



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
REGION 5  
CHICAGO, IL. 60604

**Technical Review Document on Blandin's Petition for a  
Non-Waste Determination Pursuant to 40 C.F.R. § 241.3(c)**

**Requirements under the Regulation**

Under 40 C.F.R. § 241.3(c), the Regional Administrator is authorized to grant a non-waste determination for a non-hazardous secondary material (NHSM) that is used as a fuel and has been managed outside of the control of the generator, provided that the applicant demonstrates, and the Environmental Protection Agency finds that the NHSM meets the criteria as follows:

- It has not been discarded in the first instance;
- It meets the three legitimacy criteria set forth in 40 C.F.R. § 241.3(d), as follows:
  - the NHSM is managed as a valuable commodity;
  - the NHSM has a meaningful heating value and used as a fuel in a combustion unit that recovers energy, and;
  - the NHSM must contain contaminants at levels comparable to traditional fuels;
- It meets the five factors identified in the rule as follows:
  - market participants treat NHSM as a product, not a waste
  - chemical and physical identity of the NHSM is comparable to commercial fuels
  - the NHSM is used in a reasonable timeframe
  - constituents in the NHSM are released to air, water, land from point of generation up until combustion at levels comparable to traditional fuels and;
  - it meets other relevant factors

**Procedures under the Regulation**

Once the EPA has evaluated the petition to determine if the material has been discarded in the first instance, as well as evaluated the legitimacy criteria and other factors specified by the regulation, EPA will engage in the following actions:

- Issue a draft notice tentatively granting or denying the petition and disseminate the notice by publishing it in a newspaper advertisement or making a radio broadcast in the locality where the facility combusting the NHSM is located and by making it available on EPA's website;
- Accept public comment for 30 days;
- Hold a public meeting, if requested, or at the Regional Administrator's discretion and

- Issue a final determination after receipt and consideration of public comments.

## **Background**

In a letter dated September 27, 2017, Mr. Nathan Waech, Environmental Manager of UPM Blandin Paper Company and Ms. Melissa Weglarz, Air and Water Quality Manager, of the Rapid Energy Center (Allete/Minnesota Power), jointly submitted a petition, requesting that the EPA make a non-waste determination pursuant to 40 C.F.R. § 241.3(c) regarding the paper roll fiber cores generated by the UPM Blandin paper mill (hereafter referred as Blandin, paper mill or mill). Blandin submitted additional information in support of its position in correspondence dated: November 28, 2017, March 9, 2018, April 26, 2018, and August 21, 2018. EPA's review of Blandin's information against the requirements in the rule (as set forth above) is presented below.

## **Company Descriptions and Relationship**

UPM Blandin's (Blandin) paper mill operation is a pressurized ground wood pulp and paper mill. The facility manufactures lightweight, coated, ground wood paper for printers and publishers of magazines, catalogs, and other commercial printing. The boilers at the site, known as the Rapid Energy Center (REC) are owned and operated by Allete/Minnesota Power (MP). The REC includes two solid fuel boilers and two natural gas fired boilers. Although owned by the MP, the REC provides the paper mill with all its steam requirements, most of its pneumatic (pressurized air) requirements and a third of the mill's electrical demand. The REC does not provide steam, pressurized air or electricity to any entities other than Blandin. Blandin pays for any fuel that the REC purchases to combust in the boiler. Currently the REC does not combust the paper roll fiber cores generated at Blandin in their solid fuel boilers. The solid fuel boilers are currently permitted to combust coal and wood derived fuels. In the Supplement 2, dated November 28, 2017, to the petition, Blandin stated that the paper roll fiber cores are manufactured out of wood fiber (cardboard) and may include small amounts of adhesives or laminates.

## **Non Hazardous Secondary Material Description**

The paper mill process at Blandin generates three different types of paper roll fiber core materials. Blandin considers all three types of the paper roll fiber core materials as NHSM that would be burned in the REC's energy recovery solid fuel boilers.

The paper roll fiber cores are used in the papermaking process and are the cylinders upon which the paper is wound-up as the final paper roll product is being made.

