555 Eleventh Street, N.W., Suite 1000
Washington, D.C. 20004-1304
Tel: +1.202.637.2200 Fax: +1.202.637.2201
www.lw.com

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February 21, 2012

Docket ID No. EPA-HQ-OAR-2003-0119
EPA Docket Center (EPA/DC)
Environmental Protection Agency, Mailcode 6102T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
(submitted via regulations.gov)

Docket ID No. EPA-HQ-RCRA-2008-0329
RCRA Docket, EPA Docket Center
Environmental Protection Agency, Mailcode 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460
(submitted via regulations.gov)

cc:
Mr. George Faison
Program Implementation and Information Division
Office of Resource Conservation and Recovery, 5303P
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460
faison.george@epa.gov

Re: Comments On Commercial And Industrial Solid Waste Incineration Units: Reconsideration And Proposed Amendments; Non-Hazardous Secondary Materials That Are Solid Waste [Docket ID Nos. EPA-HQ-OAR-2003-0119 and EPA-HQ-RCRA-2008-0329]

Dear Mr. Faison:

ReCommunity appreciates this opportunity to comment on EPA's proposed reconsideration of the CISWI and NHSM rules. ReCommunity appreciates EPA's attempts to clarify certain aspects of the NHSM rule, particularly those dealing with the calculations of comparable contaminants and the petition process for receiving a categorical non-waste determination. ReCommunity supports those proposed additions, with minor adjustments and clarifications that are described below. ReCommunity also notes that some of the language in the preamble to the CISWI rule reconsideration, and the inclusion of a CISWI definition of municipal waste, could lead to confusion regarding the status of products that may contain some material that was initially sourced from the MSW stream. ReCommunity requests that EPA

clarify in the final preamble that those definitions apply to the CISWI rule, and are not determinative of products with portions of their materials sourced from MSW, when portions of the materials are also new. ReCommunity will provide these comments in both dockets, as the issues are overlapping between the two.

I. WHO IS RECOMMUNITY?

ReCommunity, Inc., located at 225 S. Main Street, 2nd Floor, Rutland, VT, 05701, is the largest independent recycling company in the United States. We are focused on maximizing the recovery of recyclables from mixed waste streams (*i.e.*, unsorted municipal solid waste, commercial waste, and institutional waste) and reducing landfilling. ReCommunity partners with communities and municipalities to increase revenues by increasing the percentage of material recovered and decreasing discard. Unlike traditional waste haulers and solid waste disposal companies, ReCommunity does not generate any revenue from landfilling or discard.

In order to capture and utilize materials that cannot be recycled, ReCommunity developed ReEngineered Feedstock to convert the largest remaining portion of non-recyclable materials into a useful product. ReEngineered Feedstock is a fuel manufactured from non-recyclable fibers, light plastics, and hard plastics removed from the waste stream and highly processed, along with virgin materials such as sorbents. It has meaningful heating value relative to coal and serves as an effective air pollutant control technology. Although ReEngineered Feedstock ultimately will be used to produce a wide range of commercial and industrial products, including biofuels feedstocks, the critical first use will be as a coal replacement.

The first phase of the ReEngineered Feedstock process, the Multi-Material Processing Platform ("MMPP"), utilizes sophisticated material separation and characterization technology to recover all marketable recyclables and remove all non-combustible and prohibitive materials. The second phase, the Advanced Manufacturing Process ("AMP"), then precisely engineers ReEngineered Feedstock from the discrete, selected constituent ingredients – fibers, light plastics, and hard plastics – along with sorbents and additives sourced from virgin material. The product is an advanced fuel that is engineered to match the heating value of the coal with which it will be co-fired and optimized to reduce air emissions.

II. COMMENTS ON THE RECONSIDERATION

A. Comparable Contaminants

ReCommunity supports EPA's proposed revisions to the contaminant legitimacy criterion for NHSM used as fuels. EPA appropriately proposes several clarifications that would allow fuels attempting to meet the legitimacy criteria to be fairly compared to the fuels they are replacing. In particular, the ability to compare to any traditional fuel a unit is capable of burning, or is burning, regardless of the current status of permitting for that particular fuel in the facility, is a reasonable clarification.[1] EPA should not require facilities to be permitted for a comparable fuel simply to allow the regulatory comparison that contaminant levels for a potential alternative are similar.

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[1] 76 Fed. Reg. 80,476.

EPA's clarification that the comparison may take place against "contaminants or groups of contaminants" is also reasonable, and appropriately allows fuels to measure their contaminants in ways that provide meaningful comparisons to the manner in which EPA measures emissions.[2] EPA should clarify the preamble discussion to explicitly allow this approach, such as the grouping of total metals, for example, and other practices EPA regularly accepts for measuring emissions should explicitly be included for measuring contaminants. ReCommunity similarly supports the flexibility to use reasoned arguments and knowledge and expertise to estimate contaminant data when testing is not available or has not yet been performed.[3]

Finally, ReCommunity also supports EPA's clarification that it is appropriate to use the full range of traditional fuels for the contaminant comparison. As EPA notes, it would be inappropriate to require the use of averaging, as doing so could result in the inherent conflict of traditional fuels with above average contamination not being considered "legitimate" fuels. Although ReCommunity's initial testing of ReEngineered Feedstock indicates that contaminant profiles are comparable to the average values for Eastern bituminous coal, ReCommunity notes that the fuel variability for coal is significantly higher than that expected for ReEngineered Feedstock, since it is the product of precise manufacturing. As a result, there is a significant margin within which ReEngineered Feedstock would still be considered comparable in terms of contaminants with traditional fuels.

B. Petition Process For Categorical Determinations

ReCommunity supports the inclusion of a broader petition process for categorical listings of materials that would not be considered fuels. ReCommunity encourages EPA to modify the preamble description of the petition requirements to note the ability of fuels that are sufficiently processed to apply for a categorical listing, as this option is not discussed in the preamble. Given the nature of the determination, and its potentially severe impact on a variety of potential fuels, ReCommunity believes that providing an option for a categorical listing that applies nationally is a strong improvement to the final rule, and strongly supports its inclusion as proposed.

ReCommunity would note that for materials that are sufficiently processed, and meet the legitimacy criteria, EPA should clarify that the CISWI record-keeping requirements for "discarded" materials do not apply, even if those materials are not traditional fuels. As EPA notes in the final NHSM rule preamble, products that use in part recycled materials are considered to be "'new' products that have not been discarded," and therefore facilities combusting those new products should not be required to keep and produce records under 40 C.F.R. §60.2175(v).[4]

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[2] *Id.*; proposed to be codified at 40 C.F.R. §241.3(d)(1)(iii).

[3] 76 Fed. Reg. 80,481.

[4] *See* 76 Fed. Reg. 15,537. The CISWI record-keeping requirements are incorporated in the definition of a CISWI unit for all materials that are "discarded" except for traditional fuels. 76 Fed. Reg. 80,501, proposed to be codified at 40 C.F.R. § 60.2265.

C. Treatment Of Materials Derived From Municipal Waste

In the Reconsideration, EPA proposes to include a definition of MSW in the CISWI rules as a technical correction. EPA correctly notes that this definition will help to clarify wither the CISWI or the municipal waste combustor ("MWC") rules apply. While this indicates that the definition will not have an application for whether a material is determined to be "solid waste" under RCRA, and thus covered by Section 129 of the Clean Air Act as an initial matter, the inclusion of this definition in the jointly noticed proposals including the NHSM amendments could be confusing, without more clarification. Similarly, EPA discusses the lack of homogeneity of MSW in the CISWI section of the Reconsideration preamble, which has implications solely limited to the applicability of the qualifying small power production facilities or qualifying cogeneration facilities exemption.[5] ReCommunity requests that EPA clarify in the preamble to the NHSM amendments that new fuel products that use select, discrete components of MSW as a portion of their initial source materials, and also meet the legitimacy criteria in the NHSM rule, are not "discarded" for the purposes of either the CISWI or NHSM rules. As discussed in greater detail in Section V of the attached white paper, this clarification is only required to clear up potential ambiguity in the preambles to the final rules, and is consistent with the regulations and statutes for both the CISWI and NHSM rules.

D. ReCommunity Requests Formal Confirmation From EPA That ReEngineered Feedstock Is A Non-Waste Fuel Product

ReEngineered Feedstock is a highly processed fuel product that satisfies all of the legitimacy criteria enumerated in 40 C.F.R. § 241.3(d)(1). ReCommunity requests that, based on the framework finalized in the Non-Hazardous Secondary Materials rule and proposed in the *Commercial and Industrial Solid Waste Incineration Units: Reconsideration and Proposed Amendments; Non-Hazardous Secondary Materials That are Solid Waste* Reconsideration of the final rule ("Reconsideration"), EPA confirm that ReEngineered Feedstock is a final commercial product, or, in the alternative, a fuel that is legitimately processed from both virgin and secondary materials, that in either instance is not a solid waste. ReCommunity requests a formal determination because industrial boiler and power plant operators need certainty that co-firing ReEngineered Feedstock with coal will not subject them to regulation as incinerators under Section 129 of the Clean Air Act.

1. ReEngineered Feedstock Is The Product Of An Advanced Manufacturing Process

ReEngineered Feedstock is the valuable, sophisticated end product of an advanced manufacturing process, rendering it a product and not a secondary material. The MMPP is a highly sophisticated process that harnesses commercially available technology, such as eddy current separation, optical sorting stations, and density separation, in addition to ReCommunity's proprietary technology, to remove discrete, selected constituent ingredients – fibers, light plastics, and hard plastics – from MSW. The AMP then precisely engineers ReEngineered Feedstock, a valuable, consistent and sophisticated fuel that also serves as control technology,

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[5] 76 Fed. Reg. 80,462.

from those constituent ingredients and sorbents from virgin materials. Together, the MMPP and the AMP unquestionably constitute a manufacturing process. The result of this manufacturing process, ReEngineered Feedstock, is a valuable, sophisticated fuel and control technology that is undeniably a product, not a secondary material.

2. ReEngineered Feedstock Satisfies The Legitimacy Criteria

ReEngineered Feedstock is a valuable commodity with meaningful heating value that contains contaminant levels comparable to or lower than those in the coal with which it will be co-fired. As such, it satisfies the legitimacy criteria codified in 40 C.F.R. § 241.3(d).

a. ReEngineered Feedstock Is Highly Processed

The regulations define "processing" as "any operations that transform a discarded non-hazardous secondary material into a non-waste fuel" by removing or destroying contaminants, improving fuel characteristics, or improving as-fired energy content.[6] ReEngineered Feedstock easily satisfies all of these criteria. It is substantially free of all contaminants, including non-combustibles, prohibitive materials, and inerts. Each batch is precisely engineered to match the heating value of the coal with which it will be co-fired and optimized to satisfy the emission limits of the customer. The as-fired energy content is improved through the selection of discrete component ingredients (*i.e.*, fibers, light plastics, sorbents, and hard plastics) that are then purposefully engineered into a fuel with the desired energy content.

b. ReEngineered Feedstock Is Managed As A Valuable Commodity

ReEngineered Feedstock is engineered to be co-fired with coal, making coal the "analogous fuel." ReEngineered Feedstock is manufactured to be homogeneous and consistent within a single batch and across multiple batches. This means that combustion units will not need to stockpile ReEngineered Feedstock, and will instead use it promptly after delivery, ensuring that it is never stored for longer than a "reasonable time frame."[7] ReEngineered Feedstock can be transported and stored in pelletized or granulated form using sealed Super Sac® or Gaylord Containers to minimize the risk of release. It is engineered to remove prohibitive materials, hazardous substances, and residues, meaning ReEngineered Feedstock is stable and free of odor.

c. ReEngineered Feedstock Is A Fuel With Meaningful Heating Value

Combustion units that generate power will purchase ReEngineered Feedstock as a fuel to co-fire with coal, satisfying the second fuel legitimacy criterion that it have "meaningful" heating value. It can produce heating values ranging from 6,500 to 10,000 Btu/lb, and each batch of ReEngineered Feedstock is customized to match the specific energy needs of the purchaser.

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[6] 40 C.F.R. § 241.2.

[7] 40 C.F.R. § 241.3(d)(1)(i)(A).

d. ReEngineered Feedstock Contains Contaminant Levels Comparable To Or Lower Than Those In Coal

As explained by EPA in the Reconsideration, the "comparable contaminant" language is intended to provide flexibility when comparing contaminant levels with "traditional fuels." Because ReEngineered Feedstock is engineered to be co-fired with coal, a comparison must be made to contaminant levels found in coal. As demonstrated in greater detail in Section V(C)(2)(c) of the attached White Paper, ReEngineered Feedstock contains lower levels of arsenic, sulfur, fluorine, chlorine and a variety of other contaminants when compared with Eastern bituminous coal. ReEngineered Feedstock therefore satisfies the third and final legitimacy criterion.

Given ReEngineered Feedstock's status as a final commercial product, and that it would meet the legitimacy criteria if it were determined to be a secondary material, ReCommunity requests formal confirmation from EPA that, when combusted in an industrial boiler or power plant, ReEngineered Feedstock would not trigger Section 129 of the Clean Air Act.

* * *

Thank you for your consideration of this request. Should you have any questions or comments, please do not hesitate to contact me at Claudia.O'Brien@lw.com or (202) 637-2181.

Sincerely,

Claudia M. O'Brien

of LATHAM & WATKINS LLP
counsel to ReCommunity, Inc.

