



North Carolina Department of Environment and Natural Resources

Pat McCrory  
Governor

Donald R. van der Vaart  
Secretary

June 10, 2015

Mr. Jim Clayton  
The SEFA Group  
217 Cedar Road  
Lexington, SC 29073

SUBJECT: Applicability Determination No. 2501  
The SEFA Group  
Lexington, SC

Dear Mr. Clayton:

The North Carolina Division of Air Quality (DAQ) received your letter dated September 5, 2014, requesting the DAQ's concurrence with its determination of regulatory status of certain coal combustion residues, when used in its Staged Turbulent Air Reactor (STAR Reactor), in accordance with 40 CFR 241 "Solid Wastes Used As Fuels or Ingredients in Combustion Units" ("Solid Waste Definition Rule" or "Rule" hereinafter).

Specifically, SEFA Group (SEFA) requests the confirmation that coal ash obtained from the following specific sources meets the requirements in §241: flyash received directly from coal-fired power plant's particulate collection infrastructure (i.e., electrostatic precipitator or baghouse), and processed flyash received from landfills and ash ponds.

Unless exempt, combustion of "non-hazardous secondary material (NHSM), as defined in §241.2 would subject the emissions unit (such as STAR reactor) to requirements in 40 CFR 60 Subpart CCCC "Standards of Performance for Commercial and Industrial Solid Waste Incineration Units" or, Subpart DDDD "Emissions Guidelines and Compliance Times for Commercial and Industrial Solid Waste Incineration Units". These regulations are commonly known as CISWI ("Commercial and Industrial Solid Waste Incineration").

The DAQ has determined that the coal ash received directly from the coal-fired power plant's particulate collection infrastructure (i.e., electrostatic precipitator or baghouse) is a NHSM and an "ingredient", as defined in §241.2. DAQ has further determined that this flyash meets the legitimacy criteria included in §241.3(d)(2) and thus, concludes that it is not a solid waste. Therefore, the STAR Reactor is not subject to the requirements in CISWI.

Moreover, the processed flyash received from landfills or ash ponds is a NHSM and an ingredient, and DAQ has determined that this flyash also meets the legitimacy criteria included in §241.3(d)(2), and thus, concludes that it is not a solid waste. Therefore, the STAR Reactor is not subject to the requirements in CISWI.

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The following includes discussion on STAR Reactor, and technical and regulatory analysis supporting these conclusions for each of the above types of flyash:

### **STAR Reactor**

The STAR Reactor is a patented technology developed by SEFA for thermal beneficiation / processing of either a low or high-Btu value fine particulate matter, such as the above described flyash [hereinafter “feedstock”], along with other ingredient materials (gas, solids, and liquids) into a variety of commercial products. These products are used not only for application as a partial cement replacement but for many other commercial and industrial applications. There are several products which SEFA is currently capable of producing because of the flexibility embodied in this reactor. For example, STAR<sup>®</sup> RP, Ultrix<sup>®</sup>, Spherix<sup>®</sup>, Fortimix<sup>®</sup>, and Permanix<sup>™</sup>.

The STAR Reactor process is inherently flexible in that operating parameters can be varied and different ingredients can be added to produce a desired product. The primary component of the STAR Reactor is a cylindrical refractory-lined vessel in which the majority of the process reactions take place. These reactions can include a range of both chemical and physical reactions. Air is required for pneumatic uplift of the solids and for the process reactions enters through the floor of the STAR Reactor as well as through the walls at multiple locations. The raw feedstock and any other ingredients are introduced through the walls of the STAR Reactor. All of the solids and gases exit together at the top of the reactor. The gas/solids mixture enters a hot cyclone where the majority of solids are separated from the gas and recycled back to the STAR Reactor. The very high rate of hot recycle solids increases the operating flexibility of the process. The process reactions can occur through this reactor/hot cyclone loop. Due to the high gas velocity, the multiple injection points, and the recycle solids, there is a significant amount of turbulence created which enhances the mixing of the ingredients and optimizes the reactions. The gas and remaining solids not collected by the hot cyclone are passed over a heat exchanger which can be designed to preheat the process air, used in heat recovery, or to simply cool the gas/solids mixture. Once cooled, the solids are separated from the gas in a fabric filter recovery device. Solids can also exit the STAR Reactor at the bottom or from the recycle loop. These solids can be combined with the solids/gas stream before the heat recovery equipment or, since they have different characteristics as compared to the solids exiting the hot cyclone, they can be processed separately for a particular application. By design the STAR Reactor operates under a wide range of process parameters.

