Sierra Club Petition

Exhibit 5

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
Springfield, Illinois

Project Summary for a Construction Permit Application from MGP Ingredients of Illinois, Inc. for a Solid Fuel-Fired Boiler Project in Pekin, Illinois

Site Identification No.: 179060AAD
Application No.: 07030058
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I. INTRODUCTION

MGP Ingredients of Illinois (MGP) has proposed to construct a solid fuel-fired cogeneration boiler and associated equipment at its existing plant in Pekin. The construction of the proposed boiler and associated equipment requires a permit from the Illinois EPA because of its associated emissions.

The Illinois EPA has reviewed MGP's application and made a preliminary determination that the application for the proposed project meets applicable requirements. Accordingly, the Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the proposed construction and modifications. However, before issuing the permit, the Illinois EPA is holding a public comment period and a public hearing to receive comments on the proposed issuance of the permit and the terms and conditions of the draft permit.

II. Project Description

The proposed solid fuel-fired boiler would provide steam for MGP's existing Pekin plant, which produces wheat gluten, wheat starch, ethanol and animal feed from flour and corn. Steam for the plant is currently provided by a natural gas-fired boiler facility located next to the plant that is operated by Ameren. The proposed boiler would make high-pressure steam and also be used to "cogenerate" electricity for the plant.

The proposed boiler would be designed to fire pulverized coal and coal tailings with natural gas used as an auxiliary fuel for startup and flame stabilization. Biomass materials (e.g., bran and feed), which are produced at the plant, could also be used as alternative fuels in place of some of the coal fuel. This primary boiler will have a nominal heat input capacity of 493 million Btu per hour. Emissions of nitrogen oxides (NOx) from the boiler would be controlled by a low-NOx combustion system, overfire air and a selective catalytic reduction (SCR) system. A scrubber would be used to control emissions of sulfur dioxide (SO_2) and other gases. A fabric filter or baghouse would be used to control emissions of particulate matter (PM). Good combustion practices would be used to minimize emissions of volatile organic material (VOM) and carbon monoxide (CO). These measures would also serve to control emissions of hazardous air pollutants (HAPs) from the boiler.

In addition to the proposed solid fuel-fired boiler, a natural gas fired auxiliary boiler with a nominal heat input of 389 mmBtu/hr is also proposed. It would be used during construction of the solid fuel-fired boiler. Thereafter this boiler would serve as a conventional auxiliary boiler, to supply steam when the main boiler is out of service for maintenance. In this role, the auxiliary boiler would be typically used at an annual capacity factor of no more than 10 percent.

This project also includes fuel and bulk material storage, processing and handling equipment for the primary boiler. Control of particulate matter will be by appropriate use of dust suppressants and control devices. Engines for backup and emergency power and several comfort heaters will also be added. Fugitive dust and particulate matter emissions are generated by vehicle traffic and wind blown dust on roadways, parking lots and other open areas associated with the boiler facility. These emissions would be minimized with a Fugitive Dust Control Program as well as pavement of new roadways and the parking lots for the boiler facility.

III. PROJECT EMISSIONS

The potential or permitted annual emissions of this project, as would be allowed by the draft permit, are summarized below. Actual emissions would be less than the permitted emissions to the extent that the boiler facility would operate at less than its maximum capacity and control equipment would normally operate to achieve emission rates that are lower than the applicable standards and limitations.

Permitted Annual Emissions of the Project (Tons/Year)

SO_2	NO_x	CO	PM/PM_{10}*	VOM	Sulfuric Acid Mist	Indiv. HAP	Aggr. HAP
323.7	216.8	324.7	68.1	7.9	5.6	3.0	5.0

*Particulate matter measured as particulate matter 10 (PM_{10}), including both filterable and condensable particulate.

IV. APPLICABLE EMISSION STANDARDS

The application shows that the proposed project will readily comply with applicable state and federal emission standards, including the emission standards of the State of Illinois (35 IAC: Subtitle B) and applicable federal emission standards adopted by the United States EPA (40 CFR Part 60).

The proposed boilers would be subject to federal New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60, Subpart Db. For the primary boiler, this NSPS sets limits for emissions of NOx, SO_2, and PM, as well as opacity, from the boiler. For the auxiliary boiler, this NSPS only sets limits on NOx and SO_2. The coal handling operations would be subject to the NSPS for coal preparation plants, 40 CFR 60, Subpart Y.

