

Steven Dunn
Wisconsin Department of Natural Resources
Bureau of Air Management
101 S. Webster Street
Box 7921
Madison WI 53707-7921

By Email to: Steven.Dunn@wisconsin.gov

Re: Construction Permit No. 10-SDD-058; Operation Permit No. 737227040-PO1

March 4, 2011

Dear Mr. Dunn:

Please accept the following comments on the draft air construction and operation permit for the proposed We Energies – Biomass Fueled Cogeneration Facility in Rothschild, WI. These comments are submitted on behalf of residents of Rothschild, Wisconsin and surrounding areas who will be adversely impacted by the air emissions allowed under the proposed permit, and on behalf of Save Our Air Resources, the Biomass Accountability Project, Inc. and the Partnership for Policy Integrity.

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Classification as a “new source” vs. a “major modification of an existing source” under 40 CFR 52.21

The draft air permit treats the addition of a 50 MW (gross 55 MW) biomass-fired cogeneration project at the Domtar Mill as a “new source.” This means it is treating the biomass project as a separate and distinct operation from the paper mill. This appears to violate EPA’s PSD policies, including its aggregation policy. 72 Fed Reg. 19567 (April 15, 2010). A written analysis is needed in order to determine if a permit is complete and any permit issued complies with the aggregation policy. See also, Letter from U.S. EPA to Wisconsin DNR, Feb. 25, 2003, regarding PSD determination for Murphy Oil, Superior, WI; Letter from U.S. EPA to HOVENSA, LLC, March 30, 2010. The appropriate PSD and aggregation analysis appears to be lacking here.

For example, it is unclear whether the permit application and draft permit take into account all emissions changes at existing emissions units that will occur in the existing mill operations due to the addition of the biomass project. The application and permit only address the *new* emissions units that will be added to the mill site. Under EPA policies, the applicant is required to examine and provide detailed emissions information about how the addition of a 50 MW

biomass cogeneration project to the mill will affect existing operations and the emissions from each existing emissions unit at the mill.

Potential changes in emissions from the wastewater treatment operations due to the biomass cogeneration project have not been addressed in the permit application and draft permit. The wastewater treatment operations are an emissions unit within the meaning of 40 CFR 52.21. Therefore, under EPA policy, the applicant is required to provide detailed information about whether there will be increases in wastewater and/or sludge discharges to the wastewater system as a result of the biomass cogeneration project. For example, the application should address whether there will be an increase in the volume of discharge to the wastewater treatment system associated with the biomass project co-generation project, and whether or not this will result in a net significant emissions increase within the meaning of 40 CFR 52.21. The same analysis on mill process changes and associated emissions changes that will occur as a result of the biomass cogeneration project should be provided in the application. It does not appear that this has been done.

It also appears that the permit application should address the issue of de-bottlenecking and provide documentation of compliance with EPA's regulations, policy and guidance on this issue. See, 40 Fed. Reg. 54235 (Sept. 14, 2006); EPA 1990 PSD Workshop Manual.

Criteria pollutant emissions

Emission rates are considerably higher than what can be achieved using BACT or MACT

Comparison with the recently issued draft air permit¹ for the 38 MW Palmer Renewable Energy Facility in Massachusetts shows that this smaller plant is able to afford much more effective air pollution controls than those proposed for the Domtar plant. Emission rates are in units of lb/mmbtu; the ratio of the Domtar rate to the Palmer Renewable Energy rate is presented in the third column.

	Domtar biomass boiler	PRE biomass boiler	ratio
PM	0.024	0.019	126%
CO	0.12	0.0365	329%
NOx	0.1	0.017	588%
VOCs	0.017	0.01	170%
SO2	0.011	0.012	92%

¹ Massachusetts Department of Environmental Protection. Conditional approval for Palmer Renewable Energy 35 MW Biomass-fired power plant.

The emissions limit for SO₂ at the Domtar plant is incongruously low compared to that at the other plant, considering how much better controlled the Palmer plant is for the other pollutants. No source or documentation is provided to illustrate that this SO₂ emissions level is justified.

Emissions from the plant are significantly higher than from comparable facilities

Emissions from the Domtar plant are very high relative to comparable facilities. Comparing the emissions to the “worst case” air emissions scenario presented in the air permit for the 50 MW Russell Biomass plant in Massachusetts (which is also for a fluidized bed boiler), it is apparent that the Domtar biomass boiler’s emissions are significantly higher for NO_x, CO, VOCs, and HAPs. Units are tons per year for biomass boiler portion of project, only.

	Russell Biomass, MA	Domtar, WI
NO _x	195.48	350.4
CO	243.16	485.6
VOC	32.42	59.6
SO ₂	81	39
PM10	85.4	84.1
lead	0.2	0.11
HAPs	49.1	122.1
NH ₃	32.4	no data

A BACT analysis for sulfur should be performed

Domtar has stated that emissions of sulfur will not exceed 8 lb/hr from the biomass boiler, which equates to an emission rate of 0.01 lb/mmbtu. We can find no other example of a biomass facility with a sulfur dioxide emissions rate this low. As can be seen from the above table, the only pollutant where the Domtar plant is lower than the Russell facility is SO₂. Given that the emissions of the other pollutants are about twice as high as for the Russell plant, it seems unlikely that the emissions rate for SO₂ is credible, particularly since the “preliminary determination” document states that the maximum sulfur content of the fuel will be 0.35%, which is as high as some low-sulfur coals. It is not clear whether this sulfur content is specified for bone dry wood, or green wood, but since the number appears in a table that contains another reference to green wood (the tons per hour consumed) we assume it refers to green wood.

According to the Oak Ridge bioenergy feedstock database,² typical sulfur contents for hardwoods and softwoods are 0.009% and 0.01%, respectively. It is thus not justified for the environmental assessment prepared by the DNR to state that “For SO₂, BACT appears to be the

² http://bioenergy.ornl.gov/papers/misc/biochar_factsheet.html

CFB plus the use of low sulfur biomass fuels.” In fact, no true BACT analysis has been performed. Instead, the preliminary determination states, “Emissions of sulfur dioxide (SO₂) have been limited to less than 40 tons/year from the project. Projects which have increases in SO₂ emissions of less than 40 tons/year are not subject to PSD BACT requirements for SO₂. Thus, no SO₂ BACT analysis or emission limitation is included in this review or in the draft permit.”

