



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

March 21, 2019

Mr. Michael W. Martunas
Environmental Manager
Dragon Products Company, LLC
Box 191, U.S. Route 1
Thomaston, Maine 04861

Dear Mr. Martunas:

In your October 8, 2018 letter, on behalf of Dragon Products Company, LLC (Dragon), you requested to remove the on-hold status of your 2013 request and seek confirmation from the U.S. Environmental Protection Agency Region 1 that the discarded carpet (nylon/polyester/polypropylene) you plan to process into fuel would not be considered a solid waste when burned in your combustion unit. To be designated as a non-waste fuel under 40 CFR § 241.3(b)(4), the rule requires that there be processing of the non-hazardous secondary material (NHSM) that meets the definition of processing in 40 CFR § 241.2. Also, after processing, the NHSM must meet the legitimacy criteria in 40 CFR § 241.3(d)(1) to be designated as a non-waste fuel. Based on the information provided in your letter, supporting materials, and data obtained during EPA's May 30, 2018 site visit, we believe that the processed carpet materials would be considered a non-waste fuel under the 40 CFR Part 241 regulations, when combusted in the Dragon facility's cement kilns which are designed to burn coal¹.

The remainder of this letter provides the basis for our position. The determinations made in this letter are based on the assumption that the information provided by your company is accurate and complete. Also, the determinations made in this letter will apply only if the company ensures that the specifications of the material being burned and associated procedures are consistently maintained and unaltered over the time frame needed to burn this material.

1. Note that 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 a state, but also determined to be a non-waste fuel under 40 CFR Part 241 for the purpose of determining appropriate emission standards under the Clean Air Act for the combustion unit in which it is used.

Background

Dragon operates a Portland cement manufacturing facility located in Thomaston, Maine. In 2013, Dragon established an Alternate Fuel Program (ALTF) at the facility and with this request is proposing to utilize an alternative fuel stream in its Portland cement kiln. The proposed alternate fuel is a discarded carpet stream generated as part of a clean-up activity at an abandoned rifle range facility in Warren, Maine. The former rifle range facility owner accepted large quantities of carpet material that were intended to be used to construct back-drop berms for the rifle-range. The former owner no longer operates the site and the carpet material is being stored in large piles (the total material is estimated to be approximately 30,000 tons) as well as part of berms that were constructed prior to the shut-down of the facility. Additionally, this site was never formally operated as a rifle range. The Maine Department of Environmental Protection (MEDEP) is working with Dragon to pursue processing the material as a fuel in the cement manufacturing process.

The carpet material from the Warren site will be extracted from the piles and separated from any “non-fuel” contaminants (i.e. unwanted materials not used as fuel by Dragon including: scrap metal material, debris, dirt, plant material, wood, etc.). In addition to the initial removal of “non-fuel” contaminants, air drying will be done to promote moisture removal. Once the “non-fuel” material is separated from the carpet, the carpet will then be transported to Dragon’s facility in Thomaston, Maine. Once onsite, the material will be inspected, and if further removal of “non-fuel” contaminants or moisture removal is needed, it will be conducted. The material will then be shredded into approximately 1.5-inch nominal pieces and fed into the cement manufacturing process. Dragon has developed a draft Standard Operating Procedure (SOP) outlining the Reclamation, Delivery, and Processing of Material from the Warren Site (Attachment 1).

The purpose of this letter is to provide a regulatory interpretation concurring with Dragon’s view that the processed carpet material when burned in cement kilns (combustion units) is a non-waste fuel under 40 CFR Part 241. The NHSM regulations under 40 CFR Part 241 identify which NHSM are, or are not, solid waste when burned in combustion units. Units that burn non-waste fuel in cement kilns would not be subject to section 129 Clean Air Act (CAA) requirements but are subject to other applicable air emission control requirements.

Processing

Processing is defined in 40 CFR § 241.2 as operations that transform discarded NHSMs into a non-waste fuel or a 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 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 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 October 8, 2018 letter, you stated that the carpet material used at Dragon will go through several stages of inspection and material separation to remove “non-fuel” contaminants prior to being cut/shredded into 1.5-inch nominal size pieces to improve its fuel characteristics.