Although USEPA adopted National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subpart DDDDD, the proposed boilers will not be subject to these standards. This is because these NESHAP standards have been vacated by a federal court mandate, pursuant to a request by USEPA, and are no longer in effect. When USEPA completes its adoption of new NESHAP standards for boilers and process heaters, the proposed boilers would be subject to applicable requirements of such standards because the existing plant is a major source of emissions of hazardous air pollutants under Section 112 of the Clean Air Act.

Because the potential annual emissions of each proposed boiler by itself are not 10 tons or more for any individual HAP or 25 tons of HAP in aggregate, the boilers do not trigger a requirement for a case-by-case determination of MACT under Section 112(g) of the Clean Air Act.

V. PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The proposed project is a major modification under the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21 for emissions of SO_2, NOx, PM/PM_{10} and CO. The Illinois EPA has been delegated authority by the United States EPA to administer the federal PSD program in Illinois. These PSD rules are relevant for these pollutants because the source is located in a region whose air quality is classified as attainment for all criteria air pollutants.

The proposed project is a major modification for emissions of NO_x, SO_2, CO, and PM/PM_{10} because the potential annual emissions of the project for each of these pollutants are above the specified significant emission rates in 40 CFR 52.21(b)(23).

The potential annual emissions of other PSD pollutants are not significant. In particular, emissions of VOM and sulfuric acid mist (H_2SO_4) associated with the project are less than 40 and 7 tons per year, respectively, so that this project is not subject to PSD for these pollutants.

The substantive requirements of the PSD rules for a major project for a pollutant are: 1) a case-by-case determination of Best Available Control Technology (BACT), 2) an ambient air quality impact analysis to confirm that the project would not cause or contribute to a violation of the National Ambient Air Quality Standard(s) (NAAQS) or applicable PSD increment(s); and 3) an assessment of the impacts on soils, vegetation and visibility.

VI. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

MGP submitted a BACT demonstration in its application that provides its judgment as to the emission control technology and emission limits that should be considered BACT for different pollutants under the PSD rules for various emission units at the proposed solid fuel-fired boiler facility. The Illinois EPA has reviewed the material submitted by MGP and made its independent determination of BACT. In addition to the material submitted by MGP, the Illinois EPA's determination of BACT relies upon its general knowledge of the types of units at the proposed boiler facility and specific information about existing coal/solid fuel-fired boilers. As explained below, the Illinois EPA concurred with MGP's selection of control technologies as it reflected technologies that are in common use on coal-fired boilers and that effectively control emissions. However, the Illinois EPA's determination of BACT for the proposed project, as set forth in the draft permit, would establish emission limits and performance requirements for the control technology on certain units that are more stringent than those proposed by MGP in its application.

Selection of Illinois Coal as the Principal Fuel for the Project

MGP has explained the reasons underlying the proposed development of the boiler facility, including the selection of the design fuel for the facility. The cost of fuel is an important factor in the economics of the existing plant, being the largest factor after the cost of feedstock (grain and flour). MGP has stated that it selected Illinois coal to be the principal fuel[1] for the proposed boiler because Illinois coal and coal tailings would be readily available on a long-term basis at an affordable and stable price in comparison with other possible fuels. While natural gas has been used in recent years to supply MGP with steam, the cost of natural gas has risen significantly and MGP finds it desirable to switch to a fuel for its steam supply that is less expensive and for which a long-term fuel supply contract

[1] For purposes of this discussion of BACT, Illinois coal is considered to be the "principal fuel" for the boiler as the boiler facility would be permitted to use Illinois coal as its only solid fuel. While other solid fuels could be used to "supplement" or take the place of some of the Illinois coal, MGP would not be required by the permit to use specific quantities of such supplemental fuels in the boiler. The use of such supplemental fuels would be at the discretion of MGP, subject to the general obligation that the boiler continue to comply with applicable requirements and limits when using such supplemental fuels and that any requirements associated with use of particular supplemental fuels were satisfied.

can be obtained. Unlike natural gas and oil, it is possible to get a long-term (10 or 15 year) contract for Illinois coal.