At a sulfur content of 0.1%, less than one third of the fuel sulfur content specified by Domtar, a plant burning 500,000 tons of wood per year (Domtar’s stated figure, which is considerably too low, as demonstrated below) would produce 500 tons of sulfur. Assuming 100% conversion to SO₂ this would translate to 999 tons of SO₂. It would thus require a removal efficiency for SO₂ of 96.5% to emit the 35 tons that Domtar states will be emitted by the biomass boiler. If the fuel sulfur content were 0.35%, the removal efficiency would have to be 99%. Reviewing the air permit application for the Palmer Renewable Energy plant in Massachusetts, we see that installation of a special “Turbosorp” scrubber would remove 92.1% of SO_x from the exhaust stream of that plant. The Domtar plant does not intend to use any such equipment, so what accounts for the high removal efficiency that is apparently assumed?

Simply stating that emissions are limited without showing how they are limited is not legitimate. In fact, the sulfur content of 0.35% for the biomass used at the plant is not “low” by biomass standards. The emission rate for SO₂ is not justified and is likely to be higher than stated. The plant is extremely likely to emit more than 40 tons of SO₂, and should thus be subject to PSD requirements that BACT be determined.

NO_x BACT is too high for both boilers

Both the natural gas only and the biomass/natural gas boilers have NO_x emission rates considerably higher than those achieved by plants in EPA’s BACT clearinghouse.³

	Domtar rate	BACT
Gas only	0.012	0.0049
Biomass/gas	0.1	0.065

The supporting documents also do not appear to contain information on how NO₂ emissions would compare against the annual NO₂ NAAQS of 100 ug/m³. Why has this information been omitted?

Regarding the cost analyses for BACT for the various pollutants, claims that installing the most effective controls would cost too much are not substantiated. Over what timeframe are the costs calculated – five years? Ten years? The fact that so many other plants nationally do seem to manage to afford more effective emissions controls suggests that the cost estimates for BACT at the Domtar plant may be inflated by using a short payoff period. The cost estimates should be made transparent – the public deserves to know why this company, which will make a profit at the expense of their health, cannot afford to install more effective pollution controls. Domtar is

³ The permit for the Palmer Renewable Energy facility in Massachusetts is not yet final, thus this permit does not yet appear in the BACT clearinghouse. The NO_x emission rate in the draft air permit of 0.017 lb/mmBtu is considerably lower than the lowest limit for NO_x that currently appears in the clearinghouse.

the largest integrated producer of uncoated freesheet paper in North America and the second largest in the world based on production capacity, with revenues of \$5.465 billion and net income of \$310 million in 2009. (Source: Wikipedia)

Moreover, the Air Application, App. G, p. 23 states that the project intends to begin commercial operation (i.e. selling electricity to the grid) by September 2013. This would make the project eligible to collect a cash grant under the American Recovery and Reinvestment Act, (ARRA), P.L. 111-5, of 30% of the capital cost of the project, in lieu of an investment tax credit. Since the project is estimated to cost \$200 million, this means the developer is eligible to receive approximately \$70 million in taxpayer funds as a cash grant if it becomes operational within the time frame set by ARRA. The project schedule indicates that it plans to meet this deadline. Moreover, biomass fuel for the project is eligible for a 75% subsidy through the U.S. Department of Agriculture “Biomass Crop Assistance Program.” Finally, various state Renewable Portfolio Standard incentives, such as the ability to sell Renewable Energy Credits also contribute to the positive economics of this project. These federal and state subsidies must be weighed in any economic analysis in the BACT and/or MACT determination.

Emissions of ammonia will be significant – why are they not reported?

The facility plans on using NH₃ as part of its NO_x control system. Review of other biomass plant air permits reveals that this will lead to many tons of NH₃ emissions per year, but no emissions data are to be found in the air application documents or the permit for the Domtar plant. Why have these data been omitted?

Claim that emissions will decrease is not supportable under EPA rules

DNR’s explanation for why WEPCO’s modeling shows a 30% decrease in pollution emissions relative to current emissions indicates some ambivalence on the part of the agency. DNR is right to be ambivalent about this approach.

First, as the environmental assessment states, WEPCO’s comparison is based on “actual” emissions from the plant as now operating, versus “actual” emissions after the new biomass boiler is installed. This is not the correct way to compare emissions, and EPA will not sanction this approach. The correct way is to present emissions after the modification as the “potential to emit”

“Actual” future emissions are hypothetical numbers which to be realized in practice would require DNR placing constraints on hours of plant operation, but no such constraints appear in the air permit. The emissions limits in the permit are set, and at those emission rates, the biomass boiler alone is being permitted to emit 84 tons of PM, 350 tons of NO_x, 420.5 tons of CO, and 38.5 tons of VOCs (page 18 of the preliminary determination document states that VOC emissions from the biomass boiler will be 59.6 tons; one particularly noticeable feature of this air application is how few of the numbers match across different documents and how difficult it is to get a straightforward accounting of what the emissions from the facility will be). Once permitted that way, the facility is entitled to operate that way. If DNR is serious about ensuring that there is a decrease in emissions from the new plant compared to operation of the old plant, then they

should write tight restrictions into the permit that limit the hours of operation of the plant. Further, even WEPCO's approach for calculating the change in emissions, the so-called "reduction" in emissions (between actual operation presently, and "actual" future operation) is virtually all from NO₂. Using these numbers, there is actually a *doubling* of PM emissions, which is the pollutant most directly linked to immediate health impacts. Further, there is no discussion of how the facility's emissions of hazardous air pollutants would compare with former HAPs emissions at the site. Why have these data been omitted?