### **Technical and Regulatory Analysis**

#### Flyash Received Directly from Coal-fired Power Plant’s Particulate Collection Infrastructure (i.e., Electrostatic precipitator or Baghouse)

As described above, the STAR Reactor is capable of utilizing flyash, received directly from coal-fired power plant’s particulate emissions controls, as its primary ingredient along with other select ingredients in order to produce a variety of products for markets.

§241.2(b)(3) of the rule defines NHSM as "a secondary material that, when discarded, would not be identified as a hazardous waste under Part 261 of this chapter". Further the same section defines secondary material as "any material that is not the primary product of a manufacturing or commercial process, and can include post-consumer material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap."

It is indisputable that flyash generated from combustion of coal is not a "primary product of a manufacturing" facility (such as electric generating facility) and this product can be deemed as "post-industrial material". Moreover, coal flyash is not regulated as a hazardous waste as per Part 261 of 40 CFR "Identification and Listing of Hazardous Waste". In fact, EPA has promulgated a rule on April 17, 2015 (80 FR 21302) to regulate disposal of coal combustion residues (fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers) [CCR] as solid waste under Subtitle D "State or Regional Solid Waste Plans" of the Resource Conservation Act (RCRA) [administrative regulations included in 40 CFR 257) and not under the Subtitle C of the RCRA "Hazardous Waste Management" [administrative regulations included in 40 CFR 261]. In addition, the beneficial uses (e.g., use of flyash in concrete manufacturing replacing traditional product cement) of CCR is exempt from this regulation.

Based, on the above discussion, it is concluded that the flyash generated from the coal combustion and received directly from coal-fired power plant's particulate emissions control devices, is a NHSM.

§241.3(b)(3) of the Solid Waste Definition Rule provides that NHSMs are not solid waste when "used as an ingredient in a combustion unit that meet the legitimacy criteria specified in paragraph (d)(2) of this section." §241.2 of the Solid Waste Definition Rule defines "ingredient" as "a non-hazardous secondary material that is a component in a compound, process or product." The feedstock is merely one component among a number of variables which are introduced to the STAR Reactor to produce many different products. Therefore, feedstock processed in the STAR Reactor is an ingredient under the Solid Waste Definition Rule.

#### Legitimacy Criteria

For a non-hazardous secondary material used as an ingredient to be excluded from the definition of solid waste under §241.3 of the Solid Waste Definition Rule, the material must satisfy the following legitimacy criteria under Subsection (d)(2):

- (i) The non-hazardous secondary material must be managed as a valuable commodity;
- (ii) The non-hazardous secondary material must provide a useful contribution to the production or manufacturing process.
- (iii) The non-hazardous secondary material must be used to produce a valuable product or intermediate.

- (iv) The non-hazardous secondary material must result in products that contain contaminants at levels that are comparable in concentration to or lower than those found in traditional products that are manufactured without the non-hazardous secondary material.

*Managed as a Valuable Commodity - §241.3(d)(2)(i)*

SEFA stores its feedstock in silos and or covered shelters prior to using it as an ingredient in the STAR Reactor and conveys the material to the process equipment pneumatically. As per §241.3(d)(2)(i), the Solid Waste Definition Rule identifies the following three factors to be considered in determining whether a material is 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 ingredient, the non-hazardous secondary material must be managed in a manner consistent with the analogous ingredient or otherwise be adequately contained to prevent releases to the environment;
- (C) If there is no analogous ingredient, the non-hazardous secondary material must be adequately contained to prevent releases to the environment;

