

CORRESPONDENCE/MEMORANDUM

DATE: November 10, 2011
TO: Thomas J. Roushar
FROM: Paul O. Yeung
SUBJECT: Response to Comments on the Preliminary Determination for WPL - Columbia Energy Center, Permit 11-POY-123

FILE CODE: 4560
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Mr. Jerald Lokenvitz, Plant Manager of WPL - Columbia Energy Center wrote on November 4, 2011 and provided comments. His comments and DNR's responses are as follows:

Comment No. 1: Page 1 of 17, Project Description

Please revise the first sentence as follows: "...is authorized to construct a spray dryer absorber and a baghouse for each of Boiler B21 and Boiler B22, two lime silos, and expand the existing activated carbon injection (ACI) system installed in 2008 on Unit 2 to serve both Units 1 and 2 as described in the plans....."

Response: The sentence will be changed as requested.

Comment No. 2: Page 3 of 17, Condition I.B'.1.b.(4)(d)

Since the Title V permit number as referenced in the current wording of this condition will change, please revise the wording as follows: *This testing shall be conducted in accordance with Condition No. I.ZZZ.1.a(6) of this construction permit.*

Response: The sentence will be changed as requested.

Comment No. 3: Page 4 of 17, Condition I.B'.2.a.(1)

As discussed on page 25 of 28 in the Preliminary Determination document," there will be no physical change to the combustion portion of the two boilers B21 and B22. ... As such, the proposed project will not result in the applicability of the New Source Performance Standard (NSPS) in ss. 440.19 and NR 440.20, Wis. Adm. Code. ... However, since each boiler together with the spray dryer absorber is considered an emissions unit, adding the spray dryer to the boiler represents a physical change, and there will be an increase of particulate matter emissions, therefore each boiler is considered modified under chapter NR 406. As such, the emission limitation in s. NR 415.06(2)(c) for particulate matter and s. NR 431.05 for visible emissions will be applicable."

While WPL does not disagree with the concluding result of the department's analysis discussed above, WPL finds the logic used to arrive at the conclusion confusing. Because the spray dryer and baghouse are proposed to be installed between the existing boiler and the stack, it is the

emissions stream, post boiler, that will realize the modification and not boilers themselves, as the department has stated in the initial paragraphs of the discussion on page 25. Consistent with US EPA nomenclature, the department has referred to each boiler together with their corresponding spray dryer absorber as an emissions unit, which would be modified under this proposed project. However, for the department to conclude that the boiler is modified under ch. NR 406, following the “emissions unit conclusion” seems to contradict this conclusion. To add clarity to application of the NR 415.06(2)(c) and 431.05 limits to B21, WPL suggests that the department make footnote reference to the fact that the emissions unit consisting of the boiler and the spray dryer absorber has been modified as a part of this project warranting the application of NR 415.06(2)(c) and 431.05, but the boiler itself has not been modified. This is a moot point for B22, as it is already subject to these requirements. Furthermore, continuing with this reference, WPL requests that the department also note that this project is not considered a modification under NR 440.19 and 440.20, as concluded in the Preliminary Determination document.

Response: Footnote 2 has been added that reads: The emissions unit consisting of the boiler and the spray dryer absorber has been modified as a part of this project warranting the application of NR 415.06(2)(c) and 431.05. However, the combustion portion of boiler has not been modified, and the fuel burned will not be changed because of this project. There will be no change in emissions due to combustion of fuel. As such, the proposed project will not result in the applicability of the New Source Performance Standard (NSPS) in ss. NR 440.19 and NR 440.20, Wis. Adm. Code.

Comment No. 4: Page 5 of 17, Condition I.B'.2.c(5)

Since the Title V permit number as referenced in the current wording of this condition will change, please revise the wording as follows: *The excess emission reports required by condition I.B.2.c.(3) shall be submitted in accordance with Condition No. I.ZZZ.1.a(7) of this construction permit.*

Response: The sentence will be changed as requested.

Comment No. 5: Page 6 of 17, Condition I.BA.1.b.(4) and Page 7 of 17, Condition I.BB.1.b(4)

In order to be consistent with Condition I.B.1.b(10), please revise the wording as follows: *The permittee shall submit to the Department, within 180 days after the start of initial operation of the silo, the operating range of the pressure drop across the fabric filter control device.*

Response: The requested change will **not** be made. The Department recognizes the fact that the boiler baghouse operation will need extra time to determine the operating range of the pressure drop across the fabric filter device for the boilers because the spray dryer reagent injection rate will need to be fine tuned over an initial operation period. However, the operation of bin vent filters for the silos would not be as complicated. Thus the draft permit contained the 30-day time period for submitting the pressure drop operating range across fabric filter device for the silos.

