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NCDENR

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

April 11, 2014

Mr. Robert J. Suida
Plant Manager
Craven County Wood Energy, L.P.
201 Executive Parkway
New Bern, NC 28562

SUBJECT: Applicability Determination No. 2400 – Secondary Material Determination
Craven County Wood Energy, L.P.
Facility ID No. 2500158
New Bern, Craven County

Dear Mr. Suida:

The North Carolina Division of Air Quality (NC DAQ) received your letter dated February 24, 2014 summarizing your analysis of creosote treated wood. Craven County Wood Energy, L.P. (CCWE) is proposing to burn creosote treated wood including railroad ties and utility poles as a fuel in an existing woodwaste-fired combustion unit (boiler) at the existing 50 megawatt power plant which consists of one woodwaste-fired boiler rated at 666 million Btu per hour. Note that the permitted fuel (woodwaste) in this case consists of clean wood, railroad ties, plywood trimmings, particle board, Weyerhaeuser sludge, brooder house poultry litter and cotton waste as well as natural gas/propane (startup fuel only) and used oil (onsite generated only). Air emissions from this source are controlled by a multicyclone identified as **(CD5A-1)** and an ESP identified as **(CD5A-2)**. The boiler is used to generate steam which in turn operates a turbine/generator to produce electricity for sale to PJM (a regional wholesale electricity transmission organization) in New Bern, North Carolina.

Creosote treated wood is a non-hazardous secondary material (NHSM) within the meaning of Title 40, Part 241 of the Code of Federal Regulations (40 CFR Part 241). The creosote treated wood described in the letters referenced above is processed and meets the legitimacy criteria provided in 40 CFR 241.3(d)(1). The NC DAQ has determined, therefore, that the material is not a solid waste when used as fuel in a combustion unit. This determination relies on the language of the current Federal rule defining NHSM, discussions NC DAQ has had with representatives of the EPA, and on the proposed changes to the NHSM rule.

Processing of Discarded NHSM – 40 CFR 241.3(b)(4)

Pursuant to 40 CFR 241.2, "processing" means any operations that transform discarded NHSM into a non-waste fuel. "Processing" includes, but is not limited to, operations necessary to: remove or destroy contaminants; significantly improve fuel characteristics of the material, *e.g.* sizing or drying the material in combination with other operations; or chemically improve the as-fired energy content. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for purposes of this definition. "Secondary material" means any material that is not the primary product of a manufacturing or commercial process, and can include post-consumer material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap.

The creosote treated wood that CCWE proposes to burn is collected directly from the railroad and utility companies and transported to National Salvage & Service Corporation (National Salvage) for processing before delivery to CCWE. The CTW is currently collected by National Salvage and directly transferred to CCWE for further processing. CCWE proposes to significantly improve the fuel combustion properties of the creosote treated wood in order to produce an engineered fuel prior to use in the boiler. CCWE will improve the fuel characteristics of the material through visual inspection, sampling/testing, screening (removal of foreign materials), sizing, grinding, blending with traditional clean biomass, and drying and aging of wood. The creosote treated wood will be sampled and tested regularly for moisture content, ash content and approximate heat value. Large physical materials will be removed manually and by mechanical screening. Ferrous metal substances will be removed by passing the material through a magnetic separation system. Quality assurance testing on representative samples on a batch basis will ensure that contaminant levels are comparable to or less than those found in traditional fuels which the boiler is designed to burn. Then the creosote treated wood will be stored in an appropriate concrete lined receiving area until it is blended. The stored creosote treated wood will blended within 45 days of arrival with an existing wood pile to ensure adequate consistency in moisture and energy content, and limit emissions from combustion. Finally, the blended creosote treated wood will be stored in one of two alternating drying piles to age the fuel for 30 to 45 days resulting in more efficient combustion in the boiler.

NC DAQ has determined that the processing steps described above meet the regulatory definition of "processing" in 40 CFR 241.2 with further support from a recent EPA determination of proposed NHSM fuels.[1]

Managed as a Valuable Commodity – 40 CFR 241.3(d)(1)(i)

CCWE will store the creosote treated wood in a concrete lined receiving area prior to using it as a fuel to prevent moisture uptake in the material. Use of the concrete lined storage areas, particularly to limit moisture intake, is consistent with typical management of wood chips and other biomass fuels. In addition, CCWE has indicated that it will store the creosote treated wood for less than 45 days prior to burning the material as a fuel. The NC DAQ concludes that these management practices satisfy the requirement that the NHSM be managed as a valuable commodity, and if so managed, the creosote treated wood meets the legitimacy criterion pursuant to 40 CFR 241.3(d)(1)(i).