REQUEST FOR CLARIFICATION ON THE REGULATORY TREATMENT OF

RECOMMUNITY'S REENGINEERED FEEDSTOCK:™

A Recycled Fuel Product Leading the Way to Sustainable Communities and a Zero-Landfill Future

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I. EXECUTIVE SUMMARY

ReCommunity is the largest independent recycling company in the United States, and focuses its extensive technical expertise on expanding the recycling of discarded materials in partnership with local communities. ReCommunity has developed an exciting new product, ReEngineered Feedstock, which will be the first step to a zero-landfill future. ReEngineered Feedstock is a precisely engineered product of advanced manufacturing technology. ReCommunity uses meticulous material sorting and characterization to select discrete components from discarded materials, primarily non-recyclable organic fibers—typically paper, cardboard and similar packaging materials—that cannot be sold on the recycled materials market due to unacceptable quality-related issues. ReCommunity then combines those fibers with other discrete, specifically selected components from a community's waste stream, and with a precise mixture of sorbents and other additives, to create an engineered fuel product that precisely matches the desired heating profile and emissions reduction needs of specific coal-fired boilers. ReEngineered Feedstock's manufacturing is carefully controlled to create a chemically and physically consistent product that can be co-fired with coal and, when comprising typically 20-30% of the boiler's fuel, generate emissions reductions at precise levels to help meet air permitting requirements.

Last year, EPA promulgated rulemakings determining whether a material that was once discarded should be considered a fuel or a solid waste when combusted. ReCommunity believes that like recycled paper, its ReEngineered Feedstock is the final product of an manufacturing process, and as such has never itself been discarded, and is not a solid waste. EPA's rulemakings clearly do not apply to the combustion of final products, and in the rule and the preamble, EPA expressly recognizes that select components from the waste stream may be processed into legitimate fuels and ingredients. EPA has recently proposed reconsiderations of certain aspects of the rule. ReCommunity is concerned that certain aspects of the preamble to the final rule and the reconsiderations may create regulatory uncertainty for ReCommunity's customers—boiler and power plant operators—regarding their regulatory status. Although the text of the statutes involved, and the regulations themselves, are relatively straightforward, ReCommunity wishes to provide additional information to EPA so that EPA can clarify the status of ReCommunity's product, ReEngineered Feedstock, when combusted.

As detailed below, ReCommunity believes that its advanced manufacturing and processing technology, used to select discrete components from the waste stream, and then manufacture a commercially valuable product using those specific components along with virgin sorbents and other additives, renders ReEngineered Feedstock a product, not a secondary material or solid waste. ReEngineered Feedstock is also a final product that has not been discarded, and thus would not be treated as a solid waste in the first instance. ReCommunity seeks formal confirmation from EPA that ReEngineered Feedstock is not a solid waste, and that units (power plants and industrial boilers) that combust its ReEngineered Feedstock as a fuel along with coal will not be regulated as if they had combusted solid waste. Alternatively, ReCommunity believes that ReEngineered Feedstock is meets the *Identification of Non-Hazardous Secondary Materials That Are Solid Waste* Rule's Legitimacy Criteria for a non-waste fuel. Only with clear regulatory treatment can ReCommunity market this critical product, and continue to advance its goals of expanded recycling and to support sustainable communities' zero landfill future.

II. RECOMMUNITY – WHO WE ARE

ReCommunity, Inc., is the largest independent recycling company in the United States. ReCommunity operates a total of 36 facilities in twelve states, and employs 1,150 talented and experienced employees. ReCommunity focuses on using advanced technology to increase the capture of recyclables from mixed waste streams, i.e. unsorted municipal solid waste ("MSW")[1], commercial waste, and institutional waste. ReCommunity's advanced technology has succeeded in increasing recycling volumes in communities by 20% to 60%. ReCommunity works closely with the municipalities who are its primary customers, and establishes a mutually beneficial relationship that encourages and rewards increased recycling. However, not all materials can be sold into the recycling market even with the most advanced technology, and ReCommunity has developed an innovative solution to convert the largest portion of the remaining materials into a useful product, ReEngineered Feedstock. ReCommunity's ReEngineered Feedstock production technology can be used to produce a wide range of commercial and industrial products, including biofuels feedstocks, high value chemical feedstocks, and as a partial substitute for coal in combustion units. While ReEngineered Feedstock's first use will be as a co-firing option, replacing up to 30 % of coal used in a combustion unit, ReCommunity's technology will be used to create a variety of products as those processes are developed and implemented. In all of its potential forms, ReCommunity's ReEngineered Feedstock process provides economic advantages to the communities where ReCommunity operates facilities, and offers significant environmental benefits.

Unlike waste-haulers and solid waste disposal companies, ReCommunity does not profit from disposing of materials in a landfill. Instead, like the communities we work with, ReCommunity must pay disposal fees for any materials that are not recycled. Because of this financial arrangement, ReCommunity's incentives are aligned with those of the communities we serve to increase revenues from recycling by increasing recovered material and decreasing discard. ReCommunity creates jobs in local communities, provides much needed revenue to municipal governments, and can reduce both traditional air pollutants as well as greenhouse gases by displacing coal with ReEngineered Feedstock. By working with local communities, and applying advanced technology, ReCommunity is starting a Recovery Revolution™ that can help local communities generate revenue, create jobs, and recover resources from materials that are otherwise destined for discard, while at the same time protecting the environment.

III. THE RECOMMUNITY REENGINEERED FEEDSTOCK PROCESS

ReEngineered Feedstock is the final product of a technologically advanced manufacturing process. The ReEngineered Feedstock manufacturing process harnesses the renewable energy content of discrete components of the municipal solid waste stream to create a renewable fuel that also serves as an effective air pollution control technology. Prior to the manufacturing of ReEngineered Feedstock, the advanced sorting and materials characterization components of the ReEngineered Feedstock process recovers all marketable recyclable materials and removes select portions of the non-combustibles and inert residues from the material stream. Once the discrete, selected constituent ingredients have been selected, segregated and thoroughly processed, the ReEngineered Feedstock process synthesizes sorbents and additives made from

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[1] Municipal Solid Waste is a non-hazardous solid waste regulated under Subtitle D of the Resource Conservation and Recovery Act.

virgin materials with the other selected ingredients. All of the ReEngineered Feedstock ingredients are engineered precisely to deliver the exact fuel emissions control capabilities required. This ability to engineer a product with particular characteristics will also support the development of future ReEngineered Feedstock product lines, and could eventually allow for the incorporation of additional source materials, such as agricultural residues. The result is a fuel that has a consistent, defined origin and is specifically engineered for a target heating value, profile, fluid dynamic attributes, and combustion kinetics matched to that of the coal with which it will be co-fired.

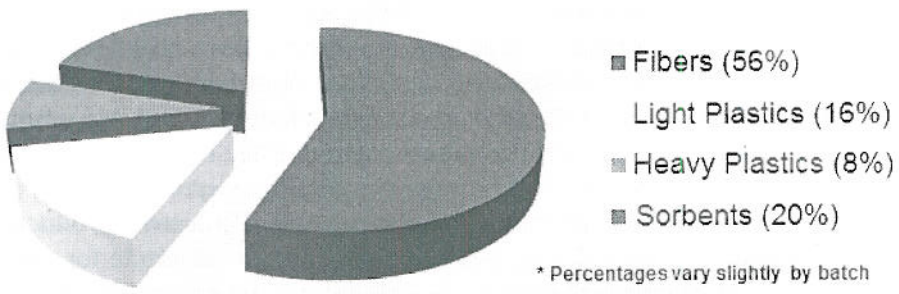

Figure 1. Constituent Ingredients of ReEngineered Feedstock

A. Objectives of the ReEngineered Feedstock Manufacturing Process

The ReEngineered Feedstock sorting, material characterization, fuel manufacturing, and sorbent addition process has two distinct objectives: (1) to maximize the effectiveness, scope and financial viability of a single stream recycling process, and (2) to engineer a homogenous fuel that is consistent over time with equivalent contaminant levels to substitute fuels, that provides meaningful heating value and controls emissions. The ReEngineered Feedstock process accomplishes the first objective—to dramatically expand recycling and reduce landfilling by removing all recyclable materials from the waste stream—by removing papers, paper products, cardboard, PET and HDPE plastics, glass, aluminum, ferrous metals, and a variety of other recyclables from the waste stream. This means that no recyclable materials are used in the production of ReEngineered Feedstock. Recyclables are stored at the Advanced Material Recovery Facility (AMRF) and then sold on the market. Unlike traditional recycling methods, which are generally limited to residential municipal waste streams, the ReEngineered Feedstock process can accept commercial and institutional waste streams, dramatically expanding the scope of the recycling process.

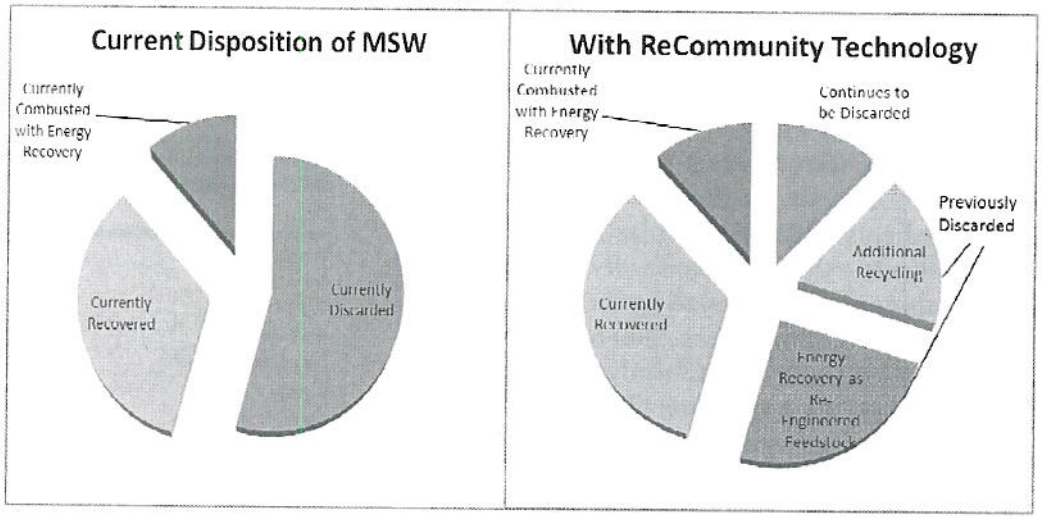

Figure 2. MSW disposition currently and with 100% ReEngineered Feedstock participation

As a direct result of ReCommunity's recycling maximization, the percentage of commercial and municipal waste streams destined for landfilling is dramatically reduced. Although the contents of individual waste streams varies considerably, on average the ReEngineered Feedstock process lowers the amount of landfilled material from the current average of 60%[2] down to approximately 10-15% of the waste stream. The advanced recycling process ensures that no valuable materials are combusted or landfilled. Increased recycling also reduces greenhouse gas emissions. A ReCommunity plant in Oakland County, Michigan will prevent more than 320,000 metric tons of CO_2 equivalent greenhouse gases from being emitted annually when operating at full capacity, the equivalent of removing 59,000 cars from the road each year. Expanded recycling also reduces air and water pollution associated with making new products from raw materials. ReCommunity shares the proceeds of its sale of recyclables with the local municipality from which it receives its initial source materials (*i.e.*, MSW).

The second objective of the ReEngineered Feedstock process is to create a homogenous fuel that has a comparable heating value relative to traditional fuels and that can be co-fired seamlessly with coal in existing (unmodified) boilers while serving as an effective control technology. Every batch of ReEngineered Feedstock is engineered to meet the specific heating value and emission control targets of individual boilers. ReCommunity will the use the quality of input coal actually intended to be used, the existing actual emissions of the facility using this coal, and the design of the boiler and other related characteristics of the system to design the co-firing rate and the ReEngineered feedstock formulation needed to achieve the desired targeted emission after the use of the ReEngineered feedstock.

[2] EPA, Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2010, available at http://www.epa.gov/osw/nonhaz/municipal/pubs/msw_2010_rev_factsheet.pdf (last visited Feb. 16, 2012).

ReEngineered Feedstock is pelletized for easy transportation, yet when pulverized and or granulated, it is fluid-dynamically and kinetically identical to the coal with which it will be co-fired. Each pellet of ReEngineered Feedstock is manufactured from the exact same discrete constituent ingredients – fibers, light plastics, hard plastics, and sorbents – that are specifically selected, segregated and thoroughly processed by the materials sorting and characterization process. Not only are the selected constituent ingredients uniformly consistent across pellets and batches, each batch of ReEngineered Feedstock is specifically tailored to the needs of the boiler in which it will be used. This precise engineering recovers all recyclable materials and removes hazardous materials and non-combustible inert materials. The ReEngineered Feedstock manufacturing process also enables the utilization of organic and food waste materials found in MSW in the fuel feedstock. The carbon content in these organics is valuable in the fuel feedstock and moisture content of the stream is reduced using heat generated during processing. The chemically consistent, homogenous constituent ingredients—both the recovered materials and the virgin sorbents—allow the ReEngineered Feedstock to be manufactured with exact precision to meet the heating and emissions needs of its customers.

ReEngineered Feedstock Facts

Units of measure (UOM): db = dry basis

801019SSP 30	UOM
Biogenic Carbon, wt. %	56.0%
Carbon, wt. % (db)	33.6%
Moisture, wt. %	2.04%
HHV, Btu/lb. (db)	9,984
CO2 emissions, lb./mmBtu	68.9 lb
Hydrogen, wt. % (db)	5.7%
Oxygen, wt. % (db)	35.9%
Nitrogen, wt. % (db)	0.3%
Sulfur, wt. % (db)	0.01%

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ReEngineered Feedstock is engineered to synthesize the sorbents and additives with the other constituent ingredients in such a fashion that they are effectively embedded across the ReEngineered Feedstock profile. Those additives are incorporated into the ReEngineered Feedstock to alter the chemical composition of the materials and ultimately to produce a fuel product with an emissions profile tailored to the needs of the end user, typically one that reduces emissions of hazardous air pollutants (HAPs) and criteria pollutants (*e.g.* NOx and SO_2) and improves combustion efficiency. The sorbents and additives are synthesized into ReEngineered Feedstock mechanically and physically in a way that causes the fluid dynamics and mechanics to be identical to the coal with which it is co-fired. This ensures that the sorbent is delivered to the precise reactivity zone in the combustor to maximize effectiveness. For example, the optimal temperature zone to remove SO_2 is 1800 - 2250 degrees Fahrenheit. Traditional sorbent injection methods (*i.e.* injecting the sorbent with the coal) result in sintering of the sorbents at high temperatures, between 3000 and 2500 degrees Fahrenheit (found in the first stage of combustion.) This precludes or retards the reactivity of the sorbent and reduces the effectiveness of the sorbent to as low as 20%. Directly injecting sorbent in the boiler in the optimal temperature zone also reduces the effectiveness of the sorbent because it is not effectively distributed across the profile of the combusted coal. Injecting larger amounts of sorbent in an attempt to distribute across the combusted coal's profile leads to slagging and reduced boiler efficiency. In contrast, ReEngineered Feedstock allows the sorbent to be injected *with* the coal, without being directly exposed to inefficient temperatures, and allows the sorbent to be evenly distributed across the combusted coal's profile to maximize the efficiency of pollutant reductions.

