants, the proposed project is major for PSD pollutants for which the project would constitute a major modification. For a project involving new emission units, such as the proposed project, a project is generally considered a major modification for a specific PSD pollutant if the annual emissions of the pollutant from the project would potentially be above the significant emission rate set by the PSD rules for the particular pollutant. However, a permit applicant may elect to show that even though the increase in emissions form a proposed project is significant, the net increase in emissions, considering contemporaneous and creditable increases and decreases in emissions of the pollutant, is not significant.

As summarized below, the proposed project would potentially be accompanied by significant increases in emissions of SO_2, NOx, PM, CO and sulfuric acid mist. However, CWLP has elected to show that the project would not be accompanied by a significant net increase in emissions of SO_2 and NOx, relying on the accompanying decrease in emissions from the shutdown of the two existing Lakeside Units. As a result, the proposed project is not subject to PSD for SO_2 or NOx, even though the emissions increases for these pollutants would be considered significant when looked at by themselves. The proposed project is only a major project for emissions of PM, CO and sulfuric acid mist under the PSD rules, subject to the substantive requirements of the PSD rules these pollutants

Project Emissions for Purposes of PSD Applicability (Emissions in Tons/Year)

Pollutant	Project Emissions	Net Change in Emissions	PSD Significant Emission Rate
NO_x	1070	-138	40
SO_2	2135	-5605	40
CO	1282	-	100
VOM	38	-	40
PM (Filterable)	187	-	25
PM (Total)	401	-	15
Sulfuric Acid Mist	53	-	7
Fluorides	2.6	-	3
Lead	0.22	-	0.6

B. Maximum Achievable Control Technology (MACT)

While a case-by-case determination of Maximum Achievable Control Technology (MACT) is not currently required for emissions of hazardous air pollutants (HAPs) from the proposed boiler, the draft permit contains such a determination in the event that circumstances change so that such a determination is required in the future. In particular, a MACT determination is not currently required for the proposed boiler because USEPA has made an official finding that it is neither appropriate nor necessary to regulate utility steam generating units under Section 112 of the Clean Air Act, which addresses requirements for emissions of HAPs. USEPA made this finding in March 2005 when it adopted the federal "Clean Air Mercury Rule," (CAMR). This rule, which provides for control of mercury emissions from coal-fired utility units on a national basis with a cap-and-trade type program, was adopted under Section 111 of the Clean Air Act, rather than Section 112 of the Clean Air Act.

However, this USEPA finding with respect to the appropriate basis to regulate utility steam generating units has been appealed by the State of Illinois and others. Accordingly, if this appeal is successful and USEPA's finding with respect to utility units is overturned, a case-by-case determination of MACT could be required for the new boiler, pursuant to Section 112(g) of the Clean Air Act. This is because the boiler would be considered a major unit for emissions of (HAPs) under Section 112(g) of the Clean Air Act absent USEPA's finding with respect to utility steam generating units. For example, due to the trace levels of chlorine in the coal supply to the boiler, the boiler would have potential annual emissions of 76.5 tons of hydrogen chloride.

New process and production units other than the new boiler that are part of this project are not subject to a case-by-case determination of MACT under Section 112(g) of the Clean Air Act. This is because this project is a modification to an existing source, i.e., CWLP's existing power plant on Lake Springfield, for purposes of USEPA's rules governing case-by-case MACT determinations, 40 CFR 63, Subpart B. Under these rules, the other new process and production units that are part of the project would only be subject to case-by-case determinations of MACT if they would constitute major sources of HAPs when considered individually, which is not the case.

C. Federal Control Programs for SO_2 and NOx Emissions from Power Plants

For the new boiler, CWLP would be subject to new requirements for control of SO_2 and NOx emissions that must be developed pursuant to the "Clean Air Interstate Rule" (CAIR), adopted by USEPA in March 2005. Until these new, more stringent requirements take effect, CWLP would be subject to current control requirements for the boiler for an affected unit that have been adopted under Title IV of the Clean Air Act, Acid Deposition, to address SO_2 and NOx emissions from boilers at power plants as related to their contribution to acid rain. Most significantly, CWLP would have to hold SO_2 allowances for the actual SO_2 emissions from the new boiler, as it does now for its existing coal-fired boilers. As the new boiler would also be an Electrical Generating Unit, the new boiler would also be subject to current control requirements under 35 IAC Part 217, Subpart W, the NO_x Trading Program for Electrical Generating Units. This regulatory program was adopted to address the impact of NOx emissions from power plants on attainment of the historic ambient air quality standard for ozone, which applied as a one-hour average. Under this program, CWLP would have to hold NO_x allowances for the actual NO_x emissions of the new boiler during each seasonal control period, as it does for its existing boilers. This program addresses NO_x emissions of all but the smallest power plants in the Midwestern and Eastern United States so that the total seasonal NO_x emissions of these plants remain within the budget established by USEPA for power plants for attainment of the historic ozone standard.

D. Clean Air Act Permit Program (CAAPP)

The existing power plant is a major source under Illinois' Clean Air Act Permit Program (CAAPP), the federal operating permit program for major sources of emissions pursuant to Title V of the Clean Air Act. To address this project, CWLP would have to submit an application to the Illinois EPA for a modification of the CAAPP permit for the plant within 12 months after initial startup of the new boiler.

VI. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Under the PSD rules, CWLP must demonstrate that Best Available Control Technology (BACT) will be used to control emissions from the proposed project of pollutants subject to PSD. CWLP has provided a detailed BACT demonstration in its application.

