UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE
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Alan Iantosca
Vice President Engineering and Projects
Fiberight, LLC
P.O. Box 21171
Catonsville, Maryland 21228

Dear Mr. Iantosca:

Thank you for your April 5, 2018, letter in which Fiberight, LLC (Fiberight) requested from the U.S. Environmental Protection Agency (EPA or Agency) its determination as to whether the fuel product EcoRight, produced at the Coastal Resources of Maine, LLC (CRM) Advanced Waste Processing Facility, is a non-waste fuel product under the Non-Hazardous Secondary Materials (NHSM) rule. In addition, Fiberight submitted to EPA a lab report containing contaminant, moisture, and heating value data for several samples obtained over several production days.[1] In the letter, Fiberight stated that EcoRight meets the legitimacy criteria of 40 CFR 241.3(d)(1) and should be considered a non-waste fuel when combusted in energy recovery units that would otherwise combust coal, provided the specifications identified in Fiberight's request are maintained.

To be designated as a non-waste fuel under 40 CFR 241.3(b)(4), the applicable regulations require that processing of the NHSM meet the definition of processing in 40 CFR 241.2. After processing, the NHSM must also meet the legitimacy criteria for fuels in 40 CFR 241.3(d)(1). Units that combust NHSM as fuels that do not meet these requirements are considered to be combusting solid waste and therefore must meet applicable emissions standards issued under section 129 of the Clean Air Act (CAA).

Based on the information provided in the April 5, 2018, letter and supplemental materials, as well as information provided during telephone discussions with EPA staff, we agree that EcoRight would be considered a non-waste fuel under the 40 CFR part 241 regulations when combusted in a unit designed to burn coal, provided the specifications identified in Fiberight's request are

[1] Supplemental information includes March 29, 2018 lab report where analysis results from six samples taken between March 11, 2017, and November 17, 2017, are presented.

maintained. Those specifications include: an ash content of 7 percent or less; a moisture content of 1 percent or less; a chlorine content of less than 0.3 percent; and a sulfur content at or above a 1:1 stoichiometric ratio with chlorine, when co-fired with coal at substitution rates up to 60 percent[2], determined by daily composite sampling.[3] The remainder of this letter provides the basis for our position, including the reasons for aforementioned conditions.[4] *If these conditions are not maintained, the Agency may reach a different conclusion.*

Background Information on EcoRight

Based on information provided to EPA, EcoRight is an engineered fuel product made from plastic films. It was initially developed at a pilot plant in Lawrenceville, Virginia, and now Fiberight intends to produce the material at the CRM Advanced Waste Processing Facility (AWPF) in Hampden, Maine, to be made commercially available as a substitute fuel for coal. CRM's AWPF has been issued Solid Waste and Air Licenses by the Maine Department of Environmental Protection (MDEP) allowing it to receive delivery of and process approximately 180,000 tons per year of municipal solid waste (MSW). Full scale operations were planned to commence at the Hampden facility near the end of 2018.

According to the information provided, EcoRight will be marketed as fuel to facilities that currently combust coal. The submitted letter and supporting information characterizes the EcoRight fuel as follows:

- Fuel/heat content of 16,448 to 18,880 Btu/lb as received,
- Moisture content of 0.4 percent,
- Chlorine content from 0.04 to 0.35 percent,
- Ash content no greater than 7 percent, and
- Sulfur content at or above a 1:1 stoichiometric ratio with chlorine when co-fired with coal at substitution rates up to 60 percent.

Processing

Processing is defined in 40 CFR 241.2 as operations that transform discarded NHSM into a non-waste fuel or non-waste ingredient, including operations necessary to: remove or destroy contaminants; significantly improve the fuel characteristics (e.g., sizing or drying of the material, in combination with other operations); chemically improve the as-fired energy content; or improve the ingredient characteristics. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for the purposes of the definition.

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[2] The 60% substitution rate ensures that the 1:1 sulfur to chlorine ratio is maintained.

[3] In similar previous non-waste determinations, EPA has included criteria of 15 percent or less moisture and ash content. Since the data provided by Fiberight indicate that the EcoRight material surpasses 15 percent by a substantial margin for both of these criteria, we have lowered these percentages to more accurately reflect the actual moisture and ash content reported for EcoRight.

