UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

FEB 6 2013

Mr. Tony Fago
Roaring Spring Biofuel
740 Spang Street
Roaring Spring, PA 16673

Dear Mr. Fago:

In your letter of May 9, 2012, you requested clarification from the U.S. Environmental Protection Agency (EPA) that Roaring Spring Biofuel's fuel cubes are non-waste fuels when burned in combustion units in accordance with the requirements in 40 CFR part 241.3(b)(4). To be designated as a non-waste fuel under that section, the rule requires that discarded non-hazardous secondary material (NHSM) undergo processing as defined in 40 CFR 241.2. Also, after processing, the NHSM must meet the legitimacy criteria for fuels in 40 CFR 241.3(d)(1). Based on the information provided in your letter, and follow-up conference calls, we believe the fuel cubes produced by Roaring Spring Biofuel and burned in appropriate combustion units would constitute a non-waste fuel under 40 CFR part 241.[1] The remainder of this letter provides the basis for our position. *If there is a discrepancy in the information provided to us, it could result in a different interpretation.*

Roaring Spring Biofuel's Fuel Cubes

Roaring Spring Biofuel processes non-hazardous material feedstocks from "pre-consumer" sources in the industrial and commercial market sectors into fuel cubes. These sources include material from recyclers, local businesses, as well as internally generated waste material (primarily paper and other wood fiber based products).[2] The non-hazardous material feedstocks include paper and polymer based products, textiles, non-halogenated plastics, wood and packaging materials. You specifically state that hazardous wastes and halogenated plastics are, and will continue to be prohibited through arrangements with suppliers. In addition, you indicate that all materials are inspected by operators at the plant for quality to ensure that any hazardous materials are not commingled with the incoming materials. You stated that while the fuel cubes

[1] A non-waste determination under 40 CFR Part 241 does not preempt 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.

[2] We note that some "pre-consumer" material may not be a waste (e.g. various types of uncoated paper generated by a local paper manufacturer), since it may be re-used without being thrown away, abandoned or discarded. This letter addresses the processing of all the non-hazardous material feedstocks presuming they are a waste.

for which analytical testing was provided were produced from 70 percent paper and 30 percent plastic, it was also noted that the recipe for the fuel cubes could have the following composition: (1) between 55 to 100 percent paper fiber; (2) between 0 to 15 percent scrap wood, wood byproducts, unused grain (possible future feedstock)[3]; and (3) between 15 to 50 percent poly/plastic based materials.[4]

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.

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, taking into account the nature and content of the discarded 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.

In your letter, you state that upon receipt, the material is inspected to ensure that it meets strict specifications and that hazardous material and halogenated plastics are not mixed with the incoming material. You also state that every type of incoming material received will be verified against a check list that your company has developed that includes at least the following; physical characteristics of the materials, texture, and contaminants. The materials are then blended in exact ratios according to a "recipe" in order to produce a "fuel cube" that is consistent from both a heating value and composition standpoint. The actual blending is accomplished by placing a select amount of materials on the receiving floor where it is blended using a front-end loader. A number of waste streams coming from outside parties are combined in this blending process and subsequently, further refined through a shredder and screening process.

---

[3] In the future, you indicated that the materials may also include waste grain and paper sludge produced in the paper making process. This letter addresses only "pre-consumer" material and not grain or paper sludge.

[4] If the fuel cubes are produced with a different paper/plastic ratio (e.g., 50 percent paper and 50 percent plastic) and/or different raw materials are used, then you would also need to meet the same 40 CFR Part 241 criteria laid out in this letter for the reconfigured fuel cubes. The determination in this letter is limited to fuel cubes produced with the same paper/plastic ratio and raw materials as those for which you provided information regarding the legitimacy criteria.

As part of the process, the shredded, sized and blended material is passed through a drum magnet to remove metals. The material enters the drum on an incline conveyor. The drum has a stationary, 180 degree arc internal magnet, with an outer drum that rotates. When material passes over the powerful magnetic field, ferrous material is attracted to the drum surface where it is safely held until it passes through the non-magnetic field where it is discharged to the rear of the drum housing. Cleaned filtered material is discharged to the front of the drum on a conveyor belt.