Meaningful Heating Value – 40 CFR 241.3(d)(1)(ii)

In the preamble to the final NHSM definitional rule, US EPA indicated that materials with a heat content of at least 5,000 Btu/lb presumptively satisfy this criterion.[2] CCWE analyzed composite samples of creosote treated wood collected. The average as-received heating value of the creosote treated wood is 6,277 Btu/lb as noted in the data attached to your request.

Since the processed creosote treated wood has an average heat content greater than 5,000 Btu/hr (approximately 6,277 Btu/lb), the proposed fuel from the processed material satisfies this legitimacy criterion. The NC DAQ has determined that the material has meaningful heating value and meets the legitimacy criterion under 40 CFR 241.3(d)(1)(ii).

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[1] See Letter dated April 3, 2012 from Becky Weber, Director, Air and Waste Management Division , US EPA Region 7, to Mr. Gregory Haug, PE of Resource Enterprises, LLC. http://www.epa.gov/osw//nonhaz/define/pdfs/Lhoist-engineered-fuels.pdf

[2] 78 Fed. Reg. 9172 (Feb. 7, 2013).

Comparable Contaminant Concentrations – 40 CFR 241.3(d)(1)(iii)

In order for a NHSM to be classified as a non-solid waste fuel, it must "contain contaminants or groups of contaminants *at levels comparable in concentration to or lower than* those in traditional fuels which the combustion unit is designed to burn."[3]

Contaminants

Contaminants are defined as "all pollutants identified in the Clean Air Act sections 112(b) or 129(a)(4) *including the elements chlorine, fluorine, nitrogen, and sulfur in cases where non-hazardous secondary material are burned as fuel and combustion will result in the formation of hydrogen chloride, hydrogen fluoride, and nitrogen oxides or sulfur dioxide.*"[4] In addition to a specific list of pollutants and precursors that fall within the definition of "contaminants," the listing also excludes pollutants that are unlikely to be found in non-hazardous secondary materials as well as individual cresol and xylene isomers.[5]

The NC DAQ reviewed the concentrations of the following contaminants in the creosote treated wood:

- **Metals:** Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Mercury, Nickel, and Selenium
- **Halogens:** Chlorine, Fluorine
- **Additional Precursors:** Sulfur
- **Hazardous Air Pollutant (HAP) compounds:** PAH

Designed, not Permitted to Burn

To determine whether a NHSM satisfies the legitimacy criteria, the current rule requires that the contaminant levels in the NHSM be compared against the levels in "traditional fuels which the combustion unit is designed to burn."[6]

Further, the US EPA issued a Guidance Concept Paper indicating its intent to "address questions raised by industry, assist them in making determinations under the rule, and ensure their use of the flexibility embodied in the rule."[7] The Agency forecasted that the guidance would include a compilation of data it had collected on contaminant levels in traditional fuels which could be used by industry and other interested parties in the contaminant level comparison.

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[3] 40 CFR 241.3(d)(1)(iii) (February 7, 2013) (*emphasis added*). Note effective April 8, 2013; however, this rule revision does not affect the outcome of this determination.

[4] 40 CFR 241.2 (February 7, 2013) (*emphasis added*).

[5] The definition is as follows: "*Contaminants* means all pollutants listed in Clean Air Act sections 112(b) and 129(a)(4), with the following three modification. This definition includes the elements chlorine, fluorine, nitrogen, and sulfur in cases where non-hazardous secondary materials are burned as a fuel and combustion will result in the formation of hydrogen chloride (HCl), hydrogen fluoride (HF), nitrogen oxides (NO_x), or sulfur dioxide (SO_2). The definition does not include the following pollutants that are either unlikely to be found in non-hazardous secondary materials and products made from such materials or are adequately measured by other parts of this definition: hydrogen chloride (HCl), chlorine gas (Cl_2), hydrogen fluoride (HF), nitrogen oxides (NO_x), sulfur dioxide (SO_2), fine mineral fibers, particulate matter, coke oven emissions, diazomethane, white phosphorus, and titanium tetrachloride. The definition does not include m-cresol, o-cresol, p-cresol, m-xylene, o-xylene, and p-xylene as individual contaminants distinct from the grouped pollutants total cresols and total xylenes." See 78 Fed. Reg. 9212 (Feb. 7, 2013).