BACT is generally set by a "Top Down Process." In this process, the most effective control option that is available and technically feasible is assumed to constitute BACT for a particular project, unless the energy, environmental and economic impacts associated with that control option are found to be excessive. This approach is generally followed by the Illinois EPA for BACT determinations. In addition to the BACT demonstration provided by an applicant in its permit application, a key resource for BACT determinations is USEPA's *RACT/BACT/LAER Clearinghouse* (Clearinghouse), a national compendium of control technology determinations maintained by USEPA. Other documents that are consulted include general information in the technical literature and information on other similar or related projects that are proposed or have been recently permitted. A summary of the proposed BACT Determination is provided in Attachment 1.

A. BACT Discussion for the Coal-Fired Boiler

Introduction

CWLP has generally explained its rationale for the proposed construction of a pulverized coal boiler in supplementary material submitted to the Illinois EPA on June 27, 2005. This material shows that given CWLP's circumstances, the proposed construction of a new coal-fired boiler is a reasoned response to CWLP's need for new, modern generating capacity.

CWLP is a municipal utility, with a single base-load power plant. This plant is located at a site that is physically constrained by Lake Springfield and by major roadways and commercial and residential development. CWLP is a governmental entity whose function is to supply electricity to residents and businesses located in Springfield. It is not a commercial power company, in competition with other power companies to supply power. These factors greatly restrict CWLP's options for development of new generating capacity, as compared to companies that are in the competitive electric power business.

These circumstances make it impracticable, if not impossible, for CWLP to use Integrated Gasification Combined Cycle (IGCC) technology as an alternative to the proposed project. In addition to overall differences in the cost and reliability of IGCC and boiler technology presently, CWLP is pursuing a project whose size is below that at which costs of IGCC technology would be minimized. Companies that are currently pursuing development of power plants using IGCC technology typically are proposing plants with at least two gasifier trains and a total capacity of more than 500 MW, so as to benefit from economies of scale.

While Circulating Fluidized Bed (CFB) boiler technology could be used for this project, it does not appear to offer significantly different emissions rates or operational advantages for CWLP, as compared to the pulverized coal boiler technology that is planned. In this regard, proposed Dallman Unit 4 would use pulverized coal technology like the three existing Dallman Units that will remain in service at the plant, but equipped with modern emission control technology as appropriate for a new boiler. This control

CWLP also has planned this project to use the same coal supply as the existing Dallman boilers. This is very desirable for CWLP for operational reasons. In addition, the plant property is too small to reasonably accommodate facilities for handling two types of coal. The site also lacks sufficient space to handle low-sulfur Western coal by 100-plus car unit trains direct from a mine. Use of low-sulfur coal also would not result in any meaningful reductions in emissions of pollutants from the project that are subject to PSD. This is because of the emission control technology being required on the new boiler, so that emissions of pollutants subject to PSD must be very effectively controlled independent of the sulfur and content of the coal supply to the boiler.

It is beyond the scope of the BACT determination for the proposed project to consider enhanced energy efficiency and clean energy sources, such as wind turbines or solar power. However, these alternatives would not address CWLP's objective of shutting down and replacing the generating capacity of its existing Lakeside Units. In addition, this project does not prevent CWLP from pursuing these alternatives approaches to meeting the demand for electricity at the same time as the proposed coal-fired boiler assures that CWLP can reliably meet the electricity needs of Springfield.

Emissions of Filterable Particulate Matter (PM)

The particulate matter (PM) emissions from coal-fired boilers can be categorized as either filterable or condensable particulate. The filterable particulate matter exists as a solid or liquid particle in the exhaust of a boiler as it leaves the stack. As such, the filterable PM would be collected by a filter placed in the stack. Condensable particulate is emitted out the stack in a gaseous state but rapidly condenses into particles when released into the atmosphere and cooled. However, due to its gaseous state in the stack, condensable particulate would pass through a filter placed in the stack. There is a long tradition in air pollution control of addressing filterable PM emissions, particularly since many mechanical processes only emit filterable particulate. Concern for condensable PM emissions is a more recent development, with wide-spread recognition of condensable PM generally beginning with USEPA's adoption of the National Ambient Air Quality Standard for PM as PM10 in 1987. Due to the difference in the nature of filterable particulate and condensable particulate, it is appropriate to separately consider BACT for filterable particulate and total particulate, considering both filterable and condensable particulate.

Emissions of filterable PM, also more commonly referred to as fly ash, from coal-fired boilers are controlled by add-on control devices. The two types of control devices that provide high efficiency for filterable PM emissions are electrostatic precipitators (ESP) and fabric filters (baghouses). ESPs remove filterable PM from flue gas by means of electrostatic attraction. Particles in the gas stream are negatively charged by discharge electrodes in the ESP. The charged particles migrate to grounded collecting plates in the ESP. The collected particulate (fly ash) continues to accumulate on the collecting plate, agglomerating together. The accumulated fly ash is periodically removed from the collecting plates, which are oriented vertically, by mechanically shaking or rapping the plates, cleaning only a fraction of the plates in the ESP at any time. The fly ash then falls by gravity into hoppers at the bottom of the ESP for temporary storage pending transfer to longer-term storage and final disposal.

A baghouse controls PM by passing the flue gas through a bank of cloth filter tubes suspended in a housing. Fly ash is deposited on the bag, accumulating until the bag is cleaned. This is performed by either blowing clean air backwards through the bag or a pulse of air to shake the bag. Like ESPs, baghouses for utility boilers are divided into multiple compartments, so that only a small fraction of the baghouse is being cleaned at any time.

Both ESPs and baghouses can provide very effective control of PM emissions, with the selection of the type of control device generally dictated by the design coal supply for a proposed boiler. Baghouses are generally considered more effective when low-sulfur coal is burned. Baghouses are not normally used for control of PM emissions on boilers fired with high sulfur coal, for which ESPs are the preferred control device. This is due to both the nature of the flue gas and fly ash generally produced by the two types of coals. Low-sulfur coal generates flue gas that does not pose significant concern for potential deterioration of the filter bags or the baghouse internals and a fly ash with a high resistivity, which is more difficult to collect in an ESP. High-sulfur generates a flue gas that can pose significant concerns for chronic deterioration of a baghouse and a fly ash with better electrostatic properties for collection by an ESP.

