ANALYSIS AND PRELIMINARY DETERMINATION
FOR THE PROPOSED CONSTRUCTION
OF A SET OF REFINED COAL EQUIPMENT

FOR
WPL - COLUMBIA ENERGY CENTER,
LOCATED AT
W8375 MURRAY ROAD,
PARDEEVILLE, COLUMBIA COUNTY, WISCONSIN

Construction Permit No.: 16-POY-059
Facility ID No.: 111003090

This review was performed by the Wisconsin Department of Natural Resources, Air Management Program, in accordance with Chapter 285, Wis. Stats., and Chapters NR 400 to NR 499, Wis. Adm. Code.

Preliminary Determination	**Signature**	**Date**
Preliminary Determination prepared by:	Paul Yeung	7/18/2016
Stationary source modeling conducted by:	Emily Houtler	7/18/2016
Peer Review conducted by:	Jonathan Wright	7/18/2016
Compliance Review conducted by:	POY for Shiw Singh	7/18/2016
Regional Supervisor or Central Office Designee approved by:	/s/ Thomas Roushar	7/18/2016

Note: Copies of the permit review files can be found at the Department of Natural Resources Bureau of Air Management Headquarters, Seventh Floor, 101 South Webster Street, Madison, Wisconsin, 53703; South Central Region Air Program, 3911 Fish Hatchery Rd, Fitchburg, WI 53711; and by using the Air Permit Search Tool located at http://dnr.wi.gov/topic/AirPermits/Search.html.

INTRODUCTION

Stationary sources that are not specifically exempt from the requirement to obtain a construction permit under s. 285.60(5), 285.60(5m), and 285.60(6) Wis. Stats. or ch. NR 406, Wis. Adm. Code may not commence construction, reconstruction, replacement, relocation or modification unless a construction permit for the project has been issued by the Department of Natural Resources' (DNR's) Air Management Program. Owners or operators subject to the construction permit requirements must submit a construction and operation permit applications to the DNR. The applications are reviewed following the provisions set forth in ss. 285.60 to 285.66, Wis. Stats. The criteria for permit issuance vary depending on whether the source is major or minor and whether the source is or is proposed to be located in an attainment or nonattainment area.

Stationary sources subject to air pollution control permit requirements are reviewed with respect to the equipment and facility description provided in the applications and for the resulting impact upon the air quality. This review ensures compliance with all applicable rules and statutory requirements. The preliminary determination shows why the source(s) should be approved, conditionally approved, or disapproved. It encompasses emission calculations and air quality analyses using US EPA models, if applicable. Individual source dispersion modeling is not able to predict concentrations of ozone in ambient air nor is an air quality modeling analysis done for direct $PM_{2.5}$ emissions from existing sources, minor new sources, and minor modifications of sources. Instead, the Department has used a weight of evidence approach to make a technical finding that direct emissions of $PM_{2.5}$ do not cause or exacerbate violation of the $PM_{2.5}$ air quality standards or increment. The Department follows federal guidance and regulation when implementing the federal permit programs including review of air quality modeling analyses as required by EPA. As a precautionary note, the emission estimates may be based on US EPA emission factors (AP-42) or theoretical data and can vary from actual stack test data.

This review is based on information contained within the application submitted for an air pollution control permits. A revised operation permit may be issued if the criteria set forth in ss. 285.63, 284.64 and 285.66, Wis. Stats., are met. The sources included in this construction permit are also required to obtain an operation permit under s. 285.60(1)(b), Wis. Stats. This review constitutes the Department's review of applications for both the construction permit and the operation permit for these units.

A final decision on the permit will not be made until the public has had an opportunity to comment on the Department's analysis, preliminary determination, and draft permit.

GENERAL APPLICATION INFORMATION

Owner/Operator: WPL - Columbia Energy Center
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Pardeeville, Columbia County, WI 53954-8731

Responsible Official: Jerald Lokenvitz
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Application Submitted By: Steven Dunn
(608) 458-6245

Application submittal date: April 8, 2016

Additional Information Submitted: April 28, 2016 through July 18, 2016

Date of Complete Application: July 18, 2016

PROJECT DESCRIPTION

Wisconsin Power and Light Company (WPL) operates a coal-fired utility plant, known as the Columbia Energy Center (CEC), in Pardeeville, Wisconsin. WPL submitted a construction permit application for the construction and operation of Refined Coal (RC) production equipment at CEC.

On July 2, 2015, the Department issued construction permit 15-DCF-051 allowing WPL to construct and initially operate a RC preparation facility at CEC. This approval was for using a refined coal preparation process in partnership with Clean Coal Solutions. WPL has yet to construct any of the allowed emission units approved for construction and initial operation under permit no. 15-DCF-051.

Since issuance of permit no.15-DCF-051, WPL has applied for and received research and testing exemption no.16-JGB-10-EXM to evaluate the use of RC additives MerSorb and S-Sorb in partnership with DTE Energy Services (DTE). This approval, received on March 11, 2016, did not allow for the construction or operation of any permanent equipment or functions that would enable long term use of these products. The purpose of this application is to obtain authorization to commence construction on the equipment to be utilized in the process of preparing RC using these additives for the CEC long term. Additionally, WPL is not proposing to conduct any of the RC testing allowed under permit exemption no.16-JGB-10-EXM.

The use of RC in place of unprocessed coal results in lower mercury and nitrogen oxide (NOx) emissions. DTE utilizes the Chem-Mod process to produce RC. The Chem-Mod process involves the application and mixing of two reagents to the coal prior to combustion- a dry bulk solid called S-Sorb for the control of NOx, and a liquid aqueous solution called MerSorb for the control of mercury emissions.

This project is considered as a continuation of the project permitted under 14-POY-174 which authorized the construction of a spray dryer absorber and baghouse for the control of acid gas emissions, and also activated carbon injection for the control of mercury emissions. As such, for the PSD applicability determination, the emissions from this project will be aggregated with the emissions from the project covered under 141-POY-174.

Based on WPL's analysis, the proposed project is not subject to federal PSD requirements. Since the particulate matter emissions from the project will be subject to the new source performance standard (NSPS) in Part 60 Subpart Y, a construction permit will be required.

SOURCE DESCRIPTION

The site includes 2726 acres south of Portage, Wisconsin between Highway 51 and the Wisconsin River.