Hazardous Air Pollutant (HAP) emissions

Categories of biomass include contaminated material likely to contain HAPs

The application materials clearly indicate that a variety of materials will be burned in the Domtar plant. The documents state:

Fuel sources may include the following and other qualifying clean biomass sources:

- *logging residue*
- *discarded woody material from primary manufacturing facilities such as paper mills, sawmills, or chip mills*
- *pulp & paper wastewater treatment plant residue from the Domtar Mill*
- *leftover woody material from secondary manufacturers such as door, window, cabinet manufacturers*
- *woody biomass from municipal wood waste, tree services, and construction companies*
- *clean solid wood waste from discarded wood packaging such as pallets/crating and from construction and demolition activities*
- *woody biomass plantations, energy crops and agricultural residues.*

For purposes of the air permit application for the Project, "biomass" excludes edible portions of food crops, refuse derived fuel, chemically treated wood, municipal solid waste, sewerage sludge, and animal waste.

Despite the inclusion of materials that can contain substantial amounts of metals and other hazardous air pollutants, the environmental assessments and the air permit spend no time discussing or dealing with this issue. It is not sufficient to say that "clean" solid wood waste from construction and demolition activities will be burned. "Clean" wood from construction and demolition activities is typically sorted out by hand, using visual inspection. The resulting wood waste always contains some amount of pressure treated wood (containing copper, chromium, and arsenic) as well as painted wood (containing lead) and stained and glued wood (a source of organic hazardous air pollutants). Because of the nature of the waste stream, which can contain "slugs" of highly contaminated material, using this material as fuel requires constant testing to assure that contamination by metals and other HAPs is kept below a minimum threshold.

Further, “leftover wood material from secondary manufacturers” is also likely to contain stained, glued, laminated and otherwise treated wood, the combustion of which can lead to emissions of dioxins and other organic hazardous air pollutants.

EPA’s boiler rule and waste rule regulations issued in February 2011 require that waste materials like those proposed to be burned at the Domtar facility must meet “legitimacy criteria” in order to be considered as fuel. See, Major Source Boiler Rule, EPA HQ-OAR-202-0058, Feb. 21, 2011; Commercial and Industrial Solid Waste (CISWI) Rule, EPA-HQ-OAR 2003-0119, Feb. 21, 2011. The permit and application materials contain no discussion of how these legitimacy criteria or the terms of the Boiler Rule and/or CISWI Rule will be met.

Further, the inclusion of wastewater treatment residue and some other materials in the list of materials to be used as fuel raises the question of whether in fact this plant should actually be regulated as an incinerator.

Reportedly, the Domtar wastewater treatment operations receive leachate from the area’s public landfill. The chemical constituents of this leachate which is mixed with the mill’s wastewater is unknown and could contain a variety of hazardous pollutants. The characteristics of the leachate should be identified and in turn there should be an analysis of how this impacts the air emissions.

HAP emissions are underestimated by using AP-42 emission factors

It is clear that the potential for metals and other HAPs in the fuel stream has not been taken into account in the air modeling done for the Domtar facility. The environmental assessment states, “*The emission factors are uncontrolled factors for waste wood combustion in the U.S. EPA’s AP-42, Compilation of Air Pollutant Emission Factors, 5th Edition, Wood Residue Combustion, Tables 1.6-3 and 1.6-4, except as noted below.*” However, the AP-42 emission factors for “waste” wood are set based on the following definition, which clearly does *not* include pressure treated, stained, or glued wood of any kind:

The burning of wood residue in boilers is mostly confined to those industries where it is available as a byproduct. It is burned both to obtain heat energy and to alleviate possible solid residue disposal problems. In boilers, wood residue is normally burned in the form of hogged wood, bark, sawdust, shavings, chips, mill rejects, sanderdust, or wood trim. Heating values for this residue range from about 4,500 British thermal units/pound (Btu/lb) of fuel on a wet, as-fired basis, to about 8,000 Btu/lb for dry wood. The moisture content of as-fired wood is typically near 50 weight percent for the pulp, paper and lumber industries and is typically 10 to 15 percent for the furniture industry. However, moisture contents may vary from 5 to 75 weight percent depending on the residue type and storage operations. Generally, bark is the major type of residue burned in pulp mills; either a mixture of wood and bark residue or wood residue alone is burned most frequently in the lumber, furniture, and plywood industries.

DNR should require that the Domtar facility test all fuels that may potentially be burned in at the plant, and then estimate HAPs emissions from such testing data. Further, emissions from burning

these materials should be calculated on a “potential to emit” basis, since it is possible that there will be periods when the plant is burning this fuel exclusively. This is extremely important for calculating emissions of metals and other HAPs on a short-term basis to assess whether daily exposure standards are exceeded. Similar modeling conducted for a facility in Massachusetts revealed that arsenic and chromium emissions from burning “clean”, sorted construction and demolition waste produced emissions that were close to 24-hour inhalation standards, even assuming that ambient levels of HAPs were at zero.

The permit does not contain a limit on lead emissions

Lead is a criteria pollutant and a hazardous air pollutant, yet it is not mentioned in the permit. Since the plant identifies construction and demolition debris as a fuel source, and this material can contain substantial amounts of lead, the permit should address the issue of lead emissions. The amount of lead estimated to be emitted by this plant (0.11 tons per year) may be a significant underestimate. The true lead content of the fuels that will actually be burned should be determined.

Combustion of sludge makes this facility an incinerator

Along with the MACT rules, EPA has issued new rules that determine whether a facility should be treated as a waste incinerator under Section 129 of the Clean Air Act. CISWI Rule, cited above. The Domtar application has avoided using the word “sludge” in its description of fuels burned, instead using the phrase “wastewater treatment residue”. Is this sludge? If so, this plant is an incinerator and should be treated as such by DNR and EPA. The plant will also qualify as an incinerator if it is burning discarded materials, such as construction and demolition debris, that do not meet the “legitimacy” criteria set by EPA. In our review of the application materials, we have encountered no discussion of how the plant plans to meet the legitimacy criteria. We thus conclude that given the fuels listed as potentially used, this plant should be treated as an incinerator.