[4] Note that a non-waste determination under 40 CFR Part 241 does not affect a state's authority to regulate a non-hazardous secondary material as a solid waste. Non-hazardous secondary materials may be regulated simultaneously as a solid waste by the state, but as a non-waste fuel under 40 CFR Part 241 for the purposes of determining the applicable emissions standards under the Clean Air Act for the combustion unit in which it is used.

The determination of whether a particular operation or set of operations constitutes sufficient processing to meet the definition in 40 CFR 241.2 is necessarily a case-specific and fact-specific determination. This determination applies the regulatory definition of processing to the specific discarded material(s) being processed, as described in correspondence and supporting materials, considering the nature and content of the material, as well as the types and extent of the operations performed on it. Thus, the same operations may or may not constitute sufficient processing under the regulation in a particular circumstance, depending on the material being processed and the specific facts of the processing. In some cases, certain operations will be sufficient to "transform discarded non-hazardous secondary material into a non-waste fuel," and in other cases, the same operations may not be sufficient to do so.

According to Fiberight, the following processing steps occurred at Fiberight's pilot plant in Lawrenceville, Virginia. Fiberight stated that the Maine facility will follow the exact same processing steps once the Maine facility completes construction and begins operation.[5]

1. Waste Evaluation

Incoming MSW will be deposited on the sorting floor, where it is visually inspected to identify any unacceptable waste such as construction and demolition waste (C&D), white goods (refrigerators, washers, etc.), and tires or other large bulky items that otherwise would not be able to physically pass through the conveyors and rotating drums. Fiberight is contractually not allowed to accept legally defined hazardous wastes. Based on the contract documents, Fiberight can reject loads containing the above materials and/or pull them out once it arrives on site and divert them to recycling or a landfill.

2. Mechanical Separation

Acceptable waste is then fed into the materials recovery facility (MRF), which uses the following manual and automated processes to separate recyclable materials, including rigid plastics, cardboard, mixed paper, ferrous and non-ferrous (i.e., aluminum) metal from the waste stream:

- A quality control pre-sort conveyor feeds the non-recyclable waste to a trommel (a large rotating cylinder with screens for size separation), which separates the material greater than 12 inches from material less than 12 inches in size.
    - Material greater than 12 inches is routed to a sort line, where recyclable material is removed, and then onto an old corrugated cardboard (OCC) screen, where recoverable cardboard is extracted and routed to the OCC bunker to be batch baled and sold. The material that passes through the OCC screen is routed to the pulping system for further processing.
    - Material 12 inches or less passes over a splitter screen. Material 8 to 12 inches is diverted to a 2D-3D Separator, and material less than 8 inches is routed to a fines screen.
        - Material under 2 inches (or "fines"), composed primarily of food waste, grit, and glass, is sent to the fines processing system for further processing.

[5] Fiberight's submittal on March 7, 2018.

- The 2 to 8-inch material is routed to a second 2D-3D separator. The 2D material is separated and sent to an optical sorting unit to remove recoverable mixed paper, with the remaining 2 to 8-inch 2D material then joining the 2D material from the first 2D-3D separator. The combined 2D material is then sent to another optical sorting unit, where plastic films are removed. The 3D material from both 2D-3D Separators is routed to the container optical sorting line where high density polyethylene (HDPE), polyethylene terephthalate (PET) and mixed 3-7 plastic containers are recovered and stored in individual bunkers to be batch baled and sold.
- The films stream, positively picked from the separated 2D materials, is sent to a quality control (QC) sorting conveyor for removal of any non-acceptable materials and then further processed and prepared for the briquetting skid, as described below. Actively targeting the films ensures fewer carry-over contaminants that must be removed from the material.

3. Briquetter Skid

After separation via the above processes, films undergo the following processing steps in preparation for the briquetter:

- Pneumatic conveyance over 250 feet to a hopper feeding a cyclone separator. Tumbling action from conveyance and the cyclone separator act to release the non-film contaminants, which "fall out" of the air stream. These non-film contaminants are periodically removed for disposal.
- Shredding. The films are then sent through a shredder, which produces a homogeneous material that can be consistently fed into the briquetter without large pieces wrapping around equipment or blocking flow into the heated dies. The rigorous physical treatment undergone in the shredder liberates non-film materials and contaminants that may be stuck to the films.
- Upon exiting the shredder, the films are transferred to a storage bin.

From the storage bin, films are conveyed to the briquetter. The material passes through a rotating drum magnet to remove any metals that still may be entrained in the shredded films. The briquetter forces the shredded films through heated dies, which melt the films together and produce elongated, rigid briquettes with sealed outer layers. As the extruded material exits the die, it breaks off into 4 to 6-inch pieces due to its own weight. The briquettes fall on to a conveyor which transports them to a storage bin.