Comment No. 6: Page 6 of 17, Condition I.BA.1.b and Condition I.BA.1.c

Since the department is requiring WPL to record the pressure drop range every 8 hours, but has not required any instrumentation for measuring and recording the pressure drop, WPL is requesting that the following conditions, which are consistent with Condition I.B'.1.b(9) and I.B'.1.c(8) be included:

Please insert a new condition I.BA.1.b(5) as follows: *The permittee shall install, maintain and operate instruments to monitor the pressure drop across the baghouse control device.*

Please insert a new condition I.BA.1.c(4) as follows: *The pressure drop monitoring device shall be accurate to within 5% of the pressure drop being measured or within ± 1 inch of water column, whichever is greater.*

Response: The conditions will be added as requested.

Comment No. 7: Page 7 of 17, Condition I.BB.1.b(1)

Please correct the typographical error by replacing *"lime silo"* with *"PAC silo"*.

Response: The typographical error will be added as corrected.

Comment No. 8: Page 7 of 17, Condition I.BB.1.b and Condition I.BB.1.c

Since the department is requiring WPL to record the pressure drop range every 8 hours, but has not required any instrumentation for measuring and recording the pressure drop, WPL is requesting that the following conditions, which are consistent with Condition I.B'.1.b(9) and I.B'.1.c(8) be included:

Please insert a new condition I.BB.1.b(5) as follows: *The permittee shall install, maintain and operate instruments to monitor the pressure drop across the baghouse control device.*

Please insert a new condition I.BB.1.c(4) as follows: *The pressure drop monitoring device shall be accurate to within 5% of the pressure drop being measured or within ± 1 inch of water column, whichever is greater.*

Response: The conditions will be added as requested.

Comment No. 9: Page 9 of 17, Condition I.G'.1.b.(4)(d)

Since the Title V permit number as referenced in the current wording of this condition will change, please revise the wording as follows: *This testing shall be conducted in accordance with Condition No. I.ZZZ.1.a(6) of this construction permit.*

Response: The sentence will be changed as requested.

Comment No. 10: Page 11 of 17, Condition I.G'.2

Please insert the following header: *Pollutant: 2. Visible Emissions.*

Response: The header was actually there in the draft permit. It will easily be seen in the final permit, if it is issued.

Comment No. 11: Page 11 of 17, Condition I.G'.2.c(5)

Since the Title V permit number as referenced in the current wording of this condition will change, please revise the wording as follows: *The excess emission reports required by condition I.G.2.c.(3) shall be submitted in accordance with Condition No. I.ZZZ.1.a(7) of this construction permit.*

Response: The sentence will be changed as requested.

Comment No. 12: Page 13 of 17, Condition I.GA.1.b.(4)

In order to be consistent with Condition I.B.1.b(10), please revise the wording as follows: *The permittee shall submit to the Department, within 180 days after the start of initial operation of the silo, the operating range of the pressure drop across the fabric filter control device.*

Response: The requested change will **not** be made. The Department recognizes the fact that the boiler baghouse operation will need extra time to determine the operating range of the pressure drop across the fabric filter device for the boilers because the spray dryer reagent injection rate will need to be fine tuned over an initial operation period. However, the operation of bin vent filters for the silos would not be as complicated. Thus the draft permit contained the 30-day time period for submitting the pressure drop operating range across fabric filter device for the silos.

Comment No.13: Page 13 of 17, Condition I.GA.1.b and Condition I.GA.1.c

Since the department is requiring WPL to record the pressure drop range every 8 hours, but has not required any instrumentation for measuring and recording the pressure drop, WPL is requesting that the following conditions, which are consistent with Condition I.G'.1.b(9) and I.G'.1.c(11) be included:

Please insert a new condition I.GA.1.b(5) as follows: *The permittee shall install, maintain and operate instruments to monitor the pressure drop across the baghouse control device.*

Please insert a new condition I.GA.1.c(4) as follows: *The pressure drop monitoring device shall be accurate to within 5% of the pressure drop being measured or within ± 1 inch of water column, whichever is greater.*

Response: The conditions will be added as requested.

Jeff Hanson of Alliant Energy provided a letter to the Department on November 4, 2011 that stated that some of the stack heights, diameters and the UTM locations for the silos would be changed. The new stack heights and diameters for the silos will be included in the final permit if and when issued. The emission limits would be the same. John Roth performed a new ambient air analysis based on these changes to the silos. John's finding and conclusion showed that the ambient air standard and increment will not be violated because of this project. The following are his finding and conclusion.