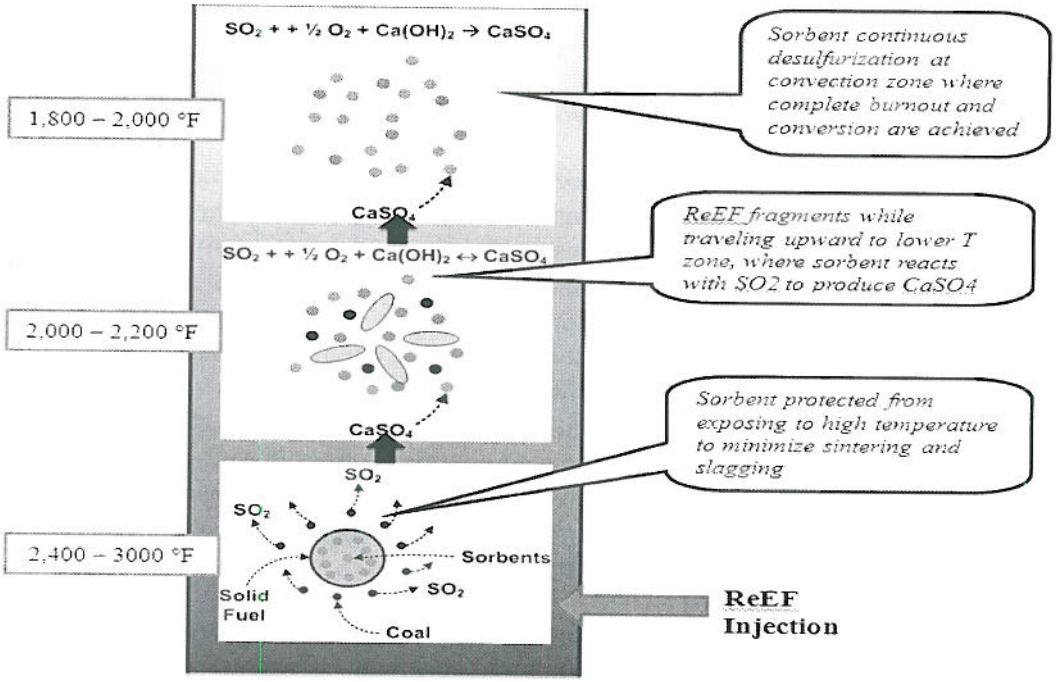

Figure 3. Optimal sorbent injection temperature zone

B. Stages Of The ReEngineered Feedstock Manufacturing Process

The ReEngineered Feedstock manufacturing process consists of two broad phases: the Multi-Material Processing Platform ("MMPP") and Advanced Product Manufacturing ("APM"). Within the MMPP, there are two practically distinct but temporally simultaneous stages: advanced materials separation and precise materials characterization.

The advanced material separation stage utilizes commercially available technology (*e.g.* optical sorting stations) and ReCommunity proprietary technology to segregate and target for removal all recyclable materials, non-processable or non-combustible materials, as well as prohibitive materials[3] from the waste stream. In the material characterization stage, the ReEngineered Feedstock process separates non-recyclable fibers, hard plastics, and soft plastics into three separate and distinct process flows. Each process flow is subjected to a battery of processing technologies, including shredders, granulizers, fluidized bed separators, and optical sorting stations to ensure that these discrete constituent ingredients are free of all non-combustible materials and residues, and when combined with sorbents can form ReEngineered Feedstock.

The advanced fuel manufacturing phase can also be broken down into two distinct but simultaneous stages: product manufacturing and the addition of sorbents and other chemical additives. ReEngineered Feedstock is manufactured in the third stage from the four chemically-consistent and homogeneous constituent ingredients: fibers, hard plastics, soft plastics, and sorbents. The addition of sorbents, when sorbents and additives are synthesized into

[3] ReCommunity considers "prohibitive" materials to be those with significant contaminant concentrations, particularly when combusted. Examples of prohibitive materials include polyvinyl chlorides ("PVCs"), electronics, batteries, drywall, and similar items.

ReEngineered Feedstock to control emissions of various air pollutants, is a central component of the manufacturing process for ReEngineered Feedstock.

1. Multi-Material Processing Platform

The ReEngineered Feedstock 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 specifically 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 and unwanted prohibitive materials. The remaining source materials are lightly shredded and then fed into ReCommunity's innovative MMPP, in which those inputs are treated by primarily automated processing lines that employ an optical sorting station, magnetic separators, eddy current separators, fluidized bed separators, filters, shredders, and granulators both to segregate and recover marketable recyclables and to remove all hazardous, prohibitive, and non-combustible residues.

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 an two optical sorting stations calibrated respectively to remove any remaining rigid plastics and segregate old corrugated containers (OCC) and old newspapers (ONP) 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.

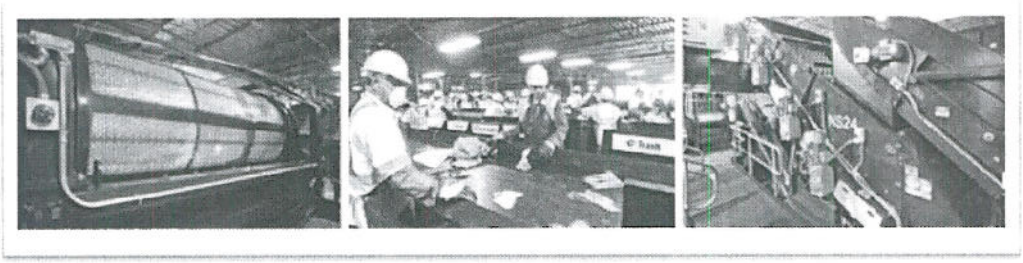

Figure 4. The Multi Material Processing Platform

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 vast 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.) that causes them to repel from the other waste. After the ferrous and non-ferrous 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. The optical sort module 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 remaining amounts of chlorine embedded in 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 devolatization properties of PVC material remaining in the non-fiber plastic stream following PVC optical sort removal. PVC has as an attribute, the ability to completely devolatize the chlorine attached from the remaining hydrocarbon structure when exposed to temperatures above 400 F. 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 will bring the entire discrete constituent stream down to comparable levels of chlorine found in other fuels. The remaining non-recyclable plastics are then subjected to fluidized bed separation to remove all nonconforming particles (*i.e.* 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.

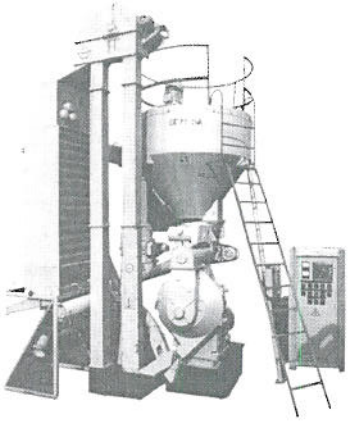

Figure 5. Pelletizer

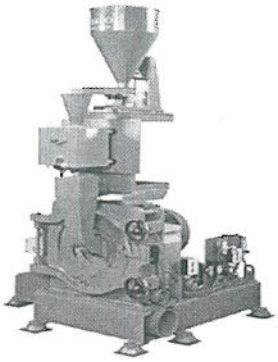

Figure 6. Pulverizer

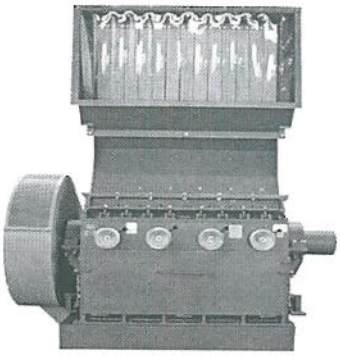

Figure 7. Granulator

2. Advanced Product Manufacturing

After the completion of the MMPP, the remaining fibers, light plastics, and hard plastics have been segregated into separate silos and are free from any non-combustible materials, inert residues, or prohibitive materials. In the fuel manufacturing and sorbent incorporation phases, the constituent ingredients are carefully metered, volumetrically mixed in the correct proportion, and conditioned to produce an end product that suits the specific energy needs of each end user. In order to maximize the effectiveness of the sorbents, as discussed above, 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 precisely 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.

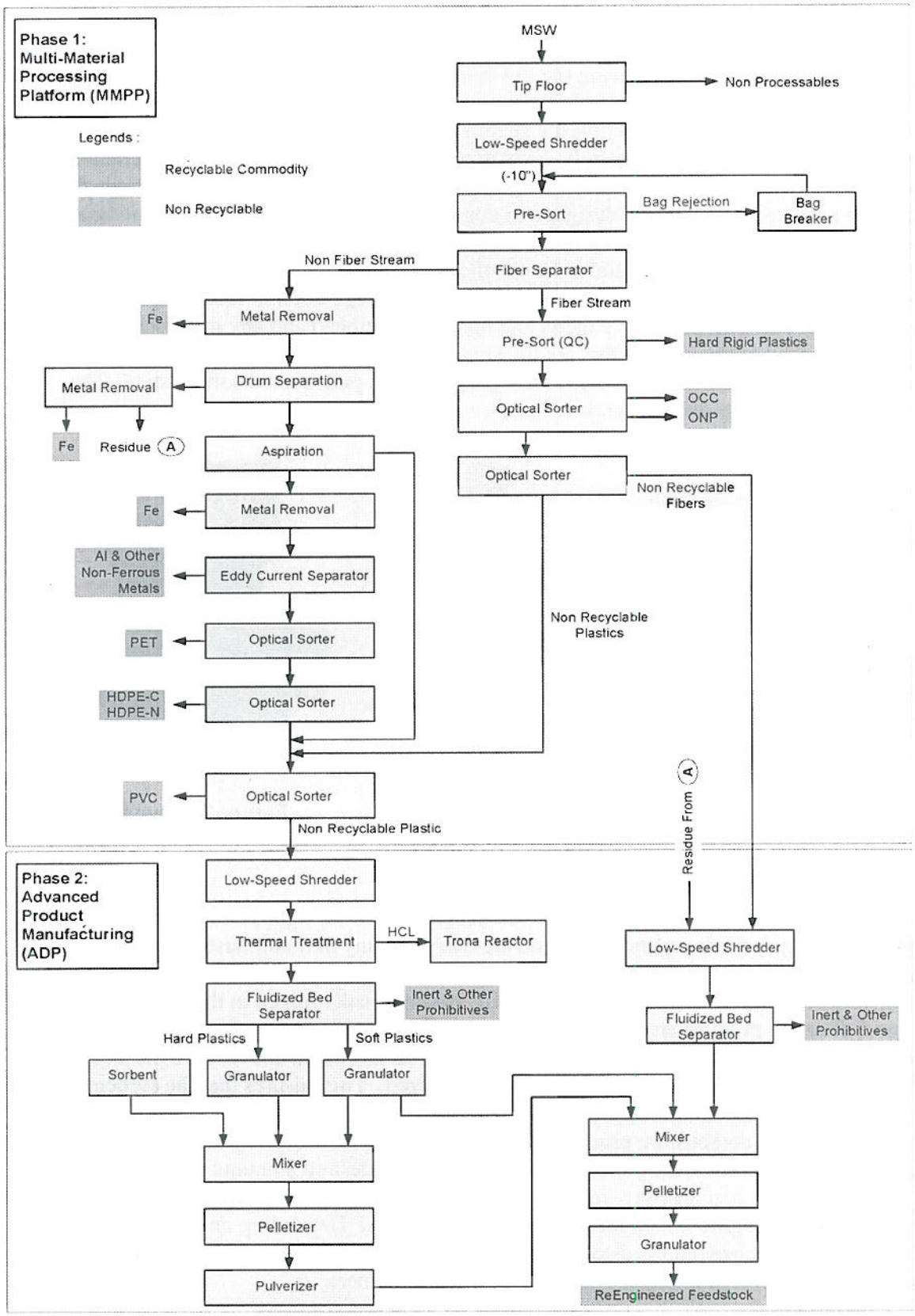

Figure 8. The ReEngineered Feedstock process

IV. BENEFITS OF REENGINEERED FEEDSTOCK

The critical first product in ReCommunity's path to a zero-landfill future is ReEngineered Feedstock, a largely renewable coal substitute that significantly controls the emissions of criteria pollutants and hazardous air pollutants ("HAPs") from existing coal-fired power plants and industrial boilers. While other product lines are planned, we focus here on the benefits from using ReEngineered Feedstock as a coal-fired boiler fuel partial substitute and emissions control technology. The benefits of ReEngineered Feedstock flow back to the communities where the initial source material is generated, in terms of jobs, air pollution reduction, waste reduction, and direct revenues to local governments at a time when local communities are increasingly facing budgetary challenges.

A. Jobs

Typical ReCommunity facilities serve communities of 100,000 to 200,000 people, and employ between 50-100 people. This compares to landfill disposal, which would typically employ only 7-8 people at the site.[4] Moreover, ReCommunity returns revenues to local governments, which will also create and maintain jobs in the community.