High ash and sulfur content indicates many non-wood materials will be burned

The 7% fuel ash content specified in the preliminary determination is extremely high for wood. In fact, ash contents of wood tend to be considerably lower than this, as demonstrated by ORNL data on biofuels characteristics (http://bioenergy.ornl.gov/papers/misc/biochar_factsheet.html). This resource states that wood ash content is around 0.5%. An ash content of 7% is actually representative of many coals. Since PM emissions are to a large extent a function of ash content, particularly in fluidized bed boilers, the high ash content of the fuel makes control of PM much more difficult.

It is also important to note that ash from burning construction and demolition waste is frequently treated as a hazardous waste, depending on the concentration of metals present. In the alternative fates for ash disposal discussed in the Rineer-authored environmental assessment, disposal as hazardous waste was not considered.

The relatively high sulfur content of the fuel (0.35%) is also comparable to some types of low-sulfur coal and is three to four times higher than sulfur contents typical of wood fuels. What materials is the plant planning on burning that have such high sulfur and ash contents, and why have these unusually high contents not been taken into account in emissions modeling?

Dioxin emissions are likely to be higher than estimated

Dioxin formation is partly controlled by chlorine in the fuel, and in general, dioxin emissions go up as chlorine emissions go up. Comparing dioxin and chlorine emission rates from the Domtar plant (Table 1b, PSC's environmental assessment) to data for a construction and demolition debris burning facility that was proposed in Massachusetts, chlorine emissions are higher at the Domtar plant, yet dioxin emissions are *lower* than at the other plant. It is thus likely that dioxin emissions will be higher at the Domtar plant than have been represented.

The facility does not meet EPA's MACT for PM

As of February 2011, the new MACT standard for filterable PM₁₀ from solid fuels is 0.0011 lb/mmbtu, and is no longer 0.008 lb/mmbtu as stated in the application. The Domtar plant must demonstrate how it will meet this more stringent standard.

The PM emission rate for the boilers is also not BACT

The PM emission rate of 0.0076 lb/mmbtu for the gas-only boiler gas boiler is significantly higher than what can be achieved, even without emissions controls. The BACT clearinghouse contains several permits for natural gas facilities that achieve PM₁₀ emissions rates of 0.004 and 0.005 without using external controls. The fact that no external controls are required invalidates arguments that BACT is too costly for the Domtar plant, an argument that is invoked repeatedly.

The PM emission rate for the biomass boiler is also significantly higher than several biomass facilities in the EPA BACT clearinghouse. The argument that installing effective emissions controls is too costly has been given too much credence by DNR. Given that emissions of PM will significantly increase if this project is built, and that modeling shows that emissions will then push ambient air concentrations of PM to 99% of the National Ambient Air Quality Standard (NAAQS), no expense should be spared in reducing PM emissions. In any case, the facility will need to meet the new MACT standard for filterable PM, which will improve its PM emissions rate to some extent. However, the amount of condensable PM permitted for this plant is high.

The facility does not meet EPA's MACT for HCl

The permit states that the Domtar facility will meet an emissions rate of 0.004 lb/mmbtu for HCl, but the new MACT standard as of February 2011 is 0.0022 lb/mmbtu. The plant must demonstrate how it will meet this standard.

There additionally appears to be some confusion in the application documents around the actual amount of HCl that will be emitted. The environmental assessment prepared by the PSC states, “*The project would be required to emit no more than about 14 tons per year of HCl gas and about 4 tons per year of HF gas.*” Yet, table 1b of the environmental assessment prepared by the PSC states that the plant will emit 14.4 lb of HCl per *hour*, which translates to a potential to emit more than 63 tons annually. This amount of HCl is not unreasonable – it is comparable to which was projected for a biomass plant proposed in Gainesville Florida, prior to use of a sorbent to reduce acid gas emissions. Even operating at just 80% capacity, the Domtar plant would thus emit more than 50 tons of HCl. Why then does the applicant claim that just 14 tons of HCl will be emitted?

Many similar biomass plants use a sorbent to decrease emissions of acid gases. Yet while the preliminary determination document considers use of a sorbent for the smaller amount of HF emissions than HCl emissions, it does not consider a sorbent for HCl, or consider how the cost per ton of acid gas mitigated by use of a sorbent would decrease if both HCl and HF were being mitigated. Why has this analysis been omitted?

Absent use of sorbent, the only other way that HCl emissions can be controlled is by constraints on plant operation. However, no such constraints are proposed. What is the real emissions rate of HCl, and why is it being represented by two different values in the same application?

Pollutant emissions are higher than stated because fuel use is underrepresented

As high as the pollutant emissions from the Domtar plant are projected to be, the actual emissions will be considerably higher if the facility actually plans to generate power to sell to the grid. The applicant has stated that the plant will consume around 500,000 tons of wood per year. However, this is not enough fuel to generate 50 MW of power, much less the gross amount of power that the plant will need to produce to meet parasitic load, the plant’s own needs, and sell to the grid. The preliminary determination document contains a figure of a maximum wood use of 86 tons per hour. This figure is revealing, since this is about the amount of wood that would be required on a *year-round basis* to meet the facility’s power generation objectives. There are simply not enough btu’s in green wood to generate the power required at the lower amounts specified by the applicant. Taking into account the lower heating value of wood, as recommended by the Oak Ridge National Laboratory’s “Biomass Energy Data Book” (edition 2),⁴ the actual amounts of wood (at 45% moisture content) required to fuel the plant at different capacities (online time) would be:

⁴ From ORNL’s “Biomass Energy Data Book”: “*The lower heating value (also known as net calorific value) of a fuel is defined as the amount of heat released by combusting a specified quantity (initially at 25°C) and returning the temperature of the combustion products to 150°C, which assumes the latent heat of vaporization of water in the reaction products is not recovered. The LHV are the useful calorific values in boiler combustion plants and are frequently used in Europe. The higher heating value (also known as gross calorific value or gross energy) of a fuel is defined as the amount of heat released by a specified quantity (initially at 25°C) once it is combusted and the products have returned to a temperature of 25°C, which takes into account the latent heat of vaporization of water in the combustion products. The HHV are derived only under laboratory conditions.*”

100% capacity: 804,650 tons/year
90% capacity: 724,125 tpy
80% capacity: 643,720 tpy

Pollutant emissions are calculated on the basis of “potential to emit”. These in turn are estimated based on the potential operation of the boiler. The boiler requires fuel, and therefore, fuel consumption should also be estimated on the basis of “potential to consume”. Because the Domtar facility will likely burn more wood than it has stated in its application, it will also emit more pollution than stated, potentially by a significant amount. DNR should require the applicant to re-estimate the amount of all pollutants generated, based on the actual amount of fuel that will be consumed.

