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

SEP 17 2019

OFFICE OF
LAND AND EMERGENCY
MANAGEMENT

August 7, 2019

Martin H. Abbott, CEO
Alternative Fuel Solutions, LLC
830 Madison Park Dr.
Madison, AL 35758

Dear Mr. Abbott:

In your letter dated September 25, 2018, you requested clarification from the U.S. Environmental Protection Agency (EPA) that your process engineered fuel, called Btu Boost, is a non-waste fuel product under the Non-Hazardous Secondary Materials (NHSM) rule. In your letter, and in subsequent follow-up letters dated December 17, 2018, March 11, 2019, and June 11, 2019, you provided information regarding your process and product specifications, as well as information regarding your position that Btu Boost meets the legitimacy criteria (per 40 CFR 241.3(b)(4)) and, thus, should be considered a non-waste fuel.

To be designated as a non-waste fuel under 40 CFR 241.3(b)(4), the 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).

Based on the information provided in your letter and supplemental correspondence, we believe that Btu Boost, produced by Alternative Fuel Solutions, LLC (AFS), and burned in combustion units for energy recovery, would constitute a non-waste fuel under 40 CFR part 241. The remainder of the letter outlines the information and logic used to reach this determination.

Background Information on Btu Boost

Btu Boost, according to the information provided, is derived from by-products of pre-consumer clean source materials, such as medical, pharmaceutical, and/or food grade packaging where the material has already been purified of most unwanted substances.

Prior to the acceptance of any NHSM, AFS will require that feedstock materials under consideration be tested by a 3rd party fuels analysis testing laboratory. AFS will not accept polyvinyl chloride (PVC) or polymers high in other known air toxins such as nitrogen or sulfur. Upon completion of pre-screening of NHSMs, AFS will make selections based on acceptable contaminant levels and energy values. All materials accepted and approved will be stored in clean, unused super sacks or gaylords and transported through AFS's approved contracted trucking company or rail service. The NHSMs will not be co-mingled with any foreign materials. The NHSMs targeted for a feedstock for Btu Boost will be predominately pharmaceutical, medical or food grade polymers, plastics, and waxes. All NHSMs will be collected directly from the manufacturer and/or industry facilities. The materials stream will not be derived from municipal solid waste (MSW); no post-consumer refuse will be used due to uncertainty of contamination.

In your December 2018 letter, you again confirmed that no remnants of commercial/construction building materials, or refuse-derived materials will be used to produce Btu Boost. In the same letter, you noted that for quality assurance, and prior to the transformation of feedstock NHSMs, AFS provides an additional visual inspection of all materials for any exposure to foreign materials or damage to storage containers during transportation. Upon the arrival of the NHSM to the AFS facility, test results will have been loaded into a proprietary software to pre-determine the appropriate proportionate mixtures prior to the transformation of the NHSMs into Btu Boost.

According to the supplemental information you provided, the pelletized densification process and the hydrophobic nature of the NHSMs used will make Btu Boost shed water and resist moisture uptake, as opposed to coal and biomass, which generally absorb water. Since consistent moisture content is necessary for effective combustion of solid fuels, Btu Boost will buffer moisture fluctuation, thus, assuring a more consistent energy output and minimize emissions.

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 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 details 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.

As described in your letters, the processing of Btu Boost involves the following steps:

1. As an initial matter, the incoming NHSM consists entirely of pre-consumer clean source materials, such as medical, pharmaceutical, and/or food grade polymers, plastics, and waxes where the material has already been purified of most unwanted substances. No PVC or polymers high in other known air toxins such as nitrogen or sulfur will be accepted based on 3rd party testing prior to receipt by the plant
2. Prior to the transformation of feedstock NHSMs, AFS provides an additional visual inspection of all materials for any exposure to foreign materials or damage to storage containers during transportation
3. Magnets above a conveyor remove metal products from the materials stream
4. Material is shredded down to approximately 2-inch size
5. Additional metals are removed via secondary magnets
6. Different types of material, such as plastics or cardboard boxes are mixed to achieve the desired blend
7. Material is shredded further to half-inch size
8. Material is sent through a pellet mill to produce fuel pellets. The size of pellets is determined by customer demands.
9. Pellets are passed through a cyclone to remove any residual fines
10. Pellets are loaded directly on a truck or into shipping containers. The pellets are in clean boxes or supersacks.

The finished product may be stored at the processing plant; however, the storage time is expected to be less than one week. Once delivered to the end user, the fuel is expected to be used quickly, depending on facility-specific fuel storage needs.

<u>Legitimacy Criteria</u>

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, 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

According to the information you provided, any Btu Boost stored at the processing plant is not expected to be stored for more than one week. Pellets are adequately contained after production (in order to prevent leakage and to provide shelter from adverse weather) by loading the pellets directly on a truck or into shipping containers. Once delivered to the end user, AFS expects the fuel to be used quickly, be managed as a valuable product fuel, and be adequately contained prior to use, similar to traditional fuels they are replacing.

Based on this information, we agree that Btu Boost is managed as a valuable commodity after it is produced, and that storage does not exceed reasonable time frames.

Meaningful Heating Value and Used as a Fuel to Recover Energy

According to your letters, AFS expects that Btu Boost will be used by power generating facilities as a fuel for steam generating units. Therefore, the criterion that the combustion unit recovers energy is satisfied.

AFS analyses and information indicate that the heating value of Btu Boost ranges between 11,600 and 12,350 Btu/lb as received, with a moisture content between 4 and 5 percent. 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.[1]

Comparability of Contaminant Levels

In the enclosures to your September 2018, December 2018, and June 2019 letters, you compared contaminant data for Btu Boost against coal and biomass. The range of concentrations found in multiple test samples of the product, both before and after pelletization, are presented for comparison in Table A which I have attached below as part of this letter.