Key production equipment includes S-Sorb storage silos, an S-Sorb day bin, a MerSorb storage tank, a mixer (in line with a conveyor belt for blending the reagents with coal), new conveyors and various chute work. This equipment will be located within the existing CEC crusher house (P06, S06)

Details on the additives and emissions control process are as follows:

MerSorb is an aqueous solution of approximately 51% by weight calcium bromide (CaBr2), with small amounts of iron oxide (Fe_2O_3), magnesium oxide (MgO), and sodium oxide (Na_2O). MerSorb will be added at a maximum rate

of 0.0035% by weight of coal (0.0035 pounds per 100 pounds of coal). At the maximum coal flowrate of 2,000 tons per hour through the coal reclaim system, the maximum MerSorb addition rate will be 140 pounds per hour.

S-Sorb is a solid additive derived from cement kiln by-products consisting primarily of calcium carbonate (CaC03) and calcium oxide (CaO), with smaller concentrations of calcium sulfate ($CaSO_4$), aluminum oxide (Al_2O_3), iron oxide (Fe_2O_3), magnesium oxide (MgO), and crystalline silica (SiO_2). S-Sorb is an alkaline additive formulated primarily from cement kiln dust. S-Sorb will be added at a maximum rate of 0.50% be weight of coal (0.005 pounds per 100 pounds coal). At the maximum coal flowrate of 2,000 tons per hour through the coal reclaim system, the maximum S-Sorb addition rate will be 10 tons per hour (20,000 pounds per hour).

According to the U.S. EPA report "Control of Mercury Emissions from Coal-Fired Electric Utility Boilers", February, 2004, and "Control of Mercury Emissions from Coal Fired Electric Utility Boilers: An Update", February, 2005, emission tests indicated that "native" mercury control efficiencies for coal fired units equipped with only PM and SO_2 controls ranged from 0% to more than 99%, depending on the type of coal fired and the air quality control systems used. One of the major factors influencing the native capture and control of mercury in existing air quality control systems is the chlorine content of the coal. Chlorine assists in the oxidation of elemental mercury (HgO) to oxidized mercury (Hg2+). Mercury capture in PM and SO_2 control systems is more effective if the mercury is oxidized. Unfortunately in this context, subbituminous coals such as those burned at CEC have low chlorine levels, and, thus, lower levels of native mercury capture and control.

Chlorine and bromine are one of a class of elements with high electronegativity (i.e. tends to attract electrons in chemical reactions) called halides. Thus, the high bromine content of the MerSorb assists in controlling mercury emissions in a similar manner to chlorine in higher chlorine content coals. The bromine in the MerSorb also reacts with the alkaline ash of subbituminous coals to form salts. These salts are then collected in the ESP and baghouse, effectively eliminating almost all of these potential emissions. While the Columbia Energy Center currently applies Calcium Bromide to its inlet coal supply, the use of MerSorb would provide a more cost effective manner in which to apply the chemical, potentially taking the place of the current application method.

The primary sorbent substance in S-Sorb is CaO which may react with SO_2 in the furnace and in the flue gas to form calcium sulfate. S-Sorb may also react with other acid gases such as hydrogen chloride (HCl), hydrogen fluoride (HF), sulfur trioxide (SO_3), and nitrogen dioxide (NO_2) to form solid salts which can be collected in the existing PM control systems. Note that HCl and HF are hazardous air pollutants (HAPs). The calcium in the S-Sorb additive may also catalyze the destruction of ammonia (NH_3) and hydrogen cyanide (HCN) in the furnace. Under certain combustion conditions, these substances may be precursors to NOx formation.

The project will include the following emission units and equipment:

P34A, P34B S-Sorb storage silos: 0.05 lb/hour for particulate matter (PM)

P35 S-Sorb day bin: bin vent filter

F36 new conveyor and transfer point: enclosed material transfer

F37 coal mixer: total enclosure and wetting of material

F38 new conveyor and refined coal transfer: enclosed material transfer

F39 modified existing coal transfer point: enclosed material transfer

P35, F36, F37, F38 and F39 will all be constructed within the existing crusher house (P06). All PM emissions from the crusher house are collected and vented through an existing baghouse.

During the construction phase of the permanent refined coal production equipment in the crusher house, a temporary equipment system will be constructed outside the crusher house. The temporary outdoor system will be removed on or before April 1, 2017 and the system will consist of:

P35T – A temporary day bin for storing S-Sorb; equipped with bin vent filter with PM outlet loading guaranteed to be less than 0.005 gr/dscf.

P40 – Cogar Feeder unit, a feeder to the conveyor: Wetting or application of dust suppressants at all times

P41 – Transfer from Cogar feeder to temporary conveyor: Wetting or application of dust suppressants at all times

P42 – Mixer: total enclosure. The mixer will be located on the temporary conveyor and there will not be a transfer point associated with the mixer. Emissions will be calculated assuming dust suppression only.

P43 – Temporary conveyor to telescoping conveyors (2 telescoping conveyors): Wetting or application of dust suppressants at all times

P44 – Transfer of refined coal from telescoping conveyors to existing conveyors in the crusher house. These conveyors transfer coal from the bottom of the crusher house to the pulverizers and power boilers: Wetting or application of dust suppressants at all times. The crusher house emission collection system will not be operating while the temporary refined coal manufacturing and conveying system is operating. The lower level of the crusher house where this transfer will take place will be sealed except for an opening for the telescoping conveyors. Emissions from this transfer operation will vent through the conveyor opening to the ambient air.

P45 – S-Sorb loading from truck to storage bin: Emissions from this unit will be piped to the bin vent filter on the day bin.

P46 – S-Sorb transfer from storage bin to day bin: bin vent filter meeting 0.005 gr/dscf, or better.

P47 – S-Sorb transfer to mixer via screw conveyor: transferred within a total enclosure around the mixer.

P48 – 3000 gallon (maximum) distillate fuel storage tank. This tank would exclusively feed a proposed portable 1 MW generator for powering the temporary system. The generator itself is portable and will remain onsite for less than one year. Thus, it qualifies as a non-road engine not subject to stationary source permitting requirements.

The permanent, as well as the temporary, coal processing equipment are subject to the New Source Performance Standard (NSPS) Part 60 Subpart Y. The permanent coal processing equipment, including the mixer, conveyor and the day bin will be placed inside the crush house (P06, S06), therefore, the crush house PM emissions from S06 will be subject the NSPS PM emission limit of 0.010 gr/dscf.

Description of New or Modified Units:

Emission Unit Information

Boiler/furnace number [or process line, etc.]:	P06

Emission Unit Information

Unit description:	Crush House
Control technology status:	Yes, Baghouse
Maximum continuous rating (MMBtu/hr):	-
Date of construction or last modification:	2016
Construction Permit Requirements:	16-POY-059

Stack Information.