Dragon’s draft SOP outlines in detail the reclamation, delivery, and processing of material from the Warren site. The SOP states that contractors reclaiming carpet from the Warren site must use an excavator with appropriate lifting attachments or equivalent piece of heavy equipment for the reclamation of material. If material is covered with clay, soil, and/or organics the material will first be removed to expose the carpet beneath. The contractor will clamp the carpet and lift, shake and drop the carpet material in order to free any debris material, as needed. The operator will remove metal bands by hand picking, magnetic removal or other methods to the extent possible before placing on truck. If the carpeting is from the native ground surface, the operator will ensure that soil, rocks, other debris are not loaded into truck; in addition to following the metal band removal, as stated above.

Since small portions of the Warren site have evidence of trespassers/vandals using the area as make-shift target backstops, the SOP has defined procedures for handling the carpet material as solid waste. In these areas, the material shall be removed to a 3-foot horizontal depth and disposed of off-site as a solid waste in accordance with State and Federal regulations.

Once the carpet material has gone through the initial removal of all “non-fuel” contaminants including excess moisture; the carpet will be delivered to the Alternative Fuels Unloading Area at Dragon Products. Additional processing will be completed at this time. The material will be visually inspected to ensure it is free of all “non-fuel” contaminants and verification will be done to ensure that excess moisture is not present. If “non-fuel” contaminants are noted, additional processing will be completed as specified in the SOP. If excess moisture is noted, the material will be stockpiled to air dry and “turned-over” to expose wet material and promote evaporation.

The dry and “non-fuel” contaminant free material will then be loaded onto a conveyer to move to the shredder to reduce the material size to 1.5-inch nominal size. This is the optimal particle size for material handling and combustion in the kiln system.

Based on all the information that Dragon has provided, EPA believes these operations, in the particular circumstances outlined in the October 8, 2018 letter and supporting documentation, meet the definition of processing in 40 CFR § 241.2. EPA also believes that Dragon will transform the discarded carpet into a processed, non-waste fuel by removing “non-fuel” contaminants and improve the fuel characteristics as necessary for use as ALTF. Until the carpet material has been sufficiently processed, it is considered a solid waste. This NHSM determination will only be in effect for the Warren site carpet and will not apply to other materials.

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, 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 or group of 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

Dragon proposes to accept processed carpet for use in the kiln’s fuel handling system. The material will be delivered and stored in live-bottom or direct dump trailers. The Alternative Fuel Storage location is permitted to store 10,000 tons of material; utilizing the oldest material first. Dragon plans to stage 1-3 days’ supply of the Warren carpet at the unloading area and no more than 2 weeks supply in the shredder staging area. As outlined in the Alternative Fuels, Fuels Management Plan (2013), Dragon maintains a concrete pad, bermed on three sides with concrete barriers for storage of the material. Stormwater run-off from the pad is managed under Dragon’s Stormwater Protection Plan. After initial and onsite processing, including shredding, the material will be fed directly into feeders that convey the material into the fuel system. The Warren carpet represents a significant value to Dragon’s Alternate Fuels Program.

Based on this information, we agree that the contained carpet will be managed as a valuable commodity by Dragon after it is processed. Storage within the haul trucks or within the bermed area, and the stormwater management plan prevent and minimize any environmental release of the material. Additionally, we agree that, in light of the fibrous nature of the material, storage for no more than two weeks after delivery to the Dragon facility will not exceed reasonable time frames.

Meaningful Heating Value and Used as a Fuel

The discarded carpet analyses obtained by Dragon reveal a heat value of approximately 12,500 to 15,400 Btu/lb. 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). Therefore, we believe that the processed material meets the meaningful heating value criterion.

Comparability of Contaminant Levels

Regarding the third legitimacy criterion, Dragon's laboratory analysis of discarded carpet demonstrates that contaminant levels, or groups of contaminant levels, in the carpet are "comparable in concentration to or lower than" the same contaminants in the traditional fuel (coal) the units are designed to burn² (see Tables 1 and 2).