As per SEFA, in a previously permitted design, the storage capacity of the silos and partially enclosed storage bins for incoming feedstock ranges from 800-2000 tons and could accommodate approximately three to ten days of production when the STAR Reactor is operating on SEFA's normal production schedule. As such, under normal operations, the incoming feedstock is typically stored no more than three days prior to introduction into the STAR Reactor process. However, during shutdown of the STAR Reactor or when off-specification feedstock is received from a supplier, the feedstock may be stored for longer periods of time, but usually no more than sixty days. In the past, as per SEFA, shutdown of the STAR Reactor has generally not exceeded twenty days. With respect to the management of off-specification feedstock, SEFA has indicated that if this off-specification material can be blended with other feedstock at ratios which ensure that processing in the STAR Reactor produces an end product which meets SEFA's quality control standards, it will attempt to do so. Depending on the nature and amount of the material's deviation from SEFA's feedstock specifications, if it cannot be blended, the off-specification feedstock will have to be rejected and returned to the supplier. If it is capable of being blended, the blending process may require storage of the off-specification feedstock for as long as 60 days depending upon the quantity involved. Accordingly, even outside of the normal three-day processing scheduling for incoming feedstock, SEFA's storage of incoming feedstock does not exceed a reasonable time frame.

Additionally, SEFA manages the incoming feedstock as a valuable commodity and takes measures to prevent loss of material during off-loading and storage. In the preamble to the rule, EPA explains that "If on the other hand, a company does not manage the non-hazardous secondary material as it would traditional ingredients, that behavior may indicate that the non-

hazardous secondary material is being discarded.” Refer to 76 FR 15543. The material must be “stored in a manner that both adequately prevents releases or other hazards to human health and the environment, considering the nature and toxicity of the non-hazardous secondary material.” *Id.* In most cases, this requirement is satisfied if the material is in some manner “contained.” *Id.* As noted, SEFA stores its feedstock in enclosed silos or covered and partially enclosed storage bins and therefore meets this criterion. Additionally, at all times prior to processing, SEFA handles the material in a manner consistent with this criterion. Feedstock is transferred from its suppliers (typically, coal-fired power plants) to SEFA either (i) directly by pneumatic conveyor into the silos or (ii) by truck to the SEFA facility. All bin vents within the pneumatic conveyor system are equipped with fabric filter recovery devices to minimize loss of this valuable material. Thus, SEFA believes that it unquestionably manages its feedstock as a valuable commodity.

*Useful Contribution to the Production or Manufacturing Process - §241.3(d)(2)(ii)*

SEFA believes that there is no question that the feedstock processed in the STAR Reactor provides a useful contribution to its production of the various end products marketed by SEFA. In the preamble to the Solid Waste Definition Rule, at 76 FR 15543, EPA explains the rationale behind this criterion for legitimacy:

A non-hazardous secondary material used as an ingredient in combustion systems provides a useful contribution if it contributes valuable ingredients to the production/manufacturing process or to the product or intermediate of the production/manufacturing process. This criterion is an essential component in the determination of legitimacy because legitimate use is not occurring if the non-hazardous secondary material doesn’t add anything to the process, such that the non-hazardous secondary material is basically being disposed of or discarded. This criterion is intended to prevent the practice of “sham” recycling by adding non-hazardous secondary materials to a manufacturing operation simply as a means of disposing of them.

SEFA states that the feedstock processed in the STAR Reactor is clearly not added to dispose of that material and the processing of the feedstock in the STAR Reactor can in no manner be characterized as “sham” recycling. Additionally, the fact that some of the constituents of the feedstock are not needed or desirable for the STAR Process does not affect the status of the “useful contribution” of the feedstock:

For purposes of satisfying this criterion, not every constituent or component of the non-hazardous secondary material has to make a contribution to the production/manufacturing activity. **For example, non-hazardous secondary materials used as ingredients may contain some constituents that are needed in the manufacturing process, such as, for example, zinc in non-hazardous secondary materials that are used to produce zinc-containing micronutrient fertilizers, while other constituents in the non-hazardous secondary material, such as lead, do not provide a useful contribution.** Provided the zinc is at levels that provides a useful contribution, we believe the non-hazardous

secondary material would satisfy this criterion, although we would note that the constituents not directly contributing to the manufacturing process could still result in the non-hazardous secondary material not meeting the contaminant part of the legitimacy criteria. The Agency is not quantitatively defining how much of the non-hazardous secondary material needs to provide a useful contribution for this criterion to be met, since we believe that defining such a level would be difficult and is likely to be different, depending on the non-hazardous secondary material. The Agency recognizes that this could be an issue if persons argue that a non-hazardous secondary material is being legitimately used as an ingredient, but in fact, only a small amount or percentage of the non-hazardous secondary material is used.