CWLP has selected filtration technology, a baghouse, to control filterable PM emissions from the proposed boiler. CWLP has stated that future requirements for control of mercury emissions were a significant factor in this decision. Boilers equipped with baghouses generally achieve significantly higher levels of mercury removal than boilers equipped with other types of PM control devices. The use of baghouse increases the likelihood that the level of mercury control achieved for the proposed boiler will be sufficient to meet applicable requirements for mercury emissions without the need to install an additional control device for mercury, such as an activated carbon injection system.

CWLP’s selection of a baghouse for the boiler has implications for the design of the boiler and its operation, since the boiler will be burning Illinois coal. As compared to use of an ESP, the flue gas entering the baghouse must be hotter so as to maintain the temperature in the baghouse well above the acid dew point temperature, minimize the risk of acid condensation and prevent damage to filter bags and the interior of the baghouse. Additional care will also be required during startup and shutdown down of the boiler and more maintenance effort may be required. However, given that CWLP is prepared to comply with a limit for filterable PM that is identical to the limit that would be set if an ESP were proposed, these consequences from use of a baghouse do not provide a basis for the Illinois EPA to dictate that an ESP must be used for control of filterable PM instead on a baghouse.

The proposed BACT limit is 0.015 lb/million Btu. This limit is consistent with BACT limits that have been set for PM emissions for many new coal-fired boilers and requires very effective control of PM emissions. It provides an appropriate margin of compliance to address the normal variability in performance of a baghouse, as shown by the variation in tested emissions. It also provides a margin of compliance to address the additional variability that may be present given the sulfur content of the coal supply to the boiler. While more stringent limits, e.g., 0.012 lb/million Btu, have been set for certain new utility boilers equipped with baghouses, a lower BACT limit would not provide an adequate compliance margin given the coal supply for the boiler. The permit explicitly addresses the compliance margin by requiring more frequent emission testing for PM emissions if test results are more than 0.10 lb/million Btu.

Total Particulate Matter, including Condensable Particulate Matter

WESP are generally recognized as the appropriate control device for control of condensable PM from coal-fired boilers. This is due to their ability to operate at lower temperatures than either baghouses or ESPs. By their nature, WESPs also can provide additional control of fine filterable particulate, supplementing the removal that is achieved by either ESPs or baghouses.

WESPs operate much the same way as dry ESPs, i.e., electrical charging of the particles or droplets to be collected, migration of the particles to collecting plates, and cleaning of the plates. The difference between the designs of the two types of precipitators lies in the presence of liquid water in a WESP. WESP cleaning is performed by washing the collection surface with water sprays and liquid removal systems employing water, rather than mechanical means such as rapping of the collection plates.

There is a limited body of test data for coal-fired boilers for total PM emissions, including condensable PM emissions. There is even less data available for coal-fired boilers equipped with wet ESPs as the final element in the control train. This is a result of a number of factors, ranging from lack of the necessary testing, the small number of new power plants that are constructed, and the proposed use of WESP on new coal-fired boilers, which is a new development that may be linked to the increasingly more stringent requirements for control of NOx emissions, which necessitates use of SCR systems. Given these circumstances, the Illinois EPA is proposing to proceed cautiously to assure that a limit is set for total PM emissions that is not too low as to not be achievable in practice and not too high so as to not represent the maximum degree of reduction that is achievable.

Another issue for the limit on total PM emissions is the ability to reliably measure condensable particulate emissions. Method 202, the established USEPA method for testing condensable PM has been shown to overstate emissions due to the contribution of “artifacts” created in the sampling apparatus. The creation of these artifacts due to conversion of SO_2 to SO_3 or other chemical reactions in the sampling apparatus is a valid concern, as collected pollutants are present in solution at higher concentrations and for a longer period than exist in the atmosphere immediately after discharge to the atmosphere. The magnitude of these effects has not been adequately quantified, since they are influenced of concentration of various pollutants in the flue gas. In addition, Method 202 accommodates variation in the testing procedures to reflect differences in state and local agency practices with respect to the scope of condensable particulate. This means that not only must emission limits be set that accommodate the potential for great variability or inaccuracy in future test result, but that caution should be exercised when acting on the results of historic tests for condensable particulate.

Accordingly, a BACT limit is proposed, 0.035 lb/million Btu, that is believed to be readily achievable. The limit is identical to the limit set for the Prairie State project. Assuming an actual emission rate of 0.010 lb/million Btu, for filterable PM, this would allow condensable PM emissions of 0.025 lb/million Btu.

A number of recently permitted new utility boilers , including WEPCO-Elm Road, Longview, Thoroughbred and Plum Point Energy, have total PM emission limits set at 0.018 lb/million Btu. While the permitting authorities in these other states have established this limit for total PM, the Illinois EPA does not believe that there is an adequate basis upon which to establish such a limit for the proposed boiler. The lower limits for total PM set for these other projects, by themselves certainly do not provide an adequate basis to set such a limit for the proposed boiler. However, none of these boilers are built and operating yet and these limits have not been shown to be achievable in practice.

The limits set as BACT for sulfuric acid mist emissions for these other project are comparable to the limit being proposed for sulfuric acid mist for the proposed boiler. As sulfuric acid mist is a major component of condensable PM emissions from coal-fired boilers, sulfuric acid mist serves as a surrogate pollutant for condensable PM. The imposition of a similar limit for sulfuric acid mist emissions from the proposed boiler should assure that the emission rate for condensable PM from the proposed boiler is similar to that being required of other new boiler projects.