MODEL RESULTS

The impact of the change in emission from the facility was calculated by modeling the modified and proposed sources along with credit for existing sources. Specifically, in addition to the proposed material handling sources the main power boiler stacks were modeled with existing parameters and existing emission rates as negative, along with the future power boiler parameters and future emission rates as positive. The results of this dispersion modeling analysis indicate that the impact of the installation of the air quality control system is less than applicable

significant impact levels (SIL) for particulate matter, NO_x, and CO. Therefore, this project is assumed to have no impact on the ambient air quality for those pollutants.

Modeling Analysis Results (All Concentrations in µg/m ³)			
	CO – 1 hour	CO – 8 hour	NO ₂ – Annual
Project Impact	570.7	112.2	0.56*
SIL	2,000	500.0	1.0
% SIL	28.5	22.4	56.0

*Note: The USEPA and WDNR Ambient Ratio Method Tier II was applied to convert NO_x emissions into NO₂

Modeling Analysis Results (All Concentrations in µg/m ³)			
	PM ₁₀ – 24 hour	PM _{2.5} – 24 hour	PM _{2.5} – Annual
Project Impact	3.30	0.67	0.12
SIL	5.0	1.2	0.3
% SIL	66.0	55.8	40.0

For SO₂ emissions, the impact of this project is above the SIL; therefore an increment and NAAQS analysis was performed considering the entire facility. A review of the Wisconsin emissions inventory found no other SO₂ increment consuming sources in the area.

Modeling Analysis Results (All Concentrations in µg/m ³)			
	SO ₂ – 3 hour	SO ₂ – 24 hour	SO ₂ – Annual
Increment Source Impact	299.4	80.0	5.47
PSD Class II Increment	512.0	91.0	20.0
% Increment Consumed	58.5	87.9	27.4
Facility Impact	826.0	198.9	13.3
Background Concentration	11.8	11.2	5.4
Total Impact	837.8	210.1	18.7
NAAQS	1,300.0	365.0	80.0
% NAAQS	64.4	57.6	23.4

D. CONCLUSION

The results of the modeling analysis demonstrate that the proposed air quality control system project at Alliant Columbia will not have an effect upon ambient air concentrations of particulate matter, NO_x, and CO and will attain and maintain air quality standards for SO₂.

Stack ID	LOCATION (UTM83)	HEIGHT (M)	TEMP (K)	VELOCITY (M/S)	DIAM (M)
S11Old	304248, 4817601	152.40	407.0	32.27	6.40
S12Old	304248, 4817675	198.12	411.5	32.56	6.40
S11New	304248, 4817601	152.40	352.0	33.03	6.40
S12New	304248, 4817675	198.12	352.0	33.03	6.40
STK_25	304075, 4817635	43.59	Ambient	9.70	0.30
STK_26	304064, 4817635	43.59	Ambient	9.70	0.30
STK_37	304260, 4817689	25.02	Ambient	1.08	0.91
S10	304341, 4817576	78.00	435.9	5.99	1.68
S23	304337, 4817571	4.11	779.8	87.83	0.20

ALLIANT ENERGY COLUMBIA ENERGY CENTER - PORTAGE Volume Source Parameters				
Volume ID	LOCATION (UTM27)	HEIGHT (M)	Sig-Y (M)	Sig-Z (M)
BIPRO	Multiple Roadway Sources	1.00	8.140	1.418
LIME	Multiple Roadway Sources	1.00	8.140	1.418
PAC	Multiple Roadway Sources	1.00	8.140	1.418
SDA	Multiple Roadway Sources	1.00	8.140	1.418
LAN	Multiple Roadway Sources	1.00	8.140	1.418

ALLIANT ENERGY COLUMBIA ENERGY CENTER - PORTAGE Emission Rates					
Stack ID	PM ₁₀ Rate (#/HR)	PM ₂₅ Rate (#/HR)	SO ₂ Rate (#/HR)	NO _x Rate (#/HR)	CO Rate (#/HR)
S11Old	-3530.9	-531.0	-18831.7	-2648.3	-8892.8
S12Old	-588.5	-147.1	-7061.9	-2648.3	-8892.8
S11New	100.0	97.1	18831.7	2648.3	8892.8
S12New	103.0	103.0	7061.9	2648.3	8892.8
STK_25	0.064	0.064	-	-	-
STK_26	0.064	0.064	-	-	-
STK_37	0.13	0.13	-	-	-
S15	<i>n/a</i>	<i>n/a</i>	<i>92.51</i>	<i>n/a</i>	<i>n/a</i>
S23	<i>n/a</i>	<i>n/a</i>	<i>5.76</i>	<i>n/a</i>	<i>n/a</i>
BIPRO	0.005148	0.001265	-	-	-
LIME	0.002218	0.000545	-	-	-
PAC	0.000858	0.000210	-	-	-
SDA	0.000267	0.000066	-	-	-
LAN	0.02518	0.002619	-	-	-

Note: Due to the insignificant impact of the project for PM, NO_x, and CO, only the SO₂ emissions from stacks S15 and S23 were considered.