During EPA review of the December 3, 2013 submittal, a direct contaminant-to-contaminant comparison utilizing Dragon's data showed that the detected concentration of metal elements including: antimony; cadmium; chromium; lead; and chlorine in the Warren site carpet stream were either slightly higher or higher than the average concentration of those elements in petroleum coke (primary fuel used at Dragon). However, in June 2014 Dragon provided additional data for cobalt, manganese, fluorine and nitrogen to coal, showing that contaminants were within the range of the concentration with the exception of antimony. With the October 8, 2018 resubmittal, Dragon provided recent data for samples collect in July 2018. The 2018 analytical results are consistent with the data Dragon previously provided showing levels comparable to or lower than coal. Since it is allowable to compare NHSM data to the traditional fuel that the combustion units are designed to burn (40 CFR 241.3(d)(1)(iii)) and Dragon has confirmed in the October 8, 2018 letter that the kiln is designed to burn coal, it is allowable to compare the carpet stream data to coal. Coal is traditional fuel and has sufficient EPA and literature contaminant data.

Also, EPA previously stated that, for the purpose of contaminant comparison, it could be appropriate to compare groups of contaminants in NHSM to similar groups in traditional fuels, provided that the groups of contaminants share physical and chemical properties that influence behavior in the combustion units prior to the point where emissions occur (76 FR 9146). While the Agency does not consider the grouping of total metals to be appropriate, it states that metals can be grouped into volatile, semi-volatile and low volatile categories (78 FR 9147). To address the concern for antimony, a low volatile metal, during the 2013 to 2014 interaction between EPA Region 1 and Dragon, a comparison table of low volatile metals (LVM) group was created.

The results in Tables 2 show that the total LVM group (including antimony) concentration, in the processed carpet is lower than or comparable to the group concentration in the coal. Therefore, we agree that the processed carpet meets the contaminant legitimacy criterion for units that can burn coal. This assumes that the carpet was tested for all contaminants expected to be present in significant amounts. Based on Dragon's submissions, this appears to be the case, but it is the company's responsibility to ensure that the testing was comprehensive, based on knowledge of the waste.

Conclusion

² It should be noted that the Dragon kiln system is designed to burn multiple traditional fuels including both coal and petroleum coke. At present, Dragon's kiln is burning only petroleum coke.

Overall, based on the information provided, we believe that the processed carpet material, as described in your October 8, 2018 letter, meets the processing definition and the legitimacy criteria outlined above. Accordingly, based on the information you provided, we would consider this NHSM (as described in Dragon's letter) a non-waste fuel under the 40 Part 241 regulations when burned in Dragon's cement kilns (combustion units) that are designed to burn coal.

If you have any questions, please contact Beth Deabay of my staff at (617) 918-1343.

Sincerely,



Bryan Olson, Director
Office of Site Remediation and Restoration

Enclosures:

Table 1: Dragon Products **NHSM Comparison of Warren Carpet Contaminants to Coal**

Table 2: Low Volatile Metals (LVM)¹ Group Comparison

Attachment 1: Standard Operating Procedures Reclamation, Delivery, and Processing of Material from the Warren Site

CC: Patrick Bird (EPA Region 1)
Lynn Muzzey (MEDEP)
Samir Bukhari (EPA Region 1)
George Faison (EPA ORCR)

Table 1
Dragon Products
NHSM Comparison of Warren Carpet Contaminants to Coal

Contaminant	Units	Coal Range	Warren Carpet Data	
			2012/2014	2018
Metals:				
Antimony (Sb)	ppm	ND – 6.9	115.9	110.0
Arsenic (As)	ppm	ND - 174	0.1	1.4
Beryllium (Be)	ppm	ND - 206	0.002	ND
Cadmium (Cd)	ppm	ND – 19	1.051	ND
Chromium (Cr)	ppm	ND - 168	27.98	14.0
Cobalt (Co)	ppm	ND – 25.2	-	13.0
Lead (Pb)	ppm	ND - 148	81.24	25.0
Manganese (Mn)	ppm	ND - 512	-	49.0
Mercury (Hg)	ppm	ND – 3.1	0.042	ND
Nickel (Ni)	ppm	ND - 730	13.21	2.2 J
Selenium (Se)	ppm	ND – 74.3	3.328	ND
Non-metals:				
Chlorine (Cl)	ppm	ND – 9080	4600	800
Fluorine (Fl)	ppm	ND - 178	-	< 10
Nitrogen (N)	ppm	13600 - 54000	-	4100
Sulfur (S)	ppm	740 - 61300	274.5	67.0 J
Heat Content*	Btu/lb	-	12723	12400

Notes:

- ND = non-detect
- J = data reported between the Limit of Quantitation and the Limit of Detection - estimated
- Coal data is from “Contaminant Concentrations in Traditional Fuels: Tables of Comparison”, U.S. EPA, dated November 29, 2011.
- Warren site carpet value in first column represents one sample analyzed during 2012 (Sb, As, Be, Cr, Ni) and one sample analyzed during 2014 (Co and Mn).