[6] 40 CFR 241.3(d)(1)(iii) (February 7, 2013).

[7] US EPA, "Non-Hazardous Secondary Materials (NHSM) Rule: Comparable Contaminant Guidance Concept Paper" (July 11, 2011. http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm-concept.pdf

The guidance was provided by US EPA on November 29, 2011. It consists of three tables that provide a range of compiled contaminant concentrations for coal, untreated wood and biomass materials, and fuel oils.[8] The table does not distinguish between concentration levels of different coal ranks (i.e., anthracite, bituminous, sub-bituminous, and lignite) or different types of biomass (i.e., wood, bark, biogas, hogged fuel, and agricultural plant residues).[9] This approach is consistent with the NHSM rule revisions that US EPA finalized on February 7, 2013.

The US EPA codified the meaning of "designed to burn" to include "a traditional fuel that can be or is burned in the particular type of boiler, whether or not the combustion unit is permitted to burn that traditional fuel."[10] Also, in the preamble of final rule US EPA clarified the language regarding potential fuel category groups that any grade/rank (e.g. anthracite, lignite, bituminous and sub-bituminous coal) could be used in the traditional fuel contaminant levels of "designed to burn" fuel for comparison purposes.[11]

CCWE is proposing to burn the processed creosote treated wood in an existing boiler system. CCWE has indicated that the boiler system is designed to burn solid fuels, including coal and wood but primarily burns wood/biomass. CCWE is also permitted to burn natural gas/propane (startup only) and used oil (onsite generated only). In accordance with US EPA's interpretation of "designed to burn," the NC DAQ compared the concentrations of contaminants in the creosote treated wood to the contaminant levels in coal, oil, and wood/biomass materials as provided in the November 29, 2011 guidance document and literature values.

Results of the Contaminant Comparison

The US EPA has indicated that a variety of comparisons could be made. For example, the highest contaminant levels in the NHSM could be compared against the highest contaminant levels in the relevant traditional fuels. Alternatively, the average values of the NHSM could be compared with the average values of the traditional fuels. "Anything less could result in 'traditional fuel' samples being considered solid waste if burned in the very combustion units designed to burn them – not the Agency's intent in either the 2011 NHSM final rule or February 7, 2013 NHSM final rule."[12] However, using different bases for comparison could lead to different results. The US EPA warned that "[i]t would not be appropriate to compare an average NHSM contaminant value to the high end of a traditional fuel range, as the existence of an average implies multiple data points from which a more suitable statistic (*e.g.,* range or standard deviation) could have been calculated." Finally, the US EPA warned that "in the context of an inspection or enforcement action, the Agency will evaluate the appropriateness of alternative methodologies and data sources on a case-by-case basis when determining whether the legitimacy criteria have been met."[13] The NC DAQ chose to use both maximum values and averages in this comparison.

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[8] US EPA, "Contaminant concentrations in Traditional Fuels: Tables for Comparison" (November 29, 2011). http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm_cont_tf.pdf

[9] This, despite the fact that a coal fired boiler is designed differently based on the rank of coal it will burn.

[10] 78 Fed. Reg. 9213 (Feb. 7, 2013).

[11] 78 Fed. Reg. 9148 (Feb. 7, 2013).

[12] 78 Fed. Reg. 9151 (Feb. 7, 2013).

[13] 78 Fed. Reg. 9151 (Feb. 7, 2013).

CCWE analyzed the contaminant levels in composite samples of creosote treated wood supplied by National Salvage. A summary of the measured contaminant levels and the contaminant levels in coal, oil and wood/biomass materials is provided as attachment to this letter. All contaminants show that the measured contaminant levels in the creosote treated wood are within the range of contaminant concentrations in the traditional fuel (wood/biomass, coal and oil) that the existing boiler system actually burns or is capable of burning (both using maximum values and averages).

Given the comparability of all relevant contaminants between biomass and creosote treated wood as characterized by your submittal, the NC DAQ has determined that the creosote treated wood does meet the legitimacy criteria under 40 CFR 241.3(d)(1)(iii).