Based on this description and evaluation of the processing, we believe Fiberight's operations meet the definition of processing in 40 CFR 241.2 and will transform waste materials into a processed, non-waste fuel appropriate for use in certain types of coal-fired combustion units. Specifically, incoming materials undergo inspection, positive optical sorting, manual QC sorting, cyclone separation, shredding, passage through a drum magnet for additional ferrous material removal, and various other processes before being heated and extruded to form EcoRight briquettes.

Legitimacy Criteria

Under 40 CFR 241.3(d)(1), the legitimacy criteria for fuels include: 1) management of the material as a valuable commodity based on the following factors – storage prior to use must not exceed reasonable time frames, and management of the material must be in a manner consistent with an analogous fuel, or where there is no analogous fuel, the material must be adequately contained to prevent releases to the environment; 2) the material must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy; and 3) the material must contain contaminants at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn.

Manage as a Valuable Commodity

Information submitted indicates that approximately 67 tons per day of EcoRight will be produced at the CRM facility and stored on tarped walking floor or dump trailers. CRM anticipates that 3 to 5 trailers per day of EcoRight will be transported to outside customers 5 days per week, with the duration of onsite storage expected to be limited to approximately 2 days. Once received at the combustion facility, EcoRight will be fed onto a conveyor and into the facility's storage pile for subsequent feed into the boiler or kiln. From a material handling perspective, EcoRight may be blended with the coal; however, it is expected that EcoRight will be kept separate to allow for greater control of the thermal output of the combustion system. EcoRight will be managed in the same manner as the coal fuel currently stored and combusted at the facilities. EcoRight can be scooped up in automated equipment and conveyed on the same systems currently in place for coal feedstocks. EcoRight will be processed in parallel with the existing feedstock and not be allowed to exceed normal storage periods for analogous fuels (i.e. coal) or degrade to the point of efficacy deterioration.

Based on this information, we believe that EcoRight will be managed as a valuable commodity by Fiberight and its customers after it is produced, and that storage – before and after delivery to customers – will not exceed reasonable time frames.

Meaningful Heating Value and Used as a Fuel to Recover Energy

Regarding the second legitimacy criterion, Fiberight indicates that heating values of sampled EcoRight range from 16,448 Btu/lb to 18,880 Btu/lb, and that the material will be used as a fuel in kilns and in combustion units that recover energy.

As the Agency stated in the preamble to the NHSM final rule, NHSMs with an energy value greater than 5,000 Btu/lb, as fired, are considered to have a meaningful heating value.[6] According to your specifications, EcoRight contains less than 1 percent moisture. Assuming a 1 percent moisture level, EcoRight would have an as-fired heating value between 16,280 and 18,690 Btu/lb. Thus, we believe that EcoRight meets the meaningful heating value criterion.

[6] See 76 FR 15541, March 21, 2011. Also see 76 FR 15482: "Except as otherwise noted, to satisfy the meaningful heating value criterion, the non-hazardous secondary material must have at least 5,000 Btu/lb, as fired (accounting for moisture), since the as-fired energy content is the relevant parameter that must be assessed to determine if it is being discarded rather than used as a fuel for energy recovery."

Comparability of Contaminant Levels

The third legitimacy criterion states that the NHSM must contain contaminants at levels comparable in concentration to or lower than traditional fuels that the combustion unit is designed to burn. The term "contaminants" refers to constituents in the NHSM that will result in emissions of air pollutants under Clean Air Act section 112(b) or the nine pollutants listed under Clean Air Act section 129, including those constituents that could generate products of incomplete combustion.[7]

The samples which have been analyzed as part of Fiberight's data submittal represent an EcoRight product produced from a combination of MSW from Long Island, New York and Lawrenceville, Virginia. Due to multiple factors, including limited supply capacity to the pilot plant, the nature of the receiving floor and the continuous process, it is impossible to discern which samples are derived from which source. If Fiberight were to attempt to completely process one "batch" or load of MSW through the system at a time, the material properties of the streams exiting the process would not be representative of an integrated and continuous operation. Although on a smaller scale, the pilot plant in Lawrenceville has been designed and operated to exacting conditions and parameters representative of the facility being built in Maine.