76 FR 15543-44 (emphasis added).

The fact that reactions in the STAR Reactor eliminate certain undesirable constituents of the feedstock material does not preclude a determination that the feedstock meets the legitimacy criteria as an ingredient. As described above, the STAR Reactor has the capability to control the chemical and physical reactions in the process to produce marketable materials with a broad range of characteristics. The constituents and characteristics of each STAR Reactor product are tailored to the intended market and vary depending on the needs of that market. The elimination of certain constituents does not affect the determination that the feedstock is an ingredient which makes a useful contribution to the products produced in the STAR Reactor.

*Produces a Valuable Product or Intermediate - §241.3(d)(2)(iii)*

As per SEFA, it is undisputed that feedstock material is used in the STAR Reactor to make valuable products. “The product or intermediate is valuable if it is (i) sold to a third party or (ii) used as an effective substitute for a commercial product or as an ingredient or intermediate in an industrial process.” Refer to 76 FR 15544. Also, as discussed above, the STAR Reactor has the capability to process its fly ash and other materials to produce a broad range of products. All of the products currently produced in the STAR Reactor are sold to third parties. Additionally, the various products produced in the STAR Reactor have application as both substitutes for commercial products and as ingredients in an industrial process. Ultrix® and STAR RP® are sold for use as partial replacement for Portland cement. Fortimix® is sold for use as an additive for rubber compounds. Permanix™ is designed for use as a broad-spectrum UV blocker. Accordingly, in all respects, SEFA’s feedstock processed in the STAR Reactor satisfies this criterion for legitimacy as an ingredient.

*Comparable Contaminants Concentration of End Product - § 241.3(d)(2)(iv)*

Again, as discussed above, the STAR Reactor has the capability to process its feedstock to reduce or eliminate some undesirable constituents and to alter the chemical and physical characteristics of others in its various end products. The Solid Waste Definition Rules provides as follows:



The non-hazardous secondary material must result in products that contain contaminants at levels that are comparable in concentration to or lower than those found in traditional products that are manufactured without the non-hazardous secondary material.

Refer to §241.3(d)(2)(iv).

The preamble to the Rule includes the following:

The assessment of whether the products produced from the use of nonhazardous secondary materials that have contaminants that are comparable to (or lower) in concentration can be made by a comparison of contaminant levels in the ingredients themselves to the traditional ingredients they are replacing, or by comparing the contaminant levels in the product itself with and without the use of the nonhazardous secondary material.

Refer to 76 FR 15544.

As applied to the use of the feedstock as an ingredient in the STAR Reactor, the relevant comparison is a comparison of the various STAR Reactor end products to comparable products in the industries in which each is used. For example, Ultrix<sup>®</sup> and STAR RP<sup>®</sup> are both used as supplementary cementitious materials in concrete, but, due to the unique processing regime of the STAR Reactor, neither has varying quantities of adsorptive unburned carbon, which characterize by-product fly ashes typically used in the marketplace. In fact, the air-entraining characteristics of Ultrix<sup>®</sup> and STAR RP<sup>®</sup> are tailored by STAR Reactor to exactly match the air-entraining characteristics of plain cement concrete.

The preamble to the proposed rule for the Solid Waste Definition Rule explains the rationale for and purpose of the comparison of contaminants in the legitimacy criteria for use of a non-hazardous secondary material as an ingredient:

The Agency recognizes that there may be instances where the contaminant levels in the products manufactured from non-hazardous secondary material ingredients may be somewhat higher than found in the traditional products that are manufactured without the non-hazardous secondary material, but the resulting concentrations would not be an indication of discard and would not pose a risk to human health and the environment.

Refer to 75 FR 31844, 31885 (Jun. 4, 2010).