Stack identification number:	S06
Exhausting unit(s):	P06
This stack has an actual exhaust point:	Y
Discharge height above ground level (ft):	38
Inside dimensions at outlet (ft):	7.2
Exhaust flow rate (normal) (ACFM):	34000
Exhaust flow rate (maximum) (ACFM):	34000
Exhaust gas temperature (normal) (°F):	60
Exhaust gas temperature (maximum) (°F):	60
Exhaust gas discharge direction:	UP
Stack equipped with any obstruction:	NO

Control Device Information

Control Device identification number:	C06
Exhausting emissions unit(s):	P06
Control device type [baghouse, ESP, etc.]:	Baghouse
Control device description:	Baghouse
Manufacturer and model number:	Buffalo Forge, P1-240
Date of construction:	2/24/1971

Emission Unit Information.

Boiler/furnace number [or process line, etc.]:	P34A
Unit description:	S-Sorb storage silo
Control technology status:	Yes
Maximum continuous rating (mmBTU/hr):	-
Date of construction or last modification:	2016
Construction Permit Requirements:	16-POY-059

Stack Information.

Stack identification number:	S34A
Exhausting unit(s):	P34A
This stack has an actual exhaust point:	Yes

Stack Information.

Discharge height above ground level (ft):	60
Inside diameter at outlet (ft):	0.75
Exhaust flow rate (normal) (ACFM):	1000
Exhaust flow rate (maximum) (ACFM):	1000
Exhaust gas temperature (normal) (°F):	Ambient
Exhaust gas temperature (maximum) (°F):	Ambient
Exhaust gas discharge direction:	Up
Stack equipped with any obstruction:	No

Control Device Information.

Control Device identification number:	C34A
Exhausting emissions unit(s):	P34A
Control device type [baghouse, ESP, etc.]:	Bin vent filter
Control device description:	Bin vent filter
Manufacturer and model number:	-
Date of construction:	2016

Emission Unit Information.

Boiler/furnace number [or process line, etc.]:	P34B
Unit description:	S-Sorb storage silo
Control technology status:	Yes
Maximum continuous rating (mmBTU/hr):	-
Date of construction or last modification:	2016
Construction Permit Requirements:	16-POY-059

Stack Information.

Stack identification number:	S34B
Exhausting unit(s):	P34B
This stack has an actual exhaust point:	Yes
Discharge height above ground level (ft):	60
Inside diameter at outlet (ft):	0.75
Exhaust flow rate (normal) (ACFM):	1000
Exhaust flow rate (maximum) (ACFM):	1000
Exhaust gas temperature (normal) (°F):	Ambient
Exhaust gas temperature (maximum) (°F):	Ambient
Exhaust gas discharge direction:	Up
Stack equipped with any obstruction:	No

Control Device Information.

Control Device Information.

Control Device identification number:	C34B
Exhausting emissions unit(s):	P34B
Control device type [baghouse, ESP, etc.]:	Bin vent filter
Control device description:	Bin vent filter
Manufacturer and model number:	-
Date of construction:	2016

CROSS MEDIA IMPACTS

No significant cross media impact is expected due to this project.

EMISSION CALCULATIONS.

2 Storage Silos (P34A, P34B)

Each S-Sorb storage silo will be equipped with a bin vent filter having a guarantee that the PM emissions at the outlet will not exceed 0.005 gr/dscf. The exhaust gas flow rate will be 1000 dry standard cubic feet per minute and moisture content is expected to be low. The PM emission rate will be:

0.005 gr/dscf * 1000 dscf/min * 60 min/hr / 7000 gr/lb = 0.043 lb/hr

The applicant requested a PM/PM_{10} emission limit of 0.05 lb/hr

0.05 lb/hr * * 8760 hrs/yr / 2000 #/ton = 0.22 tons/yr

In normal operation, the emission units P35, F36, F37, F38 and F39 will all be constructed within the existing crusher house (P06). All PM emissions from the crusher house are collected and vented through an existing baghouse. According to the applicant, no new direct pick up points with the crusher house will be used to capture the particulate emissions from these units to send to the baghouse. The particulate matter emissions will be indoor fugitive emissions escaping through the baghouse or through general ventilation. The capture efficiency is unknown.

To calculate the potential to emit from the new emission units to be constructed inside the crusher house, the indoor emissions will be assumed to be all captured and sent to the baghouse. In reality, this is not the case, as much of the emissions will settle within the building.

Emissions from transfer of material (based on AP-42 - Section 13.2.4 Aggregate Handling & Storage Piles; Batch/Continuous Drop Equation (1))

$$E = k * (0.0032) * \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} (\text{lb / ton})$$

Where:
k = 0.35 (particle size multiplier (dimensionless), PM-10)
k = 0.74 (particle size multiplier (dimensionless), PM)
U = 9.9 mph, Average Annual Wind Speed - AP-42, Table 7.1-9, Madison
M = 10%, material moisture content (%) for coal before wetting suppressant application
M = 0.5% for S-Sorb

For coal, E = 0.0006 lb/ton for PM, and 0.00029 lb/ton for PM_{10} emissions.

For S-Sorb, E = 0.04 lb/ton for PM, and 0.019 lb/ton for PM_{10} emissions.

The new emission units to be constructed in the crusher house will have these indoor emissions:

Coal Handling Material Transfers	Point ID	Material	Maximum Hourly Tons Transferred (tons/hr)	Number of Transfers	TSP Emission Factor (lbs/ton)	PM-10 Emission Factor (lbs/ton)	Uncontrolled TSP Emissions (lbs/hour)	Uncontrolled PM-10 Emissions (lbs/hour)
Coal Conveyor	F36	Coal	2,000	1	0.00060	0.00029	1.20	0.58
Refined Coal Conveyor	F38	Coal	2,008	1	0.00060	0.00029	1.21	0.582
Modified Coal Conveyor (treated as new)	F39	Coal	2,008	1	0.00060	0.00029	1.21	0.582
Total Emissions (lbs/hr)							3.62	1.744

An S-Sorb day bin P35 will also be constructed in the crusher house. The day bin will be equipped with a bin vent filter. According to the applicant, the day bin flow rate will be 3000 cfm (basically have insignificant moisture), and the bin vent filter PM outlet loading will be 0.005 gr/dscf. The PM emissions will be sent to the crusher house baghouse through general ventilation.

The day bin P35 will contribute

3000 dscf/min * 60 min/hr * 0.005 gr/dscf / 7000 gr/lb = 0.13 lb/hr of PM to the crusher house baghouse.

The F37 mixer for coal, S-Sorb and MerSorb will be totally enclosed, and it reduces the size of the coal, and is considered a crusher. The emission factor of 0.02 lb/ton is obtained from AP-42, Table 11.24-2, for high moisture ore primary crushing. The applicant stated that the temporary mixer will process coal as delivered to the facility which is in the form of medium size lumps instead of the size of crushed coal pieces. The applicant proposed to use 99% control efficiency for this total enclosure.

