July 22, 2016

George Faison
U.S. Environmental Protection Agency
OSWER, ORCR
1200 Pennsylvania Ave. NW
Mail Code 5303 P
Washington, DC 20460

Phone - (703) 305-7652
Fax - (703) 308-8638
faison.george@epa.gov

Re: Change of Company Name – Non-Hazardous Secondary Material Determination Regarding ReEngineered Feedstock

Dear Mr. Faison:

On August 24, 2012, the Environmental Protection Agency (EPA)'s Office of Solid Waste and Emergency Response issued a Non-Hazardous Secondary Material ("NHSM Letter") to ReCommunity, Inc. confirming that ReEngineered Feedstock produced under the supplied specifications would qualify as non-waste fuel under 40 C.F.R. part 241. As you may recall, we met and corresponded with you on several occasions in 2011 through 2012 along with Claudia O'Brien from Latham & Watkins.

On August 5, 2013, ReCommunity Inc. and its affiliates spun off a new company, MPH Energy LLC, later to be renamed Accordant Energy, LLC ("Accordant") for the purpose of developing and supporting the use of ReEngineered Feedstock products in the field. As Accordant continues to own the intellectual property related to ReEngineered Feedstock, we request that you replace references to ReCommunity, Inc. with Accordant Energy, LLC in your record, including on your website and elsewhere. Accordant remains deeply committed to ensuring that manufactured ReEngineered Feedstock will meet the processing definition under 40 C.F.R. § 241.2 and the legitimacy criteria under 40 C.F.R. § 241.3(d)(1) and, as result, ReEngineered Feedstock will continue to be considered a non-waste fuel product pursuant to 40 C.F.R. § 241.3(b)(4).

We thank you in advance for your assistance with this request. Please let me know if you require additional information.

Sincerely,

Paula A. Calabrese
Senior Vice-President
Accordant Energy, LLC
Paula.calabrese@accordantenergy.com
Telephone (802) 772-7368

Cc: Claudia O'Brien, Esq.

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

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

AUG 24 2012

Ms. Claudia O'Brien
Mr. Robert Wyman
Latham and Watkins LLP
555 Eleventh Street N.W. Suite 1000
Washington, D.C. 20004-1304

Dear Ms. O'Brien and Mr. Wyman:

In your letters of February 17 2012, and February 22, 2012, you requested clarification from the U.S. Environmental Protection Agency (EPA) that ReEngineered Feedstock is a non-waste fuel product under the Non-Hazardous Secondary Materials (NHSM) rule.[1] To be designated as a non-waste fuel pursuant to 40 CFR 241.3(b)(4), the regulations require that processing of 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 must meet applicable emissions standards issued under section 129 of the Clean Air Act.

Based on the information provided in your February 17th and February 22nd letters, additional supporting materials submitted,[2] as well as several meetings with EPA representatives, we believe that the ReEngineered Feedstock proposed to be generated by ReCommunity, Inc. (ReCommunity) would be considered a non-waste fuel under the 40 CFR part 241 regulations.[3] 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.*

Proposed Project

You indicated that ReCommunity developed ReEngineered Feedstock to convert the largest remaining portion of non-recyclable materials from mixed waste streams (comingled municipal solid waste, commercial waste, and institutional waste) into a useful product. ReEngineered Feedstock is a fuel manufactured from non-recyclable fibers, light plastics, and hard plastics

[1] This letter responds only to the request for "confirmation" that your material is not a waste-derived fuel contained in the comments you submitted on EPA's proposed amendments to the NHSM rule (76 FR 80452), and does not address any other aspects of those comments.. Additionally, the matters involved in this response are not part of the rulemaking for the December 2011 proposal.

[2] Additional supporting materials include a July 23, 2012 letter from Robert Wyman to Joseph Goffman and Lisa Feldt, a July 26, 2012 email from Robert Wyman to George Faison, and a July 27, 2012 email from Eli Hopson to Peter Tsirigotis.

