



North Carolina Department of Environment and Natural Resources

Division of Air Quality

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May 14, 2013

Mr. Kyle Michael  
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P. O. Box 809  
Kenansville, NC 28349

SUBJECT: Applicability Determination No. 2233  
Coastal Carolina Clean Power, LLC  
NHSM Determination

Dear Mr. Michael:

The North Carolina Division of Air Quality (NC DAQ) received your letter on May 7, 2013 requesting a determination from NC DAQ that used poultry litter from various sources considered for combustion at Coastal Carolina Clean Power, LLC (CCCP) would not be considered a solid waste. CCCP is proposing to co-fire used poultry litter with biomass in the two 215 MMBtu/hr boiler systems located at the CCCP cogeneration power plant.

Used poultry litter is a non-hazardous secondary material (NHSM) within the meaning of Title 40, Part 241 of the Code of Federal Regulations (40 CFR Part 241). The used poultry litter described in your Request for Determination will be processed by CCCP. Based on the information you submitted, the material meets the legitimacy criteria provided in 40 CFR §241.3. The NC DAQ has determined, therefore, the combustion of this material would not be subject to the requirements of the Commercial and Industrial Solid Waste Incineration (CISWI) emission standard. This determination relies on the language of the recently published Federal rules defining NHSM, and 40 CFR Part 60, Subpart CCCC and, hence may not be effective until August 7, 2013.

### Background

On February 7, 2013, the EPA published revisions to the CISWI regulations and the Solid Wastes Used as Fuels or Ingredients in Combustion Units rule (also known as the NHSM rule).<sup>1</sup> The CISWI rule (for new units) will become effective on August 7, 2013. It includes a definition of “contained gaseous material” and indicates that the definition of solid waste given in 40 CFR §258.2 may be used to determine if a material is a solid waste.

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<sup>1</sup> 78 Fed. Reg 9112 (2013).

Alternatively, the NHSM rule states that “non-hazardous secondary materials that are combusted are solid wastes,” unless they can be exempted under either 40 CFR §241.3(b) or through a petition to the US EPA under 40 CFR §241.3(c). The EPA’s interpretation makes it clear that to be subject to the CISWI rule a unit must burn a “solid waste” as that term is defined at 40 CFR §258.2 *and* does not qualify for one of the NHSM exemptions at 40 CFR §241.3. If the material is not a solid waste as defined in 40 CFR §258.2, its combustion is not subject to CISWI. Alternatively, the combustion of a solid waste can be exempt from CISWI if the conditions under 40 CFR Part 241 can be met.

Whether a material is a solid waste depends on whether 40 CFR §258.2 or the NHSM rule is being relied upon. Recent memoranda from the NC DOJ are instructive in both contexts. Specifically, the NC DOJ memorandum of September 28, 2009 described ten factors that define whether a material is a solid waste under 40 CFR §258.2. Alternatively, the NC DOJ memorandum of July 20, 2011 defines whether a material is a solid waste in the context of the NHSM rule, and lists five factors that should be considered when making the determination under three subparts of that rule.<sup>2</sup>

#### Project as Described

CCCP is assessing the technical feasibility of poultry litter as a fuel at its existing biomass cogeneration power plant. The project is being pursued in response to the Renewable Energy and Energy Efficiency Portfolio Standards (REPS) adopted by the North Carolina state legislature in 2007. Under the REPS, North Carolina electric power suppliers are required to utilize used poultry litter as a resource to generate at least 900,000 megawatt-hours (MWh) of electricity by the year 2014.

Based on the description of the process, and the chemical analysis of the material, NC DAQ determines that the processed used poultry litter meets the legitimacy criteria in 40 CFR § 241.3(d)(1) and is a non-solid waste fuel pursuant to 40 CFR § 241.3(b)(4).

#### Analysis under 40 CFR Part 241

The NHSM definitional rule defines “processing” in 40 CFR § 241.2 as:

“...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 the fuel characteristics of the material, e.g., sizing or drying the material in combination with other operations; chemically improve the as-fired energy content; or improve the ingredient characteristics. Minimal operations that result only in modifying the size or the material by shredding do not constitute processing for the purposes of this definition.”