The F37 mixer will contribute

2008 tons/hr * 0.02 lb/ton * (1-0.99) = 0.40 lb/hr of PM to the crusher house baghouse.

Thus the new units will contribute 3.62 + 0.13 + 0.40 = 4.15 lb/hr of PM to the crusher house baghouse. With 99% PM control efficiency for a baghouse, the potential to emit from the new equipment in the crusher house will be

4.15 lb/hr * (1-0.99) = 0.0415 lb/hr

0.0415 lb/hr * 8760 hrs/yr / 2000 lb/ton = 0.18 tons/yr

For PM_{10} the new units will contribute 1.74 + 0.13 + 0.40 = 2.27 lb/hr of PM_{10} to the crusher house baghouse. With 99% PM_{10} control efficiency for a baghouse, the potential to emit from the new equipment in the crusher house will be

2.27 lb/hr * (1-0.99) = 0.023 lb/hr

0.023 lb/hr * 8760 hrs/yr / 2000 lb/ton = 0.1 tons/yr

The delivery of S-Sorb and MerSorb will result in fugitive dust emissions due to truck traffic on paved roads at the site. The fugitive dust emissions rates are determined as follows.

Equation Reference: AP-42 - Section 13.2.1 Fugitive Emissions from Paved Roads

$$E = k*(\mathrm{sL})^{0.91}*(W)^{1.02}*(1-\mathrm{P}/4\mathrm{N})$$

Where:

k = 0.0022 (particle size multiplier for PM10)
k = 0.011 (particle size multiplier for PM)
sL = 1.26 (road surface silt loading (grams per square meter) (g/m2). The applicant has proposed to use the silt loading of 1.26, based on a field test of an Ohio coal fired power plant
W = 27.5 tons
P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period: P = 120 wet days for the region of Wisconsin that the proposed source will operate
N = number of days in the averaging period, 365 for annual

E = 0.37 lb/VMT for PM

E = 0.07 lb/VMT for PM_{10}

The applicant provided that the total VMT per year resulting for the delivery of the S-Sorb and MerSorb will be 1008.

PM emissions: 0.37 lb/VMT * 1008 VMT/yr / 2000 lb/ton = 0.19 ton/yr

PM_{10} emissions: 0.07 lb/VMT * 1008 VMT/yr / 2000 lb/ton = 0.04 ton/yr

Once construction is complete, the refined coal system will result in following emissions

	PM (tons/yr)	PM_{10} (tons/yr)
P34A	0.22	0.22
P34B	0.22	0.22
New equipment in crusher house	0.18	0.1

Paved road truck traffic	0.19	0.04
Total	0.81	0.58

During the construction phase of the permanent refined coal production equipment in the crusher house, a temporary equipment system will be constructed and operated to produce refined coal outside the crusher house. The temporary outdoor system will be removed on or before April 1, 2017.

The particulate matter emission factors for the conveyor and mixer are as established above.

Wet suppression will be used to control the fugitive dust emissions. The control efficiency is considered to be 95%. According to the emission factors for crushed stone and pulverized material processing in Table 11.19.2-2, wet suppression provides 95% control efficiency for fugitive dust emissions for conveyors.

The temporary S-Sorb handling processes are vented through the bin vent filter which will provide 99% of collection efficiency for particulate matter and PM_{10} emissions.

The mixer is considered a crusher. The emission factor is obtained from AP-42, Table 11.24-2, for high moisture ore primary crushing. The applicant stated that the temporary mixer will process coal as delivered to the facility which is in the form of medium size lumps instead of the size of crushed coal pieces. The enclosed mixer will be place on top of a conveyor for receiving the mixed coal, and the conveyor itself and the transfer point to the next conveyor will be totally enclosed. The applicant proposed to use 99% control efficiency for this enclosure.

The emissions from outdoor material handling will be as follows:

Coal Handling Material Transfers	Point ID	Material	Maximum Hourly Tons Transferred (tons/hr)	Number of Transfers	PM Emission Factor (lbs/ton)	PM-10 Emission Factor (lbs/ton)	Uncontrolled PM Emissions (lbs/hour)	Uncontrolled PM-10 Emissions (lbs/hour)	Control Efficiency	Controlled PM Emissions (lbs/hour)	Controlled PM10 Emissions (lbs/hour)
Loader to Cogar[1]	P40	Coal	2,000	1	0.00060	0.00029	1.20	0.58	95	0.06	0.03
Cogar to Temporary Conveyor #1[1]	P41	Coal	2,000	1	0.00060	0.00029	1.20	0.58	95	0.06	0.03
Mixer (totally enclosed)	P42	Coal, S-Sorb and MerSorb	2,008	N/A	0.02	0.02	40.16	40.16	99	0.40	0.40
Temporary conveyor to telescoping conveyors[1]	P43	Coal	2,008	1	0.00060	0.00029	1.21	0.582	95	0.06	0.03
telescoping conveyors to existing transfer conveyors in crusher house[1]	P44	Coal	2,008	1	0.00060	0.00029	1.21	0.582	95	0.06	0.03
S-Sorb Loading to storage bin[2]	P45	S-Sorb	8.00	1	0.04000	0.01900	0.32000	0.15200	99	0.0032	0.0015
storage bin to S-Sorb Day Bin[2]	P46	S-Sorb	8.00	1	0.04000	0.01900	0.32000	0.15200	99	0.0032	0.0015
S-Sorb Day Bin to Mixer[2]	P47	S-Sorb	8.00	1	0.04000	0.0400	0.32000	0.15200	99	0.0032	0.0015
Total Emissions (lbs/hr)							36.9696	34.47664		0.6496	0.5245
Total Emissions (tons/yr)[3]										1.66	1.34

[1] Controlled by wet suppression

[2] Controlled by venting through the bin vent filter

[3] If operated from September 1, 2016 through April 1, 2017

A temporary S-Sorb day bin P35T will also be constructed outside the crusher house. The day bin will be equipped with a bin vent filter. According to the applicant, the day bin flow rate will be 3000 cfm (basically have insignificant moisture), and the bin vent filter PM outlet loading will be 0.005 gr/dscf. The PM emissions from the temporary day bin P35T will be:

3000 dscf/min * 60 min/hr * 0.005 gr/dscf / 7000 gr/lb = 0.13 lb/hr of PM to the crusher house baghouse.

If operated from September 1 to April 1 (7 months), the PM emissions from P35T will be:

0.13 lb/hr * 8760 hrs/yr * 7/12 / 2000 lb/ton = 0.33 tons/yr

The temporary outdoor units will only be allowed to operate before the units in the crusher house are constructed and operational.