[3] 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.

removed from the waste stream and processed, along with virgin materials, such as sorbents.[4] You indicated that ReEngineered Feedstock has fuel-like qualities relative to coal, as well as serving as an air pollutant control technology. Although ReEngineered Feedstock ultimately will be used to produce a range of commercial and industrial products, the first use will be as a replacement for coal in coal-fired power plants and industrial boilers. This letter responds only to ReCommunity's proposed use of ReEngineered Feedstock as a coal replacement for combustion in boilers.

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.

Processing of municipal, institutional, and commercial waste streams conducted by ReCommunity is a sophisticated process that essentially involves extracting a product from a waste, which is how we view the process described in the white paper attached to your February 17, 2012 letter.

The white paper indicated that the objectives of the ReEngineered Feedstock process, which includes sorting, material characterization, fuel manufacturing and sorbent addition, are to: 1) maximize the effectiveness, scope, and financial viability of a single stream recycling process, and 2) engineer a homogenous fuel that is consistent over time with contaminant levels equivalent to substitute fuels, that provides meaningful heating value and that controls emissions. The process consists of two broad phases: the Multi-Material Processing Platform (MMPP) and Advanced Product Manufacturing (APM).[5]

Multi-Material Processing Platform (MMPP)

The white paper stated that the process begins by accepting source materials in the form of comingled municipal, institutional, and commercial waste streams at the advanced Material Recovery Facility (MRF). The MRF is designed to receive, sort, process, and store recyclable materials, and to handle mixed residential, commercial, and institutional waste. Once the source materials arrive on the tipping floor, they are pre-sorted to separate out large metals and large rigid plastics to be sent to the recycling commodity market, as well as bulky materials that cannot be processed.

After the presorted source material enters the MMPP, it is shredded and sent through a fiber separator that extracts all fibers from the waste stream. The extracted fibers are then sent through

[4] Sorbents are virgin materials and not NHSMs. Although a component of the ReEngineered Feedstock, these virgin materials would have no impact on the status of the ReEngineered Feedstock as an NHSM fuel.
[5] The description of the processing operation is taken from the white paper.

two optical sorting stations calibrated to remove remaining rigid plastics and segregate old corrugated containers and old newspapers for recycling. The optical sorting stations also segregate any remaining non-recyclable plastics and remove them to the plastics processing flow. The remaining non-recyclable fibers are finely shredded and sent through a fluidized bed separator. Fluidized bed separation removes all nonconforming particles (*i.e.,* heavy inerts and non-combustibles) and any microscopic metal fragments attached to the fibers that are too small for magnetic or eddy current separation. The pure fibers are then granulated and sent to the fiber silo.

The non-fiber stream is exposed to a drum separator, a magnetic separator, and an eddy current separation to recover all recyclable metals. The magnetic separator removes the majority of the ferrous metals from the waste stream. Ferrous metals contain iron (*e.g.,* steel, pig iron, and other iron alloys such as stainless steel) and as a result can be removed with magnets. The eddy current separator creates an energy field around the non-ferrous metals (*e.g.,* aluminum, copper, brass, etc.) which causes them to repel from the other waste. After the ferrous and nonferrous metals are removed, the waste stream moves through an optical sorting station. The optical sorter is calibrated to separate out high density polyethylene ("HDPE") and polyethylene terephthalate (PET) from the waste flow for recycling, and will substantially remove greater than 80% of the polyvinyl chloride (PVC) material from the stream. The removed PVC will be separated and sold into the PVC recycling market.

The remaining post-sorted plastics will be further subjected to thermal treatment to remove any chlorine embedded in the remaining plastics. The PVC thermal treatment module is located following the low speed shredder on the non-fiber stream. The thermal treatment system uses thermal energy to actuate the devolatilization properties of PVC material remaining in the non-fiber plastic stream following PVC optical sort removal. The free chlorine is then directed to a packed trona reactor designed to convert free chlorine into salt, preventing any release of off-gas to the atmosphere. This two-step process is designed to bring the discrete constituent stream down to the comparable levels of chlorine found in other fuels. The remaining non-recyclable plastics are then subjected to fluidized bed separation to remove heavy inerts and non-combustibles and any microscopic metal fragments attached to the plastics that are too small for magnetic or eddy current separation. Fluidized bed separation also separates and segregates hard plastics and soft plastics. The segregated hard plastics and soft plastics are then granulated and sent to their respective silos.