CCCP will obtain used poultry litter from significant producers in North Carolina and South Carolina. As described in the May 2, 2013 letter, this used poultry litter will then be transformed into a non-waste solid fuel as follows:

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<sup>2</sup> These subparts were given as,

- (1) Traditional fuels and clean cellulosic biomass (40 CFR §241.2),
- (2) Fuels or ingredient products used in a combustion unit that are made from discarded materials (40 CFR §241.3(b)(4)), and
- (3) Scrap tires and dewatered pulp and paper sludges (40 CFR §241.4(a)(1), and (4)).

- **Material Assessment & Contaminant Removal.** CCCP personnel will visually observe each load of used poultry litter and will sort and screen such material as necessary to remove any rocks or other debris. Tramp metal will be removed utilizing a conveyor belt electromagnet to prevent damage to the Facility's equipment downstream.
- **Storage.** Following contaminant removal, the used poultry litter will be stored in an engineered building to prevent alteration of the material from the environment.
- **Moisture and Heat Content Testing.** CCCP will test the moisture content of the blended material as-combusted at a minimum of twice per shift. Corrections in blending to achieve target moisture levels will be made by the Facility's Distributed Control System ("DCS").
- **Contaminant Level Analysis.** CCCP personnel will certify suppliers based on the collection and analysis of representative samples of used poultry litter by an independent laboratory to determine the contaminant levels and to ensure such levels are comparable to those in traditional fuels that CCCP's boiler system is currently capable of combusting (e.g., coal and woody biomass). The annual recertification will be performed via survey to determine if any changes have occurred in the suppliers' operations during the previous year that would impact contaminant levels in the poultry litter (e.g., use of chlorine for water treatment or treatment of litter during growing operations). Representative samples would again be collected if such operational changes could increase the concentration level of a contaminant outside the range of traditional fuels.
- **Blending.** CCCP will blend the poultry litter with biomass. The poultry litter material will be metered by a variable feed controller onto the existing boiler feed belt at specific ratios with the biomass feed that already is combusted in the boiler. This ratio will be controlled by feedback from an existing belt scale that will allow the system controls and the operator to ensure a constant ratio. Such blending will improve the characteristics of the poultry litter and provide stability to the combustion process.

If the results of supplier certification analytical testing of litter samples indicate contaminant levels from a particular supplier are greater than those of a traditional fuel, CCCP will blend such litter with clean cellulosic biomass (as defined under the NHSM Rule) that the boiler is permitted to burn on the feed belts to achieve an engineered fuel.

The steps listed above, including the removal of metal contaminants, sampling, testing, analysis, blending, and enhancement of fuel characteristics including size, surface area, density, and moisture content, transform the used poultry litter into a non-solid waste fuel.<sup>3</sup>

#### Legitimacy Criteria

Under 40 CFR § 241.3, a NHSM that is burned is a solid waste unless it can meet the criteria listed in 40 CFR §241.3(b) or 40 CFR §241.4(a). For the particular NHSM of processed used poultry litter the legitimacy criteria are given in 40 CFR §241.3(d)(1) and state that the NHSM must: (a) be managed as a valuable commodity; (b) have meaningful heat content and be used as a fuel in a combustion unit with energy recovery; and (c) contain contaminants or groups of contaminants at levels comparable in

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<sup>3</sup> See Letter from Becky Weber, Director, Air and Waste Mgmt. Div., U.S. EPA, Region 7, to Mr. Gregory Haug, P.E., Resource Enterprises, LLC (Apr. 3, 2012), available at <http://www.epa.gov/osw/nonhaz/define/pdfs/Lhoist-engineered-fuels.pdf>.

concentration to or lower than those in traditional fuels which the combustion unit is designed to burn. The used poultry litter that CCCP proposes to burn meets each of these three criteria as detailed below.

a. Managed as a Valuable Commodity – 40 CFR 241.3(d)(1)(i)