For the purpose of this petition the NHSM consists of butt ends, fiber core dust compressed into plugs and the whole fiber core from a defective roll(s). The butt ends are generated when the fiber cores for paper rolls are cut to size using a circular saw. The cores are cut to generate the paper size needed to meet the customer's specifications and the remaining core is the butt end. The second NHSM is the core dust, which is the paper fiber core material that has been captured and collected during the cutting of the fiber cores. Blandin uses operational controls during the cutting to minimize and then capture any fugitive dust. This captured material is then compressed into a plug. The third fiber core material is a whole core from which the defective

paper has been removed. Then, depending on the condition of the core at the end of paper making or after removal of the defective paper, will it be determined, if the cores will be reused.

There are only four manufacturers of industrial fiber cores in North America. The company has requested that the petition cover all four manufacturers of the fiber cores generated in North America. The four manufacturers of fiber cores in North America that are currently being used or will be used by Blandin are Corenso, Caraustar, Sonoco and Corex.

Blandin has submitted contaminant information on the fiber cores from two manufacturers (Corenso and Sonoco), received the safety data sheets and has also submitted individual test results on the fiber cores. In the April 26, 2018 supplement 2 to the petition, Blandin stated “The test results attached to the original petition request were from two of the core manufactures: Corenso and Sonoco. Three of the samples analyzed were from Corenso, Blandin’s current supplier of fiber cores. At the time when the samples were submitted for analysis, the Sonoco HQ6, as well as Corenso 5.95 Eco 7 cores was being trialed. Both, the HQ6 and the 5.95 Eco7, cores are not currently being used. Cores from the two other core manufacturers were not sampled or analyzed for contaminants as Blandin did not purchase these cores.”

In an April 5, 2018, telephone call between Ms. Carol Staniec (EPA) and Blandin’s environmental consultant, Ms. Lori Bartels, EPA requested that Blandin supply contaminant data from the other suppliers (Caraustar and Corex) on the fiber core materials. In the April 26, 2018 supplement 2 to the petition, attached was a testimonial letter from a third vendor (Caraustar) that stated that their product has the characteristics of paperboard, and exempt from the SDS requirement as a wood product. No information was submitted about the Corex fiber cores. No contaminant data was submitted on the fiber cores from Caraustar and Corex.

## **Review**

To demonstrate that a non-hazardous secondary material that is to be burned as a fuel has not been discarded in the first instance, the petitioner needs to show that it was not initially abandoned or thrown away by the generator of the non-hazardous secondary material. This threshold requirement is addressed in **Section 1** below.

To be considered a non-waste fuel, the petitioner must also demonstrate that the NHSM satisfies the legitimacy criteria in 40 C.F.R. § 241.3(d)(1) and the five factors in 40 C.F.R. § 241.3(c). This analysis is address in **Sections 2a and 2b** below.

## **Section 1: Discarded in the first instance**

To obtain a non-waste determination from EPA, Blandin must demonstrate, as a threshold matter, that the fiber cores (cores) that it burns in its combustion units, has not been “discarded” in the first instance as that term is contemplated by the Resource Conversation and Recovery Act, 42 U.S.C. §§ 6901 to 6992k (RCRA). Such demonstration is based upon and consistent with the primary case law that uses the ordinary, plain-English meaning of the term, “discard” for purposes of defining a solid waste. 76 Fed. Reg. 15456, 15463 (2011). *See also American Mining Congress v. EPA*, 824 F.2d 1177 (DC Cir. 1987), and *Safe Food and Fertilizer v. EPA*, 350 F.3d 1263, 1268 (DC Cir. 2003) (court rejected argument that material that is transferred to another firm or industry for subsequent recycling must always be solid waste and noted that EPA has the

discretion to determine if the material is not a solid waste, even if it is transferred between industries). EPA further specified in the Preamble that “[t]o demonstrate that the non-hazardous secondary material that is to be burned as a fuel has not been *discarded in the first instance*, the petitioner would need to demonstrate that it was not initially abandoned or thrown away by the generator of the non-hazardous secondary material.” 76 Fed. Reg. 15538 (emphasis added).

Blandin explained in its September 27, 2017 petition request that historically the paper roll fiber cores had been combusted in the REC boilers. On March 1, 2000, Minnesota Power purchased and began operating the REC boilers. Before that date, Blandin owned and operated the REC boilers and combusted the fiber cores generated at the mill. Blandin stated that the only reason that the fiber core materials are not combusted now was the promulgation of the NHSM rules and the concern that the fiber cores were no longer under the control of the generator. The method of collecting and management of the fiber cores and plugs was established a long time ago, when Blandin owned the boilers. The same system of management, for the fiber cores and plugs still exists today.