The stack heights and diameters will be added as permit requirements.

Jeff Hanson of Alliant Energy also wrote an email on November 7, 2011 to provide comments. His comments and DNR's responses are as follows:

Comment: First, in section BB.1.b.(4) – Since the PAC silo is already an existing source, notification of the operating range 30 days prior to initial operation is no longer possible. Please revise this notification to 30 days from issuance of the construction permit.

Response: The sentence will be changed as requested.

Comment: In BA, BB and GA, please revise references to the baghouse to fabric filter control device. Both terms already used in these sections, and a consistent term will add clarity.

Response: In sections BA, BB and GA, the references of baghouse will be changed to fabric filter control device as requested.

Comment: Lastly, in regard to initial operation, please reference a definition of the use of the term in the permit. For the scrubbers and baghouses of the boilers, this definition could be along the line of “Initial operation occurs when the spray dryer absorber and baghouse modules start controlling emissions from the boiler”. For the silo vents, it could be “Initial operation occurs when the silo is loaded for the first time”.

Response: In section ZZZ, initial operation for the spray dryer absorbers and baghouses for the two boilers will be defined as the first time each spray dryer starts spraying any reagent. The initial operation for each silo occurs when the silo is loaded for the first time.

David Bender of McGillivray Westerberg & Bender LLC wrote an email on November 7, 2011 to provide comments on behalf of the Sierra Club. His comments and DNR's responses are as follows:

Comment: First, DNR has used emission factors designed that were not designed to predict short term impacts from specific sources. Rather, they are only generally accurate, on an average basis, for long periods of time. (See e.g., PD at 15). DNR must use worst-case, site specific emission rates for the relevant time period (1 hour or less) if it intends to use the emission rates in air dispersion modeling analyses.

Response: The fugitive dust emissions from the facility's paved roads and the unpaved road (the only unpaved road is the link to the on-site landfill) were calculated from equations developed, provided and published by USEPA. In construction permit application reviews, the Department has been relying on these emissions calculations equations and protocols developed, provided and published by USEPA to determine the fugitive dust emissions from paved and unpaved haul roads. The modeled road dust emissions were based on daily worst case operation of this project. The breakdown of the total impact showed that the impacts from the fugitive dusts modeled as a volume source would be less than 20%, and at 0.12 ug/m³. Even if the modeling were to be done at 2 or 3 times the rates that were used, the final conclusion of the analysis will still be the same. It should be noted that Mr. Michael Sloat has told me that he did not recollect seeing any fugitive dust on the haul roads at the facility during any of his inspections of the facility.

Comment: Second, DNR assumes a constant control efficiency (90%) as if the assumed work practices will achieve this emission control at all times. This is unreasonable, and in fact, impossible. For example, water sprays cannot be used during freezing conditions—which is also when particulate loading to roadways is highest due to the additional application of sand and salt. A 90% emission control (24 hours/day, 365 days/year) is not enforceable as a practical matter. Nor are the silt loading and other assumptions that go into the emission factors enforceable as a practical matter. DNR must conduct its analysis, including modeling inputs, based on the worst-case scenarios that are also practically enforceable.

Response: DNR has a guidance document that addressed the control of fugitive dust emissions from haul roads. This document is in the DNR external web page: http://dnr.wi.gov/cias/guidance/guidanceexternal/GuidanceItem.aspx?ITEM_SEQ_NO=1671&ValuePath=1/1122. It stated that 90% control efficiency of fugitive dust generated on the haul roads can be considered if certain requirements are met and certain records are kept. Additional records will be required on the monthly number of truck loads of lime delivered (on paved roads), and the monthly tonnage of biproduct silo waste delivered to the on-site landfill/tonnage of biproduct silo waste delivered to the on-site landfill (on unpaved roads).

In addition, to have a better defined fugitive control plan, a requirement will be added such that the facility will be required to include, at a minimum, in the fugitive control plan the criteria when dust suppression activities will be implemented and the records of those dust suppression activities. This fugitive control plan is required to be submitted in writing within 60 days prior to the first receipt of lime for the spray dryer absorbers to the Department's South Central Region Air Program, and updated as needed.