Based on these comparisons, all but one contaminant in Btu Boost are lower than, or within the range of, those contaminants found in coal or biomass. The highest reported antimony concentration exceeds contaminant concentrations in coal and wood/biomass, so a comparison of a low volatile metals (LVM) grouping[2] was carried out. The LVM contaminant group includes antimony, arsenic, beryllium, chromium, cobalt, nickel and manganese. The resulting LVM value is lower than the lowest maximum LVM group value for the traditional fuels.

The conclusion that Btu Boost meets the contaminant legitimacy criterion for units designed to burn coal and biomass assumes that the Btu Boost was tested for any contaminant expected to be present. Additional contaminants for which Btu Boost was not tested must be present at levels comparable to or lower than those in the appropriate traditional fuel.

Conclusion

Overall, based on the information provided, we believe that Btu Boost, as described in your letters and supplemental information, meets both the processing definition and the legitimacy criteria when burned in combustion units designed to burn coal and biomass for energy recovery. This assumes that the above specifications in your request are maintained. This determination does not apply to NHSM that fails to satisfy these specifications. These specifications/conditions

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[1] See 76 FR 15,456, 15,541 (2011).

[2] See 78 FR 9112, 9146-47 (2013) for discussion of grouping as an appropriate methodology for contaminant comparison.

will ensure the consistency and homogeneity of the fuel product and that it will not contain waste materials for combustion, including contaminant levels that exceed those comparable to those typically found in coal or biomass. Accordingly, we would consider this NHSM a non-waste fuel (as described in this letter) under the 40 Part 241 regulations.

If you have any other questions regarding the non-waste determination, please contact Jesse Miller of my staff at (703) 308-1180.

Sincerely,

Cass Elliott

for Betsy Devlin, Director
Materials Recovery and Waste Management
Division

Attachment (1)

Attachment
Table A – Contaminant-by-Contaminant Comparison

Contaminant	Units	AFS BTU Boost[1]	Wood / Biomass: Range[2]	Coal[2]	Results of Comparison
Metal Elements - dry basis					
Antimony (Sb)	ppm	0.32 - 37.9	ND - 26	ND - 6.9	Flake sample above wood/biomass range, all others within wood/biomass range
Arsenic (As)	ppm	ND - 0.31	ND - 298	ND - 174	Lower than wood/biomass and coal
Beryllium (Be)	ppm	0.014 - 0.019	ND - 10	ND - 206	Lower than wood/biomass and coal
Cadmium (Cd)	ppm	ND - 0.041	ND - 17	ND - 19	Lower than wood/biomass and coal
Chromium (Cr)	ppm	0.06 - 5.7	ND - 340	ND - 168	Lower than wood/biomass and coal
Cobalt (Co)	ppm	0.16 - 24.5	ND - 213	ND - 25.2	Lower than wood/biomass and within coal range
Lead (Pb)	ppm	ND - 0.41	ND - 229	ND - 148	Lower than wood/biomass and coal
Manganese (Mn)	ppm	0.11 - 14.4	ND - 15,800	ND - 512	Lower than wood/biomass and coal
Mercury (Hg)	ppm	0.0008 - 0.02[3]	ND - 1.1	ND - 3.1	Lower than wood/biomass and coal
Nickel (Ni)	ppm	ND - 3[3]	ND - 540	ND - 730	Lower than wood/biomass and coal
Selenium (Se)	ppm	0.405 - 1.00[3]	ND - 9.0	ND - 74.3	Lower than wood/biomass and coal
Total LVM	ppm	1.6 - 84.8[4]	ND - 17,227	ND - 1,822	Lower than wood/biomass and coal
Non-metal elements - dry basis					
Chlorine (Cl)	ppm	ND - 129	ND - 5,400	ND - 9,080	Lower than wood/biomass and coal
Fluorine (F)	ppm	52 - 140	ND - 300	ND - 178	Lower than wood/biomass and coal
Nitrogen (N)	ppm	1,800 - 5,400	200 - 39,500	13,600 - 54,000	Lower than wood/biomass and coal
Sulfur (S)	ppm	ND - 1,740	ND - 8,700	740 - 61,300	Lower than wood/biomass and coal
Volatile Organic Compounds (VOC)					
Total VOCs[4]	ppm	ND - 2.23[5]	1.6 - 27	--	Lower than wood/biomass
Semi Volatile Organic Compounds (SVOCs)					
Total SVOCs[5]	ppm	<1,809[6]	---	28.3 - 2,243	**Within coal range**

Notes:

1. Except as noted, range is based on three samples of final pelletized Btu Boost product and one sample of "Flake" (product prior to pelletization). Testing was conducted between March 2012 and May 2019.
2. Ranges for Wood & Biomass Materials and Coal come 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. The 0.02 ppm value from March 2017 test report was non-detect, but the detection limit was higher than results from other samples tested. The detection limit from the March 2017 test report is therefore conservatively listed as the upper end of the range.
4. Some low volatile metal results were non-detect; the sums listed for the total LVM range conservatively include the detection limits for those contaminants.
5. Based on one sample of Btu Boost product and one sample of "Flake" (product prior to pelletization). Testing was conducted between March 2012 and May 2019.from May 29, 2019 report. No analytes were detected in the pelletized product. The upper value of the range is the sum of the individual analyte reported detection limits. Only one analyte (1,2,4-Trimethylbenzene) was detected in the "Flake" sample, and its concentration was 0.0386 ppm.
6. Based on single sample of Btu Boost product from May 29, 2019 report. No analytes were detected. The value shown is the sum of the individual analyte reported detection limits.