In addition, Blandin’s petition indicates that it has only contracted with manufacturers that provided independent information and test results on the fiber cores to ensure that the cores produced and provided to Blandin are of high quality, optimal fuel value and have the consistency and characteristics of a valuable fuel product.

The NHSM material fiber core butt ends are collected immediately after cutting and transferred via a conveyor belt to a designated butt end hopper. The dust (fiber residue) from the cutting is collected in an internally vented baghouse connected to the enclosed cutter. The fiber dust drops down the baghouse in a plug maker and is transported into a plug collection hopper, which is indoors and protected from contamination. There is no other residue mixed in with the fiber residue for the plugs. For the whole fiber cores, the remaining pulp is slabbed off and if the core can no longer be used for rolling the paper, the cores are handled in a similar manner as the butt ends and the plugs. The fiber core’s length was pre-determined by customer specifications and is usually 15-123 inches. These cores are transferred via a conveyor belt to a designated core hopper, which is stored inside. Care is taken to avoid contamination, with other materials. Cores that are crushed during paper removal and cannot be reused are recycled off site. When the fiber core hopper is full it is delivered and dumped at the REC fuel lot.

At the REC fuel lot, the fiber cores, butt ends, and the fiber plugs will then be mixed with the biomass. This mixing is usually done with a front loader, and then placed in the wood storage bins. After the mixing, the material will be feed into a wood fuel chipper/grinder to be processed into smaller pieces. The material continues to be transported over a conveyor and passes through a metal detector and a series of disc screens. The screens classify the material according to size. The larger pieces will be returned to the wood bin for further processing, while the fuel mixture continues by conveyor to one of the REC solid fuel stoker boilers.

The manner in which the petitioners, Blandin and Minnesota Power, continue to select, collect and manage the fiber core and plugs at its respective facilities, demonstrates that the fiber core material has been treated as a valuable fuel that has not been initially disposed of, abandoned or thrown away and therefore it has not been “discarded in the first instance.”

## **Section 2a -Legitimacy Criteria**

Meeting of the legitimacy criteria is another way in which EPA determines that the fuel is truly a product fuel and is not discarded when combusted. In general, meeting the criteria means: 1) that the fuel is handled as a valuable commodity rather than as a non-valued waste, 2) has a meaningful fuel value, and 3) does not have contaminants in concentrations that exceed those in traditional fuels. In contrast if the material was not handled like a valuable product fuel, if it had low energy value, or was highly contaminated, EPA could conclude the material is not being legitimately burned for energy recovery and is released to the environment and discarded. Such material would then be considered a solid waste.

To be considered a non-waste fuel, Blandin's fiber cores that Minnesota Power burns as a fuel in its combustion units must meet the three legitimacy criteria under 40 C.F.R. § 241.3(d)(1):

1. the NHSM must be managed as a valuable commodity:
  - a. the storage of the NHSM prior to use must not exceed reasonable time-frames,
  - b. the NHSM must be managed in a manner consistent with an analogous fuel,
  - c. if there is no analogous fuel, the NHSM must be adequately contained to prevent releases to the environment;
2. the NHSM must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy; and
3. the NHSM must contain contaminants at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn.

### ***Material Managed As a Valuable Commodity***

The NHSM fiber core materials must be managed as a valuable commodity, including being stored for a reasonable time frame. In Blandin's correspondence, it was discussed that the fiber cores will be handled in the same manner as the REC's current fuels, biomass (wood and bark) and coal. Minnesota Power has required that Blandin cut the fiber cores to a measurement of 40 inches or less so that the cores will fit in the boilers as well as the analogous fuels. As with the biomass and coal, care is taken to ensure that the cores, butt ends, and the dust plugs are not contaminated with other material.

