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Cert. No.: 7012 2920 0002 0263 3320
Mr. Krishnan Ramamurthy
Chief, Division of Permits
Bureau of Air Quality
Pennsylvania Department of Environmental Protection
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P.O. Box 8468
Harrisburg, PA 17105-8468

Subject: Applicability Determination
NSPS, Subpart AAAA
Energy Production Facility
Delta Thermo Energy A, LLC
Allentown, Pennsylvania
IES Project No. EV130894.04

Dear Mr. Ramamurthy:

On behalf of Delta Thermo Energy A, LLC (Delta Thermo), IES Engineers is pleased to submit the following analysis of the applicability of NSPS Subpart AAAA to Delta Thermo's proposed energy production facility to be constructed in the City of Allentown, Lehigh County, Pennsylvania.

1.0 BACKGROUND

Delta Thermo submitted a Plan Approval application to the Department's Northeast Regional Office on March 29, 2013, for the construction of an energy production facility in Allentown, Pennsylvania. This application incorporated an analysis of the applicability of federal and Pennsylvania air quality regulations, including a review of 40 CFR 60, Subpart AAAA, *Standards of Performance for Small Municipal Waste Combustion Units for Which Construction is Commenced after August 30, 1999, or for which Modification or Reconstruction is Commenced after June 6, 2001.* Our analysis concluded that Subpart AAAA is not applicable to the proposed energy production facility. However, in its technical deficiency letter dated July 19, 2013, the Department has indicated that Subpart AAAA is applicable to the proposed facility.

In this letter, we are presenting a detailed analyis confirming our conclusion that Subpart AAAA is not applicable to the proposed technology for this project and the documentation to support this conclusion.

2.0 PROCESS DESCRIPTION

An understanding of the technology used in the Delta Thermo process is essential to making the determination of Subpart AAAA applicability to this project.

The major process components of the Delta Thermo energy production facility are listed below:

1. Receiving Municipal Solid Waste (MSW) and wastewater treatment sludge (Sludge)
2. Manual sorting and removal of recyclables and unwanted items from the MSW
3. Shredding of the MSW
4. Feeding shredded MSW and Sludge in an approximately a 2:1 mix, by volume, (hereinafter referred to as feedstock) into the Resource Recycling System (RRS) units, which are operated as batch units under high-pressure steam to convert the feedstock into a completely different material, which produces clean renewable pulverized fuel
5. Post sorting
6. Drying the pulverized fuel
7. Burning the pulverized fuel in the Complete Combustion Chamber (CCC)
8. Producing high-pressure, superheated steam in a water-tube boiler
9. Using the steam in the turbine to generate electricity
10. Ancillary operations include a boiler feed-water system; an emission control system consisting of a cyclone, SCR NO_x control unit, fabric filter, packed tower, and carbon adsorption system; and a wastewater treatment system

The first six of the above process components are critical to making the determination of Subpart AAAA applicablity; the others are conventional operations for the generation of steam, production of electricity, and pollution abatement.

After receiving the MSW on the tipping room floor, the bulk items such as matresses, large furniture and applicances are manually sorted and removed from the site. Then, the MSW is placed on a belt conveyor system from which workers manually remove recyclables such as metals and glass, which are sent off site. The remaining MSW is shredded by an electric-powered shredder and dumped into a pit where it is mixed with sewage sludge from the City of Allentown Wastewater Treatment Plant adjacent to the Delta Thermo site, in a 2:1 ratio, by volume. There are five RRS units, which are operated in the batch mode. In each RRS unit, the feedstock is converted into clean pulverized fuel by by Delta Thermo's unique Hydrothermal Decomposition technology. The Hydrothermal Decomposition process breaks down the chemical bonds in the feedstock material by using high pressure, high temperature steam that accelerates the separation of the materials into simple substances or basic elements. The resulting pulverized material from the RRS chamber is chemically, physically, thermally, and elementally different from the original feedstock. The Hydrothermal Decomposition process does not involve any size classification. The wet pulverized fuel from the RRS is post-sorted using a sifter and magnetic detector to remove any metals and noncombustibles, like ceramics, before it enters the steam dryer for the removal of moisture.

The clean, dried, pulverized fuel can then either be sold for use in off-site energy production facilities or combusted on site to produce electricity. At its Allentown site, Delta Thermo will be operating a complete combustion chamber (CCC) to burn the pulverized fuel to produce high-pressure, superheated steam to produce electricity in a turbine.