Before selecting Illinois coal as the design fuel for the proposed plant, MGP considered other possibilities for its future fuel supply, including: (1) continued use of natural gas; (2) use of oil; (3) use of lower sulfur coal, e.g., Powder River Basin coal from Montana or Wyoming or Appalachian coal; (4) use of 100 percent coal tailimgs; (5) use of municipal solid waste, fuel derived from urban wood waste, or tire-derived fuel; (6) use of bio-mass materials, such as green wood or switchgrass; and (7) a combination of options, either by themselves, or with Illinois coal.

The continued use of natural gas and the use of oil were rejected by MGP due to the significantly higher cost of these fuels compared to coal and the almost certain continued increases in and volatility of the costs of these fuels, which is reflected in the absence of long-term contracts for these fuels. While MGP has selected natural gas as the auxiliary fuel for the proposed boiler and as the fuel for the auxiliary boiler, this does not indicate that use of natural gas should be mandated. The Illinois EPA concurs with this assessment. MGP has made a business decision, weighing the lower cost of coal fuel (compared to other fossil fuels) against the substantially higher capital costs for a solid fuel-fired boiler, that is the basis for the proposed project and does not necessarily need to be revisited by the Illinois EPA. In any event, the calculated cost-effectiveness of using gas or oil as a means to control SO_2 emissions is on the order of $50,000 per ton. The cost-effectiveness for control of particulate matter would be in excess of $250,000 per ton.

The use of low-sulfur coal was rejected by MGP because of concerns about its cost and the operational issues that would be posed for delivery of low-sulfur coal to the plant. As compared to Illinois coal, low-sulfur coal, particularly Powder River Basin coal, poses concerns for costs because it is used on a national basis by a significant number of coal-fired power plants, which receive shipments of coal several times per week by unit trains. In comparison, MGP would be a relatively small user of coal. It would also not have the necessary room to construct facilities to handle unit trains, so that low-sulfur coal would have to be stored at an off-site facility and transferred to the plant, further increasing the cost of the coal and posing concerns for reliability of the coal supply. The Illinois EPA agrees that use of low-sulfur coal, from outside of Illinois, would pose significant operational concerns for MGP. In addition, the use of low-sulfur coal would only reduce potential emissions of SO_2 (as relevant for consideration) by about 100 tons per year so that the cost-effectiveness would be excessive for control of SO_2. Assuming that such coal would cost only $10 per ton as delivered more than Illinois coal, the cost-effectiveness would be in excess of $20,000 per ton.

The exclusive use of only coal tailings, which are available from sites in nearby Fulton County, was rejected by MGP due to uncertainty about the seasonal reliability of supply and potential variability in the quality of this material as compared to conventional fuels. MGP’s circumstances as the operator of a manufacturing plant do not support developing the proposed boiler facility to use coal tailings as its principal fuel. While it will be advantageous for MGP to use coal tailings as an alternative fuel, this does not show that coal tailings should be the principal fuel for the proposed facility. The possible use of coal tailings does not have to be further considered by the Illinois EPA. This is because the emissions characteristics of coal and coal tailings are very similar, so that the use

of coal tailings as the principal fuel of the proposed facility would not reduce its emissions.

The use of other alternative fuels derived from waste streams was rejected by MGP due to uncertainty about the reliability of supply, as well as the cost of such materials, when compared to conventional fuels. In this regard, MGP is not located in a highly urbanized area, like Chicago or St. Louis, where these materials are generated in the amounts that could support the proposed facility. MGP was also very concerned about additional regulatory requirements that would accompany use of such materials and the potential public opposition to this project that the proposed use of such materials could generate. MGP's circumstance as the operator of a plant whose main purpose is manufacturing flour and grain products does not support developing a boiler facility with alternative fuels as its principal fuel. The possible use of fuels derived from waste streams has not been further reviewed by the Illinois EPA. In addition, the Illinois EPA does not consider it appropriate to dictate that a source use particular waste materials as a fuel if it has not voluntarily elected to do so.

The use of bio-mass materials was also rejected by MGP because of uncertainty about the adequacy and reliability of supply and the cost of such materials as compared to commercial fuels, which is again reflected in the absence of long-term contracts for these fuels. This uncertainty was even greater than that associated with alternative fuels as the infrastructure to produce and supply commercial quantities of bio-mass materials to the plant is not established. While it will be clearly advantageous for MGP to use bio-mass materials, particularly off-specification feed made at the plant, as a supplemental fuel with coal, the circumstances do not support developing the proposed solid fuel-fired boiler facility with bio-mass as the principal fuel. The Illinois EPA concurs with this assessment. In other words, it is reasonable for the proposed facility to use incidental amounts of biomass fuel when it happens to become available. However, it would be another matter to require the facility to use a fuel that is not commercially available.