Health effects

DNR’s claim that air is safe is inconsistent with prior DNR statements

DNR’s environmental assessment for the Domtar plant claims that emissions from the plant will not harm public health, stating

According to the findings of the air quality analysis (air dispersion modeling) under permit action 10-SDD-058, the emissions from the facility (and nearby sources that contribute to impacts) will attain and maintain the NAAQS, which are set to protect public health and welfare. Those standards (NAAQS) are set at levels such that the most susceptible populations (children, elderly, and people with respiratory conditions) are protected.

and

The results of the modeling analysis demonstrate that the primary standard for the listed pollutants will be met provided the emissions rates, stack parameters and all other restrictions used in this analysis do not change. Therefore, the health of "sensitive" populations such as asthmatics, children, and the elderly will be protected.

However, the Wisconsin DNR itself is on record as stating that the EPA standard for PM is *not* protective of the public health. A letter from DNR to EPA on occasion of EPA’s consideration of the PM NAAQS states:

The standards EPA has proposed (an annual standard of 15 ug/m³ and a daily standard 35 ug/m³) are substantially too high. They are quite simply inadequate to protect public health.

We request that EPA set a daily maximum standard of no higher than 25 ug/m³, and an average annual standard no higher than 12 ug/m³. This would put the federal annual average in line with California's wisely-chosen annual standard,

while providing a daily limit that is calculated to greatly aid in meeting the average annual limit.

Further, your proposal will allow greatly elevated levels of pollution on far too many days each year. The standard should be set at the 99th percentile, meaning no more than four days in any year should be above the standard...

... The science is overwhelmingly clear that your proposal does not protect the public health. Please meet the health-protection purposes of the Clean Air Act and set the national standard at a level that truly will protect public health -- an average annual standard of 12 ug/m³ and a daily standard of 25 ug/m³.⁵

The Rothschild area will likely be in nonattainment if the Domtar plant is built

EPA is likely to drop the PM_{2.5} NAAQS later this year. When it does, this will serve as Agency recognition of what health professionals and EPA scientists know, that there is a linear relationship between PM concentrations and health effects that extends below the current health threshold. Any decrease in PM concentrations leads to an improvement in health outcomes, and increases in PM are linked to increased rates of asthma and other health impacts.

Considering that the plants modeled emissions for PM are at 99% of the *current* NAAQS for PM, DNR's statement that "*These expected concentrations are close to violation of the NAAQS and might likely be the most logical pollutant situations to watch during plant operation*" is a significant understatement. When EPA reduces the NAAQS for PM, the Rothschild area will certainly be in nonattainment if the Domtar plant is built.

5 Letter dated March 17, 2006 from Jeffrey A. Schimpff, Bureau of Science Services, Wisconsin DNR, to Stephen Johnson, EPA Administrator (EPA docket OAR-2005-0175). The letter continues:

Millions of Americans are at risk from breathing particulate pollution, including people with asthma and other chronic lung diseases, children, seniors, and those with cardiovascular disease or diabetes.

EPA staff scientists and a panel of independent scientific reviewers have recommended much lower limits than you propose for the national standards for the smallest, or fine, particles. Given the dangerous health effects, there was no reason to propose a standard higher than the lowest levels recommended by EPA scientists. The standards you have proposed simply do not reflect responsible health care policy.

You should also provide even more protection than your staff has recommended via the limits on the larger, or coarse, particles. EPA should include all types of coarse particles in this standard. There is no scientific basis to determine that particles from any source - especially sources that can include toxics such pesticides and heavy metals - are safe for people to breathe. To protect public health, the coarse standard needs to be much tighter.

The science is overwhelmingly clear that your proposal does not protect the public health. Please meet the health-protection purposes of the Clean Air Act and set the national standard at a level that truly will protect public health -- an average annual standard of 12 ug/m³ and a daily standard of 25 ug/m³.

These stronger new standards would provide substantial health protection for tens of millions of Americans living in nearly every state of our nation, and be a fitting response to the need for better federal protections against the debilitating impacts of air pollutants that respect no state boundaries.

Further, even if EPA does *not* drop the PM NAAQS, increasing PM emissions from the Domtar plant and pushing this area to the brink of nonattainment for PM will stifle development of even minimally polluting industries that might actually bring jobs to the area. As stated in the Rineer environmental assessment,

“A county where monitoring data has resulted in a design value greater than the NAAQS is designated as a non-attainment county. Along with the obvious public health concern, being designated non-attainment may have an adverse impact on economic development of an area. Any major modification or major new emissions source would have to install the very best control equipment and find offsets for new emissions. DNR has anecdotal evidence suggesting that industrial sources looking to expand appear to avoid designated non-attainment areas.”

DNR’s *own* assessment is thus that development of the Domtar facility may stifle future economic growth in the Rothschild area. Additionally, there are at least 8 schools and day-care centers within five miles of this plant. It is surprising that this fact has not been noted and given more importance by DNR.

Noise should be modeled

The Rineer-EA states, *“The consultant could not produce a predictive model of what the noise would be from the proposed plant because there is not enough information in the literature about how much noise parts of such a plant would make when it operates.”*

This is simply not the case. There are many noise models available, and noise assessments are routinely performed as part of biomass air permitting applications in Massachusetts and other states. It is inconceivable that DNR would permit a project that is essentially located within a residential community to go forward without noise modeling.