Table 2: Low Volatile Metals (LVM)¹ Group Comparison

Contaminant	Units	Warren site Carpet ²	2018 Warren site Carpet	Coal: Range ³	Results of Comparison
Metal Elements					
Antimony (Sb)	ppm	115.9	110.0	ND-10	Not comparable to coal
Arsenic (As)	ppm	0.1	1.4	ND-174	Lower than coal
Beryllium (Be)	ppm	0.002	ND	ND-206	Lower than coal
Chromium (Cr)	ppm	27.98	14.0	ND-168	Lower than coal
Cobalt (Co)	ppm	16	13.0	ND-30	Lower than coal
Manganese (Mn)	ppm	24	49.0	ND-512	Lower than coal
Nickel (Ni)	ppm	13.21	2.2J	ND-730	Lower than coal
Total LVMS	ppm	197.192	189.6	ND->730⁴	Lower than coal
<p>Notes:</p> <ol style="list-style-type: none"> See 40 CFR 63.1219 (e) (4) for reference on low-volatile metals (LVM) group. Warren site carpet value represents one sample analyzed during 2012 (Sb, As, Be, Cr, Ni) and one sample analyzed during 2014 (Co, Mn). Range for Coal is from a combination of EPA data and literature sources, as presented in EPA document <i>Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011</i>, available at www.epa.gov/epawaste/nonhaz/define/index.htm. The high and low ends of each individual metal's range do not necessarily add up to the total LVM range. This is because maximum and minimum concentrations for individual metals do not always come from the same sample. 					

	Dragon Products Company, LLC. ENVIRONMENTAL DEPARTMENT	SOP XXX
DATE REVISED:		EFFECTIVE DATE: 01/1/18
SUBJECT: Standard Operating Procedures Reclamation, Delivery, and Processing of Carpet Material from Warren, Maine		

BACKGROUND AND PURPOSE

The following Standard Operating Procedure (SOP) provides guideline requirements for the reclamation, delivery, and processing of the automotive carpet material (carpet) stockpiled at a former firearm facility in Warren, Maine (Warren site). The carpet material will be delivered to Dragon Products Company, LLC (Dragon) in Thomaston, Maine to be used as an alternative fuel source for the manufacture of portland cement.

The Warren site contains approximately 30,000 tons of exposed carpet material. The material consists of unused baled carpet cuttings from the automotive industry. The source of the material is a manufacturing company located in Lewiston, Maine that produces automotive interiors for major automotive manufacturing companies, i.e. Ford, General Motors, etc. In 1997 the carpet material was delivered to the Warren site to be used as back-stops and sound barriers for a proposed sport shooting/rifle range. The business venture was unsuccessful and the rifle range was never completed. The material has been sitting idle onsite since the late 1990's. In addition to the exposed carpet material, an unknown volume of carpet material covered with a soil/clay cover also exists at the site. Although the initial focus will be on the processing and removal of the exposed material, this SOP addresses the processing of both exposed and covered carpet material.

Dragon is licensed under air emission license A-326-70-E-R/A and Solid Waste Order #S-20851-WV-X-N to utilize carpet material shipped directly from the manufacturer in Lewiston, ME as an alternative fuel source for the manufacture of portland cement. After seeking approval from EPA to burn the carpet material under its existing licenses the EPA granted approval on XXXX XX, 2018 for Dragon utilize the carpet material from the Warren site as an alternative fuel source for the manufacture of portland cement.

This SOP provides reclamation processing criteria to ensure sufficient processing occurs prior to Dragon burning the carpet for energy recovery. This SOP sets forth Dragon's requirements for carpet material to be acceptable for processing at the Thomaston facility. In addition, the SOP provides guidelines for additional processing at the Thomaston site in order to effectively utilize the material.