In the first year of operation, the outdoor temporary units can be operated from September 1 to April 1 (7 months), and the remaining 5 months with the refined coal operated in the crusher house.

5 months of new equipment operation in the crusher house will result in 0.18 tons/yr * 5/12 = 0.08 tons/yr of PM emissions.

5 months of new equipment operation in the crusher house will result in 0.1 tons/yr * 5/12 = 0.04 tons/yr of PM_{10} emissions.

Therefore in the first year, the worst case emissions are as follows:

	PM (tons/yr)	PM_{10} (tons/yr)
P34A	0.22	0.22
P34B	0.22	0.22
P35T	0.33	0.33
Temporary outdoor refined coal production units (7 months)	1.66	1.34
New equipment in crusher house (5 months)	0.08	0.04
Paved road truck traffic	0.19	0.04
Total	2.7	2.19

The facility is an existing PSD major source. The project net emissions increases are determined as follows.

The project will not result in more coal or any other fuel being burned. As such, the net emissions increases for nitrogen oxides, sulfur dioxide, carbon monoxide and volatile organic compound are not applicable.

This project is considered as a continuation of the project permitted under 14-POY-174 which authorized the construction of a spray dryer absorber and baghouse for the control of acid gas emissions, and also activated carbon

injection for the control of mercury emissions. As such, for the PSD applicability determination, the emissions from this project will be aggregated with the emissions from the project covered under 141-POY-174.

The net increases of PM and PM_{10} emissions due to the project in 14-POY-174 were determined to be:

	PEI				Project
Pollutant	Unit 1 (tpy)	Unit 2 (tpy)	Mat. Hndl. (tpy)	AQC (tpy)	Net Inc. (tons)
PM	0	0	2.79	1.61	4.4
PM_{10}	0	0	0.50	1.26	1.76

The net emissions increase of PM and PM_{10} for the proposed refined coal project will be as follows:

	PEI					Project	PSD	PSD Review
Pollutant	Unit 1 (tpy)	Unit 2 (tpy)	Mat. Hndl. (tpy)	AQC (tpy)	Refined Coal (tpy)	Net Inc. (tons)	SER (tons)	Required (Yes/No)
PM	0	0	2.79	1.61	2.7	7.1	25	No
PM_{10}	0	0	0.50	1.26	2.19	2.82	15	No

Particulate Matter ($PM_{2.5}$) Emissions:

The net emissions increases of PM and PM_{10} are both below 10 tons per year, the significant emission threshold for $PM_{2.5}$, as defined in s. NR 405.02(27), Wis. Adm. Code.

APPLICABLE REQUIREMENTS

Particulate Matter Emissions (PM):

Particulate matter emissions from the refined coal production units to be constructed inside the crusher house are subject to the New Source Performance Standard in Part 60 Subpart Y. The crusher house, controlled by a baghouse, is also subject to the emission limits in s. NR 415.05(1) and (2), Wis. Adm. Code.

During construction inside the crush house, a temporary refined coal production system will be constructed and operated. These coal processing units will be subject to the New Source Performance Standard in Part 60 Subpart Y. The S-Sorb handling units will be subject to s. NR 415.04, Wis. Adm. Code for the control of fugitive dust emissions.

The haul roads will be subject to s. NR 415.04, Wis. Adm. Code for the control of fugitive dust emissions.

Fine Particulate Matter (PM_{10}):

Emissions of particulate matter (PM_{10}) are required to meet air quality standards in s. NR 404.04(8), Wis. Adm.

Code and increment s. NR 404.05(3)(a), Wis. Adm. Code.

At the maximum theoretical emission rates the permittee is able to meet these emission limitations and attain ambient air quality standards and increment. For additional information please see the section on **AIR QUALITY REVIEW.**

The net emissions increases of PM and PM_{10} both below 10 tons per year, the significant emission threshold for $PM_{2.5}$, as defined in s. NR 405.02(27), Wis. Adm. Code.

HAZARDOUS AIR POLLUTANT REVIEW

A. State HAPs (NR 445):

In the USEPA document, AP-42, Compilation of Air Pollutant Emission Factors, no emission factor of hazardous air pollutants (HAPs) for coal processing. While that does not mean there is absolutely no HAP emission, any HAP emissions, if any, would be insignificant and would not be addressed for coal processing plants.

The calcium oxide injected will be reacted with the acid gases and carbon dioxide to form calcium chloride, calcium fluoride, calcium sulfate and calcium carbonate. The S-Sorb silos may result in small amounts of calcium oxide emissions, but based on the allowable particulate matter emission rate, the calcium oxide potential to emit from the silos will be well below the table value of calcium oxide.

The MerSorb contains calcium bromide ($CaBr_2$). Based on the permit application materials, the maximum amount of bromine added (as part of MerSorb) will be 58.2 pounds per hour. As a result of combustion, the following reaction occurs:

$$2\ CaBr_2 + O_2 \rightarrow 2\ CaO + 2\ Br_2$$

The bromine would further react to form hydrogen bromide (HBr). Tests by another utility showed that the bromine present would result mostly as hydrogen bromide emissions. The atomic weight of bromine is 79.9, and that for hydrogen bromide is 80.9. Therefore 58.2 pounds per hour of bromine would all become hydrogen bromide, and the hydrogen bromide generated would be:

$58.2 * (80.9/79.9) = 58.9$ lbs/hr

The spray dryer absorber currently being operated will reduce the HBr generated significantly. The control efficiency for controlling HCl for such a absorber is 95%. The control of HBr is in the range of 90%. In addition, the S-Sorb contains additional calcium oxide, and magnesium oxide and aluminum oxide. These chemicals will also react with the HBr. The expected combined HBr emissions exiting the 2 boiler stacks will be 5.89 lbs/hr.

The NR 445 table value for HBr with stack taller than 75 feet is 12.2 pounds per hour. The table value is not expected to be exceeded.

B. Federal HAPs (MACT, GACT, NESHAP):

The coal processing plants are not subject to a NESHAP.

COMPLIANCE AND TECHNOLOGY REVIEW

The new coal preparation and processing equipment will be subject to the New Source Performance Standard (NSPS) in Part 60 Subpart Y (s. NR 440.42, Wis. Adm. Code). The permanent equipment, including the coal and S-sorb mixer, conveyors will be placed inside the crusher house which is controlled by a baghouse. The NSPS PM emission limit of 0.010 gr/dscf is expected to be met. Compliance testing per NSPS requirements will be included in the draft permit.

During the construction phase of the permanent refined coal production equipment in the crusher house, a temporary equipment system will be constructed outside the crusher house. The temporary outdoor system will be removed on or before April 1, 2017.