Greenhouse gas emissions

DNR must consider GHG emissions from biomass burning at the Domtar plant

The Domtar permit is being considered in the window of time when EPA is still requiring consideration of GHG emissions from biomass for “BACT anyway” sources. Since the Domtar plant has to consider BACT for conventional pollutants, it must also consider BACT for greenhouse gas emissions. The permit application and permit fail to include a legally acceptable BACT analysis to establish that the burning of biomass is BACT for greenhouse gases, as required by the Clean Air Act “Tailoring Rule” which became final on January 2, 2011. Therefore, the draft permit violates the Tailoring Rule.

Biomass power is not carbon neutral

Various statements in the two environmental assessments performed for the Domtar plant demonstrate that Wisconsin DNR and others do understand that biomass is not really carbon

neutral. Even if fuel is 100% sourced from logging waste that “would decompose anyway”, thus emitting CO₂, the timeframe of emissions for burning this material is instantaneous, while CO₂ from decomposition takes years and even decades to be emitted. When trees are cut for fuel that would not otherwise be cut, the carbon emissions from burning biomass increase dramatically. The combination of the higher CO₂ emissions produced per unit energy from wood than fossil fuels, the loss of forest carbon sequestration capacity that is tying up *current* carbon emissions, and the large difference in efficiency between the Domtar biomass boiler (24% efficient) versus a new gas boiler (considerably higher) mean that harvesting forests for fuel is the single worst thing a state that is interested in reducing its carbon emissions can do. The question is therefore, When would Wisconsin like to start reducing its emissions from the power sector? If the answer to that question is “immediately”, then under no circumstances should this plant be built – even if it promises to only use logging residues as fuel.

Trees will be cut to fuel the Domtar plant

In any case, it is extremely unlikely that this plant will use just logging residues as fuel. As stated in the Rineer EA, “*According to the Renewable Resource Solutions study, about 1.28 million green tons of logging residue biomass are available each year.*” However, the EA does not state whether this amount of material is available in the region, or in the whole state. According to recent data from the US Forest Service, there are about 3.5 million green tons of logging residues generated in the whole state of Wisconsin, annually. Assuming that at least one half of this material is either left onsite to preserve soil fertility, as Wisconsin’s own guidelines on biomass harvesting stipulate, or is unavailable for other reasons, this means that there are *at most* about 1.75 million green tons of residues actually available in the whole state. The figure of 1.28 million tons from the Renewable Resource Solutions study is thus a significant overstatement of the fuel that would be available for the Domtar plant. Additionally, if the plant already needs to travel up to 100 miles to obtain the 130,000 tons of wood that it currently burns, it is not credible that there are an additional several hundred thousand tons available in this same radius. This makes it a near certainty that the plant will either increase harvesting rates to provide fuel, or will rely heavily on non-forest sources of biomass, such as construction and demolition waste, which will also increase greenhouse gas emissions relative to alternative fates of this material, as well as significantly increasing HAPs emissions.

Greenhouse gas emissions per MWh from biomass have been underrepresented

Because the application has considerably underestimated the amount of wood that will be required to generate the amount of power specified, the greenhouse gas emissions from burning biomass at this plant, represented on an output basis as CO₂ equivalents per MWh, have also been underrepresented. DNR should recalculate the CO₂ emitted per MWh generated, estimating wood consumption based on the lower heating value of biomass, as the Oak Ridge National Laboratory biomass guidance indicates

Biomass carbon emissions are “real”

Greenhouse gas emissions at the stack of the biomass boiler are 3,120 lb/MWh gross output, more than six times higher than the 510 lb/MWh of the natural gas boiler. These numbers speak for themselves. There is nothing in any of the application materials reviewed to suggest that these emissions from biomass are any less “real” and climate-change inducing than emissions from natural gas. There is no evidence produced to demonstrate that fuel will be sourced solely from forestry residues – indeed, it is explicitly stated in the Rineer-authored EA that harvest of woodlands can be considered, if only as a “last resort”. However, absent any controls in the field, and absent any legally binding obligations, fuel providers for the Domtar plant will cut what they want, where they want. There is nothing to stop them from harvesting trees for fuel, and DNR has no basis for concluding otherwise. The fact that the plant already sources wood from up to 120 miles away indicates that obtaining “residues” sufficient to fuel the plant will be impossible.

Because biomass is not carbon neutral, biomass is not BACT for GHG emissions

The DNR is reluctant to engage with the question of how different sources of biomass can affect net emissions of greenhouse gases. The department evidently thinks it is beyond the scope of its responsibilities. However, EPA disagrees. The requirement that carbon emissions from this plant undergo BACT analysis necessitates DNR examining how CO₂ emissions can best be reduced. In fact, the Rineer-EA does spend time discussing forest carbon and how use of wood for fuel may influence net carbon emissions. This discussion deserves comment, and is reproduced here.

2.3.4.4 Possible increasing of sequestration in the woodlands

It might be possible to increase the amount of carbon sequestered before beginning operation of a biomass-fired plant so that the carbon debt from combustion can be lessened. During the years before any wood was needed for the plant, Domtar and WEPCO could ensure that the amount of woodland available for logging (and thus biomass harvest), is increased so that the carbon is banked (against the prospective carbon debt) and a build-up of additional sequestered carbon occurs before the combustion process begins.

This unfortunately misses the point, entirely. Increasing the amount of land available for exploitation as biomass fuel will simply serve to liquidate more forest carbon into the atmosphere.

The Forest Guild has indicated that some forest management strategies can apparently increase carbon sequestration rates and store more carbon over time than others. These strategies include cultural methods that increase forest structural complexity, such as uneven-aged management, retaining residual components of the original stand, or extending cutting rotation time to allow more carbon to be sequestered. The use of logging residues rather than whole trees is viable because the residue would eventually decay and emit carbon while live trees would continue to sequester it. If whole trees were used, the use of less healthy trees that are likely to die in the near future could allow the healthier trees to continue to sequester carbon.

There is no credible research that shows increased logging (“forest management”) leads to increased carbon storage, relative to leaving forests unexploited. There are, to be sure, ways to do forestry that leave more carbon standing relative to other approaches, but simply letting forest and soil carbon accumulate, undisturbed, is what maximizes forest carbon storage. It is important to note that harvesting for biomass after commercial timber harvesting tends to strip the most carbon out of forests, and leave the least material onsite. Biomass harvesting is not “fussy” uneven-aged management that retains forest carbon; it is by definition the removal of everything that doesn’t have value as sawtimber and it is conducted on a scale where removal of anything less than 50% of standing material is barely cost-effective.