Finally, these other projects do provide relevant data to set a target for the limit for total PM emissions for the proposed boiler. If an emission rate of 0.018 lb/million Btu can be reliably achieved for total PM emissions from the proposed boiler, as demonstrated by a series of tests, final BACT limit would be set at this level without attempting to determine whether an even lower limit might be achievable.

Emissions of Carbon Monoxide (CO)

Carbon monoxide (CO) emissions are the result of incomplete combustion. The available control methods are: 1) Increased excess air and 2) Design of the combustion process and good combustion practices to minimize the formation of CO. Add-on control devices are not used to control CO emissions from coal-fired boilers.

Increasing the levels of excess air introduced into the boiler, above the level that would otherwise be present for proper operation of the boiler, could theoretically reduce CO emissions of a boiler by raising the amount of oxygen available to complete oxidation of CO into CO_2. However, this technique would have the adverse effect of increasing emissions of other pollutants. It would increase NO_x emissions, as much of the NOx is formed thermally, due to the combination of nitrogen and oxygen in the combustion air in the flame, rather than from nitrogen in the fuel. This reaction is facilitated by excess air, as it provides more oxygen to participate in this reaction. More generally, increased excess air would reduce the energy efficiency of a boiler, requiring consumption of additional fuel with accompanying emissions, to produce the needed amount of electrical power. Generating additional NOx, PM, and SO_2 emissions to reduce CO emissions is an unacceptable consequence of employing excess air. For these reasons, high excess air levels has not been selected as BACT for CO emissions.

As a practical matter, CO emissions from the proposed coal-fired boiler can be effectively minimized by relying on good combustion practices, i.e., careful management of the combustion process for essentially complete combustion. A properly operated boiler effectively functions as a thermal oxidizer. For the proposed boiler, a more stringent limit for CO emissions, achieved with additional excess air would be counterproductive given the need to reduce NO_x emissions. Generally, CO emissions from the boiler are inversely related to NO_x emissions. A CO emission limit less than 0.12 lb million Btu on the proposed boiler would unduly restrict further NO_x reductions, which are typically of greater importance than CO reductions.

Proper boiler design and operation with good combustion practices will provide appropriate control of CO emissions from the new boiler. The proposed BACT limit is 0.12 lb/million Btu, which is consistent with the BACT limits set for other recently permitted coal-fired utility boiler projects. This limit provides CWLP with a reasonable ability to minimize formation of NOx using low-NOx combustion technology. It also provides an appropriate margin of compliance to account for normal variation in the operation of the boiler. This compliance margin would essentially be codified by the permit, which requires that CWLP conduct continuous emissions monitoring for CO if tested emissions are greater than 0.09 lb/million Btu, i.e., greater than 75 percent of the limit set as BACT.

<u>Emissions of Sulfuric Acid Mist</u>

In a coal-fired boiler, a small amount of the sulfur in the coal is converted into sulfuric acid mist, rather than SO_2. This process is similar to the reaction in the atmosphere of much of the SO_2 emitted from the boiler, as the SO_2 gradually reacts to form sulfates. The formation of sulfuric acid mist in a coal-fired boiler is increased by the presence of an SCR system, as the catalyst also facilitates the reaction of SO_2 to SO_3, which then reacts with water to form sulfuric acid mist. While sulfuric acid mist is recognized as a separate pollutant, it also constitutes a major component in the condensable particulate matter emissions from a coal-fired boiler.

There are three basic options for control of sulfuric acid mist emissions from a coal-fired boiler: co-removal with SO_2 scrubbing, sorbent injection, and use of a wet electrostatic precipitator (WESP). Scrubbing for SO_2 also provides control of sulfuric acid mist by absorbing the mist in the alkaline scrubbant. However, scrubbers are not as effective for sulfuric acid mist as for SO_2. This is because the sulfuric acid mist is present as very fine droplets, rather than as a gas. Accordingly, only a moderate level of control can be relied upon.

With sorbent injection, chemical reagents are introduced into the boiler at various point(s) in either powder form or as a liquid solution to absorb sulfuric acid mist. The sorbent is subsequently collected as PM by the PM control device. Materials such as magnesium oxide, calcium oxide, organic amines, ammonia, and sodium bisulfite have all worked to reduce sulfuric acid emissions. Some of the more economical options are the injection of ammonia or hydrated lime downstream of the air heater or sodium bisulfate injection upstream or downstream into ductwork of the air heater. Sorbent injection is most commonly used as an operational practice on a boiler to protect the interior of a boiler from corrosion, especially the air preheater, which is the final step in the boiler, rather than as a means to control emissions. Accordingly, it is often used in conjunction with the installation of an SCR if needed to counter the additional sulfuric acid mist created as a result of the SCR. However, sorbent injection for control can also be affective for control of emissions of sulfuric acid achieving levels of control that are achieved with a WESP, as discussed below.

WESPs are the established control technique for emissions of sulfuric acid mist from acid production plants and chemical processes that generate sulfuric acid mist. As already discussed, in addition to controlling sulfuric acid mist, WESPs also provide additional control of fine filterable particulate, emissions acid gases sulfuric acid mist that are present in the exhaust in very small droplets of water, and control for condensable particulate.

Give the multiple benefits of a WESP, the BACT limit for sulfuric acid mist is based on use of a WESP. The proposed BACT limit that is 0.005 lb/million Btu. This is a stringent limit that is in line with the BACT limits set for other recently permitted new coal-fired utility boilers.