B. Air Pollution Reductions

ReEngineered Feedstock controls conventional pollutants, HAPs, and greenhouse gases when compared with boilers fired with solely coal. ReEngineered Feedstock is precisely engineered to control the emissions of traditional air pollutants including SO_2, SO_3, NO_x, and HCl (as well as other acid gases). ReCommunity's on-specification process can precisely create a feedstock that will match an existing power plant's fuel and emissions reduction needs. As an example, please see in Figure 9 below the calculated reductions of SO_2 and NO_x that result from cofiring 20% of a coal fired power plant by weight with ReEngineered Feedstock at 455,460 MWh annual production (based on benchscale testing, as applied to a 100MW coal-fired boiler). Given these capabilities, ReEngineered Feedstock can dramatically reduce the costs of reducing pollution, such as the capital costs of NO_x controls or flue gas desulfurization shown in Figure 10. As can be seen in the graphs, the capital costs are significantly higher on a per kw basis for smaller plants, making ReEngineered Feedstock an especially valuable option for smaller plants.

[4] This does not include jobs related to waste pickup and transport, which are identical under both the traditional landfill and ReCommunity scenarios.

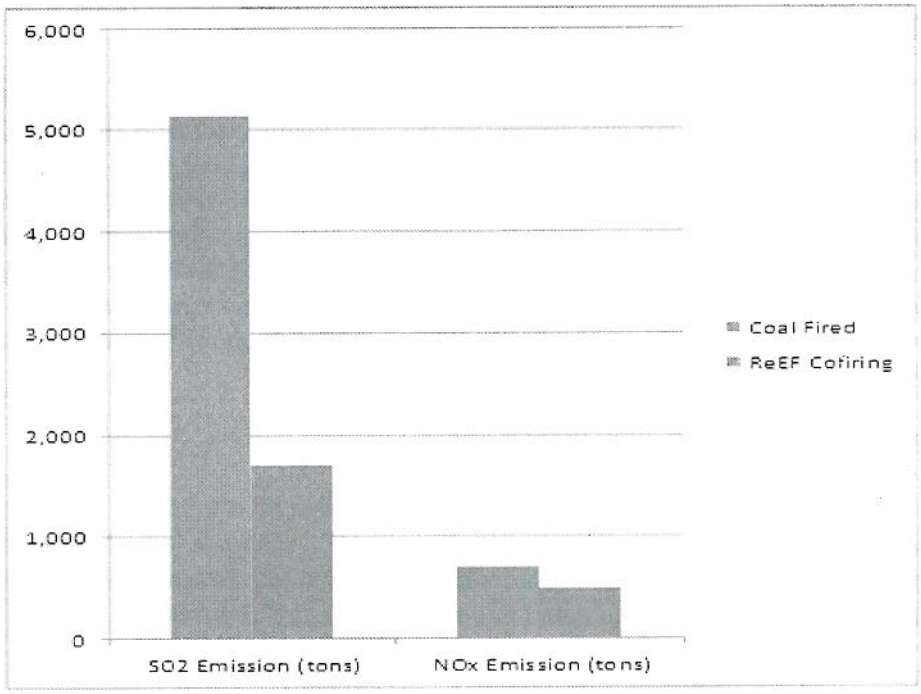

Figure 9. – SO2 and NOx Emissions, calculated, from power plant with 455,460 MWh annual production.

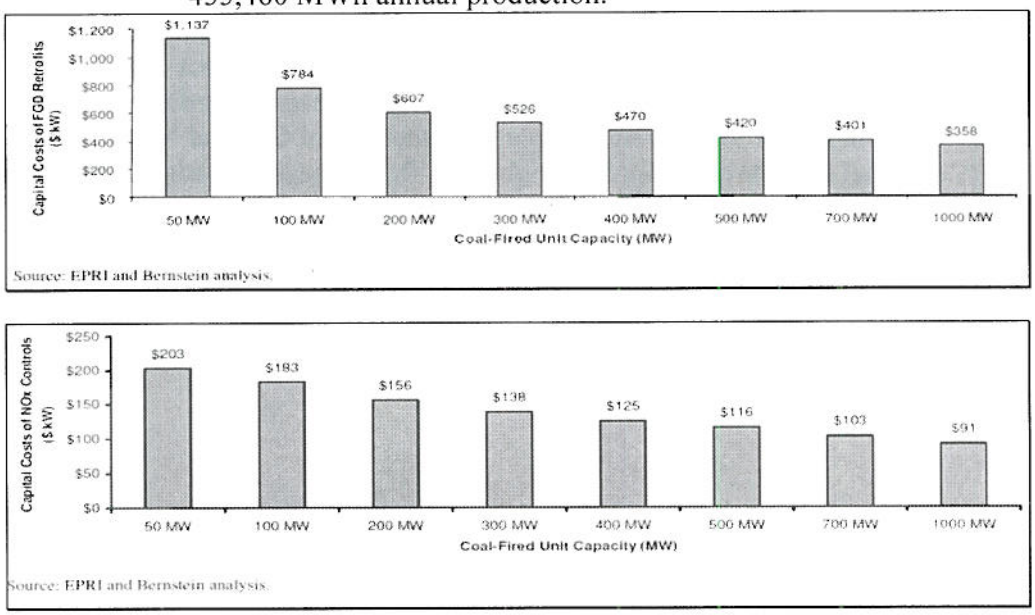

Figure 10. Estimated capital costs of NOx controls and FGD retrofits

In addition to the direct pollution reductions, ReEngineered Feedstock can also increase the efficiency of power plants, both by reducing the need for emissions control equipment, which requires a 2-3% efficiency reduction due to parasitic loading, and improvements in boiler efficiency due to reduced slagging and boiler tube contamination of (between 1 and 2 %).

ReEngineered Feedstock also inherently reduces greenhouse gases, as the fuel content of ReEngineered Feedstock is primarily sourced from biogenic, renewable fibers. As a result, unlike the carbon emitted from fossil fuels, the carbon emitted from ReEngineered Feedstock is largely comprised from CO_2 that was recently captured from the atmosphere by plants.

Coal (All Ranks, average)	Petroleum	Natural Gas	ReEngineered Feedstock
210	160	115	<70

Table 1. Fossil CO_2 emission rates (lbs CO_2/mmBtu)

C. Waste Reduction

ReCommunity's focus on a zero-landfill future led it to invest in and develop technology that would allow an ever-increasing portion of the current material destined for a landfill to be recycled or reused. The ReEngineered Feedstock process begins by significantly increasing the percentage of a community's waste stream that is recycled, by between 20% to 60%. ReCommunity then uses the remaining materials, excepting 10-15% that are inert, prohibitive, or otherwise noncombustible. This allows the capture and reuse of between 85-90% of the current municipal waste stream. Importantly, ReCommunity's technology can be applied to waste streams that have been challenging for traditional recycling to access, including the commercial, industrial, and institutional waste streams. The reduced landfilling preserves land area for more beneficial uses, reduces greenhouse gas emissions from decaying organic materials, and also saves communities money by reducing disposal fees. As can be seen in Table 2, below, the eventual widespread adoption of ReEngineered Feedstock technology could reduce landfill methane emissions by 100 $MMTCO_2E$ annually.

Current	ReEngineered Feedstock Potential
• 250 million tons generated	• 250 million tons generated
• 65 million tons recycled, 20 composted, and 29 combusted	• 220-225 million tons recycled & used
• 136 million tons landfilled	• 25-30 million tons landfilled
Landfill methane – 123 $MMTCO_2E$	Landfill methane – 22.5 $MMTCO_2E$

Table 2 – Landfill methane emissions with 100% ReEngineered Feedstock market adoption

These benefits—including jobs, reduced pollution, reduced waste, and revenues for local communities—will occur only if ReCommunity's ReEngineered Feedstock is classified by EPA as a legitimate fuel, not a waste. As such, ReCommunity seeks confirmation that its ReEngineered Feedstock will be regulated as a product or a fuel, not a solid waste, when burned as a fuel or ingredient in combustion units.

V. SECTION 129 OF THE CLEAN AIR ACT SHOULD NOT APPLY TO ANY FACILITIES USING REENGINEERED FEEDSTOCK PRODUCTS AS FUEL

A. The Definition Of "Solid Waste" Under The Resource Conservation And Recovery Act Governs Whether A Generation Unit That Co-Fires ReEngineered Feedstock Will Be Regulated Under Section 112 Or Section 129 Of The Clean Air Act

1. Statutory Framework

The Clean Air Act ("CAA") is a comprehensive federal law that regulates air emissions from stationary and mobile sources.[5] Section 112 of the CAA addresses emissions of HAPs and requires the EPA Administrator to issue technology-based standards for major sources and certain area sources.[6] For both new and existing major sources of HAPs, Section 112 directs the Administrator to establish emissions standards that require stringent emissions reductions, commonly referred to as "maximum achievable control technology" or "MACT" standards.[7] EPA regulates HAP emissions from power plants and commercial and industrial boilers pursuant to this Section 112 authority.[8]

Section 129 of the CAA, by contrast, addresses emissions from solid waste combustion, and directs the Administrator to "establish performance standards… for each category of solid waste incineration units."[9] Under Section 129, EPA has promulgated new source performance standards ("NSPS") and emission guidelines ("EG") for municipal solid waste combustors ("MWC") and commercial and industrial solid waste incinerators ("CISWI"), among others. As such, facilities that combust solid wastes are subject to Section 129 of the CAA, not Section 112. Although Section 129(g)(1) defines the term "solid waste generation unit" as "a distinct operating unit of any facility which combusts any *solid waste material* from commercial or industrial establishments or the general public . . ." it does not identify what constitutes a solid waste for the purposes of the section.[10] Instead, Section 129(g)(6) defines the term "solid waste" to "have the meaning[] established by the Administrator pursuant to the [Resource Conservation and Recovery Act ("RCRA")]."[11] The RCRA definition of "solid waste" is therefore central to the assessment of whether a particular combustion unit is regulated under Section 112 or Section 129 of the CAA.

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[5] 42 U.S.C. § 7401 et seq. (2011).

[6] 42 U.S.C. § 7412(d); *see also* 42 U.S.C. § 7412(a)(1) (defining the term "major source" as "any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants"); 42 U.S.C. § 7412(a)(2) (defining the term "area source" to mean "any stationary source of hazardous air pollutants that is not a major source").

[7] 42 U.S.C. § 7412(d)(3).

[8] On May 3, 2011, EPA proposed national emission standards for hazardous air pollutants ("NESHAP") from coal- and oil-fired electric utility steam generating units ("EGU"). 76 Fed. Reg. 24,976. After considering public comments, EPA finalized the New Mercury and Air Toxics Standard, which is widely referred to as the Utility MACT Rule, in December 2011. 77 Fed. Reg. 9304 (February 16, 2012).

[9] 42 U.S.C. § 7429(a)(1)(A).

[10] 42 U.S.C. § 7429(g)(1) (emphasis added).

[11] 42 U.S.C. § 7429(g)(6).

RCRA, in turn, gives EPA the authority to control hazardous wastes from the "cradle to grave," including the generation, transportation, treatment, storage, and disposal of such wastes.[12] RCRA also sets forth a framework under which EPA and the states manage non-hazardous solid wastes. RCRA defines the term "solid waste" to include:

> [A]ny garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities...[13]

2. Regulatory Framework

On March 21, 2011, EPA issued a final rulemaking titled *Identification of Non-Hazardous Secondary Materials That Are Solid Waste* (the "NHSM Rule") to clarify the RCRA definition of solid waste.[14] Generally speaking, that rulemaking identified the various non-hazardous secondary materials ("NHSM") that constitute solid waste under RCRA. It also outlined standards and procedures for determining whether or not a NHSM would be classified as a solid waste under RCRA when used as a fuel or ingredient in a combustion unit.

At the same time, EPA promulgated NSPS and EG for CISWI units under its CAA Section 129 authority (the "CISWI Rule"). The NHSM Rule and the CISWI Rule are linked—the former defines what constitutes a "solid waste"; any unit that combusts a solid waste is a "solid waste incineration unit" subject to Section 129 and, in turn, the CISWI Rule (or another incinerator standard), rather than a MACT standard promulgated under Section 112 of the CAA. In other words, units that burn solid waste under RCRA (as defined by the NHSM rule) are subject to Section 129 of the CAA, while units that burn no NHSMs, or NHSMs that are not considered solid waste under the NHSM Rule, are regulated by Section 112.

The D.C. Circuit has indicated that whether a facility is regulated under the Section 112 air emissions standards or the emissions requirements for incinerators under Section 129 depends first and foremost on whether that facility burns a solid waste.[15] For instance, in response to a challenge to the 2005 *Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units* (the so-called "CISWI Definitions Rule"),[16] in which EPA revised the definition of "commercial and industrial solid waste" to exclude solid waste burned in any combustion unit designed for or operated with energy recovery, the D.C. Circuit confirmed that the operative determinant for whether Section 129 of the CAA applies is whether a facility burns "solid waste."[17] In other words, the D.C. Circuit concluded that whether a unit should be regulated as a "solid waste incineration unit" or CISWI unit under the CAA depends on whether that unit combusts solid

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[12] 42 U.S.C. § 6901 et seq. (1976).

[13] 42 U.S.C. § 6903(27).

[14] 76 Fed. Reg. 15,456 (March 21, 2011).

[15] *See, e.g., NRDC v. EPA*, 489 F.3d 1250 (D.C. Cir. 2007).

[16] 70 Fed. Reg. 55,568 (Sept. 22, 2005).

[17] *NRDC v. EPA*, 489 F.3d at 1260.

waste.[18] Under the CAA, "solid waste" carries the definition established by the Administrator pursuant to RCRA.

For the reasons discussed below, ReEngineered Feedstock is not a solid waste, and thus Section 129 of the CAA should not apply to any facility combusting ReEngineered Feedstock.