POLICY AND PROCEDURES

WARREN SITE

Reclamation and Processing Requirements

APPROVED BY:	PREPARED BY: Environmental Department	PAGE NO.: 1 of 1

	Dragon Products Company, LLC.	SOP XXX
	ENVIRONMENTAL DEPARTMENT	
DATE REVISED:		EFFECTIVE DATE: 01/1/18
SUBJECT: Standard Operating Procedures Reclamation, Delivery, and Processing of Carpet Material from Warren, Maine		

Contractors reclaiming the carpet material from Warren for delivery to Dragon must sufficiently process the material in order to remove non-fuel contaminants. Contaminants such as wood, plastic, metal, soil, and debris must be removed from the material prior to loading into trucks. In addition to contaminant removal the material will be handled in a manner to promote moisture removal through air drying. Handling methods will include, but are not limited to, additional staging and stockpiling onsite. Material with excess moisture will be stockpiled in a manner that promotes additional air drying and the stockpile will be “turned-over” to expose wet material and promote additional moisture removal. Once dried the material can be loaded for transport to Dragon.

Baling wire and metal bands used to secure the material into bales must be removed prior to being loaded into trucks. The material must be visually inspected to ensure the material is free of non-fuel contaminants.

The contractor will use an excavator with appropriate lifting attachments or equivalent piece of heavy equipment for the reclamation of the material. If the material is covered with clay, soil, and/or organics, this material will first be removed to expose the carpet material beneath. Once the reclamation equipment is fixed in place and a truck is staged for loading, the equipment operator will carefully clamp and lift the carpet material. The operator will shake and drop the material in order to free the material of debris, as necessary. The equipment operator will remove metal bands (by hand picking, magnetic removal, or other method) to the extent practicable prior to placing the material onto the truck. Metal bands will be recycled or otherwise disposed of in accordance with State and Federal regulations for solid waste. When reclaiming material from the native ground surface the operator must ensure soil, rocks, and other debris is not inadvertently excavated and loaded with the carpet material.

Small portions of the site have been used by trespassers/vandals as make-shift target backstops. Any material that has been obviously used for such purposes (evidenced by bullet holes, target remnants, etc.) shall be removed to the horizontal depth of three feet. This material shall not be processed into fuel and shall be disposed of off-site as solid waste in accordance with State and Federal regulations.

Delivery Requirements

Carpet material being delivered to Dragon must be free of all non-fuel contaminants such as wood, plastic, metal, soil, etc. In addition, all excess moisture should be removed prior to delivery. Each load of carpet material must be weighed prior to unloading. Dragon has a truck scale at the cement plant in Thomaston, ME that can be used to weigh the material located at Dragon’s Distribution Department.

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	Dragon Products Company, LLC.	SOP XXX
	ENVIRONMENTAL DEPARTMENT	
DATE REVISED:		EFFECTIVE DATE: 01/1/18
SUBJECT:	Standard Operating Procedures Reclamation, Delivery, and Processing of Carpet Material from Warren, Maine	

Each load of carpet must be delivered to the Alternative Fuels Unloading area. After unloading, the truck delivering the material must return to the scales for a post-weight in order to accurately determine the volume of carpet received. Dragon reserves the right to refuse any load that contains excess contaminants or moisture.

DRAGON SITE

Processing Requirements

Additional processing must be completed on the carpet material delivered to Dragon prior to introduction into the shredding system as discussed in this section.

All material in the Alternative Fuels Unloading area will be visually inspected to ensure it is free of non-fuel contaminants such as rocks, wire, and organics. Any contaminants found through this examination will be removed and the clean material transported to the Shredding Staging area. The visual inspection will also determine if excess moisture is present in the material that will require additional air drying. Material with excess moisture will be placed adjacent to the Shredder Staging area and stockpiled in a manner that promotes additional air drying (moisture removal). The stockpile will be "turned-over" to expose wet material and promote evaporative drying. Once dried the material will be moved to the Shredder Staging area to be loaded into the shredding system.

Dragon's shredder utilizes a conveyor to introduce material into the shredding system. Once material is loaded it is conveyed into the shredder for size reduction. Dragon has used various screen sizes to evaluate the optimal particle size for combustion of the virgin carpet material in the kiln system. After several years of processing experience Dragon has determined that a 1.5-inch screen size provides the optimal particle size for material handling and combustion in the kiln system. Once the material passes through the shredder's screening system it is conveyed to a secondary hopper where it is metered onto the long conveyor that transports the material to the calciner portion of the kiln system and combusted.

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