The GHG analysis should include methane emissions from wood storage

It is good that methane emissions from biomass combustion have been calculated, but this is only part of the methane generation associated with biomass fuels. Storage of green chipped fuel wood is likely to lead to development of anaerobic conditions in the presence of an abundant carbon source, the ideal conditions for methane buildup. Methane is a regulated greenhouse gas under EPA’s new rules. Studies have found significantly greater rates of decomposition and mass loss for whole-tree chips than clean, debarked chips, and that piles of whole-tree chips are more prone to spontaneous combustion than clean, debarked chips.⁶ Studies have shown that enclosure of even dried wood can lead to significant accumulation of methane. For instance, oceanic transport of pellets, which are processed and dried and thus present less risk of fermentation than green chips, has nonetheless been found to sometimes result in dangerously high buildups of toxic gasses during transport. One study found average methane concentrations of 605 ppm in the hold areas of vessels transporting wood pellets,⁷ a condition that led to an explosion and fatality on a wood-transport ship. The DNR should require an assessment of net methane production from fuelwood piles as part of the greenhouse gas analysis for biomass power at the Domtar plant. It may also want to examine safety and fire issues surrounding the risk of spontaneous combustion of the fuel pile, a phenomenon that is fairly common at biomass and pellet processing plants.

Natural gas should be considered a BACT strategy for reducing emissions

Burning biomass leads to significantly greater conventional and greenhouse gas pollutant emissions than burning natural gas. The ratio of the emissions rates are presented in the following table:

⁶ Springer, E. 1980. Should whole-tree chips be dried before storage? USDA Forest Products Laboratory Research Note FPL-0241.

⁷ Svedberg, U., et al. 2008. Hazardous off-gassing of carbon monoxide and oxygen depletion during ocean transportation of wood pellets. *Annals of Occupational Hygiene*, 52:259-266.

Pollutant	ratio biomass emission rate to gas emission rate
PM	316%
CO	200%
NOx	833%
VOCs	283%
SO2	1667%
lead	6%
mercury	100%
Fluorides	1613%
H2SO4	30000%
GHG	612%

These ratios would be even higher if they were all, like the ratio for greenhouse gas emissions, expressed relative to actual usable energy and not just on a heat-input basis.

The Domtar plant would be considerably cleaner if it were simply to fire 100% natural gas. Indeed, EPA has recognized that fuel switching can constitute BACT, stating

This approach does not preclude a permitting authority from considering options that would change aspects (either minor or significant) of an applicants' proposed facility design in order to achieve pollutant reductions that may or may not be deemed achievable after further evaluation at later steps of the process. EPA does not interpret the CAA to prohibit fundamentally redefining the source and has recognized that permitting authorities have the discretion to conduct a broader BACT analysis if they desire.

Nonetheless, the “preliminary determination” document for the Domtar facility states:

Potential for fuel switching as BACT – Based on recent USEPA guidance, the potential for using a cleaner fuel, even to the point of changing the project substantially, needs to be part of the BACT analysis process. For this boiler, using a natural gas as a clean fuel could reduce emissions of PM (including PM10 and PM2.5), CO, NOx, VOC and fluorides. Therefore, the Department has examined requiring the use of natural gas as part of the BACT determination for each and all of these pollutants.

This proposed boiler has been put forward with these primary goals:

- *Generating electricity and steam from a renewable source. Generating green jobs in Wisconsin (in lieu of purchasing out-of-state fossil fuels).*
- *Reduction in greenhouse gas emissions due to the use of renewable fuels.*

Additionally, the design of the boiler is for biomass and is much more complex than that needed to combust only natural gas.

Based on these parameters, the Department determines that use of biomass is an inherent part of this project and will not further consider the use of only natural gas, or other cleaner fossil fuel, as part of any BACT analysis.

DNR's argument that the plant will generate "green" jobs is not supported by the data. The Environmental Assessment provided by the Public Service Commission states, regarding jobs (page 43),

After completion, the plant would require about 150 permanent logging and trucking jobs in the surrounding area to supply the fuel supporting its operation. These logging and trucking jobs may or may not be new jobs, but there is no reason to believe that plant operation would result in a job loss in these occupations as a result of the project operation. On the other hand, there may not be any significant increase in permanent jobs in the Wausau area after the plant was placed in operation.

DNR's dismissal of natural gas as BACT also does not comport with EPA's guidance on implementation of the greenhouse gas tailoring rule, which requires thorough documentation of all the steps taken in a BACT determination. One would assume that this would also apply to the dismissal of natural gas as BACT for pollutants at the Domtar plant, which is based on the demonstrably false argument that biomass will reduce greenhouse gases relative to fossil fuels. EPA's "PSD and Title V Permitting Guidance for Greenhouse Gases", issued November 2010, states:

*Since the BACT provisions in the CAA and EPA's rules provide discretion to permitting authorities, a critical and essential component of a successful BACT analysis (whether it follows the top-down process or another approach) is the record supporting the decisions reached by the permitting authority. Permitting authorities should ensure that the BACT requirements contained in the final PSD permit are supported and justified by the information and analysis presented in a thorough and complete permit record. The record should clearly explain the reasons for selection or rejection of possible control and emissions reductions options and **include appropriate supporting analysis**. In accordance with relevant statutory and regulatory requirements, the permitting authority must also provide notice of its preliminary decision on a source's application for a PSD permit and an opportunity for the public to comment on that preliminary decision. Thus, the record must also reflect careful consideration and response to each significant consideration raised in public comments. Each BACT analysis **must be supported by a complete permitting record that shows consideration of all the relevant factors**.*

DNR's claim that biomass reduces greenhouse gas emissions essentially states that because biomass is included in Wisconsin's suite of renewable energy technologies, this is sufficient to

prove it is carbon neutral. This does not meet EPA’s standard that “each BACT analysis be supported by a complete permitting record that shows consideration of all the relevant factors.” DNR has not demonstrated that the kinds of biomass burned will be restricted to those with fast carbon payback time, and even the fuels did have a fast carbon payback time, the Clean Air Act is designed to regulate what comes out the stack of an emitting facility – not what the net balance of that pollutant will be at some point in the future once the carbon has “grown back”. Absent any demonstration that biomass fuels will actually reduce carbon emissions, the only way to evaluate greenhouse gas emissions from biomass versus natural gas is with the stack emission rate in the permit, which is more than six times higher for biomass than for natural gas.