B. ReEngineered Feedstock Is The Final Product Of A Manufacturing Process, Not A Secondary Material

In the regulations clarifying the RCRA definition of solid waste, EPA defines a "secondary material" as "any material that is *not* the primary product of a manufacturing or commercial process…".[19] ReEngineered Feedstock, however, *is* the final product of a manufacturing process, not a secondary material. Indeed, ReEngineered Feedstock is the final product and sole output of a manufacturing process designed to produce a feedstock for fuels and chemicals that is uniform, homogeneous, specialized, and valuable. As discussed above, ReCommunity's process accepts raw inputs and prepares a final product with a defined chemical composition by measuring a precise blend of feedstock materials, undertaking physical preparation, and incorporating specialized sorbents and other additives. Such precise engineering allows targeted production for a variety of applications, both for specific power plant performance and for other sectors, including biofuels production. As such, ReEngineered Feedstock is *not* a secondary material because it is the primary product of a manufacturing process.

Even if it were a "secondary material," however, ReEngineered Feedstock still would not constitute a solid waste when combusted under the NHSM Rule because it is not "discarded." In the preamble to the Final NHSM Rule, EPA explained that the "ordinary plain-English meaning of the term discarded means 'disposed of,' 'thrown away,' or 'abandoned.'"[20] EPA also explained that the D.C. Circuit has rejected a more expansive meaning of the term that would encompass materials "no longer useful in their original capacity" even if they were not destined for disposal, expressly embracing the concept of beneficial reuse.[21]

As a valuable commercial product, ReEngineered Feedstock cannot be considered "discarded" under the applicable definitions. Accordingly, ReEngineered Feedstock does not constitute a NHSM or a "solid waste" under RCRA even though some of its constituent parts may, at one time, have constituted waste. EPA has expressly embraced this concept and recognized that "[t]he principle that products can be produced from a waste is common to industrial processes and commercial recycling markets."[22] In the preamble to the Final NHSM Rule, EPA reasoned that because newspapers and aluminum cans discarded by consumers are then collected, sorted, and processed into new recycled paper and aluminum products, they are

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[18] *Id.*

[19] 40 CFR § 241.2 (emphasis added). That section further provides that secondary material "can include post-commercial material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap," none of which is relevant to the present discussion of ReEngineered Feedstock fuel.

[20] 76 Fed. Reg. 15,463.

[21] *Id.* (quoting *American Mining Congress v. EPA*, 824 F.2d 1177, 1185-87 (D.C. Cir. 1987)).

[22] 76 Fed. Reg. 15,537.

not considered solid waste.[23] Nor is collected plastic, which is typically sent to a reclaimer who sorts, grinds, and cleans it, and then delivers the sorted and cleaned plastic to a manufacturer who will use it as feedstock.[24] ReCommunity performs both functions, processing discarded fibers and plastics and utilizing them as feedstock in its own ReEngineered Feedstock manufacturing process.

Recycled fuel products are no different from these materials with respect to discard.[25] If discarded NHSMs "are later collected, segregated, and processed into a homogeneous fuel product that is marketed and sold as a valuable commodity and is no different from traditional fuels used today, then they should no longer be considered solid waste, just as recycled paper is not a solid waste."[26] In fact, the Final NHSM Rule expressly identifies certain materials—such as scrap plastics, construction and demolition wood, and landfill gas—that could otherwise fall within the CAA's definition of "municipal waste" as having the potential for conversion from solid waste to legitimate, non-waste fuels or products.[27] Notably, EPA grants specific regulatory exclusions even in the more stringent hazardous waste context, in recognition of the fact that secondary materials can be processed into valuable products. [28]

In short, because ReCommunity's process is designed to manufacture a final product, and because the final product is managed and sold as a valuable commodity (*i.e.*, fuel), ReEngineered Feedstock does not constitute a "discarded" "secondary material" or "solid waste" under RCRA. The NHSM Rule therefore should not apply, and combustion units that burn ReEngineered Feedstock should not be subject to Section 129 of the CAA, but instead to Section 112 and the rules and regulations promulgated under that section.

C. Even If It Were A Secondary Material Subject To The NHSM Rule, ReEngineered Feedstock Has Been Sufficiently Processed And Would Meet EPA's Legitimacy Criteria For Fuels That Can Be Combusted Without Triggering Section 129 Of The CAA

Even if ReEngineered Feedstock were to constitute a secondary material subject to the NHSM Rule, it should not be classified as a "solid waste" under RCRA. Generally speaking, the Final NHSM Rule and its implementing regulations classify non-hazardous secondary materials burned in combustion units as solid wastes unless they are expressly excluded. Section 241.3, which governs the standards and procedures for identifying NHSMs that are solid wastes when used as fuels or ingredients in combustion units, excludes the following NHSMs from the definition of solid waste (among others):

> (4) Fuel or ingredient products that are used in a combustion unit, and are produced from the processing of discarded non-hazardous secondary materials and that meet the legitimacy criteria specified in paragraph (d)(1) of this section, with respect to fuels, and paragraph (d)(2) of this section, with respect to ingredients. The legitimacy criteria apply after the non-hazardous secondary

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[23] *Id.*

[24] *Id.*

[25] *Id.*

[26] *Id.*

[27] *See* Section V.D.2 below.

[28] *Id.* (citing 50 Fed. Reg. 634 (Jan. 4, 1985)).

> material is processed to produce a fuel or ingredient product. Until the discarded non-hazardous secondary material is processed to produce a non-waste fuel or ingredient, the discarded non-hazardous secondary material is considered a solid waste and would be subject to all appropriate federal, state, and local requirements.[29]

This exemption squarely fits the process ReCommunity employs to manufacture ReEngineered Feedstock and is especially significant because it signals EPA's understanding that a manufacturing process utilizing source materials that constitute non-exempt non-hazardous secondary materials (*i.e.*, discarded secondary materials classified as solid waste under the NHSM Rule and, in turn, RCRA) can, through sufficient processing, produce non-waste fuel products to be used in combustion units. The regulations expressly support this interpretation, noting that the legitimacy criteria referenced in the exemption "apply after the non-hazardous secondary material is processed to produce a fuel or ingredient product," and explaining that "[u]ntil the discarded non-hazardous secondary material is processed to produce a non-waste fuel or ingredient, the discarded non-hazardous secondary material is considered a solid waste…".[30] As EPA explained:

> Fuel or ingredient products that result from the processing of discarded non-hazardous secondary materials and that meet the legitimacy criteria as discussed below are not solid wastes. Because the resulting fuel/ingredient products are, in effect, reclaimed or extracted products from a recycling process, EPA considers such materials to be "new" products that have not been discarded and therefore are not solid wastes.[31]

As discussed below, the ReEngineered Feedstock production process accepts as inputs—and processes—particular, discrete components of discarded NHSMs consistent with the regulations, along with sorbents, ultimately transforming the source materials into a final fuel product that meets the NHSM Rule's legitimacy criteria. ReEngineered Feedstock should therefore be exempt from classification as a solid waste under both the NHSM Rule and RCRA, and should not trigger Section 129 of the CAA when combusted.

1. The Select NHSMs Used To Produce ReEngineered Feedstock Have Been Sufficiently Processed To Exempt The Final Fuel Product From Classification As A Solid Waste Under The NHSM Rule

The regulations define "processing" as "any operations that transform discarded non-hazardous secondary material into a non-waste fuel or non-waste ingredient product," and further provide that "[p]rocessing includes, but is not limited to, operations necessary to:

> Remove or destroy contaminants; significantly improve the fuel characteristics of the material, *e.g.*, sizing or drying the material in combination with other

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[29] 40 CFR § 241.3(b)(4).

[30] 40 CFR § 241.3(b)(4).

[31] 76 Fed. Reg. 15,537.

> operations; chemically improve the as-fired energy content; or improve the ingredient characteristics.[32]

The ReEngineered Feedstock production process does exactly that. As discussed above, the process begins by accepting source materials in the form of comingled MSW, which constitutes solid waste under RCRA when it reaches ReCommunity's facilities.[33] The source materials are pre-sorted to separate out large metals and large plastics to be sent to the recycling commodity market, as well as bulky materials that cannot be processed and unwanted prohibitive materials. The remaining source materials are shredded and then fed into ReCommunity's innovative Multi-Material Processing Platform, in which optical, magnetic, and eddy current separators segregate and recover marketable recyclables[34] and remove hazardous, prohibitive, and non-combustible residues. The marketable recyclables are then sold as commodities on the market, and ReCommunity shares the proceeds with the local municipality from which it receives its source materials (*i.e.*, MSW). The materials then enter a second phase of sorting and processing on a finer scale, with further shredding of the remaining materials and employing density, magnetic, and eddy current separators to filter out any remaining recyclable materials, residues, and fine non-combustibles. As discussed above select fibers, heavy plastics, and light plastics are separated and segregated.

Once select portions of the post-recycling materials have been classified precisely, those discrete, sorted components enter the manufacturing phase of the ReEngineered Feedstock process, during which they are combined with other materials to create a new fuel product. In the manufacturing phase, the characterized and sorted components are carefully measured, mixed, and conditioned to produce an end product that suits the specific energy needs of each end user. Part of the final manufacturing process involves the introduction of sorbents and additives that were not originally part of the MSW source materials. Those additives are incorporated into the ReEngineered Feedstock to engineer the physical and chemical properties of the product, and ultimately to produce a fuel product with an emissions profile tailored to the needs of the end user, typically one that controls emissions of HAPs and criteria pollutants. Once the product has been crafted, it is then subject either to granulation, densification, or pulverization, depending on the application. The ReEngineered Feedstock (granules, pellets, or pulverized particles) is then ready for combustion.

As the preceding discussion illustrates, ReCommunity's procedures accomplish more than simply changing the shape or size of the source materials, and as such constitute "processing" under the applicable regulations. In fact, the ReEngineered Feedstock process does precisely that which EPA envisioned when it promulgated the Final NHSM Rule, which is to reclaim or extract specific materials from a recycling process to fabricate "new" products that have not been discarded and therefore do not constitute solid wastes under RCRA. The process also covers all of the potential aspects of the regulatory definition of "processing," insofar as it

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[32] 40 CFR § 241.2. In contrast, the regulations provide that, "[m]inimal operations that result only in modifying the size of the material by shredding do not constitute processing for purposes of this definition."

[33] Please see Section III for a detailed discussion of the content, properties, and legal definition of MSW.

[34] Primarily old corrugated cardboard, old newspapers, mixed paper/fibers, HDPE, PET, mixed plastics, ferrous metals, and non-ferrous metals.

significantly improves the fuel characteristics of the material, chemically improves the as-fired energy content, and improves the ingredient characteristics.[35]

Type of Fuel	HHV (Btu/lbs, as received)[36]	Moisture Content (wt.%)	Ash Content (wt.%)
Eastern Bituminous Coals	11,441	8.54	10.86
ReEngineered Feedstock	**9,984**[37]	**2.04**	**10.95**
MSW[38]	4,500-6,000	30-40	25-35

Table 3. – HHV, moisture and ash content of coal, ReEngineered Feedstock, and MSW

As the chart illustrates, ReEngineered Feedstock, with its high heating value and low moisture and ash contents, exhibits characteristics that are more similar to coal than to MSW. ReEngineered Feedstock also contains sorbents and other additives that, as discussed further below, control specific air emissions such as SO_2, NOx, HCl, dioxins and furans, and improve both the product's fuel characteristics and as-fired energy content. The MMPP and ReEngineered Feedstock manufacturing technologies also enable ReCommunity to produce varieties of ReEngineered Feedstock that are homogeneous and chemically and physically consistent, greatly improving boiler performance. In short, ReCommunity processes the NHSMs used to produce ReEngineered Feedstock sufficiently to exempt the final fuel product from classification as a solid waste under the NHSM Rule.

2. The Final ReEngineered Feedstock Product Satisfies The Legitimacy Criteria For A NHSM Used As A Fuel

Materials are considered legitimate fuels if they conform to the criteria codified in 40 CFR § 241.3(d) (the so-called "legitimacy criteria"). EPA designed these criteria to ensure that the fuel in question is not being "sham" recycled for the sole purpose of avoiding regulation as a solid waste.[39] Generally speaking, to meet the fuel legitimacy criteria, a NHSM must:

- Be managed as a valuable commodity,
- Have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy, and

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[35] *See* 40 CFR § 241.2.

[36] All values for HHV, moisture content, and ash content are presented as averages.

[37] ReCommunity can engineer ReEngineered Feedstock to meet the specific energy needs and emissions limitations of individual combustion units. Although the heating value will vary depending on the sorbent mix, the heating value of a particular type of ReEngineered Feedstock is constant and does not fluctuate.

[38] Data for MSW are reproduced from Table XII-1, at http://www.unep.or.jp/ietc/publications/spc/solid_waste_management/vol_i/18-chapter12.pdf.

[39] 76 Fed. Reg. 15,459.

- Contain contaminants at levels comparable to or lower than those in traditional fuels the combustion unit is designed to burn.[40]

ReEngineered Feedstock meets all of these criteria.[41]

a. ReEngineered Feedstock Is Managed As A Valuable Commodity

EPA has determined that the following three factors dictate whether a NHSM is being managed as a "valuable commodity":

(A) The storage of the non-hazardous secondary material prior to use must not exceed reasonable time frames;

(B) Where there is an analogous fuel, the non-hazardous secondary material must be managed in a manner consistent with the analogous fuel or otherwise be adequately contained to prevent releases to the environment; and

(C) If there is no analogous fuel, the non-hazardous secondary material must be adequately contained so as to prevent releases to the environment.[42]

ReEngineered Feedstock is to be burned as a fuel by combustion units in addition to or in lieu of traditional coal. As a result, coal constitutes an "analogous fuel," and only the first two "valuable commodity" criteria apply in this context. 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. Instead, combustion units will purchase ReEngineered Feedstock and use it promptly, and thus never store the fuel materials for any longer than a "reasonable time frame[]."