NHSMs that are managed as a valuable commodity must not be stored for a period that exceeds reasonable time frames and must be managed in a manner that is consistent with analogous fuels (or otherwise adequately contained to prevent releases to the environment). CCCP will store the used poultry litter in an enclosed building for a period not to exceed 90 days prior to burning the material as a fuel. The purpose of maintaining the used poultry litter in an enclosed building is to prevent loss of the material to the environment, manage odors from the material, and limit moisture content in the fuel. The storage operations are consistent with typical management of wood chips and other biomass fuels.

b. Meaningful Heating Value – 40 CFR 241.3(d)(1)(ii)

In the preamble to the final NHSM definitional rule, the EPA indicated that materials with heat contents of less than 5,000 British thermal units per pound (Btu/lb) contain meaningful heat “if the energy recovery unit can cost-effectively recover meaningful energy from the NHSM used as fuel.”<sup>4</sup> Factors that may be considered include “whether the facility encounters a cost savings due to not having to purchase significant amounts of traditional fuels they otherwise would need, whether they are purchasing the non-hazardous secondary materials to use as a fuel, whether the non-hazardous secondary materials they are combusting can self-sustain combustion, and whether their operation produces energy that is sold for a profit....”<sup>5</sup>

With respect to self-sustaining combustion, the Request for Determination states: “Based on CCCP’s research, poultry litter can reportedly self-sustain combustion within a variety of boiler systems, including stoker such as those at the Facility. CCCP envisions blending poultry litter with at least some woody biomass to ensure long-term, reliable combustion in CCCP’s systems. Determining this ratio is the primary driver behind the Demonstration Test Program that CCCP plans to conduct at the Facility before fully integrating poultry litter into its fuel source.” Further, as written in your May 9 and 10, 2013 e-mails, “CCCP will include in its procedures for supplier certification a requirement to test the LHV content of representative samples to establish that poultry litter with a minimum LHV of 2,317 Btu/lb will be provided to CCCP. 2,317 Btu/lb is the lower end of the range of LHV for coal. In addition, as indicated in our original submittal, as part of our processing procedures CCCP will blend litter with other biomass on the feeder belt and test for moisture content twice daily to ensure that the processed litter will have a heat content that will self sustain combustion in CCCP’s boiler(s).” While NCDAQ does not agree with CCCP as to the lower range of LHV for coal, woody biomass will be added as part of the processing to improve combustion. As such, there will be no supplementary fuels utilized to assist in the combustion of the processed litter within the boiler.

CCCP analyzed the heat content of used poultry litter samples collected from two poultry litter suppliers in the vicinity of CCCP. The lower heating values (as received) of the two samples were 3,822 and 4,805 Btu/lb. As CCCP plans to utilize poultry litter from producers in North and South Carolina, they also considered recent NHSM determinations issued by NC DAQ. Specifically, the March 13, 2013 Applicability Determination for Prestage AgEnergy of NC, LLC and the March 8, 2013 Applicability Determination for Poultry Power USA were included as Attachments 2 and 3, respectively. These determinations were based on extensive sampling from many suppliers in North and South Carolina.

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<sup>4</sup> 76 Fed. Reg. 15,541 (Mar. 11, 2011).

<sup>5</sup> 76 Fed. Reg. 15,523 (Mar. 11, 2011).

Analysis of the data showed that LHVs of samples, as received, varied from a low of 1,917 Btu/lb to a high of 5,735 Btu/lb. As a basis of comparison, the lower heating value of green sawdust (as received), which has a moisture content of approximately 60%, is about 2,500 Btu/lb<sup>6</sup>.

Summaries of the data received on the heat content of the used poultry litter are provided in Attachments 1 and 2 of the Request for Determination.