Conclusion

As described in the letter received from CCWE on February 24, 2014, the creosote treated wood is processed and does meet the legitimacy criteria provided in 40 CFR 241.3(d)(1). Therefore, the NC DAQ has determined that it is not a solid waste when used as fuel in a combustion unit. As a result of this determination, the existing boiler would not be subject to the combustion source emission standards for biomass fuel promulgated pursuant to Section 129 of the Clean Air Act. If you have any questions regarding this NHSM determination, please contact Mr. Jeff Twisdale at (919) 707-8472.

Sincerely,

Mark J. Cuilla, CPM, Acting Chief, Permits Section
Division of Air Quality, NCDENR

Attachment

c: Washington Regional Office
Central Files

Appendix A
Comparison of Contaminant Levels in Creosote Treated Wood with Traditional Fuels
Craven County Wood Energy, L.P.

Metal elements - dry basis			Coal			Wood & Biomass			Fuel Oils			CCWE Tested Concentrations in Creosote Treated Wood					
Contaminant		Units	Full Range[1,2]			Full Range[1,2]			Full Range[1,2]			Utility Poles 9/4/2013	Railroad Ties 10/10/2013	Utility Poles 10/10/2013	Utility Poles 11/18/2013	Maximum	Status
Antimony	(Sb)	ppm	ND	–	10	ND	–	26	ND	–	15.7	<.678	<.500	<.500	<0.791	0	Within range of all fuels
Arsenic	(As)	ppm	ND	–	174	ND	–	298	ND	–	13	<1.36	<1.00	<1.00	<1.58	0	Within range of all fuels
Beryllium	(Be)	ppm	ND	–	206	ND	–	10	ND	–	19	<0.0678	<0.0500	<0.0500	<0.0791	0	Within range of all fuels
Cadmium	(Cd)	ppm	ND	–	28[4]	ND	–	17	ND	–	1	0.244	0.291	<0.100	22.3	22.3	Within range of Coal
Chromium	(Cr)	ppm	ND	–	168	ND	–	340	ND	–	37	0.937	4.84	0.67	1.44	4.84	Within range of all fuels
Cobalt	(Co)	ppm	ND	–	30	ND	–	213	ND	–	9	<0.678	1	<0.500	<0.791	1	Within range of all fuels
Lead	(Pb)	ppm	ND	–	148	ND	–	340	ND	–	57	2.75	5.96	0.542	0.606	5.96	Within range of all fuels
Manganese	(Mn)	ppm	ND	–	512	ND	–	15,800	ND	–	3,200	18.3	123	6.33	61.9	123	Within range of all fuels
Mercury	(Hg)	ppm	ND	–	3.1	ND	–	1.1	ND	–	0	<0.018	<0.0133	<0.0133	<0.021	0	Within range of all fuels
Nickel	(Ni)	ppm	ND	–	730	ND	–	540	ND	–	270	0.742	10.8	<0.250	0.422	10.8	Within range of all fuels
Selenium	(Se)	ppm	ND	–	74.3	ND	–	9	ND	–	4	1.42	<1	1.24	<1.58	1.42	Within range of all fuels
Non-metal elements - dry basis																	
Chloride	(Cl)	ppm	ND	–	9,080	ND	–	5,400	ND	–	1,260	NA	11.9	12	32.6	32.6	Within range of all fuels
Fluoride	(F)	ppm	ND	–	178	ND	–	300	ND	–	14	NA	4.14	7.6	<1.58	7.6	Within range of all fuels
Sulfur	(S)	ppm	740	–	61,300	ND	–	8,700	ND	–	57,000	824	282	309	348	824	Within range of all fuels
HAP compounds																	
PAH[3]	--	ppm	6	–	253	--	–	--	3,900	–	58,555[5]	19,421	31,183	54,893	21,513	54,893	Within range of Fuel Oils

[1]ND = Non Detect

[2]Coal, Wood & Biomass, and Fuel Oil ranges are from U.S. EPA's "Contaminant Concentrations in Traditional Fuels: Tables for Comparison" except as noted.

[3] CCWE tested for 17 PAH compounds.

[4] Gluskoter, H.J. and Lindahl, P.C., (1973), Cadmium - mode of occurrence in Illinois coals. Science, (188), 264-266.

[5] "Characteristics of Spilled Oils, Fuels, and Petroleum Products: 1. Composition and Properties of Selected Oils" U.S. EPA, (2003), Table 12.18.