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

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[40] *See* 40 CFR § 241.3(d)(1).

[41] ReEngineered Feedstock also satisfies the legitimacy criteria for a NHSM used as an ingredient in a manufacturing or production process. *See* 40 CFR § 241.3(d)(2). ReEngineered Feedstock has been specifically engineered to deliver sorbents at precisely the correct time and temperature to substantially reduce air emissions during energy production, and can be sold at a premium price above its fuel substitution value. As such, it constitutes both a valuable ingredient in the clean energy production process and a valuable commodity that is managed accordingly. Combustion units pulverize ReEngineered Feedstock immediately prior to firing, and do not store it for any longer than a reasonable period of time. In addition, ReEngineered Feedstock is transported in pellet or granulated form, in sealed 1,000-pound Super Sack® and Gaylord Containers, to prevent releases to the environment. By substantially reducing air emissions, ReEngineered Feedstock provides a useful contribution to the energy production process. It also results in the production of a final, valuable product—energy associated with lower contaminant concentrations (*e.g.*, HAP and criteria pollutant emissions) than that produced from firing traditional coal alone. ReEngineered Feedstock therefore qualifies as a non-waste ingredient under the applicable regulations.

[42] 40 CFR §§ 241.3(d)(1)(i)(A)-(C).

Containers that minimize the risk of release. As they do with coal, combustion units will then pulverize the ReEngineered Feedstock when they are ready to fire it together with or in place of traditional coal.

b. ReEngineered Feedstock Has A Meaningful Heating Value And Is Used As A Fuel In Power Plant Combustion Units

In addition to being managed as a valuable commodity, the "non-hazardous secondary material must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy."[43] As discussed, combustion units that generate power will purchase ReEngineered Feedstock for use as a fuel either in addition to or in lieu of traditional coal, thus satisfying the second prong of this fuel legitimacy criterion. Combustion units recover energy by burning a wide variety of coals with heating values ranging from approximately 2,800 to 15,200 Btu/lbs.

Type of Fuel	Minimum HHV (Btu/lbs, as received)	Maximum HHV (Btu/lbs, as received)	Average HHV (Btu/lbs, as received)
All Ranks of U.S. Coal	2,810	15,247	11,491
Eastern Bituminous Coals	8,948	13,080	11,441
Sub-Bituminous Coals	4,450	13,800	8,600
Lignite	2,800	9,700	6,400
ReEngineered Feedstock	-	-	9,984[44]

Table 4. Heat values for a variety of coals and ReEngineered Feedstock[45]

A "meaningful" heating value, then, would be one that approximates the heating value of the coal fired in a particular combustion unit. Because ReCommunity can customize ReEngineered Feedstock to meet the specific energy needs and emissions limitations of individual combustion units, it can engineer fuel product varieties that produce heating values ranging from 6,500 to 10,000 Btu/lbs.[46] ReEngineered Feedstock can therefore match the heating value of the coal with which it will be fired, satisfying the regulatory requirement that non-waste fuel products have a "meaningful" heating value.

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[43] 40 CFR § 241.3(d)(1)(ii).

[44] Although the heating value will vary depending on the sorbent mix, the heating value of a particular type of ReEngineered Feedstock is constant and does not fluctuate. As such, there is no true range of heating values for a specific ReEngineered Feedstock product line.

[45] United States Geological Survey - U.S. Coal Quality Database.

[46] The heating value of a particular type of ReEngineered Feedstock is determined by the chemical composition of that variety. In other words, its heating value does not fluctuate. The range of heating values presented above merely reflects ReCommunity's ability to tailor ReEngineered Feedstock to meet the specific energy needs of individual combustion units.

c. ReEngineered Feedstock Contains Contaminant Concentrations Comparable To Or Lower Than Those In Traditional Fuels

The final fuel legitimacy criterion requires that:

> The non-hazardous secondary material must contain contaminants at levels comparable in concentration to or lower than those in traditional fuels which the combustion unit is designed to burn. Such comparison is to be based on a direct comparison of the contaminant levels in the non-hazardous secondary material to the traditional fuel itself.[47]

As EPA explained in the preamble to its *Commercial and Industrial Solid Waste Incineration Units: Reconsideration and Proposed Amendments; Non-Hazardous Secondary Materials That Are Solid Waste* ("Reconsideration"), this language is intended to provide flexibility for persons to make comparisons on the basis of contaminants or groups of contaminants.[48] In fact, EPA often groups contaminants as a standard practice when developing regulations, including the CAA Section 112 and Section 129 regulations that apply to the same combustion units impacted by the NHSM rule (*i.e.,* industrial, commercial and institutional boilers and process heaters and CISWI units and other solid waste incinerators).[49]

EPA explained that the phrase "traditional fuels which the combustion unit is designed to burn" includes traditional fuels that can be burned or are burned in a particular unit, whether or not those fuels are specifically identified in and allowed by the facility's permit.[50] Further, the traditional fuel contaminant comparison should use a value on the upper end of its statistical range, since doing otherwise (*i.e.*, selecting any lower value) could result in some "traditional fuels" potentially being considered solid waste when burned in the very combustion units originally designed to burn this range of fuels.[51]

The table below outlines the average concentrations of contaminants contained in Eastern bituminous coal and the average values for the same contaminant concentrations in ReEngineered Feedstock. As the data show, ReEngineered Feedstock contains contaminant concentrations comparable to or lower than the average for traditional Eastern bituminous coal in nearly all instances. Given that ReEngineered Feedstock is a precisely engineered material, we expect significantly lower variability in ReEngineered Feedstock than is naturally found in coal, as can be seen by the standard deviations in values in Table 5, below. As a result ReEngineered Feedstock will be far below the upper statistical range for Eastern bituminous coal, and thus clearly with contaminant levels comparable to, and in most instances lower than, traditional fuels. For example, traditional coal and ReEngineered Feedstock exhibit average concentrations of Arsenic (As) equal to 19.61 ppm and 0.98 ppm, respectively, and Mercury (Hg) equal to 0.10 ppm and less than 0.005 ppm, respectively. ReEngineered Feedstock therefore satisfies the third and final fuel legitimacy criterion and properly ought to be considered a non-waste fuel under the RCRA regulations.

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[47] 40 CFR § 241.3(d)(1)(iii).

[48] 76 Fed. Reg. 80,471.

[49] 76 Fed. Reg. 80,478.

[50] 76 Fed. Reg. 80,477.

[51] 76 Fed. Reg. 80,481.

Eastern Bituminous Coal			ReEngineered Feedstock		
	Average	Stdev		Average	Stdev
Moisture	8.54	3.18	Moisture	2.04	0.01
Ash, wt.% (db)	10.86	4.52	Ash, wt.% (db)	10.95	0.54
Dehydrated Sorbent, wt.% (db)	0.00	0.00	Dehydrated Sorbent, wt.% (db)	18.87	0.00
Volatile Matter, wt.% (db)	35.56	3.23	Volatile Matter, wt.% (db)	69.95	0.56
Fixed Carbon, wt.% (db)	45.06	4.06	Fixed Carbon, wt.% (db)	0.24	0.15
Carbon, wt.% (db)	63.36	4.38	Carbon, wt.% (db)	31.30	0.00
Hydrogen, wt.% (db)	5.39	0.37	Hydrogen, wt.% (db)	5.43	0.00
Oxygen, wt.% (db)	15.60	3.50	Oxygen, wt.% (db)	33.45	1.54
CO2 emission, lb/mmBtu	203.04	3.62	CO2 emission, lb/mmBtu	70.0	5.75
HHV, Btu/lb (db)	11,441	760	HHV, Btu/lb	9,984	0.00
Non-metal elements – dry basis			Non-metal elements – dry basis		
Nitrogen, wt.% (db)	1.28	0.34	Nitrogen, wt.% (db)	< 0.01	0.00
Sulfur, wt.% (db)	1.87	1.72	Sulfur, wt.% (db)	0.01	0.00
Chlorine (Cl), wt.% (db)	0.06	0.07	Chlorine (Cl), wt.% (db)	0.04	
Flourine (F) ppm	96.29	209.08	Flourine (F) ppm	14.28	2.71
Metal elements – dry basis			Metal elements – dry basis		
Arsenic (As), ppm	19.61	24.62	Arsenic (As), ppm	0.98	0.44
Beryllium (Be), ppm	3.17	1.37	Beryllium (Be), ppm	0.66	0.16
Chromium (Cr), ppm	16.82	15.16	Chromium (Cr), ppm	5.12	1.74
Cobalt (Co), ppm	7.46	8.07	Cobalt (Co), ppm	4.22	1.08
Mercury (Hg), ppm	0.10	0.08	Mercury (Hg), ppm	<0.005	0.00
Nickel (Ni), ppm	28.76	24.20	Nickel (Ni), ppm	6.69	0.65
Selenium (Se), ppm	2.95	1.83	Selenium (Se), ppm	2.00	0.00

Note: ReEngineered Feedstock chlorine data content based on PVC removal and thermal treatment. HHV and CO_2 value assumes ReEngineered Feedstock data manufactured with 20% plastic/80% fiber content; results will vary depending on sorbent mix.

Table 5. Contaminant data for Eastern Bituminous Coal and ReEngineered Feedstock[52]

D. The Use Of Discrete Components Of Municipal Waste As An Initial Source Material Does Not Prevent Conversion Into A Final Commercial Product

ReEngineered Feedstock uses discrete components of municipal solid waste as part of its initial source material. But this fact standing alone is irrelevant when determining whether the final manufactured product is a fuel, or whether it meets the NHSM's legitimacy criteria; neither the CAA nor RCRA, nor the NHSM or CISWI regulations, excludes discrete materials originally sourced from MSW from being considered a fuel. In other words, using discrete components of MSW as a precursor material does not itself trigger coverage by CAA Section 129; that role is clearly assigned to the combustion of "solid waste" as determined by the Administrator under RCRA (*i.e.*, under the NHSM Rule). Instead, under the CAA, sufficient quantities of "municipal waste" can trigger treatment under a specific category of Section 129 solid waste incineration units (*i.e.*, large or small municipal waste combustors). As discussed in further detail below, the legal characterization of waste as "municipal" does not prevent selected components of MSW from being sufficiently processed, as defined under the NHSM Rule.

[52] All Eastern bituminous data taken from the US Coal Quality Database, http://energy.er.usgs.gov/coalqual.htm; except for chlorine, which is taken from Bragg, L.J., R.B. Finkelman, and S.J. Tewalt. 1991. Distribution of Chlorine in United States Coal. In Chlorine in Coal (Stringer, J. and d.d. Banerjee, eds.). Elsevier, Amsterdam.

Although the regulations are clear that final products like ReEngineered Feedstock are never "discarded," and thus are not "secondary materials," some language in the preambles to the Final NHSM Rule and Reconsideration suggests the contrary.[53] However, EPA did not provide for or imply any distinct treatment for "municipal waste" in the proposed NHSM Rule.[54] As a result, commenters could not be expected to know that EPA was considering, or had assumed, that products containing discrete and selected components initially sourced from MSW were to be treated differently from products containing other solid wastes in the NHSM context. ReCommunity therefore requests that EPA correct any confusion those comments may have caused, and specifically find that ReCommunity's ReEngineered Feedstock is a legitimate fuel.

1. RCRA's Definition Of Solid Waste Dictates Whether A Unit Is Covered By Section 129 Of The CAA

Whether a particular combustion unit constitutes a "solid waste incineration unit" subject to Section 129 of the Clean Air Act depends on whether that unit burns "solid waste" as defined by RCRA, *not* whether that waste can be characterized as "municipal." Under the CAA, it is the presence of "solid waste" in a combustion chamber that triggers the Act's definition of "solid waste incineration unit," and thus coverage under Section 129.[55] By contrast, the CAA's definition of "municipal waste" is used *solely* to determine into which category of incinerator a "solid waste incineration unit" fits under Section 129.[56] For example, incinerators burning less than 30% "municipal waste" do not fall into the large or small "municipal waste" incinerator categories, but are still considered incinerators under Section 129.[57] If Congress had intended for a material's presence in the municipal waste stream to permanently and finally render that material a solid waste, then the CAA's language directing reliance on RCRA's definition of "solid waste," as determined by the Administrator, would be superfluous. EPA's NHSM rulemaking confirms this reading of the statutes, noting that the "determination by the Agency stands or falls based on the RCRA statute and case law, not the CAA."[58]

2. EPA's NHSM Rulemaking Consistently Allows Materials That Meet The CAA Definition Of "Municipal Waste" To Be Processed Into Non-Waste Fuels Or Ingredients

The CAA definition of "municipal waste" could apply to many materials that EPA expressly recognizes under the NHSM Rule as potentially being eligible for conversion from solid wastes to legitimate, non-waste fuels or ingredients. Rubber and leather (which account for 6.48 million tons of MSW per year), Wood (5.63 million tons annually), Plastics (6.68 million tons annually), Glass (11.5 million tons of MSW annually), Food Wastes (31.7 million tons of

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[53] The D.C. Circuit has expressly held that a preamble cannot trump the actual text of a regulation or statute. *See National Wildlife Federation v. EPA*, 286 F.3d 554, 569-70 (D.C. Cir. 2002) ("The preamble to a rule is not more binding than a preamble to a statute. A preamble no doubt contributes to a general understanding of a statute, but it is not an operative part of the statute and it does not enlarge or confer powers on administrative agencies or officers. *Where the enacting or operative parts of a statute are ambiguous, the meaning of the statute cannot be controlled by language in the preamble.*") (emphasis added).

[54] *See* 75 Fed. Reg. 31,844 (June 10, 2009).

[55] *See* Section I; *NRDC v. EPA*, 489 F.3d 1250 (D.C. Cir. 2007).

[56] *See* 42 U.S.C. § 7429(a)(1).

[57] *See* 42 U.S.C. § 7429(g)(5).

[58] 76 Fed. Reg. 15,470.