MGP did not find that combinations of any of these above options for fuels provided significantly different circumstances than any of the options by themselves. Combinations of options would tend to increase the disadvantages for the project. The Illinois EPA concurs with this assessment as the shortcomings of more options would be present for the facility.

Likewise, MGP also did not find that one or more of the rejected options provided significantly different circumstances when combined with use of Illinois coal that would allow a "blended fuel" to be used as the principle fuel for the proposed boiler facility. The Illinois EPA concurs with this assessment, in that it would depend on the availability of fuel blends which may significantly alter the operation of the boiler.

Selection of Boiler Technology for the Project

The technologies considered for combustion of coal were (1) coal gasification, (2) fluidized bed boiler technology, and (3) conventional pulverized coal boiler technology, as proposed by MGP.

Coal gasification was deemed unsuitable for several reasons: The technology has not been developed for projects that are this small. (The proposed boiler would be equivalent to about a 50 MW Integrated Gasification Combined Cycle (IGCC) plant, whereas planned IGCC plants are typically 500 MW or greater.) Gasification technology at this scale has not yet matured for the industrial scale and little has been done at this scale to determine its reliability,

issues that are still not definitively resolved for larger plants. Also, the MGP site does not have enough acreage to house the full gasification block and associated equipment. Lastly, the overall cost would result in a significant increase in electricity and steam production cost.

Comparing fluidized bed and pulverized coal boiler technology, MGP determined that pulverized coal boiler technology was preferable based on a life cycle analysis. A fluidized bed boiler would have higher auxiliary power requirements with lower operational availability, probably in conjunction with lower boiler efficiency. MGP's selection of boiler technology is reasonable as it has selected the design of boiler that would be more efficient when used with the design fuel.

BACT Discussion for the Solid Fuel-Fired Boiler

For the boiler, BACT must be established for emissions of NOx, SO_2, PM and CO.

NOx - To control NOx emissions, available techniques and technologies were reviewed by MGP. In addition to low-NOx burners and overfire air normally used to minimize generation of NOx emissions from boilers, the following available technologies were among those technically feasible: natural gas reburning, fuel lean gas reburning, advanced gas reburning, amine enhanced gas injection, selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), and hybrid selective reduction. The following available technologies were deemed infeasible: rotating opposed overfire air (not mature), induced flue gas recirculation (operational difficulties associated with recirculation of ash-laden flue gas), SCONOX (SO_2 fouls the catalyst), THERMOLONOx (technology still under development, failed in control testing), electro-catalytic oxidation (technology still under development), and the Pahlman Process (technology still at the research stage).

Beyond the given use of low NOx combustion techniques, of the feasible add-on technologies, the most effective is generally SCR. SCR involves the injection of ammonia or urea into the flue gases of a boiler or other combustion unit in the presence of a catalyst, located downstream of the combustion zone at an appropriate temperature to destroy NOx, converting it to nitrogen and water. SCR, the chosen BACT technology (in addition to low NOx combustion controls, is the best performing technology that reduces NOx emissions so that further review of lesser-performing alternatives was unnecessary.

Because low-NOx combustion and SCR are together the most effective control technology for NOx, further evaluation of other feasible control technologies is not necessary. The proposed NOx BACT limit is 0.10 lb/mmBtu, 30-day average.

SO_2 – The SO_2 emissions of boilers originate from the sulfur contained in the fuel. The design fuel supply for the boiler is coal with a nominal sulfur content of 3.62 percent by weight and a nominally equivalent uncontrolled SO_2 emission rate of 6.75 lb/mmBtu. In accordance with the top-down BACT process, MGP started by looking at available add-on control technologies for reducing SO_2 from coal-fired boilers ("flue gas desulfurization"). These include: wet scrubbing, regenerable wet scrubbing, "dry scrubbing" or spray dryer adsorber, combined dry and wet scrubber, circulating dry scrubber, duct sorbent injection, furnace sorbent injection, limestone injection dry scrubbing, an activated carbon bed, electro-catalytic oxidation and the Pahlman Process.