AIR QUALITY REVIEW

Dispersion modeling of direct $PM_{2.5}$ emissions is ineffective as a means for showing whether a source will cause or exacerbate violation of the $PM_{2.5}$ air quality standard or increment. Direct, industrial stationary source emissions of $PM_{2.5}$ do not correlate with ambient concentrations of $PM_{2.5}$ in the atmosphere. The details of this evaluation are available in the attached Technical Support Document (TSD) titled "Air Quality Review of $PM_{2.5}$ Emissions from Stationary Sources in Wisconsin", dated February 2016, attached.

For the reasons described in the attached Technical Support Document (TSD), the Department's approach to determine whether a direct $PM_{2.5}$ source causes or exacerbates violation of the $PM_{2.5}$ air standard or increment, and thus can be issued an air permit, will be consistent with the determination used for other regional pollutants such as ozone. The Department has determined that direct $PM_{2.5}$ emissions from existing sources, minor new sources, and minor modifications of sources do not cause or exacerbate violation of the $PM_{2.5}$ air quality standard or increment. This conclusion and the information contained in the supporting TSD document serves as the Department's finding pursuant to s. 285.63(1)(b), Wis. Stats for the $PM_{2.5}$ air quality standard.

Ms. Emily Houtler has performed the Air Quality Review. The following is her findings and conclusions.

A. INTRODUCTION

An air dispersion modeling analysis was completed on July 8, 2016 to assess the impact of the particulate matter emissions from WPL Columbia Energy Center in Pardeeville (Columbia County).

B. MODELING ANALYSIS

- Columbia Energy Center supplied the emission parameters used in this analysis. Building dimensions were determined using measurements taken on plot plans provided by the applicant. Please refer to the source table.
- Five years (2006-2010) of preprocessed meteorological data was used in this analysis. The surface data was collected in Madison (MSN), and the upper air meteorological data originated in Green Bay.
- The AERMIC Model (AERMOD) model was also used in the analysis. The model used rural dispersion coefficients with the regulatory default options. These allow for calm wind and missing data correction, buoyancy induced dispersion, and building downwash including recirculation cavity effects. Terrain effects were also accounted for, with elevation data derived from digitized USGS data sets.
- Regional background concentrations were found to be as follows:

BACKGROUND CONCENTRATIONS
(Concentrations are in $\mu g/m^3$)

Pollutant	Averaging Period	Concentration
PM_{10}	24 hr	29.4

- Receptors used in this analysis followed USEPA and WDNR ambient air policy and consisted of 1,933 points in a rectangular grid with 25-meter resolution extending 500 meters from the sources. Receptors on top of company-owned buildings, within the facility fence line, or otherwise not considered ambient air in relation to the facility were excluded. Elevations were derived from the AERMOD terrain processor AERMAP, using the National Elevation Dataset.

- The Columbia County PSD baseline for PM_{10} was set in 1994. Any increase of allowable emissions since that date consume increment. The several sources at the Columbia Energy Center facility consume increment and a review of the emissions inventory found one other source in the immediate area. See the final table for more information.

C. MODEL RESULTS

The results of the dispersion modeling analysis indicate that applicable air quality standards will be met assuming the emission rates and stack parameters listed in the source tables.

Modeling Analysis Results (All Concentrations in $\mu g/m^3$)		
	PM_{10} – 24 hour	PM_{10} – Annual
New Source Impact	11.3	1.2
PSD Increment	30.0	17.0
% Increment Consumed	37.7	7.1
Facility Impact	86.4	n/a
Background Concentration	29.4	n/a
Total Concentration	115.8	n/a
NAAQS	150.0	n/a
% NAAQS	77.2	n/a

D. CONCLUSION

The results of the modeling analysis demonstrate that the applicable air quality standards will be satisfied assuming the emissions rates and stack parameters listed in the source table.

WPL – COLUMBIA ENERGY CENTER - PARDEEVILLE Emission Rates & Stack Parameters*							
ID	LOCATION (UTM83)	HEIGHT (M)	HEIGHT (FT)	DIAMETER (M)	VELOCITY (M/S)	TEMPERATURE (K)	PM_{10} (#/HR)
S01	304209, 4817364	10.06	33.00	0.305	0.101	316.5	1.270
S02	304202, 4817384	10.06	33.00	0.244	0.101	316.5	1.270
S03_A	304693, 4816853	11.89	39.00	1.737	15.93	285.9	0.365
S03_B	304698, 4816853	11.89	39.00	1.737	15.93	285.9	0.365
S05	304564, 4817125	11.28	37.00	1.372	0.101	288.7	0.048
S06	304427, 4817173	11.58	38.00	2.195	0.101	288.7	2.910
S07	304371, 4817359	53.34	175.0	0.853	0.101	288.7	0.240
S08	304371, 4817419	53.34	175.0	0.972	0.101	288.7	0.024
S09	304371, 4817455	53.34	175.0	1.003	0.101	288.7	0.030
S10	304340, 4817350	78.03	256.0	1.676	5.986	435.9	2.610
S11	304248, 4817601	152.4	500.0	6.401	33.03	352.0	2.100
S12	304248, 4817676	198.1	650.0	6.401	33.03	352.0	2.100
S20	304372, 4817411	53.34	175.0	0.942	0.101	288.7	0.490

* The source parameters in the table were used for modeling purposes, based on conversion from English units. Refer to the permit application forms or submittals in support of the permit application for the original English unit parameters.