Startup and Shutdown

Compliance with the above BACT limits, which are expressed in lb/million Btu, is intended to be demonstrated by periodic emission testing and proper operation and work practices between tests, as confirmed by opacity monitoring, operational monitoring, and recordkeeping. This approach does not assure that compliance with these rate-based BACT limits can be reasonably determined during startup and shutdown of the boiler. This is because it is impractical to conduct emissions testing during such events. Startups and shutdowns of the boiler are expected to be infrequent events given the new boiler's role in providing base-load power. It would be unrealistic to expect such events could be successfully coordinated with the availability of personnel and equipment to conduct emissions testing. In addition, the applicable USEPA Reference Methods for emissions testing are generally developed to provide reliable measurements during stable operation of an emission unit. Emission testing actually entails three separate one-hour test runs, with the measured emission rate determined as the average of the individual test runs. Accordingly, even if an emission test could be scheduled during a startup or shutdown, it would not provide useful data to determine compliance. Each run of the test would be for a different segment of the transitory conditions during the startup or shutdown of the boiler. As such, it would be inappropriate to average the data from the individual test runs and the data from any individual test run could not be relied upon by itself.

These circumstances are of particular importance for CO emissions, since good combustion practices are being used to control CO emissions. The effectiveness of these practices will vary as air flow rates into the boiler go up or down, burners are brought into or taken out of service, and furnace temperatures vary during the startup and shutdown of the boiler. The CO BACT limit of 0.12 lb/million Btu that can be reliably achieved when the boiler is being fired at 2,000 million Btu/hour, cannot be assured when the boiler is fired at only 20 or 200 million Btu/hour during the course of a startup or shutdown event, even as the CO emissions stay within the permitted hourly rate. They are of less concern for PM and sulfuric acid mist, as emissions of these pollutants are controlled by add-on control devices whose effectiveness should be less dramatically affected by the transitory operating conditions of the boiler during startup and shutdown, if they are affected at all. Nevertheless, the available measurement methodology for testing emissions of these pollutants also makes it infeasible for compliance with limits expressed in lb/million Btu to be determined during startup and shutdown events.

Given these circumstances, the BACT limits expressed in lb/million Btu would not apply during startup and shutdown of the boiler. Instead, CWLP must first carry out startup and shutdown of the boiler in a manner that minimizes emissions, in accordance with written procedures that meet certain specific requirements set forth in the permit, such as appropriate use of natural gas during such events. Second, the limits on emissions of the boiler expressed in lb/hour, which would continue to apply during periods of startup and shutdown, would serve as "secondary" BACT limits. Since testing will not be feasible to empirically demonstrate compliance with such limits, compliance will have to be determined by means of engineering analysis and evaluation. However, such engineering evaluation will be far more practical to perform, and to be reviewed, for limits expressed in lb/hour, rather than in lb/million Btu, as would have to be attempted if the "basic" BACT limits applied during startup and shutdown events. Finally, as the hourly emission limits set for the boiler continue to apply during such events, CWLP would also have to include and account for emissions during such events when it determines compliance with the annual emission limits set for the boiler.

For emissions of PM, this situation is not altered by the fact that CWLP must conduct continuous emissions monitoring for PM emissions from the boiler. Continuous monitoring of PM emissions from boilers has not yet been demonstrated to be sufficiently reliable that the Illinois EPA is prepared to mandate that CWLP use PM monitoring to determine compliance with applicable limits for filterable PM emissions during regular operation of the boiler. (Current PM monitoring systems only measure filterable PM, and do not account for condensable PM emissions, which is present in the flue gas in a gaseous state.) Instead PM continuous emissions monitoring is being required for purposes of compliance assurance monitoring, to provide additional operational data related to the overall operation of the control train on the boiler that will assist in assuring that the control equipment is properly operated and maintained. It would do this by alerting CWLP to possible abnormal operation, for which CWLP would have to undertake an investigation, followed by any appropriate corrective action. To use monitoring to directly determine compliance requires that the monitor provide data of very high reliability. Essentially, the need for an investigation is eliminated and the source must immediately undertake corrective action, proceeding as if it were not in compliance. This dictates a very high standard for the demonstration that a continuous monitor can be relied upon to determine compliance. Finally, even if PM continuous emission monitoring is demonstrated to provide reliable data for regular operation of the boiler, this does not show that it would provide reliable data for startup and shutdown of the boiler. This is because accuracy of PM continuous emissions monitoring is evaluated by comparison to simultaneous measurements of PM made by emissions testing. If the test methods are not reliable during the transitory operating conditions of startup and shutdown, as already discussed, this means that the reliability of continuous monitoring during those events cannot be directly confirmed.

B. BACT Discussion for Other Units

In its application, CWLP also addresses BACT for other emission units that are part of the proposed project. Appropriate control measures are proposed

PM emissions from handling of coal, ash, limestone and gypsum will be effectively controlled in a variety of ways. These include use of baghouses or other appropriate control devices and implementation of other control measures to effectively control direct "process" and fugitive emissions from these operations. The emission control requirements are accompanied by compliance procedures that are appropriate for the type of control measures that are applied to the different material handling operations, including provisions for regular inspections by appropriate personnel, periodic observations of opacity and visible emissions, recordkeeping, and emission testing if and as needed.

PM emissions from the cooling tower will be controlled by use of high-efficiency drift eliminators, designed to maintain drift loss to no more than 0.0005 percent. Dry cooling is an alternative to the wet cooling tower proposed as part of this project. Dry cooling is typically used at power plants located in arid regions where water resources are very limited and the relative humidity is low. This does not demonstrate that dry cooling is appropriate for this project, which is not located in an arid region. This is because of the additional power required by dry cooling and its effect on the energy efficiency and overall emissions of the proposed project. Accordingly use of high-efficiency drift eliminators has been selected as BACT for the cooling tower.