As described in your May 2, 2013 letter, “The as-received heating value of poultry litter has a significant heating value, and its combustion within the Facility's boilers will allow the heating value to be recovered and used to generate steam and electricity, the principal “product” of CCCP. CCCP's energy systems will actually be more cost effective when combusting poultry litter compared to woody biomass that is typically used at the Facility because renewable energy credits obtained under the statutory REPS for poultry litter command a higher price in the marketplace. In addition, the nutrient value of bottom ash makes it a desirable by-product that can be used as a soil amendment that will increase in value with the poultry litter combustion process.” Whether the process may or may not be profitable in the absence of the NC REPS is not considered.

c. Comparable Contaminant Concentrations – 40 CFR 241.3(d)(1)(iii)

For an NHSM to be classified as a non-solid waste fuel, it must “contain contaminants or groups of contaminants at levels comparable in concentration to or lower than those in traditional fuel(s) which the combustion unit is designed to burn.”<sup>7</sup> The US EPA issued a Comparable Contaminant Guidance Concept Paper indicating its intent to “address questions raised by industry, assist them in making determinations under the rule, and ensure their use of the flexibility embodied in the rule.”<sup>8</sup> The guidance was provided on November 29, 2011, including tables that provide both a range and an average of compiled contaminant concentrations for coal, untreated wood and biomass materials, and fuel oils.<sup>9</sup> It is US EPA’s stated intent that contaminant levels should be compared in such a manner that traditional fuel samples could not be “considered solid waste if burned in the very combustion units designed to burn them.”<sup>10</sup> Further clarification was provided in the February 7, 2013 rule noting that “when comparing contaminant levels between NHSMs and traditional fuels, persons are not limited to comparing average concentrations. Traditional fuel contaminant levels can vary considerably and the full range of contaminant values may be used.”<sup>11</sup> It is important to note that the traditional fuel used in the comparison need not be the traditional fuel the applicant will burn or is even permitted to burn. The only requirement is that the unit is designed to burn the traditional fuel used in the comparison.<sup>12</sup> This means that the unit may be subject to emission standards different, and possibly less stringent than those that would be required had the unit been permitted to burn the traditional fuel used in the comparison.

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<sup>6</sup> Appendix E, Klausner Holding USA, Inc. N. C. Air Permit Application No. 4200201.12A

<sup>7</sup> 40 CFR 241.3(d)(1)(iii).

<sup>8</sup> US EPA, “Non-Hazardous Secondary Materials (NHSM) Rule: Comparable Contaminant Guidance Concept Paper” (July 11, 2011), available at <http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm-concept.pdf>.

<sup>9</sup> US EPA, “Contaminant concentrations in Traditional Fuels: Tables for Comparison” (November 29, 2011), available at [http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm\\_cont\\_tf.pdf](http://www.epa.gov/osw/nonhaz/define/pdfs/nhsm_cont_tf.pdf).

<sup>10</sup> 76 Fed. Reg. 80841 (Dec. 23, 2011). *See also* Letter from Donald R. van der Vaart, Chief, Permit Section, NC Div. Air Quality, to Mr. John Prestage, Sr. Vice President, Prestage Farms, P. 6 (July 19, 2012), available at <http://www.ncair.org/permits/memos/prestage%20farms%20NHSM%20determination.pdf>.

<sup>11</sup> 78 FR 9112 at 9144. (Feb. 7, 2013).

<sup>12</sup> *Id.* at 9145.

The EPA also clarified somewhat what the method of comparison used should measure. To avoid a metric comparison that would possibly define a traditional fuel itself as not meeting the legitimacy criteria, applicants should use the entire range of contaminant values of traditional fuels to compare with values in the NHSM. However, the comparison must also recognize the variability of contaminant values in the NHSM. That is, “the full range of traditional fuel contaminant values can only be used if persons also consider some measure of variability in the NHSM contaminant data.”<sup>13</sup> It is not clear, unfortunately, whether the EPA believes that the maximum stated values provided for traditional fuels are the actual maximum values or not. Alternatively, the EPA would recognize the variability of contaminant levels in the traditional fuels.