In addition, EPA has recognized that contaminant levels in the products made from NHSM can have contaminant levels within a "small acceptable range" at 76 FR 15523 (March 21, 2011).

The above discussion clearly provides that it may be allowable under §241.3(d)(2)(iv) for certain contaminants in the end product made with non-hazardous secondary materials ingredients to be "somewhat higher" or within a "small acceptable range" than those in traditional products. Thus, SEFA's fly ash feedstock satisfies the legitimacy criterion in §241.3(d)(2)(iv) despite the slightly higher concentrations of arsenic and beryllium in the STAR RP<sup>®</sup> as compared to Portland Cement, as included in Attachment A to the SEFA's September 2014 letter. Also, using additional analytical data received from SEFA<sup>1</sup>, it can be said that the contaminant levels in the SEFA product are within the range of contaminants levels or within a "small acceptable range" for Portland Cement (traditional product).

Additionally, as stated in the preamble to the proposed rule above, the purpose of the contaminant comparison criterion is to demonstrate that the use of the non-hazardous secondary material ingredient is not indicative of discard and does not pose a risk to human health and the environment. Expanding of the "indication of discard" aspect of this component of the legitimacy criteria, EPA further explains:

Based on our assessment of all of the comments, we believe it appropriate to include contaminant levels as a legitimacy criterion. Thus, we do not agree with those commenters that assert that contaminant comparisons are not appropriate to require as part of the legitimacy criteria. The Agency believes the criterion is necessary because non-hazardous secondary materials that contain contaminants that are not comparable in concentration to those contained in traditional fuel products or ingredients **would suggest that these contaminants are being combusted as a means of discarding them**, and thus the non-hazardous secondary material should be classified as a solid waste. **In some cases, this can also be an indicator of sham recycling.**

Refer to 75 FR 31871-72 (emphasis added).

As such, the primary purpose of the comparison on contaminants in an end product using the non-hazardous secondary material ingredient to that of traditional products made without the non-hazardous secondary material ingredient is to demonstrate that such use is not a means of discarding the non-hazardous secondary material or indicative of sham recycling.

With respect to the additional industrial uses for products produced by using fly ash feedstock as an ingredient in the STAR Reactor, a direct comparison of SEFA's end product to a traditional product which is manufactured without fly ash feedstock is not feasible for many of the end products produced in the STAR Reactor. However, based on the detailed comparison of the STAR<sup>®</sup> RP to Portland Cement and the various markets for SEFA's other STAR Reactor products as included in the above referenced submittal, it is clear that SEFA is not processing the fly ash feedstock as a means of discarding the fly ash or any of its constituents.

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<sup>1</sup> Email dated 5/12/2015 from Thomas Pritcher, Environmental Consulting & Technology, Inc., to Rahul Thaker, NCDAQ.



To the extent that the purpose of the contaminant comparison is to demonstrate that these products do not pose a risk to human health and the environment, SEFA has provided additional information as well as copies of the material safety data sheets for these products to demonstrate that no such risk is posed in the various industrial uses of STAR Reactor end products. For example, the material safety data sheets for Spherix<sup>®</sup> and Fortimix<sup>®</sup> included in Attachment B to the SEFA's September 2014 letter. As per SEFA, in many cases, the STAR<sup>®</sup> Reactor end products provide a safe alternative to traditional products which may pose a potential risk to human health and the environment.

#### Flyash Received from Landfill or Ash Pond

§241.3(b)(4) of the rule provides that NHSMs are not solid waste when “fuel or ingredient products that are used in a combustion unit, and that 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.”

As discussed above, the coal flyash disposed off in a landfill or an ash pond can be deemed as a NHSM. Prior to being used as an acceptable ingredient (feedstock) in the STAR Reactor, any flyash received from landfills or ash ponds must be “processed,” as that term is defined in the rule. As discussed below, any commercial agreement between a supplier and SEFA will specify the acceptable criteria (i.e., specifications) for a feedstock that can be used in the STAR Reactor as a condition for supplying processed flyash to SEFA.