The add-on control technologies deemed to be feasible were: wet scrubbing, regenerable wet scrubbing, dry scrubbing, combined dry and wet scrubbing,

duct sorbent injection, and furnace sorbent injection. Technologies, such as, limestone injection dry scrubbing or use of an activated carbon bed, were deemed infeasible mainly because these technologies are still in the research and development stage.

In a scrubbing system, a sorbent material is sprayed into the flue gases of an emission unit, which adsorbs SO_2. MGP has proposed a spray dryer adsorber or “dry Scrubber”, in which the sorbent is injected as a slurry, which dries in the ductwork and is collected as particulate in a baghouse. The proposed SO_2 BACT limits, 30 day rolling average, are 0.185 lb/mmBtu, and, if emissions are 0.140 lb/mmBtu or greater, 98 percent reduction must also be met. This represents a top level of control for industrial-scale boilers. The combination of limits would appropriately address variations in the sulfur content of fuel.

PM - For particulate matter, emissions occur as a result of carryover of fly ash and lime in the flue gas. Options for control of this filterable particulate include filter technology (i.e., baghouses) and electrostatic precipitators. When dry scrubbing is employed for SO_2 control, baghouses are used for particulate control. This also applies to the MGP system. Baghouses can achieve similar control of filterable particulate as an ESP, even when considering that it will work in combination with the scrubbing system. The proposed baghouse represents the top control technology for this boiler. The proposed BACT limit for filterable PM_{10} is 0.012 lb/mmBtu, 3-hour average.

Particulate emissions also occur as condensable particulates. The combination of the dry scrubber system and baghouse, will provide very effective control of total PM, including both filterable and condensable particulate, from the solid fuel-fired boiler. This is because the spray dryer is very effective in controlling sulfuric acid mist, which is one of the principal constituents of condensable particulates. BACT for total PM_{10} is proposed as 0.03 lb/mmBtu, 3-hour average.

This BACT determination also serves to control particulate matter as $PM_{2.5}$ (i.e., particulate matter with an aerodynamic diameter of 2.5 microns or less). Based on the application, most of the filterable particulate from the boiler, after control by the baghouse, would be $PM_{2.5}$. In addition, the proposed BACT determination would require the filter bags in the baghouse to use a fabric material that has enhanced control of fine particulate matter, as compared to a conventional woven or felt filter material.

CO – CO emissions are a result of incomplete combustion of fuel. The feasible control technologies are 1) high levels of excess air and 2) design of the combustion process 3) add-on controls (e.g., oxidizers or oxidation catalyst) and 4) good combustion practices to minimize the formation of CO. A large amount of excess air in the boiler could theoretically reduce CO emissions by raising the amount of oxygen available to provide more complete oxidation of CO to CO_2. Use of this technique would have the adverse environmental impact of increasing emissions of other pollutants, particularly NOx, which is supported by excess air.

A properly designed and operated boiler effectively functions as a thermal oxidizer. CO formation is minimized when the boiler temperature and excess oxygen availability in the combustion zone of the boiler are adequate for complete combustion. Although add-on control is possible to further reduce CO emissions, the use of add-on control would not be cost-effective.

The Top-Down BACT process indicates that best practices of combustion system design is the best means to reduce emissions of CO. The proposed BACT limit for CO is 0.15 lb/mmBtu, 24-hour average.

BACT Discussion for the Natural-Gas Fired Auxiliary Boiler

The auxiliary boiler is a natural gas-fired boiler that will be used to supply steam to the plant when the solid fuel-fired boiler is being constructed and will thereafter serve as an auxiliary boiler once the solid fuel-fired boiler is operational. As an auxiliary boiler, it will only be operated on an intermittent basis when the solid fuel-fired boiler is out of service and otherwise as needed to assure availability for such use. As such, this auxiliary boiler would be idle most of the time (i.e., no greater than 10 percent of its annual capacity) after the solid fuel-fired boiler begins operation.

For the auxiliary boiler, good combustion practices and low-NOx burner technology are proposed as BACT for CO and NOx, and use of natural gas for SO_2 and PM. Given the nature of the auxiliary boiler, including infrequent and intermittent operation after the coal-fired boiler begins operation, additional control measures are not practical for the auxiliary boiler. The proposed BACT limits are 0.035 lb/mmBtu, 24-hour average, for NOx and 0.059 lb/mmBtu, 3-hour average, for CO. BACT limits are proposed for only NOx and CO as needed to address the performance of the low-NOx burners for the pollutants that are affected by combustion.