Fugitive dust control for new roadways and open areas associated with this project must be controlled by appropriate application of water or other dust suppressants. In addition, regularly traveled roads and roadways must be paved and be subject to treatment for effective control of dust from paved roads. The required fugitive dust control program is accompanied by requirements for recordkeeping to confirm that the program is properly implemented.

VII. MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (MACT)

As previously explained, while a case-by-case MACT determination is not necessary for the proposed boiler at this time, the draft permit contains a case-by-case MACT determination to address the possibility that USEPA's finding with respect to regulation of HAP emissions from utility steam generating units is overturned. This determination addresses the three "classes" of HAPs emitted from coal-fired boilers, i.e., mercury, acid gases, and organic HAPs. This determination does not address emissions of other metals from the boiler, which are addressed by the BACT determination for PM emissions.

Mercury

Emissions of mercury are addressed individually because of the nature of mercury, which is normally emitted in gaseous form from a boiler, unlike other metals, which are present as particulate. The proposed MACT determination for mercury for the proposed boiler is based upon the information on mercury emissions presented in the application and review of information prepared by USEPA and others about control of mercury emissions from coal-fired utility boilers. This material indicates that mercury emissions from coal-fired boilers may be very effectively controlled by "co-benefit" when certain combinations of control devices are used to control emissions of other pollutants from a boiler. The combination of SCR, baghouse, and scrubbing, as proposed by CWLP for the proposed boiler, is one such combination of control devices. Emissions of mercury can also be very effectively controlled by introduction of a sorbent material, usually activated carbon, into the flue gas. Accordingly, the MACT determination for the proposed boiler establishes two technology-based alternatives as MACT for the boiler, either effective mercury control as a result of co-benefit or effective use of a sorbent injection system specifically for control of mercury emissions.

Under the first alternative, the emission control measures used for the boiler would have to achieve a mercury control efficiency of at least 95 percent by co-benefit, without injection of activated carbon or other similar material specifically for control mercury emissions. Some consideration would be allowed for washing of the raw coal at the mine in determining the effectives of control. The remainder of the emissions control would have to be achieved by co-benefit at the boiler. This approach is being taken because washing of raw coal is effective in lowering the mercury content of the product coal, as well as removing non-combustible material and increasing the heat content of the shipped coal. In addition, mercury emissions are being limited in terms of an emission rate, i.e., lb/million Btu input or lb/GWh output, so that consideration of the effect of coal washing would be inherent in the form of the emission standard. For this purpose of considering the effect of coal washing, the nominal level of removal proposed for conventional washing of coal, as is currently conducted for the coal being used by CWLP, is conservatively set at 25 percent. If an enhanced coal washing process were to be introduced to specifically target removal of mercury, a higher value for the nominal control efficiency provided by the coal washing process could be set. This would occur on a case-by-case basis following an evaluation of the levels of mercury removal that are being achieved by such process.

Under the second alternative, powdered activated carbon or other similar sorbent material would have to be used for the maximum practicable degree of mercury removal. The required level of mercury injection would be determined from an evaluation of the effectiveness of the sorbent injection system installed on the boiler. This evaluation would identify the rates of sorbent injection into the boiler that assure that ample amounts of sorbent are present in the flue gas to collect mercury.

<u>Hydrogen Chloride</u>

The hydrogen chloride emission limits were determined from information on hydrogen chloride emissions in the application and review of other information and information prepared by USEPA about control of hydrogen chloride emissions from coal-fired boilers. The limits are based on the scrubber and WESP used for control of SO_2 and sulfuric acid mist emissions from the boiler also providing effective control of hydrogen chloride emissions. To account for potential variability in the trace chlorine levels in the coal supply to the boiler, which would affect the level of hydrogen chlorine in the flue gas, limits are proposed in terms of both emission rate and control efficiency. The limit selected for the emission rate alternative is 0.020 lb/million Btu, which is the emission limit set by USEPA as MACT for coal-fired industrial boilers. The limit selected for the control efficiency alternative is 97.5 percent, which reflects effective operation of the control system for control of hydrogen chloride emissions.

Volatile Organic Material

VOM emissions are addressed in the proposed MACT determination as VOM serves as a surrogate for emissions of organic HAPs, which are the fourth class of HAPs emitted by coal-fired boilers. The limit for VOM emissions is based on use of good combustion practices to minimize emissions, as would also be used for emissions of CO. The selected limit reflects a review of the BACT limits set for other new coal-fired utility boilers that are subject to PSD for VOM emissions, to set a stringent limit for VOM emissions from the proposed boiler.

VIII. AIR QUALITY ANALYSIS

A. Introduction

The previous discussion addressed emissions and emission standards. Emissions are the quantity of pollutants emitted by a source, as they are released to the atmosphere from a stack. Standards are set limiting the amount of these emissions primarily as a means to address the quality of air. The quality of air as we breathe it or as plants and animals experience it is known as ambient air quality. Ambient air quality considers the emissions from a particular source after they have dispersed following release from a stack, in combination with pollutant emitted from other nearby sources and background pollutant levels.

The concern for pollutants in ambient air is typically expressed in terms of the concentration of the pollutant in the air. One form of this expression is parts per million. A more common scientific form is microgram per cubic meter, i.e. a millionth of a gram in a cube of air one meter on a side.

The United States EPA has established standards, which set limits on the level of pollution in the ambient air. These ambient air quality standards are based on a broad collection of scientific data to define levels of ambient air quality where adverse human health impacts and welfare impacts may occur. As part of the process of adopting air quality standards, the United States EPA compiles the various scientific information on impacts into a "criteria" document. Hence the pollutants for which legal air quality standards exist are known as criteria pollutants. Based upon the nature and effects of a pollutant, appropriate numerical limitation(s) and associated averaging times are set to protect against adverse impacts. For some pollutants several standards are set, for others only a single standard has been established.