The EPA has also approved the processing of mixed NHSM streams in which the average contaminant level of the mixture is used in the comparison rather than comparing the contaminant levels in each NHSM material stream contributing to the ultimate processed fuel. US EPA used this approach because the concentrations of the individual NHSM material streams were “not reflective of the concentration . . . in the engineered fuel products.” Later the EPA affirmed that the processed mixture would be sampled and tested to confirm legitimacy. This indicates that materials may be blended in order to reduce their contaminant levels to below the traditional fuel levels. This would be distinguished from the prohibition of this method for the definition of hazardous waste (so-called “Mixture Rule”). CCCP is similarly proposing to produce a non-solid waste fuel by collecting multiple streams of used poultry litter collected from different poultry houses in North Carolina and South Carolina. The NHSM streams will then be processed to produce the final fuel product. Nonetheless, the NC DAQ did not use the US EPA approach for the contaminant concentration analysis, but rather looked at the variability of contaminant concentrations in sampled used poultry litter streams, and compared the upper prediction limits (UPLs) to the high end of the traditional fuel levels.

The EPA has made clear that no single statistical method or test should be defined in this regard.<sup>14</sup> In one instance the EPA responded to a commenter who compared the 99% UPL of chlorine in pulp and paper sludge with “chlorine concentrations observed in coal.”<sup>15</sup> In a subsequent discussion, the EPA offered as an example method that met their approval the comparison of the 90% predicted level of the contaminant in the NHSM with the maximum value in the traditional fuel.<sup>16</sup> Therefore, the US EPA has condoned comparing of UPLs against the maximum traditional fuel levels based on either a 99% or 90% confidence level. It is not clear whether US EPA would condone the use of a UPL based on a confidence level below 90% in this regard.

CCCP would add the processed poultry litter as a boiler fuel to a system that is designed and permitted to burn woody biomass, fuel oil (Nos. 2 and 4) and coal. The predicted contaminant levels of the poultry litter were compared to the following contaminant levels in coal and biomass:

- **Metals:** Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Lead, Manganese, Mercury, Nickel, Selenium
- **Total Halogens** (including chlorine and fluorine)
- **Additional Precursors:** Nitrogen, Sulfur

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<sup>13</sup> Id. at 9152.

<sup>14</sup> “The agency disagrees that any one statistical tool or comparison methodology will fit every situation given the variety of NHSMs, traditional fuels, contaminants and combustion units that exist.” 78 Fed. Reg. 9112 at 9168.

<sup>15</sup> Id.

<sup>16</sup> Id. at 9153.

### Results of Comparison

There are long established statistical tests to determine whether two materials are statistically different based on samples from both material populations. However, the US EPA is simply interested in not designating a candidate NHSM as solid waste if doing so based on its contaminant level would *ever* also define the traditional fuel as a solid waste as well.<sup>17</sup> To this end, the US EPA has indicated that a variety of comparisons could be made. For example, the highest contaminant levels in the NHSM could be compared against the highest contaminant levels in the relevant traditional fuels. Alternatively, the average values of the NHSM could be compared with the average values of the traditional fuels. “Anything less could result in ‘traditional fuel’ samples being considered solid waste if burned in the very combustion units designed to burn them – not the Agency’s intent in either the 2011 NHSM final rule or today’s proposed rule.”<sup>18</sup> However, using different bases for comparison could lead to different results. The US EPA warned that “[i]t would not be appropriate to compare an average NHSM contaminant value to the high end of a traditional fuel range, as the existence of an average implies multiple data points from which a more suitable statistic (*e.g.*, range or standard deviation) could have been calculated.” Finally, the EPA warned that “in the context of an inspection or enforcement action, the Agency will evaluate the appropriateness of alternative methodologies and data sources on a case-by-case basis when determining whether the legitimacy criteria have been met.”<sup>19</sup>

In this case, each predicted contaminant concentration of the processed used poultry litter is comparable to the contaminant concentrations in coal or wood. For total halogen content, the NC DAQ calculated the UPL for various confidence intervals for the total halogen content in poultry litter on an as-fired basis.<sup>20</sup> Total halogens in used poultry litter are predominately comprised of chlorine.