3.0 RELEVANT SUBPART AAAA DEFINITIONS

Subpart AAAA was originally promulgated in December 1995, but was vacated by the U.S. Court of Appeals in 1997. In response to the Court's vacatur, EPA re-promulgated the rule in 2000. This rule applies only to "municipal solid waste" combustion units constructed after August 30, 1999, that have the capacity to combust at least 35 tons per day but not more than 250 tons per day of municipal solid waste (MSW) or refuse-derived fuel (RDF). (Emphasis added.)

The following definitions from Subpart AAAA are relevant to this applicability determination.

> *Municipal solid waste* or *municipal-type solid waste* means household, commercial/retail, or institutional waste. Household waste includes material discarded by residential dwellings, hotels, motels, and other similar permanent or temporary housing. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, nonmanufacturing activities at industrial facilities, and other similar establishments or facilities. Institutional waste includes materials discarded by schools, by hospitals (nonmedical), by nonmanufacturing activities at prisons and government facilities, and other similar establishments or facilities. Household, commercial/retail, and institutional waste includes yard waste and refuse-derived fuel. Household, commercial/retail, and institutional waste does not include used oil; sewage sludge; wood pallets; construction, renovation, and demolition wastes (which include railroad ties and telephone poles); clean wood; industrial process or manufacturing wastes; medical waste; or motor vehicles (including motor vehicle parts or vehicle fluff). (Emphasis added.)
>
> *Refuse-derived fuel* means a type of municipal solid waste produced by processing municipal solid waste through shredding and size classification. That includes all classes of refuse-derived fuel including two fuels: (Emphasis added.)
>
> (1) Low-density fluff refuse-derived fuel through densified refuse-derived fuel.
> (2) Pelletized refuse-derived fuel.

4.0 REGULATORY ANALYSIS

The Delta Thermo facility will not combust MSW or refuse-derived fuel as defined by Subpart AAAA, but instead will burn a processed (pulverized and de-watered) clean fuel (not a waste) created from the feedstock in the Hydrothermal Decomposition batch process through the injection of high-pressure and high-temperature steam in a specialized piece of equipment identified as an RRS chamber.

While it is true from a review of the EPA's definitions that Delta Thermo utilizes the shredding activity in producing pulverized fuel, it does not utilize size classification. (Emphasis added.) Both the shredding and size classification activities must be satisfied to meet the Subpart AAAA definition of RDF. This lack of the use of size classification in Delta Thermo's Hydrothermal Decomposition process means that the pulverized fuel produced does not meet the EPA's definition of RDF presented in Subpart AAAA, which states that RDF is "a type of municipal solid waste produced by processing municipal solid waste through shredding and size classification."

Moreover, since EPA's definition of MSW or municipal-type solid waste "means household, commercial/retail, or institutional waste" and does not include … sewage sludge…," Delta Thermo's pulverized fuel does not meet the definition of MSW or municipal-type solid waste since it contains processed sewage sludge. Therefore, the pulverized fuel is neither MSW nor RDF under the Subpart AAAA definitions.

In addition, during the development of Subpart AAAA, EPA's focus was on the combustion of municipal solid waste (MSW) and refuse-derived fuel (RDF) in mass-burn facilities. We believe that the unique, state-of-the-art technology incorporated into the Delta Thermo design was not available at that time and, therefore, could not have been considered by EPA during the rulemaking process.

In summary, Delta Thermo will be producing and combusting a clean, homogeneous, pulverized, de-watered fuel generated from Delta Thermo's Hydrothermal Decomposition batch process. This pulverized fuel has a higher heating value than the delivered feedstock and is is neither MSW nor RDF under the Subpart AAAA definitions. In addition, this fuel is no longer a waste and has a monetary value; it can be sold to third parties for use as a fuel.

Based on the above analysis, we conclude that the Subpart AAAA requirements are not applicable to Delta Thermo's proposed energy production facility. We look forward to the Department's concurrence on this matter. Should you have any questions, please feel free to contact me or Ashok Soni. We will be happy to arrange a teleconference or attend a meeting to discuss this matter in more detail.

Sincerely,

Robert W. Schlosser, P.E.
Principal Project Manager

cc: R. Kempa, DEP Northeast Region
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