EPA stated in the 78 Fed. Reg. 15520, that "the reasonable time frame" is an appropriate standard considering the large number of nonhazardous material(s) that may be subject to this rule and is flexible enough to allow accumulation of these materials to be cost effective. In Blandin's determination of reasonable, the company knew that the fiber core materials are generated continuously, and the use and storage is predictable and can be kept consistent. Blandin's core collection bins are typically emptied every 24-36 hours. The time frame for emptying the core collection bins is similar to the time frame for storage prior to combusting the other traditional solid fuels when they come on site. The plug collection hoppers are emptied approximately every two weeks. These collections are the result of the hoppers being full, company practice to ensure that the quality of the fuel is maintained, and the piles are not subject to any additional contaminants or wet weather. The NHSM fuel is rotated in the same manner as the coal piles and biomass purchased fuels.

Blandin will mix the fiber core material in with the bark in the outside storage pile. Once mixed, Blandin manages the combination of fiber core material and bark in the same manner as unadulterated bark. Blandin will then transfer the product via front loader to the wood fuel chipper and grinder before being transferred to the storage barn. The purpose of the machines is to mix the material and then process the mixture into smaller uniform pieces. From the chipper and grinder, the material will be transported to the wood storage barn where a belt conveyer, feeds the mixture into one of the two REC solid fuel stoker boilers. The fiber core materials should be burned within two days of being delivered to the REC storage barn. It is anticipated that the REC would combust 100% of the quantity of fiber core material that is delivered, which is approximately 7.5 tons/month.

Just as the current fuel combination is considered a valuable commodity, as such, Blandin will consider the fuel combination made with fiber cores a valuable commodity. Any fiber core mixture loadings that are used in combustion would reduce the amount of bark and coal loadings, needed in the boilers. This additional fuel source reduces the cost of energy to both companies, Blandin and Minnesota Power. Blandin pays for any fuel that MP purchases, and therefore the companies will also reduce the amount of purchased fuel that is needed.

Based on the information discussed above, EPA finds that Blandin manages its fiber core material mixtures as a valuable commodity and does not exceed a “reasonable time frame” in storing its fiber core mixtures, as required by the NHSM final rule (40 C.F.R. § 241.3(d)(1)(i)(A)).<sup>1</sup>

### ***Meaningful Heating Value and Used As A Fuel to Recover Energy***

The second legitimacy criterion under the regulation is that the NHSM must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy. In the preamble to the NHSM rule, dated February 7, 2013, EPA stated a heating value benchmark of 5,000 Btu/lb. as fired (which includes moisture) to define a presumptive meaningful heating value. See 78 Fed. Reg. 9172 If heating values are lower than 5,000 Btu/lb., as fired, however, the petitioner is required to demonstrate to EPA that the energy recovery unit (ERU) can cost-effectively recover meaningful energy from the NHSM used as a fuel. Factors that may be considered by the Agency in determining whether a combustion unit cost-effectively recovers energy from NHSMs include, but are not limited to: whether the facility encounters a cost savings due to not having to purchase significant amounts of traditional fuels that it otherwise would need; whether the facility purchases the NHSM to use as a fuel; whether the NHSM can self-sustain combustion; and/or whether the facility’s operation produces energy that is sold for profit. See 76 Fed. Reg. 15523.

In its September 27, 2017 petition, Blandin tested the fiber core material from the two different manufacturers. The heating values for these fiber cores ranged from 6,771-7,344 Btu/lb. on a wet basis. The value range for dry basis is 7,032-7,461 Btu/lb. Both range values are greater than EPA’s benchmark of 5,000 Btu/lb., as fired (which includes moisture). Information from the two manufactures about the fiber cores heating values, on a wet basis, were greater than the heating values of the EPA’s benchmark. For these reasons, the fiber core materials from the two

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<sup>1</sup> The NHSM final rule does not define “reasonable time frame” as such time frames can vary among the large number of non-hazardous secondary materials and industries involved. See 76 Fed. Reg. 15523.

manufacturers can be considered to have a meaningful heating value and could be used as a fuel to recover energy.

The boilers at the REC are owned and operated by Allete/Minnesota Power. The REC includes two solid fuel boilers and two natural gas fired boilers. Although owned by the MP, the REC provides the paper mill with all its steam requirements, most of its pneumatic (pressurized air) requirements and a third of the mill's electrical demand. Blandin explained that the REC does not provide steam, pressurized air or electricity to any other entities other than Blandin and Blandin pays for any fuel that the REC purchases to combust in the boiler. Therefore, any fiber cores that are combusted reduce the amount of the bark/coal in the REC boilers purchased by Blandin.