S23	304334, 4817346	12.19	40.00	0.098	0.101	830.4	0.422
S24	304286, 4817337	30.48	100.0	0.610	27.91	795.9	1.880
S25	304075, 4817635	43.59	143.0	0.305	9.702	-1.000	0.064
S26	304064, 4817635	43.59	143.0	0.305	9.702	-1.000	0.064
S34A	304425, 4817398	18.29	60.00	0.229	0.001	295.4	**0.050**
S34B	304434, 4817399	18.29	60.00	0.229	0.001	295.4	**0.050**
S37	304260, 4817689	25.02	82.00	0.914	1.079	-1.000	0.130
S35T	304456, 4817315	3.048	10.00	0.229	0.001	295.4	0.130
1CELL1	304188, 4817435	17.00	56.00	9.144	9.775	319.6	0.662
1CELL2	304179, 4817441	17.00	56.00	9.144	9.775	319.6	0.662
1CELL3	304137, 4817466	17.00	56.00	9.144	9.775	319.6	0.662
1CELL4	304154, 4817455	17.00	56.00	9.144	9.775	319.6	0.662
1CELL5	304169, 4817446	17.00	56.00	9.144	9.775	319.6	0.662
1CELL6	304162, 4817451	17.00	56.00	9.144	9.775	319.6	0.662
1CELL7	304147, 4817462	17.00	56.00	9.144	9.775	319.6	0.662
2CELL1	304051, 4817530	17.00	56.00	9.144	9.775	319.6	0.662
2CELL2	304043, 4817535	17.00	56.00	9.144	9.775	319.6	0.662
2CELL3	303997, 4817566	17.00	56.00	9.144	9.775	319.6	0.662
2CELL4	304019, 4817550	17.00	56.00	9.144	9.775	319.6	0.662
2CELL5	304036, 4817540	17.00	56.00	9.144	9.775	319.6	0.662
2CELL6	304028, 4817545	17.00	56.00	9.144	9.775	319.6	0.662
2CELL7	304008, 4817557	17.00	56.00	9.144	9.775	319.6	0.662
S11_O	304248, 4817601	152.4	500.0	6.401	32.27	407.0	-343.8
S12_O	304248, 4817676	198.1	650.0	6.401	32.56	411.5	-106.1
Unimin Increment Sources							
IN_S23N	305579, 4818457	14.94	49.00	1.520	21.57	318.0	8.841
IN_S31N	305541, 4818466	14.08	46.00	0.840	19.48	294.0	0.889
IN_S33N	305534, 4818468	14.08	46.00	0.840	11.82	294.0	1.294
IN_S36N	305454, 4818469	12.19	40.00	0.610	3.570	294.0	0.008
IN_S34N	305545, 4818465	14.08	46.00	0.840	20.37	294.0	0.255
IN_S37N	305456, 4818464	10.36	34.00	0.530	0.001	294.0	0.002
IN_S44N	305600, 4818186	2.740	9.000	0.100	0.100	683.0	0.221

Notes:

- Sources in bold consume increment
- Sources S11_O, S12_O, and all Unimin sources were only used in the increment analysis.
- Source S35T is a temporary unit that will be operated by the facility for less than one year.

EMISSIONS FROM NEW (OR MODIFIED) EQUIPMENT.

Once construction is complete, the refined coal system will result in following emissions

	PM (tons/yr)	PM_{10} (tons/yr)
P34A	0.22	0.22

P34B	0.22	0.22
New equipment in crusher house	0.18	0.1
Paved road truck traffic	0.19	0.04
Total	0.81	0.58

In the first year during the construction of the refined coal production equipment in the crusher house, the worst case emissions are as follows:

	PM (tons/yr)	PM_{10} (tons/yr)
P34A	0.22	0.22
P34B	0.22	0.22
P35T	0.33	0.33
Temporary outdoor refined coal production units (7 months)	1.66	1.34
New equipment in crusher house (5 months)	0.08	0.04
Paved road truck traffic	0.19	0.04
Total	2.7	2.19

FACILITY AND PROJECT CLASSIFICATION

1. Project Status.

The facility is an existing PSD major source. The project net emissions increases are determined to be below the PSD significant emission thresholds defined in s. NR 405.02(27), Wis. Adm. Code. The project is synthetic minor for PSD.

2. Facility Status and EPA Classification After the Permit is Issued.

After the permit is issued, the facility will remain a major source of PSD, HAP and Part 70.

Total Facility - Pollutant Specific Source Classification

Pollutant	PSD/NAA Status	Part 70 Status	EPA Classification*
PM	Major	NA	NA
PM_{10}	Major	Major	A
$PM_{2.5}$	Major	NA	NA
SO_2	Major	Major	A

Total Facility - Pollutant Specific Source Classification

Pollutant	PSD/NAA Status	Part 70 Status	EPA Classification*
NO_x	Major	Major	A
CO	Major	Major	A
VOC	Major	Major	A
Lead	Major	Major	A
CAA HAPs		Major	A

*** - EPA Classification for a pollutant is based on the source's annual PTE for that pollutant:**

A - Means the source's maximum theoretical emissions and potential to emit for a pollutant is greater than major source thresholds. The source is a major source (will have a FOP).

SM80 - Means the source's maximum theoretical emissions of a pollutant is greater than major source thresholds and potential to emit is at least 80% but less than 100% of major source thresholds. The source is a non-major source (will have a FESOP).

SM - Means the source's maximum theoretical emissions of a pollutant is greater than major source thresholds but potential to emit for the pollutant is less than 80% of major source thresholds. The source is a non-major source (usually will have a FESOP).

B - Means the source's maximum theoretical emissions and potential to emit for the pollutant is less than major source thresholds. The source is a non-major source (will have a SOP).

STATUS UNDER WISCONSIN ENVIRONMENTAL POLICY ACT (WEPA)

An air pollution control construction permit that does not require review under chs. NR 405 or 408, Wis. Adm. Code, is considered a minor action under s. NR 150.20(1m)(o), Wis. Adm. Code and as such, is compliant with WEPA and does not require a determination prior to permit issuance.

Notification of the determination required under s. NR 150.35, Wis. Adm. Code, is included in the public notice.

RULE APPLICABILITY

Particulate matter emissions from the refined coal production units to be constructed inside the crusher house are subject to the New Source Performance Standard in Part 60 Subpart Y. The crusher house, controlled by a baghouse, is also subject to the emission limits in s. NR 415.05(1) and (2), Wis. Adm. Code.

During construction inside the crush house, a temporary refined coal production system will be constructed and operated. The coal processing units will be subject to the New Source Performance Standard in Part 60 Subpart Y. The S-Sorb handling units will be subject to s. NR 415.04, Wis. Adm. Code for the control of fugitive dust emissions.

The haul roads will be subject to s. NR 415.04, Wis. Adm. Code for the control of fugitive dust emissions.

NEW SOURCE PERFORMANCE STANDARDS (NSPS) AND NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)APPLICABILITY

		Yes	No	NA	Explanation
NSPS	**For proposed construction of a source:**				
	1. Is the proposed source in a source category for which there is an existing or proposed NSPS?	☒	☐	☐	The new refined coal production processes are subject to Part 60 Subpart Y.
	2. Is the proposed source an affected facility?	☒	☐	☐	[Explain if necessary to clarify]
	For the proposed modification of an existing source:				
	1. Is the existing source, which is being modified, in a source category for which there is an existing or proposed NSPS?	☐	☐	☒	[If yes, identify the NSPS(s) and the affected process(es).]
	2. Is the existing source, which is being modified, an affected facility (prior to modification)?	☐	☐	☒	[Explain if necessary to clarify here and in the following items]
	3. Does the proposed modification constitute a modification ***under NSPS*** to the existing source?	☐	☐	☒	[Clarify if necessary]
	4. Will the existing source be an affected facility after modification?	☐	☐	☒	[If yes, identify the NSPS(s) and the affected process(es).]
NESHAPS	**Part 61 NESHAPS:**				
	1. Is the source subject to a Part 61 NESHAPS?	☐	☒		[If yes, identify NESHAP(s) and the affected process(es).]
	Part 63 NESHAPS:				
	1. Is the source subject to an existing Part 63 NESHAPS?	☐	☒		The refined coal processes are not subject to any NESHAP.
	2. Is the proposed project subject to s. 112(g) of the Clean Air Act?	☐	☒		
	The section 112(g) rules only apply to case-by-case MACT standards that are developed for new construction or reconstruction of sources that (by themselves) constitutes a new major source of federal hazardous air pollutants (for source categories not covered under an existing Part 63 MACT standard).				