MSW annual),[59] and a variety of other materials exempt from classification as "solid waste" if found to be "non-waste fuels" under the NHSM Rule, all fall under the CAA definition of MSW.[60] If any of these materials developed a permanent "solid waste" taint that could not be removed through sufficient processing, then entire commercial recycling streams would necessarily constitute solid wastes, since recycled materials are indistinguishable from products made with solely virgin materials. Examples of materials that may at one point have been part of the municipal waste stream include:

a. **Scrap Plastics:** "[S]crap material from the manufacturing of plastic items, off-specification (off-spec) manufactured plastic goods, and packaging materials used in shipments to industrial users."[61] Given that plastics are frequently recycled, sometimes from single-stream MSW, the entire stream of plastics contains materials that could once have been MSW.

b. **Construction and Demolition ("C&D") Wood**: The NHSM Rule specifically allows C&D wood to be treated as a fuel, even if it contains small amounts of foreign material.[62]

c. **Manure**: "...today's final rule also says that manure would not be considered a solid waste when burned in a combustion unit as a fuel for energy recovery under the following circumstances: within the control of the generator; sufficiently processed; or non-waste determination given by Administrator."[63]

d. **Biomass and other materials**: Biomass, particularly paper, is one of the largest components of MSW, yet EPA expressly recognizes that biomass can be used as part of a coal-like fuel: "[c]oal fines, biomass, and other materials can be mixed and processed into pellets (or other forms) that have the consistency and handling characteristics of coal" and may be able to qualify as legitimate fuels.[64]

e. **Landfill Gas**: EPA considers methane generated from MSW landfills to be a fuel, not a solid waste, as long as the methane is sufficiently processed.[65] As a result, landfill gas plants burning sufficiently processed landfill gas are not treated as incinerators

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[59] *Municipal Solid Waste in the United States – 2007 Facts and Figures* EPA.

[60] *See* 42 U.S.C. § 7429(g)(5).

[61] EPA *Material Characterization Paper – Scrap Plastics* [need pincite].

[62] 76 Fed. Reg. 15,486.

[63] 76 Fed. Reg. 15,481.

[64] 76 Fed. Reg. 15,538.

[65] *See* EPA, *Letter to Sue Briggum*, p.2 (Aug. 5, 2011), *available at* http://www.epa.gov/epawaste/nonhaz/define/pdfs/landfill-gas.pdf (last accessed Jan. 30, 2012).

> under Section 129 of the CAA, even though the material they are combusting is entirely derived from MSW.[66]

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In short, because ReEngineered Feedstock satisfies the legitimacy criteria for non-waste fuels, it should not be considered a solid waste under RCRA. Therefore, combustion units that burn ReEngineered Feedstock should be subject to Section 112 of the CAA, not Section 129. By clarifying this characterization, EPA would allow ReEngineered Feedstock to provide the numerous benefits of a recycled product—including lower greenhouse gas emissions, lower traditional air pollutant emissions, reduced costs of compliance with air pollution regulations, reduced waste generation, and increased boiler efficiency—all while generating economic benefits for local communities.

VI. REENGINEERED FEEDSTOCK IS NOT LEGALLY, TECHNICALLY, NOR IN PRACTICE, EITHER MUNICIPAL WASTE OR REFUSE DERIVED FUEL

As described above in Section II, ReEngineered Feedstock is an engineered, valuable, and homogeneous fuel that is the product of a technologically advanced manufacturing process. In contrast, municipal waste is a heterogeneous waste that, when combusted, is done so primarily for disposal purposes. The composition and emissions of municipal waste are highly variable, it has low heating values, high ash and moisture contents, and it is not treated as a valuable commodity. The ReEngineered Feedstock sorting and manufacturing processes, in contrast, utilize unprocessed municipal waste as an initial source material, much like a wheat field provides the fibers and carbohydrates for end products like bread and straw after sufficient processing and related manufacturing. The ReEngineered Feedstock process isolates and segregates discrete, selected constituent ingredients from the MSW—fibers, hard plastics, and soft plastics—from which the fuel is manufactured along with sorbents made from virgin materials. Just as a loaf of bread does not contain the roots or stalk of the wheat—but does contain other non-wheat materials (like yeast and salt)—so to the ReEngineered Feedstock contains only the intended, specified constituent ingredients derived from the municipal waste stream, and also includes other virgin materials such as sorbents. ReEngineered Feedstock, like the bread from the wheat field, is an engineered product that is physically, chemically, and legally distinct from the source material.

A. Regulatory Treatment of Municipal Solid Waste And Refuse-Derived Fuel

Section 129 of the Clean Air Act defines "municipal waste" as:

> [R]efuse (and refuse-derived fuel) collected from the general public and from residential, commercial, institutional, and industrial sources consisting of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustible materials and non-combustible materials such as metal, glass and rock…"[67]

From a broader regulatory perspective, municipal waste falls within the RCRA definition of "solid waste," which includes, in pertinent part, "any garbage, or refuse… from industrial,

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[66] *See id.*

[67] 42 U.S.C. § 7429 (g)(5).

commercial, mining, and agricultural operations, and from community activities…".[68] As discussed above, the Final NHSM Rule determines which "non-hazardous secondary materials," when used as fuels or ingredients in combustion, are "solid wastes" under RCRA.[69] Under the Final NHSM Rule, unprocessed municipal waste falls squarely within the definition of "solid waste." Boilers that combust solid waste, including unprocessed municipal waste, are required to meet the emissions standards for solid waste incineration units under CAA Section 129.

Currently, municipal waste used for combustion falls within one of two categories: MSW and refuse-derived fuel ("RDF").[70] MSW is unprocessed municipal waste and is typically combusted primarily for purposes of disposal, although energy can also be recovered in the process. RDF is a minimally processed form of MSW that is intended to improve the combustibility of the MSW and reduce damage to the combustion unit, which is achieved through the removal of some larger non-combustibles and by size reduction to facilitate co-firing with coal. However, despite processing, RDF retains substantially all of the properties and variability of the underlying MSW.[71] The RDF is designed only to remove certain easily reached materials from the MSW that would damage the boiler equipment and then combust everything that remains. In stark contrast, the ReEngineered Feedstock process specifically selects certain of its constituent ingredients from the MSW and then characterizes and processes them to such a high degree that all unwanted materials are removed. ReEngineered Feedstock is then engineered from these discrete, consistent, and homogeneous constituent ingredients (including sorbents made from virgin materials) along with sorbents and additives.

From a legal and regulatory perspective, there is little to no difference between MSW and RDF; for this reason the definition of MSW in CAA Section 129 includes "refuse derived fuel."[72] EPA has even recognized that MSW and RDF are functionally equivalent, noting in a 1995 final MSW combustors rule that changes in the regulations were made to "clarify that RDF is a type of *preprocessed* MSW and not a different type of waste, the phrase 'MSW or RDF' in several paragraphs is being replaced with 'MSW' to avoid redundancy."[73] As such, units that burn RDF, either alone or co-fired with coal, are treated the same as units that combust unprocessed MSW, and regulated as incinerators under CAA Section 129.

Further emphasizing this legal equivalence, the CISWI/NHSM Reconsideration notes that, like MSW, "refuse derived fuel cannot be homogeneous because it is derived from MSW."[74] EPA recognizes that RDF is always inconsistent in formulation, can never have known fuel properties, does not have a defined origin, nor does it have predictable chemical and physical attributes.[75] This mean that RDF can never have consistent combustion characteristics

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[68] 42 U.S.C. § 6903(27); 40 CFR § 258.2.

[69] 76 Fed. Reg. 15,456.

[70] RDF is an umbrella term that encompasses a variety of processing methods used to facilitate combustion of municipal waste. The American Society for Testing and Materials ("ASTM") categorizes different types of RDF based on its degree of processing. The ASTM classification system is widely accepted and used both by EPA and industry. RDF processing in use in the United States today consists of the removal of some metals and non-combustibles and shredding.

[71] Floyd Hasselriis, *Variability of Municipal Solid Waste and Emissions From Its Combustion*, at 333.

[72] 42 U.S.C. § 7429(g)(5).

[73] 60 Fed. Reg. 65,382-83 (Dec. 19, 1995) (emphasis added).

[74] CISWI Reconsideration at 80,462.

[75] *Id.*

nor can it have a consistent emissions profile.[76] In contrast to RDF, ReEngineered Feedstock has a defined origin, is consistent in its formulation and emissions profile, and has fuel properties comparable to coal and other traditional fuels. ReEngineered Feedstock uses specific, discrete separated materials processed from MSW as some of its raw components; RDF is, for all practical purposes, MSW. EPA reasonably treats RDF and MSW as regulatory equivalents, but that treatment cannot reasonably be extended to ReEngineered Feedstock.

B. The Composition Of MSW Is Highly Variable And Heterogeneous

The primary distinguishing characteristic of municipal waste is the extreme variability and heterogeneity of its composition when compared with coal or other traditional fuels. The variability is such that, while the legal definition is fixed, there is little consensus on what exactly constitutes the waste stream. Numerous studies underscore the difficultly of properly characterizing the composition and quality of municipal waste, with one study noting that "large numbers of at least 200 lb (100 kg) samples [need] to be taken and analyzed to get even a rough estimate of the properties and variations..."[77] The major waste components (*e.g.*, plastics, metals, glass, wood, yard trimmings, etc.) are generally stable across studies and surveys, but the subcategories are quite variable.[78]

A number of factors account for the variability in composition of MSW, including seasonal variations, regional variations, climate, population density, state waste management policies, and the differing ratios of household, industrial and commercial wastes.[79] Seasonal variations in yard trimmings are impacted by grass clippings, autumn leaves and Christmas trees, depending on climate. Bans on certain MSW components, such as lead-acid batteries, used oil, and scrap tires, are common, but by no means uniform or uniformly enforced. Arizona, California, Delaware, Kansas, New Mexico and Ohio all allow lead-acid batteries to be landfilled and six other states allow the landfilling of used tires.[80] Bans on yard trimmings, white goods, and electronics are much more variable.[81] The amount of materials recovered through recycling programs has been shown to have a strong influence on the composition of MSW, particularly on the paper components such as newspapers, cardboard, and office paper.[82] MSW further varies across regions and population density. Rural areas produce fewer newspapers and telephone directories on a per capita basis than urban areas.[83] Not surprisingly, the levels and types of commercial activity in a community have a strong impact on products like corrugated boxes, office paper, wood pallets, and food scraps from restaurants.[84]

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[76] *Id.*

[77] Floyd Hasselriis, *Variability of Municipal Solid Waste and Emissions From Its Combustion*, at 333.

[78] Bryan F. Staley and Morton A. Barlaz, *Composition of Municipal Solid Waste in the United States and Implications for Carbon Sequestration and Methane Yield*, 10 J. ENVTL ENGIN. 135, 903 (2009).

[79] FLOYD HASSELRIIS, REFUSE-DERIVED FUEL PROCESSING 3 (Butterworth Publishers, 1984).

[80] *Technical Support Document For Revision Of Certain Provisions: Proposed Rule For Mandatory Reporting of Greenhouse Gases*, Office of Air and Radiation, U.S. Environmental Protection Agency, 19 (July 8, 2010).

[81] *Id.* at 19.

[82] *Id.* at 19.

[83] *Id.* at 17.

[84] *Id.* at 17.

The difference between unprocessed MSW and RDF is a difference of degree, not of kind. RDF processing merely reduces, but does not eliminate, the variability and heterogeneity of the underlying MSW. Even the most advanced RDF processes do nothing to alter the "time varying characteristics (*e.g.*, composition) of the incoming MSW."[85] RDF "essentially retains the properties of the original MSW" and, as a result, variability in emissions.[86] The size of the particles, the glass content, and the presence of non-combustibles in RDF may constitute a relative improvement when compared with MSW, but RDF remains fundamentally a heterogeneous waste. RDF processing methods are intended to facilitate combustion, not to engineer a fuel,[87] and not even the most sophisticated RDF processes sever the causal link between the composition of the underlying MSW and the final RDF.

In contrast, ReEngineered Feedstock is a manufactured product, with a constant composition and set of characteristics. ReEngineered Feedstock draws some of its source material from specific, discrete components of the MSW stream, and as a result the fuel itself is consistent and homogeneous. Each specific, made-to-order batch of ReEngineered Feedstock contains that exact same composition of fibers, light plastics, heavy plastics and sorbents made from virgin materials. The patented MMPP process extracts all marketable recyclables from the municipal waste stream, and isolates and removes all non-recyclable non-combustible materials, intert materials, and prohibitive materials for landfilling. As described in more detail above, the MMPP outputs the discrete constituent ingredients of ReEngineered Feedstock to the AMP (sorbents are added during the AMP), and those constituents are identical irrespective of the municipal waste stream. The link between the variable composition of municipal waste is completely severed by the ReEngineered Feedstock MMPP process, which allows the AMP to always begins with specifically selected, chemically-consistent constituent ingredients.

	MSW	RDF	ReEngineered Feedstock
Partial Removal of NonCombustible Inerts (dirt, grit, glass, metals, aluminum)		X	X
Full Removal of Non-Combustible Inert Materials			X
Removal and Sale of All Recyclable Metals, Plastics and Fibers			X
Managed as a Valuable Commodity			X
Consistent and Predictable Chemical Composition			X
Optical Sorting Technology			X
Materials Classification			X
Engineered for Specific Heating Value and Specific Downstream Chemical or Process Optimization			X
Sorbents and Additives for Targeted Emission Reductions			X

Table 7. Processing steps for MSW, RDF, and ReEngineered Feedstock

[85] L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §3.

[86] Floyd Hasselriis, *Variability of Municipal Solid Waste and Emissions From Its Combustion*, at 333.

[87] United Nations Environment Programme, SOLID WASTE MANAGEMENT 297.