Areas can be designated as attainment or nonattainment for criteria pollutants, based on the existing air quality. Areas in which the air quality standard is met for a pollutant are known as attainment. If the air quality standard is exceeded, the area is known as nonattainment.

Given the geographic extent of areas designated as nonattainment and the USEPA's process for redesignating an area to attainment, the air quality in some or all of an area designated as nonattainment may actually be in compliance with the relevant air quality standard.

In attainment areas one wishes to generally preserve the existing clean air resource and prevent increases in emissions, which would result in nonattainment. In a nonattainment area efforts must be taken to reduce emissions to come into attainment. An area can be attainment for one pollutant and nonattainment for another.

Compliance with air quality standards is determined by two techniques, monitoring and modeling. In monitoring one actually samples the levels of pollutants in the air on a routine basis. This is particularly valuable as monitoring provides data on actual air quality, considering actual weather and source operation. The Illinois EPA operates a network of ambient monitoring stations across the state.

Monitoring is limited because one cannot operate monitors at all locations. One also cannot monitor to predict the effect of a future source, which has not yet been built, or to evaluate the effect of possible regulatory programs to reduce emissions. Modeling is used for these purposes: Modeling uses mathematical equations to predict ambient concentrations based on various factors, including the height of a stack, the velocity and temperature of exhaust gases, and weather data (speed, direction and atmospheric mixing).

Modeling is performed by computer, allowing detailed estimates to be made of air quality impacts over a range of weather data. Modeling techniques are well developed for essentially stable pollutants like particulate matter, NO_x, and CO, and can readily address the impact of individual sources. Modeling techniques for reactive pollutants, e.g., ozone, are more complex and have generally been developed for analysis of entire urban areas. They are not applicable to a single source with small amounts of emissions.

Air quality analysis is the process of predicting ambient concentrations in an area or as a result of a project and comparing the concentration to the air quality standard or other reference level. Air quality analysis uses a combination of monitoring data and modeling as appropriate.

B. Air Quality Analysis

An ambient air quality analysis was conducted by a consulting firm, Burns & McDonnell, on behalf of CWLP to assess the air quality impacts of the proposed project due to its PM, CO and sulfuric acid mist emissions, the pollutants that are subject to PSD. Under the PSD rules, this analysis must demonstrate that the proposed project will not cause or contribute to a violation of any applicable air quality standard or PSD increment.

The following tables summarize the results of the air quality analysis conducted for the proposed project. The initial analysis necessary for this project under the PSD rules evaluated whether the proposed project would have "significant impacts" for CO and PM, the criteria pollutants that are subject to PSD. In its guidance for the performance of PSD air quality analyses, USEPA has established Significant Impact Levels for different pollutants. If modeled impacts of a project are above the level for a pollutant, a more refined air quality analysis is required under the PSD rules. This more refined analysis must also address existing emission units at the source at which a project is located and other large stationary sources in the surrounding area, in addition to the proposed project. The significant impact levels are a fraction of the applicable National Ambient Air Quality Standards for a pollutant, which are the threshold levels set by USEPA for health and welfare effects from a pollutant. The significant impact levels also do not correspond to threshold levels for effects on flora or fauna from a pollutant.

The initial analysis conducted for the proposed project shows that the impacts for CO air quality are well below the significant impact levels set for CO. Because the maximum CO impacts did not exceed the significant impact levels, no additional modeling was performed to address CO emissions from start-up of the boiler on the CO NAAQS, which apply as a 1-hour and 8-hour average. However, the maximum* predicted impacts of the project for PM10 were greater that the significant impact levels, on both a short term and annual basis. Therefore, further modeling was required to address both the consumption of PSD Increments and the protection of the PM10 ambient air quality standards. These maximum impacts are largely attributable to the PM emissions from units other than the new boiler, which are released at or near ground level. As part of this analysis, modeling was conducted for the new boiler at 100, 75, 50, and 25 percent loads. This reduced load analysis was conducted to account for weather conditions during which air quality impacts are higher at reduced load, due to reduced exhaust velocity and lower effective plume height from the boiler. The predicted air quality impacts of the boiler at reduced loads were also considered when the maximum impacts of the project were being identified.

Table 1. Significant Impact Modeling (ug/m^3)

Pollutant	Averaging Period	Maximum Predicted Impact	Significant Impact Level
PM10	24-hour	29.9	5
	Annual	5.5	1
CO	1-hour	296.0	2000
	8-hour	60.8	500

One part of the refined air quality analysis for PM10 involves modeling the proposed project and all other new units in the area that consume PSD increment to determine whether the PSD increment will be consumed. This analysis was done with an inventory of increment consuming source supplied by IEPA. The results of the increment consumption modeling, as provided below, show that this project will not result in an exceedance of the PM10 increments.

Table 2: PM10 Increment Consumption (ug/m^3)

Averaging Period	Maximum* Increment Consumed	Applicable Increment
24-Hour	26.9	30
Annual	5.5	17

* The maximum air quality impacts are determined using the appropriate procedure for consistency with the applicable measure of air quality impact, as follows: Highest 1st high for the annual increment and highest 2nd high for the daily increment.

The other part of the refined air quality analysis for PM10 involved modeling to confirm that the National Ambient Air Quality Standards (NAAQS) for PM10 is protected. This modeling combines with the maximum modeled impacts for the PM10 emissions of the proposed project, the existing power plant and other large sources in the area, with representative background concentrations. Background values were taken data collected in 2001, 2002 and 2003 at the ambient monitoring station in Nilwood, the station nearest to Springfield at which PM10 is monitored. The results of this analysis, as provided below, show that the proposed project will not cause or contribute to violations of the applicable NAAQS.