BACT Discussion for Material Handling

PM emissions from handling solid fuel and other material will be effectively controlled in a variety of ways. These include use of baghouses, wetting agents and implementation of other control measures to effectively control stack and fugitive particulate emissions from handling material with the potential to generate dust.

The proposed BACT determination for bulk handling operations at the boiler facility is based on the BACT demonstration provided in the application, review of the BACT determinations made for material handling operations associated with other new coal-fired boilers, and the Illinois EPA's experience with material handling operations. The proposed BACT determination would appropriately establish BACT for the different types of material handling operations. The BACT requirements for material handling include readily enforced performance standards as it is practical to do so, e.g., no visible emissions and use of appropriately designed filtration devices. These BACT requirements are accompanied by requirements for performance testing, operational instrumentation, inspections, recordkeeping, notifications and reporting.

BACT Discussion for Roadways and Open Areas

MGP has proposed a variety of measures, including paving (roadways), dust suppression, sweepers and vacuum trucks (as needed), to control emissions of fugitive dust from truck traffic on those plant roads associated with the boiler facility. The proposed BACT determination for these roadways is intended to require that these emissions be effectively controlled while still providing appropriate operational flexibility in the manner with which this is accomplished in practice by the boiler plant. This general approach has been taken because of the Illinois EPA's experience with fugitive dust control programs. This experience indicates that dust control programs must be flexible to appropriately respond to changing operation and weather

conditions (rain, hot, dry weather in the summer, and snow and ice in the winter). In addition, dust control programs change and evolve over time as new control techniques and service providers become available to control emissions. Accordingly, like material handling operations, roadways associated with the boiler facility are most appropriately addressed through establishment of broad BACT control requirements, rather than with detailed, prescriptive requirements for control of emissions.

For this purpose, the draft permit proposes two types of BACT requirements for these roadways, an opacity requirement and a number of work practice requirements. First, control measures must be used such that opacity of emissions from truck traffic on roadways and windblown dust does not exceed 10 percent. (This requirement would not apply during high wind speed, defined as wind speed in excess of 25 miles per hour, as provided by 35 IAC 212.314.) Second, the required work practices for control of fugitive dust must include: 1) paving of regularly traveled roads; 2) treatment of roads for effective control of emissions, to meet minimum nominal levels of control of emissions; and 3) handling of collected dust in a manner that prevents it from being released back into the environment. This approach requires very effective control of PM and $PM_{2.5}$ emissions from the roadways associated with the boiler facility, as control of emissions is addressed both by a numerical opacity standard, which may readily be enforced by any qualified opacity observer, and by specific requirements and performance standards for the fugitive dust control program.

BACT Discussion for Engines

The engines would be emergency engines, operating for at most 500 hours per year. These engines will have to meet NSPS standards, 40 CFR 60, Subpart IIII for stationary compression ignition internal combustion engines and use ultra low sulfur diesel engines. Given these circumstances, further measures for control of emissions would not be cost effective.

VII. IMPACT ANALYSIS

A. Air Quality Impacts

The previous discussions addressed emissions and emission standards. Emissions are the quantity of pollutants emitted by a source, as they are released to the atmosphere from various emission units. Standards are set limiting the amount of these emissions as a means to address the presence of contaminants in the air. The quality of air that people breathe 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 or other emission point, in combination with pollutants emitted from other nearby sources and background pollutant levels. The level of 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 in micrograms per cubic meter, which are millionths of a gram by weight of a pollutant contained in a cubic meter of air.

The United States EPA has established standards for the level of various pollutants 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 USEPA compiles scientific information on the

potential impacts of the pollutant into a “criteria” document. Hence, the pollutants for which air quality standards exist are known as criteria pollutants. Based upon the nature and effects of a pollutant, appropriate numerical standards(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. In an attainment area, the goal is 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 in 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 air 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, NOx, 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 for NO_2, SO_2, PM_{10} and CO

An ambient air quality analysis was conducted by the consulting firm, Mostardi-Platt Environmental, on behalf of MGP to assess the impact of the emissions of the proposed project. This analysis must determine whether the proposed project will cause or contribute to a violation of any applicable air quality standard.

