UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

Ms. Jennifer Garvon, PE
Project Manager
CEC, Inc.
3701 Arco Corporation Dr., Suite 400
Charlotte, North Carolina 28273

Dear Ms. Garvon:

This is in response to your letter dated July 6, 2020, requesting an applicability determination (AD) for Title 40, Code of Federal Regulation (CFR), Part 63, Subpart FFFFFF - National Emission Standards for Hazardous Air Pollutants (HAPs) for Secondary Copper Smelting Area Sources as it may apply to a proposed secondary copper recovery facility at AMES Copper Group (AMES) in Shelby, North Carolina. Based on the information provided by you, and information contained within the synthetic minor construction and operating permit application filed with the North Carolina Department of Environmental Quality (NCDEQ) on May 6, 2020, the proposed facility is subject to the provisions of Subpart FFFFFF. The details of our AD are explained in the remainder of this letter.

Overview of the Proposed AMES's Copper Recovery Facility

The AMES copper recovery facility may be represented by five main unit operations as described below:

i) Stripping, Magnetic Separation, Sorting and Feedstock Formulation
- Feedstocks to the facility will include tubing, valves, windings, wire, radiators, turnings, mill scrap, ammunition casings (brass and bronze) and high-copper concentration alloys. Feedstocks will not include tin or zinc-ingots, fire-refined copper anodes or cathodes, motors, printed circuit boards, telephone switching gear, blast furnace slag, ingot maker drosses and slag or remelter drosses and slag.
- Raw material pre-smelting screening will utilize magnetic separation to screen and remove magnetic material from the feedstock. Determination of feedstock formulation recipes will include manual sorting, selection and consolidation of feedstock to produce a feedstock copper concentration formulation of not less than ninety weight (wt) percent (%). Pyrometallurgical treatment, such as sweating or burning of insultation on the wire, or volatilization of oils or organic compounds, will not occur at the facility.

ii) Charging and Melting
Over a period of approximately twelve hours, feedstock is piecemealed into the furnace as practical to achieve, and maintain, melting of the feedstock material. Smelting of the feedstock formulation will occur within an indirect natural gas fired tilting refinery anode furnace. The anode furnace's capacity is approximately one-hundred and eighty tonnes and a batch cycle time requires

approximately twenty-four hours to complete. Acidic and basic fluxing agents (silica and lime) are added during the charging and melting cycle to effect first stage refining of copper and slag formation.

iii) Oxidation and Deslagging
Second stage refining of the copper is accomplished by injecting compressed air, nitrogen and additional lime and silica fluxes into the molten bath over a period of approximately four hours. The oxidation cycle is necessary to enable oxidation of the impurities, resulting in an immiscible less-dense slag that may be mechanically separated and removed from the molten bath. As a result of this necessary oxidation cycle to remove impurities, undesirable elemental copper oxidation reactions also occur in the molten bath.

iv) Reduction
In the reduction cycle, final copper refining is achieved by converting oxides of copper to elemental copper. This reduction is accomplished by injecting natural gas through refining nozzles and into the molten bath for a period of approximately two hours. During this reduction cycle, carbon within the natural gas reacts with the oxygen of the copper oxides and liberates carbon dioxide, effecting the recovery and purification of elemental carbon.

v) Anode Casting and Cooling
Molten refined copper is transferred by the transfer launder system into an intermediate ladle, which is maintained at a temperature above the melting point. From the intermediate ladle, the molten material is transferred to the anode casting wheel by a secondary transfer launder system. The anode casting wheel contains anode molds that are indexed for filling with molten copper. Once filled, the molten copper within the anode molds is cooled to achieve pseudo solidification of the anodes for removal of the molds from the indexing system. The anodes are removed from the molds and cooled further for local storage at the facility. The anode casting and cooling unit operations requires approximately six hours to empty the capacity of the anode furnace. The proposed process will produce copper anodes with a copper purity of 99.7 wt%, anode copper grade product. The copper anode product will be shipped off site for further refining.

CEC's Basis of Proposed Subpart FFFFFF Non-Applicability

As detailed in the information you provided to the U.S. Environmental Protection Agency (EPA), and information contained in the permit application to the NCDEQ, you reason that Subpart FFFFFF is not applicable to the proposed facility based on the following presumptions:

i) The proposed facility does not meet the definition of a secondary copper smelter under §63.11158 since it does not produce "anode copper" as defined in §63.11158.

ii) The proposed facility will not utilize a pyrometallurgical purification process for raw material pretreatment, such as sweating or burning of insultation on the wire, or volatilization of oils or organic compounds.

The EPA's Applicability Determination

Under provisions of §63.11153(a), a new secondary copper smelter that is an area source of HAPs emissions is subject to this subpart. §63.11153(b) specifies that the affected source is a secondary copper smelter if construction or reconstruction occurred on or after October 6, 2006. Under definitions in §63.11158, secondary copper smelter means "… a facility that processes copper scrap in a blast furnace and converter or that uses another pyrometallurgical purification process to produce anode copper from copper scrap." Smelting furnace means "… any furnace, reactor, or other type of vessel in which copper scrap and fluxes are melted to form a molten mass of material containing copper and slag." Anode copper means "… copper that is cast into anodes and refined in an electrolytic process to produce high purity copper." Under provisions of §63.11155, emissions of particulate matter from the capture and control system of any smelting furnace, melting furnace, or other vessel that contains molten material, are limited to 0.002 grains per dry standard cubic foot.

According to the preamble in the Federal Register notice for the proposal of Subpart FFFFFF, electrolytic refining to produce high-purity copper from anode copper may occur either onsite at a secondary copper smelter or at another location.[1]

Based on the supporting information, that includes the information contained in the permit application for the proposed facility and filed with the NCDEQ, the EPA has concluded that the proposed facility will be an affected facility under Subpart FFFFFF. The bases of the EPA's determination are provided below:

i) The feedstock to the proposed process is not high-quality unalloyed copper scrap with a copper purity of greater than 99 wt% copper, which is a characteristic of a remelter.[1]

ii) The anode furnace may be classified as a "smelting furnace" because it is a furnace in which copper scrap and fluxes are melted to form a molten mass of material containing copper and slag.

iii) Pyrometallurgical purification will be performed at the proposed facility. The anode furnace's smelting and fire refining cycles are considered pyrometallurgical purification processes.

iv) The proposed process will not produce a specification brass or bronze product, which are characteristic products of ingot makers.

v) The proposed process will increase the copper concentration by approximately 10 wt%, which is moderately greater than what an ingot maker could achieve.

vi) The proposed process will produce a copper anode product with a product copper concentration of approximately 99.7 wt%, which may be classified as anode copper when the anodes are electrolytically refined, either on-site, or off-site.

[1] National Emission Standards for Hazardous Air Pollutants for Area Sources: Polyvinyl Chloride and Copolymers Production, Primary Copper Smelting, Secondary Copper Smelting, and Primary Nonferrous Metals—Zinc, Cadmium, and Beryllium; Proposed Rule, 71 Fed. Reg. 59311 (October 6, 2006).

vii) The proposed copper product produced at AMES meets the definition of anode copper because copper anodes produced at the site will be further refined after leaving the facility.

This AD was coordinated with the EPA Office of Enforcement and Compliance Assurance and Office of Air Quality Planning and Standards. If you have any questions about this AD, please contact Tracy Watson at (404) 562-8998, or by email at watson.marion@epa.gov.

Sincerely,

GREGG WORLEY

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Gregg Worley
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