Advanced Product Manufacturing (APM)

After the completion of the MMPP, you indicated that the fibers, light plastics, and hard plastics that have been segregated into separate silos are free from any non-combustible materials, inert residues, or "prohibitive materials" (materials with significant contaminant concentrations when combusted, including PVCs, electronics, batteries, drywall and similar items). In the fuel manufacturing and sorbent incorporation phases, the constituent ingredients are metered, volumetrically mixed in the correct proportion, and conditioned (pelletized and granulized) to produce an end product that suits the energy needs of each end user. In order to maximize the effectiveness of the sorbents, hard plastics and sorbents are first precisely metered, mixed, and pelletized. This ensures that the sorbents are effectively synthesized across the ReEngineered

Feedstock's profile so that it is activated to the optimal point in the combustion process. After the sorbents have been synthesized into the profile of the hard plastics, the pellets are granulized. The desired amounts of granulated fibers and soft plastics are then metered and mixed with the granulated hard plastics and sorbents. The thoroughly mixed feedstock is then pelletized. Depending on the specifications of the customer, ReEngineered Feedstock can be transported and stored in pelletized form or granulated and delivered in Super Sack® or Gaylord containers.

Based on this description, we believe your operations meet the definition of processing in 40 CFR 241.2 and will transform the processed materials into a non-waste fuel by significantly improving the fuel characteristics and removing contaminants.[6] In particular, thermal treatment operations that remove remaining chlorine embedded in the plastics, and fluidized bed separation that removes inert and other prohibitive materials are clearly not "minimal operations" as described above in the Part 241 processing definition.[7]

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 at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn.

Manage as a Valuable Commodity

As indicated above, ReEngineered Feedstock is to be burned as a fuel by combustion units in addition to the traditional fuel coal; specifically, you note that the ReEngineered Feedstock will comprise between 20 to 30 percent of the fuel used in coal-fired power plants and industrial boilers. As a result, coal constitutes the analogous traditional fuel to which ReEngineered Feedstock will be compared for purposes of the legitimacy criteria. You note that because ReCommunity's manufacturing process enables it to produce a final product that is both homogeneous and consistent, meaning that the fuel characteristics are consistent both within a single batch and across multiple batches produced on different dates and/or at different locations, combustion units will not need to purchase and stockpile large quantities of ReEngineered Feedstock to guarantee an adequate supply. Thus, the ReEngineered Feedstock will be used promptly after delivery, ensuring the material is never stored for longer than a "reasonable time frame" as discussed in the NHSM final rule (40 CFR 241.3(d)(1)(i)(A).[8]

---

[6] You also note that the processing operation conducted by ReCommunity is expected to produce a fuel product that will likely also reduce dioxin formation compared to facilities firing 100 percent coal. July 27, 2012 email from Eli Hopson to Peter Tsirigotis.

[7] Prior to completion of the processing of the waste, these materials are considered solid waste and are subject to the appropriate federal, state, and local regulations.

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

Once ReCommunity meters, mixes, and conditions the component materials and manufactures the ReEngineered Feedstock, it typically subjects it to a densification process to produce pellets that reduce the risk of release of ReEngineered Feedstock into the environment during transportation. Whether delivered to end users in pellet or granulated form, however, ReEngineered Feedstock is transported in sealed 1,000-pound Super Sack® and Gaylord containers that minimize the threat of release.

Based on this information, we believe that the ReEngineered Feedstock will be managed as a valuable commodity—that is, used promptly after delivery with storage times not exceeding a reasonable time frame.