Pursuant to §241.2, “processing” means any operations that transform discarded non-hazardous secondary material into a non-waste fuel or non-waste ingredient product. Processing includes, but is not limited to, operations necessary to: remove or destroy contaminants; significantly improve fuel characteristics of the material, e.g. sizing or drying the material in combination with other operations; or chemically improve the as-fired energy content. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for purposes of this definition. Under the same section of the Rule, “Secondary material” is defined as any material that is not the primary product of a manufacturing or commercial process, and can include post-consumer material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap.

While it is recognized that coal flyash which was initially placed into a landfill may be considered to have been “previously discarded” by custom and practice, coal-fired utilities also collect this coal ash in permitted wastewater treatment ponds. This coal ash has not historically been considered “discarded” as it was merely solids settling within a permitted wastewater unit. SEFA believes that the processing of these materials as required to satisfy SEFA's specifications for its feedstock would meet the requirements for processing of “previously discarded” materials under the Solid Waste Definition Rule as applied to CISWI. As such, the requisite processing of materials to be used as feedstock in the STAR Reactor would be sufficient to transform them to an ingredient.

The Solid Waste Definition Rule provides that a previously discarded material may be processed to transform the waste to a non-waste ingredient. Specifically, §241.3(b)(4) of the Solid Waste Definition Rule provides as follows:

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 material is processed to produce a fuel or ingredient product. Until the discarded nonhazardous 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.

As per SEFA, any processing of materials from landfills or from ash ponds to meet SEFA's feedstock specifications will be undertaken under the control of the supplier prior to being received by SEFA for use as an ingredient in its STAR Reactor. Accordingly, this feedstock when received by SEFA or used in the STAR Reactor would meet the legitimacy criteria for direct use as an ingredient and therefore would not be a solid waste under the Solid Waste Definition Rule. All feedstock shipped to SEFA for use as an ingredient in the STAR Reactor will first be required to undergo processing by the supplier to be:

- A. Free of all, but minimal contaminants (e.g., organic debris, slag);
- B. Finely-divided and free-flowing,
- C. Have consistent moisture content of  $\leq 25\%$ ; and
- D. Have a consistent chemical composition, including organic content as measured by loss on ignition.

The above are SEFA specifications for acceptance of any coal flyash (discarded in landfills or ash ponds).

As per SEFA, the specific processing steps that may be needed to meet the SEFA specifications (as described above) and produce a suitable feedstock for the STAR Reactor will vary depend upon the specific characteristics of each source of coal flyash. Generally speaking, one or more of the following four processing steps will be necessary to produce a suitable feedstock for the STAR Reactor:

- 1) Dewatering,
- 2) Screening/Separation,
- 3) Milling, and
- 4) Blending.

For use as a feedstock in the STAR Reactor, coal ash from an ash pond having higher moisture content will likely need to be processed using most, if not all, of these steps. Coal ash

from a landfill may not require every step. For example, it may be unnecessary to dewater coal ash from landfills if the material has consistent and acceptable moisture content.

Depending on the source of the ash, the general steps described above can require sub processes. For example, feedstock appropriate for the STAR Reactor, it may be necessary to remove larger particles or other materials found with the ash. In addition, to meet SEFA's specifications, some coal ash may require further processing through a separate loop that includes equipment (e.g., roll crusher) needed to produce a more finely-divided, free-flowing feedstock. For others, it may be necessary to utilize a magnetic separator to remove metal constituents. Also, materials such as coal, pyrites, or other more coarse materials may need to be screened. The Screening/Separation step will occur routinely to produce a free-flowing, finely-divided feedstock suitable for the STAR Reactor. Depending on the source of coal ash, milling may not be necessary to achieve a finely-divided and free-flowing material.

As emphasized by SEFA, the specific processing steps and the specific processing equipment cited above are typical examples for how these materials might be processed to produce a suitable feedstock. Those performing the actual work (i.e., suppliers) will elect to use different techniques and/or equipment. SEFA states that as long as the processed coal ash conforms to SEFA's general specifications outlined above, the coal flyash received from landfills or ash ponds will have been sufficiently "processed" and will be a suitable feedstock as an ingredient in the STAR Reactor.