Under freezing conditions when water sprays cannot be used, the facility will be applying a surfactant as a wetting agent to control fugitive dust on haul roads.

As stated in the above response, even if the modeling were to be done at 2 or 3 times the rates that were used, the final conclusion of the analysis will still be the same. Moreover, even if the emissions from the haul roads are 2 or 3 times higher, the net emissions increase will still be below the PSD significance levels.

Comment: Third, DNR assumes hourly maximum emission rates and certain stack/exhaust gas parameters (temperature and velocity) that are not enforceable in the permit. The permit lacks enforceable hourly emission limits. Moreover, the permit lacks any requirements to ensure that exhaust gas parameters are at least as high as those assumed for the analysis. Without such requirements, DNR cannot assure that emissions disperse sufficiently to avoid AAQS violations. At a minimum, DNR should include hourly mass emission limits and requirements on minimum stack exit temperature and velocity (with sufficient monitoring and reporting).

Response: PM, PM₁₀, and PM_{2.5} emission limits were included in the draft permit for the boilers and the silos and the ambient air analysis was done using those limits. These limits are based on the exit grain loading specification the facility will include in their equipment bidding process for the fabric filter devices. For this specific analysis, all the PM, PM₁₀, and PM_{2.5} ambient air impacts have been determined to be due to the new emissions of these pollutants. For the silos, the temperature input for the silos in the analysis was “ambient”. The exhaust flow rate was based on the maximum loading rate of material into the silo. At that point, the emission rate would also be the maximum. Both the exhaust flow rate and emission rate are dependent on the rate of loading of the silo. As such, in this particular ambient air analysis, enforceable requirements for the silo stack parameters will not be necessary.

Comment: Fourth, DNR modeled only the change in PM/PM₁₀/PM_{2.5} impacts compared to the SIL. DNR determined that the net increase (i.e., by modeling old emission rates as negative numbers and new

rates as positive numbers) in air pollution specifically from the project would be below the SIL. There is no legal basis to use a SIL for this purpose. Moreover, and perhaps more importantly, DNR has never modeled the total PM2.5 impacts from the facility as a whole—meaning there is no basis in the permit record for a conclusion that the facility will not cause or contribute to violations of the PM2.5 AAQS. Even if DNR’s analysis showing that the increase from this project (and only accounting for the modified emission rates) is below the SIL is accurate, this analysis does not show whether the impact from the facility is above or below the AAQS. Unless and until DNR determines that the entire facility cannot cause or contribute to a violation of the PM2.5 AAQS, it cannot issue the permit.

Response: The Department received a guidance letter dated April 18, 1989 from Mr. Steve Rothblatt, Chief, Air and Radiation Branch, USEPA Region V. In the letter, he stated that “The Office of Air Quality Planning and Standards recently informed us that the showing of insignificant impact is sufficient. Thus, a PSD source which has demonstrated an insignificant impact for a given pollutant need not provide any additional NAAQS or PSD increment analyses for that pollutant.” A copy of the letter is attached. The Department has been following that USEPA guidance since then.

Comment: Furthermore, the new equipment will have a parasitic load on the plant and will increase fuel usage to meet the same net output and the new chemical processes will likely increase greenhouse gas emissions. Yet, DNR has apparently concluded that there will be no increase in greenhouse gases (CO2e). (See PD at 18.) There is no apparent basis for this assertion in the record. In contrast, other coal plants that have added similar equipment have predicted significant increases in CO2e emissions. See e.g., Iowa DNR Fact Sheet for Permit 11-160 (available at https://aqbweb.iowadnr.gov/psd/9704010/PSD_PN_11-160/11-160_Fact_Sheet.pdf). DNR should determine whether there will be an increase in CO2e emissions and, if so, whether the increase subjects the facility to BACT for CO2e. The basis for that determination must be in the permit record. If an increase will occur (as other permitting agencies have concluded for similar projects), a BACT analysis for CO2e must be made available to the public for a new notice and comment period.

Response: The permit application material has stated that: “The AQCS Project will not affect the capacity of each power boiler. In addition, this project will not result in any additional fuel consumption. WPL has also determined that the boilers will not realize an increased utilization, i.e., the increase in annual operating hours from the project will be zero.” The applicant has informed the Department that whatever power necessary to operate the spray dryer absorbers and associated equipment may result in that small amount of power not being sent to the power grid. As such no increase in fuel usage is expected.

cc: Michael R. Sloat - South Central Region Air Program, Reedsburg Area Office