Regarding the third legitimacy criterion, Fiberight submitted a summary table comparing contaminant levels in traditional fuels (specifically, coal) with concentrations found in the EcoRight. Concentration data included results from independent laboratory analyses of six samples from the pilot plant.

A direct contaminant-to-contaminant comparison of these updated results are attached as Table 1. Based on the comparison, all contaminants in EcoRight are comparable to or lower than those contaminants in coal.

The conclusion that EcoRight meets the contaminant legitimacy criterion for units designed to burn coal (the only traditional fuel under comparison) assumes that EcoRight was tested for any contaminant expected to be present and at representative concentrations. Additional contaminants for which EcoRight was not tested and levels of contaminants during operations must be present at levels comparable to or lower than those in the appropriate traditional fuel, based on Fiberight's knowledge of the material.

Conclusion

Overall, based on the information provided, we believe that EcoRight, as described in Fiberight's letter and supplemental information, meets both the processing definition and the legitimacy criteria outlined above if the specifications in Fiberight's request are maintained, including: the ash content is maintained at 7 percent or less; the moisture content is maintained at 1 percent or less; the chlorine remains less than 0.3 percent; and the sulfur content remains at or above a 1:1 stoichiometric ratio with chlorine (when combined with coal), determined by daily composite

[7] See 40 CFR 241.2.

sampling. These specifications/conditions will ensure the consistency and homogeneity of the material, and that it will not contain waste materials for combustion or contaminant levels that exceed those typically found in traditional fuels. Accordingly, we would consider EcoRight a non-waste fuel (as described in this letter) under the 40 Part 241 regulations when combusted in units designed to burn coal at up to a 60 percent coal substitution rate.

If Fiberight has any other questions, please contact George Faison of my staff at (703) 305- 7652.

Sincerely,

Barnes Johnson

Barnes Johnson, Director
Office of Resource Conservation and Recovery

Attachment

Attachment

Table 1: Contaminant-by-Contaminant Comparison

Contaminant	Units	EcoRight[1]	Coal Range[2]	Results of Comparison
Metal Elements - dry basis				
Antimony (Sb)[3]	ppm	<4.0	ND - 10	Lower than coal
Arsenic (As)[3]	ppm	<1.0	ND - 174	Lower than coal
Beryllium (Be)[3]	ppm	<0.1	ND - 206	Lower than coal
Cadmium (Cd)[3]	ppm	<0.4	ND - 19	Lower than coal
Chromium (Cr)	ppm	3 - 17	ND - 168	Lower than coal
Cobalt (Co)[3]	ppm	<2.0	ND - 25.2	Lower than coal
Lead (Pb)	ppm	4 - 64	ND - 148	Lower than coal
Manganese (Mn)	ppm	10 - 26	ND - 512	Lower than coal
Mercury (Hg)	ppm	0.026 - 0.043	ND - 3.1	Lower than coal
Nickel (Ni)	ppm	2 - 8	ND - 730	Lower than coal
Selenium (Se)[3]	ppm	<2.0	ND - 74.3	Lower than coal
Non-metal elements - dry basis				
Chlorine (Cl)	ppm	367 - 3,553	ND - 9,080	Lower than coal
Fluorine (F)	ppm	39 - 48	ND - 178	Lower than coal
Nitrogen (N)	ppm	500 - 900	13,600 - 54,000	Lower than coal
Sulfur (S)	ppm	200 - 500	740 - 61,300	Lower than coal
Hazardous Air Pollutant (HAP) Compounds				
Benzene	ppm	ND	ND - 38	Lower than coal
Ethyl benzene	ppm	ND	0.7 - 5.4	Lower than coal
16-PAH	ppm	ND	6 - 253	Lower than coal
PAH (52 Extractable)	ppm	-	14 - 2,090	Lower than coal
Styrene	ppm	ND	1.0 - 26	Lower than coal
Toluene	ppm	ND	8.6 - 56	Lower than coal
Xylenes	ppm	ND	4.0 - 28	Lower than coal

ND = not detected

Notes:

1. EcoRight range represents fourteen samples taken on different days in October and November 2017 and tested by ALS Environmental
2. Ranges for Coal from a combination of EPA data and literature sources, as presented in EPA document Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011, available at https://www.epa.gov/rcra/contaminant-concentrations-traditional-fuels-tables-comparison.
3. Antimony, arsenic, beryllium, cadmium, cobalt, and selenium were not detected. In these cases, values presented in this table are the method detection levels (as the method reporting limit) for each contaminant.