The starting point for determining the extent of the modeling necessary for this proposed boiler facility, began with an evaluation on whether the project would have a “significant impact”. The PSD rules identify Significant Impact Levels, which represent thresholds triggering a need for more detailed modeling. These thresholds are specified for all

criteria pollutants, except ozone and lead. The significant impact levels do not correlate with health or welfare thresholds for humans, nor do they correspond to a threshold for effects on flora or fauna. For pollutants for which impacts are above the significant impact level, modeling would be performed by incorporating the proposed new emissions units for the proposed project, the existing plant itself and significant stationary sources in the surrounding area.

However, the ambient air quality impact analysis demonstrates that the project would not cause or contribute to a violation of the National Ambient Air Quality Standard(s) (NAAQS) or applicable PSD increment(s) for NOx, PM_{10}, SO_2 and CO for either normal operation or during periods of startup or malfunction. Table 1 shows that the maximum predicted impacts of each pollutant will be below the significant impact levels. As the air quality impacts of the proposed boiler facility would not be significant for PM_{10}, the facility would also not have significant impacts for $PM_{2.5}$.

Table 1 – Maximum Project Impacts (ug/m^3)

Pollutant	Averaging Period	Maximum Predicted Impact	Significant Impact Level
NO_2	Annual	0.38	1
PM_{10}	24-hour	4.60	5
PM_{10}	Annual	0.96	1
SO_2	3-hour	12.3	25
SO_2	24-hour	4.93	5
SO_2	Annual	0.53	1
CO	1-hour	27.9	2,000
CO	8-hour	15.8	500

The results demonstrate that all impacts are insignificant and no refined (full impact) analysis is required.

C. Vegetation, Soils Analysis and Visibility

MGP provided an analysis of the impacts of the proposed project on vegetation, soils and visibility. This analysis focused on the use of modeled air concentrations and published screening values for evaluating exposure to flora from selected criteria pollutants (SO_2, NOx, CO, ozone and PM_{10}). The proposed project's emissions are not expected to result in harmful effects to the soils, vegetation and visibility in the area. Maximum modeled impacts for SO_2, NOx, CO and PM_{10} do not exceed the secondary NAAQS level set forth by USEPA. Maximum modeled 3-hour average SO_2 impacts do not exceed the NAAQS for the secondary standard.

D. Construction and Growth Analysis

MGP provided a discussion of the emissions impacts resulting from residential and commercial growth associated with construction of the proposed project. Anticipated emissions resulting from residential, commercial, and industrial growth associated with construction and operation of the project are expected to be negligible. Despite the 20 to 100 workers required during the construction phase (of roughly 18 months) and about 30 permanent employees for operation of the boiler and associated equipment, emissions associated with any new residential

construction, commercial services, and supporting secondary industrial services are not expected to be significant. To the extent that the project draws from the existing work force and is supported by the existing infrastructure, impacts would be minimal and distributed throughout the region.

VIII. PERMIT CONDITIONS

The conditions of the permit set forth the emission control requirements that the project must meet. These requirements include the applicable emission standards that apply to the project. They also include the measures that must be used and the emission limits that must be met as BACT for emissions of SO_2, NOx, CO and PM/PM_{10} from the project.

The permit also establishes enforceable limitations on the amount of emissions for which the project is permitted. Limitations are set for SO_2, NOx, CO, PM/PM_{10}, i.e., the pollutants for which the project is major, and for pollutants for which the project is not significant, e.g., VOM and sulfuric acid mist. In addition to annual limitations on emissions, the permit includes short-term emission limitations and operational limitations, as needed to provide practical enforceability of the annual emission limitations. As previously noted, actual emissions associated with the project would be less than the permitted emissions to the extent that the boiler facility operates at less than capacity and control equipment normally operates to achieve emission rates that are lower than the applicable standards and limitations.

The permit also establishes appropriate compliance procedures for the ongoing operation of the boiler facility, including requirements for emission testing, required work practices, operational monitoring, recordkeeping, and reporting. These measures are imposed to assure that the operation and emissions of the facility are appropriately tracked to confirm compliance with the various limitations and requirements established for individual emission units.

IX. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the application for the proposed project meets applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a construction permit for the project. Comments are requested on this proposed action by the Illinois EPA and the conditions of the draft permit.