DNR’s dismissal of consideration of fuel switching to natural gas is unjustified and not supportable in light of EPA’s clear mandate to consider all options to reduce pollution. As EPA states, DNR can evaluate major facility changes – including fuel switching – “if they desire”. In this case, it would not even be true fuel switching, since Domtar *already* intends to burn natural gas in the biomass boiler. Yet nowhere is the circular logic of the biomass myth more apparent than here. DNR is saying that even though burning all natural gas would result in dramatic reductions in emissions compared to burning biomass, the idea – which DNR *itself* does not even appear to believe – that biomass will “reduce” greenhouse gas emissions compared to fossil fuels is sufficient to trump all those other, health-based considerations. And while DNR itself appears to acknowledge the fact that even biomass from forestry residues is not carbon neutral, the myth of carbon neutrality (upon which the determination of biomass as a “renewable” fuel is at least in part based) is allowed to take precedence over the obvious and common-sense conclusion that biomass emits dramatically more CO₂ than natural gas (as demonstrated by the stack emission numbers in the permit).

Prioritizing reductions in greenhouse gases – and especially illusory reductions – over reducing emissions of other pollutants is not supported by EPA guidance. In fact, EPA’s guidance states:

*When weighing any trade-offs between emissions of GHGs and emissions of other regulated NSR pollutants, EPA recommends that permitting authorities focus on the relative levels of emissions rather than endpoint impacts. As a general matter, GHG emissions contribute to global warming and other climate changes that result in impacts on the environment and society. However, due to the global scope of the problem, climate change modeling and evaluations of risks and impacts of GHG emissions currently is typically conducted for changes in emissions orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying these exact impacts attributable to the specific GHG source obtaining a permit in specific places is not currently possible with climate change modeling. Given these considerations, an assessment of the potential increase or decrease in the overall level of GHG emissions from a source would serve as the more appropriate and credible metric for assessing the relative environmental impact of a given control strategy. **Thus, when considering the trade-offs between the environmental impacts of a particular level of GHG reduction and a collateral increase in another regulated NSR pollutant, rather than attempting to determine or characterize specific environmental impacts at particular locations, EPA recommends that***

permitting authorities focus on the amount of GHG emission reductions that may be gained or lost by employing a particular control strategy and how that compares to the level of collateral increase for other regulated NSR pollutants.

What EPA is saying here is that because greenhouse gases are emitted on a large scale, and the impacts of any one facility are small, it is important to focus first on reducing the emissions regulated by the Clean Air Act that *do* have quantifiable impacts at the local level – that is, pollutant emissions that affect health, like PM and NO_x – and only *then* evaluate how different approaches for controlling these pollutants affect greenhouse gas emissions. There is nothing in this guidance to support DNR’s approach of allowing an unsubstantiated claim of carbon neutrality for biomass to trump the considerable reductions in conventional pollutants that would occur if natural gas were burned instead.

Conclusion

We urge DNR to step back to put this project in perspective. Each of the air pollutants emitted under the draft permit is regulated for a reason: science shows that it has a negative impact on human health. Whether it is dioxin, and ultra-toxic air pollutant for which there is no known safe limit, or particulate matter that is causally linked to increased mortality from cardiopulmonary diseases or lung cancer, the impacts on the citizens of Wisconsin will be real and long term. Yet, this project is being funded with millions of dollars in taxpayer and rate payer money under the guise of being “clean” and “renewable” energy that has benefits for clean air. This assumption is questionable at best.

We note that Governor Walker recently withdrew approval for a similar biomass burning electricity project in Madison, Wisconsin, stating that it will save the state \$100 million. In reviewing the air pollution permit to construct and operate the WE Energy project at the Domtar mill, we urge DNR to ensure the strictest level of regulation under the Clean Air Act, due to the short and long term impacts on public health and our Nation’s economic well being.

In closing, at a time when Wisconsin is struggling with an economic crisis that is affecting the budget of every family and the ability of the state to address costs associated with health care, this project makes no sense. It will use precious taxpayer dollars for a project that will emit toxic and hazardous pollutants to the atmosphere. Scarce taxpayer and ratepayer money intended for “clean” renewable energy will be misspent on this project, with serious negative results.

Please send a copy of all future correspondence on this matter, including the final determination, to:

Attorney Margaret E. Sheehan, via email at meg@ecolaw.biz
Mary Booth, PhD, via email at mbooth@pfpi.net

Very truly yours,

Mary S. Booth, PhD, Partnership for Policy Integrity
Partnership for Policy Integrity
54 Arnold Rd.
Pelham, MA 01002
917- 885-2573
mbooth@pfpi.net

Save Our Air Resources
Rothchild, WI

/signed/
Margaret E. Sheehan, Esq.
Biomass Accountability Project
P.O. Box 380083
Cambridge MA 02238
800-729-1363
contact@ecolaw.biz

Cc:
Honorable Scott Walker, Office of the Governor, 115 East State Capitol, Madison, WI 53707
Timothy Lundquist, Office of the Governor, Wisconsin, by email tim.lundquist@wisconsin.gov
Michael Brune, President, Sierra Club (by email)
Robin Mann, Board Chair, Sierra Club (by email)
James McCaffrey, Sierra Club, Massachusetts Chapter
Danny Marcus, EPA Region 5
Kristine Gilmore, Superintendent, D.C. Everest Area School District, Wisconsin
Save Our Air Resources, Wisconsin
Rob Hughes, SOAR
Todd and Sara Babl, Rothchild Wisconsin
Paul Schawntes, SOAR
Midwest Environmental Advocates