It needs to be noted here that the EPA has recognized similar processing steps (similar to SEFA suggested processing steps as above to meet the SEFA specifications) are "likely to meet our definition of processing, as it appears that these processes in fact remove contaminants and improve the ingredient characteristics of these recovered CCRs (i.e., **ash from ponds and landfills**)". Refer to 76 FR 15518, March 21, 2011 (emphasis added).

With respect to the requirement for meeting the legitimacy criteria in §241.3(d)(2), pursuant to §241.3(b)(4), for flyash received from landfill or ash pond, SEFA emphasizes that after completion of "processing", it will become similar to the flyash received directly from coal-fired plant's particulate collection infrastructure (i.e., Electrostatic precipitator or Baghouse), and thus, will meet all legitimacy criteria as discussed above for it.

Finally, with respect to the particular criterion for comparable contaminants concentration of end product (traditional products) in §241.3(d)(2)(iv), SEFA analyzed each of these materials for semi-volatile organic compounds, organo-chlorine pesticides, PCBs, chlorides, metals and sulfur content, during engineering studies to assess the suitability of coal ash previously placed in water treatment ponds (pond ash) or previously placed in landfills (landfill ash). A comparison of the constituents in dry source feedstock, pond ash and landfill ash from SCE&G's<sup>2</sup> Wateree facility is provided in Attachment C to the SEFA's September 2014 submittal. In comparison to the dry collection feedstock, the landfill ash is comparable with slightly higher results for a few constituents. The sampling results on pond ash indicate that all constituents detected were lower

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<sup>2</sup> www.sceg.com

than those for the dry collection feedstock and the landfill ash. Despite certain variables in the manner in which coal ash were previously placed in ponds or landfills, as per SEFA, these sampling results are sufficient to demonstrate that contaminants in coal flyash previously placed in ponds and landfills are comparable to or lower than those in dry collection coal flyash processed as feedstock (that is, flyash received directly from the coal-fired power plant's particulate emissions control) for the STAR Reactor. Furthermore, the metals and sulfur levels of the landfill ash are comparable to those of the dry collection feedstock, and the metals and sulfur levels of the pond ash are significantly lower than those of the dry collection feedstock. Finally, more recent sampling data (March-April 2015) for dry ash and pond ash, provided by SEFA, indicates that the contaminants in pond ash as are lower than the dry ash received directly from electric utility plant.<sup>3</sup> Therefore, SEFA concludes that there will be no increase in emissions as a result of the use of pond ash and landfill ash as a feedstock for the STAR Reactor.

### Conclusions

In summary, the DAQ has determined that the fly ash received directly from the coal-fired power plant's particulate collection infrastructure (i.e., electrostatic precipitator or baghouse) is a NHSM and an "ingredient", as defined in §241.2. DAQ has further determined that this flyash meets the legitimacy criteria included in §241.3(d)(2). Thus, it concludes that it is not a solid waste and therefore, STAR Reactor is not subject to the requirements in CISWI.

Moreover, the processed flyash received from ash landfills or ash ponds meets the definition of "processing" in §241.2, and is also a NHSM and an ingredient. DAQ has further determined that this flyash also meets the legitimacy criteria included in §241.3(d)(2). Thus, it concludes that it is not a solid waste and therefore, STAR Reactor is not subject to the requirements in CISWI.

It needs to be emphasized here that this letter includes only the "non-waste" determination, which is specific to the materials discussed herein. Further, the determination does not give any permission to SEFA to burn or process flyash in the STAR Reactor. SEFA will need to evaluate and submit a permit application for an air permit, as needed, for burning / processing flyash, as discussed herein, in the STAR Reactor at any location in NC.

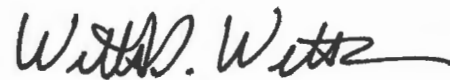
If you have any questions regarding this determination, please contact Rahul P. Thaker, P.E., QEP, at (919) 707-8470.

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<sup>3</sup> Email dated 5/12/2015 from Thomas Pritcher, Environmental Consulting & Technology, Inc., to Rahul Thaker, NCDAQ.

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Sincerely,

A handwritten signature in black ink, appearing to read "W.D. Willets". The signature is fluid and cursive, with a long horizontal stroke at the end.

William D. Willets, P.E., Chief, Permitting Section  
Division of Air Quality, NCDENR

c: Central Files