C. The Emissions From Combusted MSW Are Highly Variable

There is a direct causal link between the heterogeneous and variable composition of MSW or RDF and its emissions variability when combusted. The seasonal, regional, and other variations in the municipal waste stream impact CO_2, NOx, PM, HCl, ash, and a variety of pollutants emitted from the combustion of MSW. The variability of combusted MSW emissions stands in marked contrast to the emissions profile of ReEngineered Feedstock, which is controlled, constant, and homogeneous due to the highly specific contents of the fuel. In addition to the constant and homogeneous composition, the ReEngineered Feedstock manufacturing process culminates in the infusion of sorbents and additives into the fuel to lower targeted emissions.

The variability of emissions from the combustion of MSW is caused by the variability of municipal waste composition. For example, CO_2 emissions from combusted MSW vary greatly with the seasonal changes in the content and ratio of "fossil-to-biogenic components."[88] The content and ratios of biogenic matter are strongly influenced by the recovery of paper, yard trimmings, and other seasonal and regional variables (*i.e.*, urban versus suburban, and arid versus temperate climates).[89] Nitrous oxide emissions are also highly variable based on the composition of the MSW. In a study of greenhouse gas emissions from waste-to-energy ("WTE") plants as part of EPA's Waste Reduction Model ("WARM"), the reliability of the data for N_2O emission was limited because ranges were so broad, "in some cases, the high end of the range was 10 times the low end of the range."[90] The variability of MSW emissions is exacerbated because WTE plants cannot store MSW for long periods of time to even out seasonal variations; the strong odor and presence of volatile organic compounds ("VOCs") make long-term storage infeasible. ReEngineered Feedstock, in contrast, produces limited odor and low VOCs, and can be stored in similar situations and timeframes as the coal it displaces.

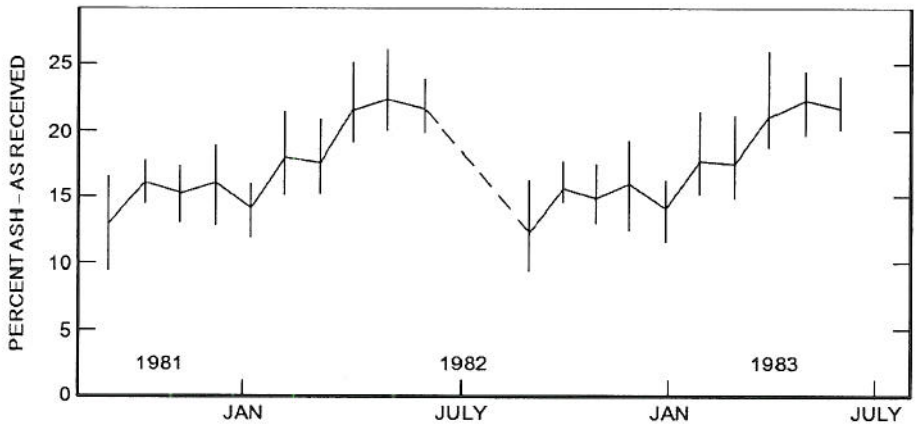

Figure 9. Seasonal variation in Ash content of an RDF sample.

RDF exhibits less variability in its emissions profile only when compared with unprocessed MSW. The variation in sulfur, chlorine, and lead content in a St. Louis RDF study

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[88] *Technical Support Document For Revision Of Certain Provisions: Proposed Rule For Mandatory Reporting of Greenhouse Gases*, Office of Air and Radiation, U.S. Environmental Protection Agency, 20 (July 8, 2010).

[89] *Id.* at 20.

[90] Environmental Protection Agency Waste Reduction Model (WARM), Report on Combustion, Pg. 13.

also showed clear seasonal variations. Within the seasonal variations there was also a high degree of variation within a single sample (*e.g.*, the sulfur content averaged 760 ppm but the range was between 200 and 1500 ppm within the sample set).[91] The same study of combusted RDF at the St. Louis plant found much higher lead concentrations during the winter "when refuse is dry," but concentrations "were low or nil" during spring and summer.[92] The St. Louis RDF study also found "seasonal variation in the lead and cadmium concentrations of ash residues from a municipal incinerator, very likely resulting from seasonal moisture variations and the consequent variations of furnace temperatures." The study also found that there were "spikes" in the metal content that could have seriously biased the resulting average values. RDF moisture and ash contact is "greatly affected" by seasonal variation in the composition of the underlying MSW, primarily due to yard waste.[93] ReEngineered Feedstock, in contrast, will maintain constant composition, and result in constant emissions levels due to the consistent source input materials and addition of specifically calculated sorbent and additive mixes for each application.

D. The Low Heating Value, Low Energy Content, And High Emissions Profiles Of MSW And RDF Are The Direct Result Of The Failure To Remove Metals, Glass, Moisture, And Other Non-Combustibles From The Waste Stream

1. High Ash, PM, CO, Dioxins, HCl, and Other Emissions

The lack of processing in MSW and the incomplete processing of RDF leads to the presence of inert residues, metals, glass, and a variety of other non-combustibles that impact emissions profiles, increasing ash and moisture content, PM, CO, dioxins, and often HCl. In addition to their highly variable nature, emissions from combusted MSW and RDF are also higher on average, in both acid gases (including NO_x, SO_2, SO_3 and HCl) and total metals, including arsenic. It is difficult to paint an accurate portrait of the emissions profiles of combusted MSW and RDF precisely because of this high variability and heterogeneity of emissions. Nevertheless, several generalizations about the emissions contents of MSW and RDF relative to coal can be made. As EPA notes in one project study: "RDF had higher volatile matter and lower fixed carbon contents than coal. . . [w]as higher in moisture, hydrogen, chlorine, ash, and oxygen contents than coal" and, as a result, had half the heating value.[94] Increased particulate matter, high chlorine and ash content were also found at the RDF facilities surveyed.[95]

The difficulty inherent in characterizing the composition of MSW from a purely definitional standpoint underscores the need for strict emission limits—it is impossible to know exactly what a municipal waste combustor is burning at any given time and, as a result, emitting

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[91] Floyd Hasselriis, *Variability of Municipal Solid Waste and Emissions From Its Combustion*, at 337.

[92] *Id.* at 339.

[93] FLOYD HASSELRIIS, REFUSE-DERIVED FUEL PROCESSING 39 (Butterworth Publishers, 1984).

[94] R.J. Vetter, M.L. Smith, K.W. Ragland, R.K. Ham, and R.P. Madding, *Test Firing Refuse-Derived Fuel in an Industrial Coal-Fired Boiler*, Project Summary at 2.

[95] V.J. Landrum and R.G. Barton, *Municipal Waste Combustion Assessment: Fossil Fuel Co-Firing*, Project Summary at 3.

(uncontrolled) on a given day or in a given week or year.[96] ReCommunity's manufacturing process for producing ReEngineered Feedstock specifically targets the removal of PVC materials and thermally treats all plastics, dramatically reducing the available chlorine in the emissions chamber. As a result, the creation of HCl, and the chlorine-based organics, such as furans and dioxins, are proportionally reduced to be consistent with, or lower than, coal. ReCommunity further anticipates that pilot-scale emission testing which will be conducted at the SCANA Urquhart Plant will show that ReEngineered Feedstock has materially lower emission levels for NOx, dioxins and furans.

	MSW	RDF	ReEngineered Feedstock
SO_2	0.384	0.355	0.031
HCl	0.711	0.634	0.330
Cadmium (Cd)	1.21E-03	7.95E-04	1.36E-04
Arsenic (As)	4.86E-04	5.40E-04	1.36E-04
Chromium (Cr)	9.97E-04	1.27E-03	5.52E-04
Lead (Pb)	2.37E-02	1.83E-02	3.62E-03

Table 8. Emissions (all data is lb/mmBtu)[97]

2. Low Energy And Heating Value

The heating value and moisture content of RDF may constitute slight improvements when compared with MSW, but they are not equivalent to coal,[98] and are not sufficient "to justify RDF being regarded as a clean or high-quality fuel in terms of combustion."[99]

Fuel Type	HHV (Btu/lbs, as received)	Moisture Content (wt.%)	Ash Content (wt. %)
Eastern Bituminous Coal	11,441	10.86	10.86
ReEngineered Feedstock	**9,984**[1]	**2.04**	**10.95**
MSW	4,500 – 6,000	30 – 40	25 – 35
RDF	5,00 – 6,500	20 – 30	20 – 30

Table 9. Comparison of relative HHV, Moisture and Ash Content

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[96] *Technical Support Document For Revision Of Certain Provisions: Proposed Rule For Mandatory Reporting of Greenhouse Gases*, Office of Air and Radiation, U.S. Environmental Protection Agency, 16 (July 8, 2010).

[97] Data based on EPA's Emissions Factors & AP 42, *Compilation of Air Pollutant Emission Factors*

[98] RDF represents an approximate 500 Btu/lb improvement in HHV, and a 10-15 percent improvement in ash and moisture content. *See* Table 3 *supra*; L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §5.

[99] *Id.*

E. Unlike ReEngineered Feedstock, MSW and RDF Cannot Be Used In Standard Coal-Fired Boilers

The variable composition, low heating value, and high ash and moisture content of MSW causes problems with storage and combustion in typical coal-fired boilers. The combustion of MSW, either alone or co-fired with coal, would require the modification of any existing coal-fired boilers.[100] Plants must also build storage facilities specifically designed to deal with the odor, VOC emissions, and hygiene problems prior to combustion, and the increased ash content after combustion.[101] Moreover, many of the characteristics of MSW and RDF, including high ash and moisture content, low heating value, the presence of non-combustibles, and the overall compositional variability, would cause degradation in boiler performance and damage to facilities if they were fired in coal-fired boilers.[102]

High ash content from co-fired MSW, four to six times higher than coal,[103] can cause damage to burners and boilers and seriously degrade the quality of the exhaust gases,[104] while also creating handling and disposal problems for boilers that co-fire RDF.[105] The presence of non-combustibles, such as metals and glass, can cause a "a buildup of silicon dioxide and metal oxide deposits on the heat transfer surfaces, of the boiler" leading to loss of the heat transfer capability of the surfaces and in severe cases require shutdown and overhaul of the boiler.[106] The high chlorine content of some waste streams results in the creation of HCl during combustion that has "a corrosive effect on the internal surfaces of the burner and sections of the boiler, especially the boiler tubes."[107]

The low and variable heating values and energy content of combusted MSW and RDF also impact boiler efficiency.[108] The inconsistent heat content requires constant monitoring of the injection of RDF, increasing the relative cost of the energy produced. Boiler efficiency is further negatively impacted by increases in flue gas production, unburned carbon, and fuel moisture losses.[109] Indeed, co-firing RDF impacts nearly every aspect of boiler operation and performance, "including boiler efficiency, flue gas flow rates, stack emissions, bottom ash production, slagging and fouling."[110]

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[100] *Id.*

[101] *Id.*

[102] "*Refuse-Derived Fuel Moisture Effects On Boiler Performance and Operability*" Arvan and Woodward. Pg. 37

[103] L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §5.

[104] *Id.*

[105] Regional System Technical Evaluation Final Report, Prepared for: Solid Waste Management Coordinating Board at 28 ("The presence of metals and other contaminants may prohibit continued land application. All ash may be required to be disposed of in an ash monofill if RDF co-firing is utilized.") (2000).

[106] L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §5; *See also* L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §5 ("The presence of small particles of metal and of glass fines (<0.125 cm) in RDF can present problems in the combustion system.").

[107] L.F. Diaz & G.M. Savage, *Production and Quality of Refuse-Derived Fuel (RDF)*, §5.

[108] Environmental Protection Agency Waste Reduction Model (WARM), Report on Combustion, Pg. 13.

[109] V.J. Landrum and R.G. Barton, *Municipal Waste Combustion Assessment: Fossil Fuel Co-Firing*, Project Summary at 3.

[110] *Id.* at 3.

Not so with ReEngineered Feedstock. ReEngineered Feedstock is engineered specifically to co-fire with coal, with heating values tailored to the coal with which it will be co-fired. ReEngineered Feedstock does not require modification of boilers, nor does it cause damage or increase operating costs when co-fired. It is free-flowing and pulverized to match coal. The fluid dynamics and kinetics of pulverized ReEngineered Feedstock are also similar to pulverized coal. ReEngineered Feedstock is densified prior to shipment and designed for low-VOC content to ease transportation and storage, obviating the need for special transportation or storage facilities.

In summary, ReEngineered Feedstock uses certain discrete components of MSW as an initial source material (along with virgin materials such as sorbents), but first recovers all marketable recyclables, removes prohibitives and non-combustibles, and following a careful synthesizing of precisely characterized components. This extensive processing far exceeds anything currently in use today by MSW or RDF facilities, and also exceeds all processing discussed as sufficient in the preamble to the final NHSM rule. MSW and RDF are highly variable, must be burned in specialized facilities, and contain numerous high-emitting materials. ReCommunity's ReEngineered feedstock guarantees a chemically consistent, carefully engineered product that will control emissions, and can be burned exactly like coal in existing power plants. ReEngineered Feedstock meets the criteria for consideration as a fuel under the NHSM; MSW and RDF do not.

VII. CONCLUSION

For the reasons discussed above, ReCommunity respectfully requests that EPA clarify that ReEngineered Feedstock, as described above, is either a final commercial product or a non-waste fuel satisfying EPA's legitimacy criteria, and therefore not a solid waste when combusted. The discrete components of MSW that ReEngineered Feedstock incorporates are more highly processed than many of the materials which EPA has identified as legitimate fuels in its preamble to the final NHSM rule, and those materials are then used along with virgin sorbents and other additives to precisely manufacture a final commercial product. ReEngineered Feedstock offers significant environmental and economic benefits, in terms of reduced cost of compliance with air pollution control requirements for coal-fired combustion units, expanded recycling, and increased jobs and revenues for local communities. As the keystone product in ReCommunity's effort to reinvest in sustainable communities to convert wastes into resources, ReEngineered Feedstock can catalyze the Recovery Revolution, and help move the United States to a zero-landfill future.