UPL Confidence Level	Total Halogens, ppm at 28% moisture by weight
90	8,547
95	9,308
99	10,860

According to EPA responses to comments, these values should be compared with the maximum observed total halogen content for coal on an as-fired basis, which is 8,610 ppm at 7% moisture by weight.<sup>21</sup> The UPL of total halogens in used poultry litter based on a 90% confidence level is below the maximum concentration of total halogens in coal. Therefore, the total halogen concentration in used poultry litter is comparable to coal, and the material is not a solid waste. Note that any woody biomass that is added to enhance combustion characteristics has not been included in this analysis. Since the poultry litter satisfies this criterion under 40 CFR §241.3 there is no reason to consider used poultry litter under the definition of solid waste under 40 CFR §258.2.

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<sup>17</sup> Indeed, the EPA points out in its proposed rule that, for example, the coals used in a comparison need not be limited to the coal received from either the current or past suppliers. Of course, in cases where the unit is not permitted to burn coal, but is designed to burn coal, any coal rank can be considered including anthracite, lignite, bituminous, and sub-bituminous. 76 Fed. Reg. 80477 (Dec. 23, 2011).

<sup>18</sup> 76 Fed. Reg. 80841 (Dec. 23, 2011).

<sup>19</sup> 76 Fed. Reg. 80482-3. (Dec. 23, 2011).

<sup>20</sup> The analysis also included Cl data provided by CCCP for two additional litter samples. NCDAQ assumed the Cl content was equivalent to total halogen content.

<sup>21</sup> Note that the EPA approved the comparison of the UPL of the NHSM with the maximum value for the traditional fuel rather than with the UPL of the traditional fuel.

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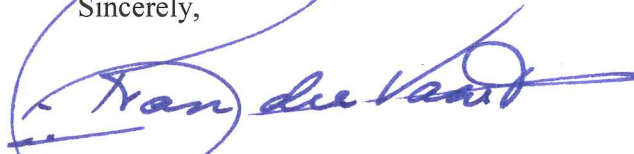
Included as part of Attachment 1 to the Request for Determination is the table "SUMMARY OF CONTAMINANT LEVEL COMPARISONS FOR PROCESSED USED POULTRY LITTER," that summarizes measured contaminant concentration ranges for coal and biomass samples provided by Poultry Power USA and Prestage AgEnergy to NC DAQ for NHSM determination, as well as contaminant testing conducted on two poultry litter samples from potential suppliers in the vicinity of the subject facility. CCCP analyzed the contaminant compositions of the poultry litter samples and "determined that the only contaminant present near the upper end of the range of coal (i.e., 9,000 (Btu/lb) [*sic*]<sup>22</sup>) is chlorine."

CCCP argues that "Given the consistency of these results and that poultry litter will be obtained from the same geographical region as previously submitted samples (North and South Carolina)... the analytical data is representative of poultry litter that will be combusted at the Facility. Although it is anticipated that the contaminant concentrations of all poultry litter received at the Facility will have compositions within the range of traditional fuels that the boilers are capable of accommodating, as discussed earlier, CCCP will blend any off-specification litter on the boiler feed belts with clean cellulosic biomass that the respective boiler is both permitted to combust and capable of combusting to produce an on-specification engineered fuel."

#### Conclusion

As described in your May 2, 2013 letter and associated correspondence from you and your representatives, the used poultry litter is processed and does meet the legitimacy criteria provided in 40 CFR § 241.3(d)(1). Therefore, the NC DAQ has determined that it is not a solid waste when used as fuel in a combustion unit. As a result of this determination, the proposed boiler would not be subject to the combustion source emission standards promulgated pursuant to Section 129 of the Clean Air Act. If you have any questions regarding this determination, please contact Brian Bland at (919) 707-8732.

Sincerely,



Donald R. van der Vaart, Ph.D., P.E., J.D.  
Chief

cc: Wilmington Regional Office  
Central Files

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<sup>22</sup> Id. Halogen content is expressed in ppm rather than Btu/lb.