This material is then sent to a cubing system. Just prior to the actual cubing, the material passes under a magnetic bar to further remove remaining metal. The cuber then extrudes the material into a very hard, dense cube through heated dies and the cubes are sized to create fuel cubes with a physical dimension of 1.25" x 1.25" x 2". In a follow-up phone conversation, you noted that the cubing processes create a homogenous material which increases combustion efficiency and improves fuel characteristics. Cubing also allows the product fuel to be more easily managed and transported.

Based on this description of your operations, we believe the specific process that you use to produce the fuel cubes meets the definition of processing in 40 CFR 241.2 thus transforming any discarded paper and polymer based products, textiles, non-halogenated plastics, wood and packaging materials into new product fuel cubes. We look at this, essentially, as a four step process. First, you direct suppliers to remove hazardous materials and halogenated plastics, for which you later inspect to make sure the incoming material meets strict specifications and has been initially processed to extract non-hazardous material. At your stage of production, you first blend the material according to exact ratios to improve its fuel characteristics by making it consistent for heating value and more homogeneous. After blending you remove metals that would not be suitable for burning by using a rotating drum magnet. In this process, the material passes over a powerful magnetic field, and metal contaminants are safely held until they pass through the non-magnetic field and are discharged. This part of the processing changes the chemical composition of the incoming material.[5] Finally, as discussed above, the cuber extrudes the material into a very hard, dense cube which is then sized to create a fuel that has the physical characteristics to make it a substitute for coal. As indicated above, the cubing processes contribute to homogeneity of the material, thus increasing combustion efficiency and improving fuel characteristics.

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

[5] Your May 9, 2012, letter states, "It is important to note that the process does not involve any chemical reactions or chemical processing. The production process is strictly a mechanical process. Thus, the chemical composition of the final fuel cubes is the same as the chemical composition of the incoming materials." We note that removal of metals is a type of chemical processing and removal of those metals alters the chemical composition of the material. In this instance, removal of metals through a primary drum magnet and secondary cuber magnet clearly changes the chemical composition of the incoming material. Although the *cubing* process may be strictly mechanical, the removal of metal contaminants (after blending but prior to cubing) is essential to our determination that the entire production process constitutes sufficient processing under 40 CFR 241.2.

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, 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

Regarding the first criterion, the processed fuel cubes are stored on site in fuel delivery trailers for no more than one week. The fuel cubes are then sold to manufacturing plants, lime and cement kilns, and biofuel boilers for their fuel value.

Based on that information, the material is managed as a valuable commodity and storage does not exceed a "reasonable time frame" as discussed in the NHSM final rule (40 CFR 241.3(d)(1)(i)(A).[6] Although no analogous fuel was identified, storage in buildings, storage bins and fuel delivery trailers is appropriate to prevent releases or contamination to the environment. Please note that the facilities receiving the fuel cubes must also manage them as a valuable commodity for the material to remain a non-waste fuel.

Meaningful Heating Value and Used As A Fuel to Recover Energy

Regarding the second legitimacy criterion, you indicated that Roaring Spring Biofuel's fuel cubes have a heating value between 9,000 and 10,000 Btu/pound as-fired. 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 (see 76 FR 15541, March 21, 2011). Thus, we believe that Roaring Spring Biofuel's fuel cubes meet the second legitimacy criterion.

Comparability of Contaminant Levels

Regarding the third criterion on contaminant levels, your letter requested confirmation that the fuel cubes meet the contaminant legitimacy criterion when compared to coal, the traditional fuel used in combustion units in which Roaring Spring Biofuels fuel cubes are designed to burn. In Attachment II of your submittal, "Roaring Spring Biofuel Contaminant Test Levels," you compared contaminant data for the fuel cubes to contaminant data for coal as outlined in the "Contaminant Concentrations in Traditional Fuels: Tables for Comparison." Your Attachment II is enclosed for reference.