Meaningful Heating Value and Used as a Fuel to Recover Energy

Regarding the second legitimacy criterion, you indicated that the ReEngineered Feedstock can be designed to have a heating value between 6,500 and 10,000 Btu/pound. 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 the ReEngineered Feedstock meets the second legitimacy criterion.

Comparability of Contaminant Levels

The enclosed table outlines the concentrations of contaminants contained in coal and the values for the same contaminant concentrations in ReEngineered Feedstock. Information submitted by ReCommunity presented average concentrations and standard deviations for the first set of contaminants shown in the table, while ranges of contaminant concentrations were presented for the second set of contaminants. As shown, the average contaminant concentrations in the first set of contaminants are lower than average concentrations in coal. Given that ReEngineered Feedstock is a precisely engineered material, you indicated that significantly lower variability is expected in ReEngineered Feedstock than is naturally found in coal.

The ranges in the second set of contaminants shown are comparable to or less than the ranges shown for coal. As you discussed in your email of June 26 from Robert Wyman, the second set of contaminants was based on materials sourced from refuse derived fuel (RDF) facilities, rather than ReEngineered Feedstock, as that was the most readily available material. The RDF material, however, was processed utilizing hammer mill shredding, which tends to cross-contaminate fibers with trace metals. While ReCommunity then processed the RDF-sourced material as they would ReEngineered Feedstock, the initial hammer-mill shredding reduced the size and intermingled all materials at a level that makes it impossible to fully recover the feedstock to pre-hammer mill shredded conditions. As the metal concentrations were still comparable to coal based on EPA's data for traditional fuels, you indicated that ReCommunity is confident that these levels will be reduced when the source material is unprocessed waste, which will then be subject to the full-scale ReEngineered Feedstock processing and treatment. Overall, you have indicated both in the materials you have provided to the Agency and in meetings with EPA representatives that the operations employed to manufacture Re-Engineered Feedstock

ensure a homogenous product. Thus, you would expect that this contaminant comparison to be representative of all Re-Engineered Feedstock, regardless of when it is manufactured.

The conclusion that the ReEngineered Feedstock is comparable to coal assumes that the ReEngineered Feedstock was tested on any contaminant that would be expected to be present. Additional contaminants for which the ReEngineered Feedstock were not tested must be present at levels comparable to or lower than those in the appropriate traditional fuel, based on your knowledge of the material.

Conclusion

Overall, based on the information provided, we believe that the ReEngineered Feedstock, as described in your letters and supporting materials, meets both the processing definition and the legitimacy criteria outlined above. Accordingly, we would consider this NHSM a non-waste fuel under the 40 Part 241 regulations.

If you have any other questions regarding the applicability of the Clean Air Act emission standards to the ReEngineered Feedstock, please contact Peter Tsirigotis at 919-541-9411 or David Cozzie at 919-541-5356; for other questions regarding processing and the legitimacy criteria, please contact me at 703-308- 8404 or George Faison of my staff at 703-305-7652.

Sincerely,

James R. Berlow, Director
Program Implementation and Information Division

Enclosure

Enclosure

Comparison of Contaminant Levels

Contaminant	Units [1]	RE Feedstock: Average ± Std Dev	Coal: Average [2]	Result of Comparison
Arsenic (As)	ppm	0.98 ± 0.44	8.2	Lower than coal
Beryllium (Be)	ppm	0.66 ± 0.16	1.9	Lower than coal
Chromium (Cr)	ppm	5.12 ± 1.74	13.4	Lower than coal
Cobalt (Co)	ppm	4.22 ± 1.08	6.9	Lower than coal
Mercury (Hg)	ppm	< 0.005	0.09	Lower than coal
Nickel (Ni)	ppm	6.69 ± 0.65	21.5	Lower than coal
Selenium (Se)	ppm	2.0	3.4	Lower than coal
Chlorine (Cl) [3]	ppm	400	992	Lower than coal
Fluorine (F)	ppm	14.28 ± 2.71	64	Lower than coal
Nitrogen (N)	ppm	< 100	15,090	Lower than coal
Sulfur (S)	ppm	100	13,580	Lower than coal
Contaminant	**Units**	**RE Feedstock: Range [4]**	**Coal: Range [5]**	**Result of Comparison**
Antimony (Sb)	ppm	ND - 11	ND - 10	Comparable to coal [6]
Cadmium (Cd)	ppm	ND - 1	ND - 19	Lower than coal
Lead (Pb)	ppm	1 - 36	ND - 148	Lower than coal
Manganese (Mn)	ppm	2 - 72	ND - 512	Lower than coal