CRITERIA FOR CONSTRUCTION PERMIT APPROVAL

Section 285.63, Wis. Stats., sets forth the specific language for permit approval criteria. The Department finds that:

1. The source will meet emission limitations.
2. The source will not cause nor exacerbate a violation of an air quality standard or ambient air increment.
3. The source is operating or seeks to operate under an emission reduction option. Not Applicable.
4. The source will not preclude the construction or operation of another source for which an air pollution control permit application has been received.

PRELIMINARY DETERMINATIONS FOR 16-POY-059

The Wisconsin Department of Natural Resources has reviewed application and other materials submitted by WPL - Columbia Energy Center for 16-POY-059 and hereby makes a preliminary determination that this project, when constructed and operated consistent with the application and subsequent information submitted, will be able to meet the emission limits and conditions included in the attached Draft Permit. Furthermore, the Department hereby makes a preliminary determination that an operation permit may be issued with the following Draft Applicable Limits and Draft Permit Conditions. A final decision regarding emission limits and conditions will be made after the Department has reviewed and evaluated all comments received during the public comment period. The proposed emission limits and other proposed conditions in the Draft Permit are written as they will appear in the Final Permit. These proposed conditions may be changed as a result of public comments or further evaluation by the Department.

COMMONLY USED ACRONYMS AND ABBREVIATIONS:

acfm	Actual cubic feet per minute
AP-42	Compilation of Air Pollutant Emission Factors
BACT	Best Available Control Technology
BTU or btu	British Thermal Unit
°C	Degrees Celsius
CAA	Federal Clean Air Act
CAMS	Compliance Assurance Monitoring System
CEM	Continuous Emission Monitoring
CFR	Code of Federal Regulations
CH_4	Methane
CI	Compression Ignition
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
COMS	Continuous Opacity Monitoring System
Department	Wisconsin Department of Natural Resources
dscf	Dry standard cubic foot
dscm	Dry standard cubic meter
EPA	United States Environmental Protection Agency
ESP	Electrostatic Precipitator
°F	Degrees Fahrenheit
FESOP	Federal Enforceable State Operating Permit
FID	Facility Identification Number
FOP	Federal Operating Permit
ft	Feet
g	Grams
GACT	Generally Available Control Technology
GCP	General Construction Permit
GHG	Greenhouse Gas
GOP	General Operation Permit
gr	Grains
GWP	Global Warming Potential
MTE	Maximum Theoretical Emissions
MW	Megawatts
n/a	Not Applicable
N_2O	Nitrous Oxide
NAA	Non-Attainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NMOC	Non-methane Organic Compounds
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NSCR	Non-Selective Catalytic Reduction
NSPS	New Source Performance Standards
NSR	New Source Review
Pb	Lead
PHAP	Hazardous Air Pollutant Emitted as a Particulate
PM	Particulate Matter
PM_{10}	Particulate Matter less than 10 microns in diameter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
ppm	Parts per million
ppmdv	Parts per million dry volume
ppmv	Parts per million by volume
ppmw	Parts per million by weight
PSD	Prevention of Significant Deterioration
psia	Pounds per square inch absolute
psig	Pounds per square inch gauge
PTE	Potential to Emit
RACT	Reasonable Available Control Technology
RCP	Registration Construction Permit
RICE	Reciprocating Internal Combustion Engine
ROG	Reactive Organic Gases
ROP	Registration Operating Permit
s.	Section

COMMONLY USED ACRONYMS AND ABBREVIATIONS:

HAP	Hazardous Air Pollutant	scf	Standard cubic feet
Hg	Mercury	sec	Seconds
hr	Hour	SCR	Selective Catalytic Reduction
hp	Horsepower	SDS	Safety Data Sheet
H_2S	Hydrogen Sulfide	SI	Spark Ignition
HVLP	High Volume Low Pressure	SNCR	Selective Non-Catalytic Reduction
Kg	Kilogram	SO_2	Sulfur Dioxide
kW	Kilowatt	SOP	State Operating Permit
LACT	Latest Available Control Techniques	Temp	Temperature
LAER	Lowest Achievable Emission Rate	THC	Total Hydrocarbons
lb	Pound	TPY	Tons per year
m	Meter	µg	Microgram
MACT	Maximum Achievable Control Technology	VE	Visible Emissions
MPAP	Malfunction, Prevention, and Abatement Plan	VHAP	Hazardous Pollutant Emitted as a Vapor
mg	Milligram	VOC	Volatile Organic Compounds
mm	Millimeter	Wis. Adm. Code	Wisconsin Administrative Code
MM	Million	Wis. Stats.	Wisconsin Statutes
MMBtu/hr	Million British Thermal Units Per Hour	yr	Year
MSDS	Material Safety Data Sheet	MTE	Maximum Theoretical Emissions

PERMIT FEE CALCULATION

BASIC FEES.	
PSD or NAA minor modification of a Part 70 major source. [$7,500]	$7,500.00
TOTAL BASIC FEES	$7,500.00
ADDITIONAL FEES.	
The permit application is for a PSD or NAA minor source or minor modification to a major PSD or NAA source whose projected air quality impact requires a detailed air quality modeling analysis. [$1,000]	$1,000.00
The application is for a source not reviewed under ch. NR 405 or 408, Wis. Adm. Code, where the applicant requested in writing and received the permit within 50 days of receipt of a complete application [$5,000].	$5,000.00
The application is for a source which requires specific permit conditions limiting the potential to emit to make the source a minor source or to make the modification a minor modification [$3,500].	$3,500.00
The construction permit requires emission testing.	$3,750.00
The permit application required review and analysis of two or more basic emissions units.	$10,400.00
TOTAL ADDITIONAL FEES	$23,650.00
TOTAL FEES (Total Basic Fees + Total Additional Fees)	$31,150.00
CREDITS.	
The initial fee submitted with the application. [$7,500]	-$7,500.00
TOTAL CREDITS	-$7,500.00
TOTAL AMOUNT DUE (Total Fee + Total Credit)	$23,650.00