The solid fuel boilers where the fiber core material will be combusted are spreader stoker boilers. To assist in the determination of whether the fiber core material is being used as a fuel and not being discarded when combusted, EPA looked to see if the recovery unit (stoker boiler) was able to burn a traditional fuel; i.e., coal and biomass. This included having an appropriate feed mechanism, (e.g. or a way to load the solid fuel of a particular size into the unit) and the ability to adjust the physical parameters to ensure spatial mixing and flame stability per unit specifications. Blandin stated that the purpose of the NHSM material entering the wood chipper and grinder machines are to mix the material with the traditional fuels, and then process the mixture into smaller uniform pieces. The ground fiber cores are transferred from the wood bin in the storage barn onto a conveyor belt. Once the material reaches the boilers, feeders distribute the wood and fiber core materials over the surface of a moving grate. This application of the fuel and fiber cores into the furnace and onto the grate results, in both the fuels burning equally by virtue of a thin, fast burning fuel bed.

EPA finds that the data and information provided by Blandin, on the REC boilers and the use of the fiber cores as a fuel, demonstrate that the REC's boilers can cost-effectively recover energy, that the material is not being discarded when combusted and, therefore, EPA finds that the fiber core material that Blandin burns in its boilers satisfies the second legitimacy criteria under the rule of being a material with a meaningful heating value and that is used as a fuel to recover energy.

### *Comparability of Contaminant Levels*

Regarding the third criterion, Blandin, indicated in its petition that its fiber core material contains contaminants or groups of contaminants at levels that are comparable to or lower than those in traditional fuel(s) (wood and coal) that the unit is designed to burn, based on data submitted to the Agency.

Blandin stated that the paper roll fiber cores are manufactured out of wood fiber (cardboard) and may include small amounts of adhesives or laminates. The sample results that Blandin submitted does include wood fiber materials and any adhesive that was added to the fiber core.

EPA compared the sample test results and information submitted with the petition and the two supplements against the values of the following traditional fuels: wood/biomass and coal and developed the comparison table that is attached to this document. As stated in 40 C.F.R. § 241.3(d) (1) (iii), “[i]n determining which traditional fuel(s) a unit is designed to burn, a person

may choose a traditional fuel that can be or is burned in the particular type of combustion unit.” The results in the contaminant table are based on a dry weight basis.

EPA finds that the data provided by Blandin, and presented in the contaminant table attached to this technical document, demonstrates that Blandin’s fiber core material meets the legitimacy criteria for contaminant levels, as it contains contaminants or groups of contaminants at levels comparable in concentration to or lower than those contained in wood/biomass and coal, all traditional fuels that the REC’s boilers are designed to burn.

### **Section 2b -- Criteria found in 40 C.F.R. § 241.3(c) (1) (i) through (v)**

As outlined above in the review section, the Agency must also evaluate the non-waste petition against the applicable factors in 40 C.F.R. § 241.3(c) (1) (i) through (v). The remainder of this document will address the factors found in 40 C.F.R. § 241.3(c)(1)(i) through (v).

#### ***Market participants treat NHSM as a product, not a waste***

The REC has limited the fiber cores to a maximum length and stated that best practices must be used to avoid contamination with other materials. These practices ensure that the fiber cores do not require additional handling, as compared to the traditional fuels that are burned. Once delivered to the REC, the fiber cores and plugs are transported to the boilers to be combusted in the same manner as the bark fuel. The petitioners have stated that they both have monetary incentives to maintain the quality of the fiber cores which helps ensure that the high quality is maintained in the fiber cores and the material is recognized as a valuable commodity, in addition to reducing the overall fuel costs. See the above discussion of how the fiber cores are managed as a valuable commodity for more information. Based on the information discussed above, the Agency finds that Blandin’s market participants treat the NHSM as a product, thus satisfying the requirements in 40 C.F.R. § 241.3(c)(1)(i).