Table 3: Results of the NAAQS Analysis for PM10 (ug/m^3)

Averaging Period	Maximum* Modeled Impact	Monitored Background	Total Impact	NAAQS
24-Hour	86.0	63.0	149.0	150
Annual	24.0	19.3	43.3	50

* The maximum air quality impacts are determined using the appropriate procedure for consistency with the applicable measure of air quality impact, as follows: Highest average of annual data for five years for the Annual NAAQS, and 6th high in five years for the Daily NAAQS.

The modeling conducted by CWLP also allows an assessment of the impact of the proposed project on compliance with the PM2.5 NAAQS, based on the emissions of the boiler, which is the key unit for purposes of PM2.5 air quality. The maximum PM 2.5 impacts of the boiler are predicted as 1.82 ug/m^3, 24-hour average. While USEPA has not yet set significant impact levels for PM2.5, the maximum daily impact is below the applicable significant impact level set by USEPA for PM10. The impact of the boiler on an annual basis would be a fraction of this level, no more than 0.2 ug/m^3, which would be less than the 1.0 ug/m^3 significant impact level for PM10 on an annual basis. Current air quality data for Springfield is available from the ambient monitoring station operated by the Illinois EPA at the State Fairgrounds. When these maximum predicted PM2.5 impacts from the boiler are combined with the current air quality data, compliance is still shown with the PM2.5 NAAQS (65 ug/m^3 and 15 ug/m^3).

Table 4: Monitored PM2.5 Air Quality Data for Springfield (ug/m^3)

Year	Highest Daily Concentrations (24-hour)				Annual Concentration	
	1st	2nd	3rd	4th	Year	3-Year Ave
2005	44.8	38.5	37.0	36.6	15.1	13.5
2004	35.8	32.9	30.2	25.6	11.8	12.9
2003	34.1	33.3	31.5	30.3	13.6	13.4
2002	41.1	34.0	33.3	31.9	13.3	-
2001	33.8	32.9	32.2	28.7	13.4	-

CWLP also conducted modeling for the sulfuric acid mist emissions from the project. The maximum predicted impact was 0.26 ug/m^3, 24-hour average.

USEPA has not established either NAAQS or PSD Increments for sulfuric acid mist.

C. Other Air Quality Related Impacts

Under the PSD rules, CWLP must also submit analyses to address changes in air quality from growth in the area that result from the project, and construction of the source itself. It must also evaluate the potential for visibility impairment and address the potential impacts on soil and vegetation.

CWLP provided an additional impact analysis discussing the emissions impacts resulting from residential and commercial growth associated with the proposed project. Anticipated residential and commercial growth associated with construction and operation of the new boiler is expected to be low, as are the emissions resulting from this growth. Most impacts would be temporary, resulting from the work force required during the construction phase. CWLP predicts that the number of additional permanent employees needed for operation of the boiler will be about 20. This would only result in additional secondary employment and associated economic activity if these positions could not be filled from the current work force in the Springfield area. The secondary air emissions (i.e., e.g., increased vehicle traffic) from construction activity and any long-term growth are not expected to significantly impact air quality in the Springfield area or in the immediate vicinity of the plant.

CWLP's air quality consultant, Burns and McDonnell, provided an additional analysis to evaluate potential impacts to vegetation and soils. Modeling was performed to determine maximum impacts of arsenic, cadmium, chromium, cobalt, fluorides, lead, manganese, mercury, nickel, and selenium. Maximum impacts were compared to screening levels found in the USEPA's *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animal*, EPA 450/2-81-078. The screening values in this USEPA guidance document address direct impacts on soils and plants, and the effects on animals consuming the plants. The modeled impacts were all well below the appropriate screening levels for all indicators.

A visibility analysis was also prepared for potential impacts on the two nearest PSD Class I Areas, the Wilderness Area at the Mingo National Wildlife Refuge in Missouri, and Mammoth Cave National Park in Kentucky, both of which are located over 300 kilometers from Springfield. The analysis conforms to USEPA visibility guidance, including the use of the VISCREEN model with worst-case meteorology. The results show that the proposed facility will not cause perceivable visibility degradation at either area.

An analysis of potential impacts of fogging and icing from the proposed cooling tower was prepared by TRC Environmental on behalf of CWLP. This analysis was specifically requested by the Illinois EPA because of concern about the potential impact of the cooling tower on visibility and driving conditions on nearby Interstate 55. The results of this analysis indicate that fogging and icing will not occur off of plant property for any of the plume abatement designs considered and should not pose safety concerns for traffic on the nearby highway.

IX. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the draft permits would meet all applicable state and federal air pollution control requirements, subject to the conditions in the draft permit.

Attachment 1 – Summary of Proposed BACT Determinations

Boiler:

Pollutant	Emission Limits (lb/million Btu)	Principal Control Measures
PM	Filterable - 0.015 Total – 0.035	Baghouse and Wet Electrostatic Precipitator
CO	0.12	Good Combustion Practices
Sulfuric Acid Mist	0.005	Scrubber and Wet Electrostatic Precipitator

Bulk Material Handling and Other Operations:

Operation	PM Limitation	Control Measures
Handling of Coal And Other Dry Materials	Fugitives - No visible emissions Process (stack)- 0.01 grain/dscf	Dust Suppression, Enclosure and Baghouses, Filters and Other Approved Control Devices
Storage Buildings	No visible emissions	Enclosure, Dust Suppression and Control Devices
Storage Piles	No visible emissions or 90 percent control (98 percent for limestone)	Work Practices and Dust Suppression
Existing Receiving Operations	10 percent opacity Process (stack)- 0.01 grain/dscf	Material Quality and Enclosure
Cooling Tower	Design drift rate no more than 0.0005 percent	High-Efficiency Drift Eliminators
Roadways and Open Areas	-	Paving and Fugitive Dust Control Program