Notes:

1. All contaminant analyses are on a dry weight basis.
2. Coal averages calculated from EPA Office of Air Quality Planning and Standards (OAQPS) database, as presented in EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011,* available at www.epa.gov/epawaste/nonhaz/define/index.htm.
3. ReEngineered Feedstock chlorine data based on PVC removal and thermal treatment.
4. Antimony, cadmium, lead, and manganese data available from early testing, prior to a redesign of the shredding process that reduces cross-contamination of metals. Concentrations of these metals in current and future ReEngineered Feedstock are expected to be the same or lower than those presented here.
5. Coal ranges from EPA data and literature sources, as presented in EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011,* available at www.epa.gov/epawaste/nonhaz/define/index.htm.
6. Levels measured in ReEngineered Feedstock are within a small acceptable range of levels measured in coal. See 76 FR 15523.

Endsmarr

Comparison of Contaminant Levels

Contaminant	Unit	Mean ± SD	Range	Max vs. CDC Limit
Arsenic (As)	µg/m	0.68 ± 0.44	0.1 – 1.9	Lower than case
Barium (Ba)	µg/m	0.46 ± 0.13	0.2 – 0.9	Lower than case
Chromium (Cr)	µg/m	3.12 ± 1.24	1.0 – 13.4	Lower than case
Cobalt (Co)	µg/m	1.27 ± 1.08	0.1 – 6.9	Lower than case
Manganese (Mn)	µg/m	~ 0.003	0.001 – 0.09	Lower than case
Nickel (Ni)	µg/m	6.89 ± 0.45	2.1 – 21.3	Lower than case
Selenium (Se)	µg/m	2.0	1.1 – 3.4	Lower than case
Cadmium (Cd) [1]	µg/m	450	190 – 910	Lower than case
Chromium (Cr)	µg/m	34.28 ± 7.71	19 – 44	Lower than case
Mercury (Hg)	µg/m	~ 100	15,000 – 15,500	Lower than case
Lead (Pb)	µg/m	130	15,300 – 15,500	Lower than case

Contaminant	Unit	Mean ± SD	Range	Max vs. CDC Limit
Antimony (Sb)	ppm	ND – 11	ND – 10	Comparable to case [1]
Cadmium (Cd)	ppm	ND – 7	ND – 19	Lower than case
Lead (Pb)	ppm	1 – 16	ND – 149	Lower than case
Manganese (Mn)	ppm	1 – 75	ND – 312	Lower than case

Notes

1. Not detected in all samples.
2. Values are mean ± standard deviation from EPA (1989) and Air Quality Planning and Standards (OAQPS) datasets, as presented in Arts van Donkelaar et al. Canadian Commission of Communities in Transition Public Health Committee, November 26, 2021. www.ccc.ca/CCCTP/Reports/Air_Quality.pdf
3. Underpowered (sample size too small to reliably detect an effect).
4. Accuracy, precision, and completeness data available from earlier sampling, prior to a redesign of the sampling protocol and reduced sample size in 2018. Concentrations of these metals in current and future sampling are expected to be the same or lower than those reported here.
5. Case values from EPA data and accuracy values, as presented in EPA Document Control Number (Document Control Number) in Canadian Public Health Committee, November 26, 2021, available at www.ccc.ca/CCCTP/Reports/Air_Quality.pdf.
6. Values measured in Bad Ischemia Treatment are within a usual acceptable range of levels observed in Case, as of November 26, 2021.