#### ***Chemical and Physical identity of the NHSM is comparable to commercial fuels***

The analyzed chemical constituents of the fiber core material are presented in the attachment to this document that demonstrates that all levels of elemental metals, non-metal elements (chlorine, fluorine, nitrogen and sulfur), hazardous air pollutants (formaldehyde, 16-PAH) were below or comparable to the levels for traditional fuels. The traditional fuels used as a comparison are wood/biomass and coal. In the April 26, 2018 supplement to the petition, Blandin stated that NHSM material enters the wood chipper and grinder machines, along with the traditional fuels, to mix the fuel material and then process the mixture into smaller uniform pieces. This ensures that the material transferred from the wood bins by a conveyor belt to the boiler is physically similar. Once at the boilers, the feeders would distribute the wood and fiber core material over the surface of a moving grate. The addition of the fuel and fiber core material, into the furnace and onto the grate, results in both suspensions burning and resulting in a thin fast-burning fuel bed. The Agency believes that based on this information and the attached comparison table, the chemical and physical identity of the NHSM is comparable to that in commercial fuels, and, thus, satisfies the requirements in 40 C.F.R. § 241.3(c)(1)(ii).



***The NHSM is used in a Reasonable Timeframe***

Blandin stated that the fiber core collection bins are typically emptied every 24-36 hours. The plug collection hoppers are emptied approximately every two weeks. These collections are the result of the hoppers being full and company practice to ensure that the quality of the fuel is maintained, and the piles are not subject to any additional contaminants or wet weather.

Blandin will mix the fiber core material and plugs in with the bark in the outside storage pile. Once mixed, Blandin manages the combination of fiber core material and bark in the same manner and on the same schedule. Blandin will then transfer the product via front loader to the wood fuel chipper and grinder before being transferred to the storage barn.

As Blandin stated in its original submittal, under normal operations, from the storage barn, the fiber core materials will be burned within two days of being delivered to the REC and that the REC would combust 100% of the quantity of core material generated-approximately 7.5 tons/month. This two-day time frame is similar to the time frame for combusting the other traditional solid fuels when they come on site. The Agency believes that based on this information and information further described above, the NHSM is used in a reasonable time frame, thus satisfying the requirements in 40 C.F.R. § 241.3(c)(1)(iii).

***The Constituents in the NHSM that are released to air, water, land from point of generation up until combustion at levels are comparable to traditional fuels***

In the petition, Blandin stated that the hoppers that contain the fiber cores and plugs are transported to the REC boilers by fork lift trucks. The transport of the fiber core material will not generate any emissions as they are solid pieces that do not create dust when moved. The operational controls mentioned on page 2 for the processing of the sawdust into plugs minimize emissions and releases onto the ground during the transport. Once delivered to the wood yard the fiber cores and plugs are treated the same as the bark. Based on this information and that described above, the constituents in the NHSM that are released to air, water, land from point of generation up to combustion are at levels comparable to those in traditional fuels, and, thus, satisfy the requirements in 40 C.F.R. § 241.3(c)(1) (iiii).

***Other Relevant Factors***

As noted earlier, fiber cores and plugs were historically combusted in the REC boilers for many years, and cores are already a permitted fuel in the conjoined Blandin/REC Title V/Part 70 / State /Federal air permit. The REC boilers were designed to burn solid, fossil and biofuels. Combusting the fiber core material will reduce the combustion of traditional fuels including coal, a fossil fuel. As stated in the 76 Fed. Reg. 15542, “We (the Agency) believe NHSMs that have meaningful heating values that are used as non-waste fuels, in combustion units, provide a useful contribution and are valuable products, since they are replacing traditional fuels that otherwise would be burned.”

**Conclusion**

Based on the information provided in Blandin and Allete/Minnesota Power’s original petition request, dated September 27, 2017, and additional information submitted by the Company in

correspondence dated November 28, 2017, March 9, 2018, April 26, 2018 and August 21, 2018, EPA concludes that the fiber core material, supplied from two manufacturers, Corenso and Sonoco, when burned in the REC's combustion units for energy recovery, constitute a non-waste fuel under 40 C.F.R. Part 241. Not enough information, at this time, has been received regarding fiber cores manufactured at Caraustar and Corex, and therefore their fiber cores are not included in this non-waste determination.

Accordingly, EPA tentatively approves Blandin's petition for a non-waste determination, in part, and is seeking public comment. The discovery of any substantive discrepancy in the information provided by Blandin to EPA could result in a different conclusion by the Agency.

**Attachment**

Contaminant Concentrations Compared to Wood and Coal

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