As indicated in your Attachment II, the fuel cubes meet the legitimacy criterion for contaminant levels for which you tested when compared to coal. This conclusion assumes that the fuel cubes were tested for any constituents expected to be present. Additional constituents for which the fuel cubes were not tested must, as is the case for those tested, be present at levels comparable to or less than those in coal, based on your knowledge of the material.

---

[6] As discussed in the NHSM final rule (76 FR 15520), "reasonable time frame" is not specifically defined as such time frames vary among the large number of non-hazardous secondary materials and industries involved.

Conclusion

Overall, based on the information provided in your letter, we believe the facts indicate that the fuel cubes meet both the processing definition and the legitimacy criteria outlined above. Accordingly, we would consider this NHSM a non-waste fuel under the 40 CFR Part 241 regulations.

If you have any questions, please contact Michael Svizzero of my staff at 703-308-0046.

Sincerely,

Betsy Devlin, Director
Materials Recovery and Waste Management Division

Enclosure

Enclosure

Attachment II

Roaring Spring BioFuel Contaminant Test Levels
Comparison with Coal and Additional Selected HAP Compounds[1]

Contaminant	Units	Literature Sources	OAQPS Databases[2]			Roaring Spring Biofuel
		Range	Range	Average	Non-Detect Rate	70% paper & 30% plastic
Metal elements- dry basis						
Antimony (Sb)	ppm	0.5 – 10[3]	ND- 6.9	1.7	25%	0.714
Arsenic (As)	ppm	0.5 – 80[3]	ND- 174	8.2	8%	0.692
Beryllium (Be)	ppm	0.1 – 15[3]	ND - 206	1.9	12%	0.0524
Cadmium (Cd)	ppm	0.1 – 3[3]	ND - 19	0.6	38%	0.0583
Chromium (Cr)	ppm	0.5 – 60[3]	ND - 168	13.4	1%	5.1
Cobalt (Co)	ppm	0.5 - 30[3]	ND - 25.2	6.9	8%	1.98
Lead (Pb)	ppm	2 – 80[3]	ND - 148	8.7	5%	14.9
Manganese (Mn)	ppm	5.0 – 300[3]	ND - 512	26.2	<1%	22.3
Mercury (Hg)	ppm	0.02 – 1[3]	ND - 3.1	0.09	5%	0.033
Nickel (Ni)	ppm	0.5 – 50[3]	ND - 730	21.5	<1%	3.51
Selenium (Se)	ppm	0.2 – 10[3]	ND - 74.3	3.4	22%	0.4
Non-metal elements - dry basis						
Chlorine (Cl)	ppm		ND - 9080	992	4%	371
Fluorine (F)	ppm		ND - 178	64	9%	29.5
Nitrogen (N)	ppm		13600 - 54000	15090	0%	2000
Sulfur (S)	ppm		740 - 61300	13580	0%	200
Hazardous air pollutant (HAP) compounds						sampled in parts per billion (ppm)
16 -PAH	ppm	6.0 – 253[5]				<20.64
Benzene	ppm	ND – 38[4]				<5
Biphenyl	ppm	1000 – 1200[6]				<1.29
Cumene	ppm	6000 – 8600[7]				<5
Ethyl benzene	ppm	0.7 - 5.4[4]				<5
Formaldehyde	ppm	1.6 – 27[8]				14.7
Hexane	ppm	50 – 10000[6]				<5
Naphthalene	ppm	ND – 7330[6]				<5
Phenol	ppm	ND – 7700[6]				<1.29
Styrene	ppm	1.0 – 26[4]				<5
Toluene	ppm	8.6 – 56[4]				<5
Xylenes	ppm	4.0 – 28[4]				<5

Sources and Notes:

1. This table includes data for anthracite, bituminous, sub-bituminous, and lignite coal and selected additional HAPs from other fuel types.
2. USEPA, Office of Air Quality Planning and Standards (2011a & 2011b).
3. Clarke and Sloss (1992).
4. Fernandez-Martinez (2000).
5. Laumann, et al. (2011).
6. USEPA (2000).
7. World Health Organization (1999).
8. T. Hunt (2011).