



**Mike DeWine**, Governor  
**Jon Husted**, Lt. Governor  
**Laurie A. Stevenson**, Director

June 15, 2021

Jane Neal  
AMG Vanadium LLC  
2295 Innovation Way,  
Zanesville, Ohio 43701

**Re: AMG Vanadium LLC  
Non-permit Related Variance  
Correspondence  
RCRA C - Hazardous Waste  
Muskingum County  
OHR 000 212 902**

**Subject: Variance From Classification as a Waste Modification**

Dear Ms. Neal,

On June 11, 2021, the Director of Ohio EPA approved a Variance from classification as a waste (Variance) modification to AMG Vanadium LLC (AMG) for the facility located at 2295 Innovation Way, Zanesville, Ohio 43701 in Muskingum County. This modified Variance allows AMG to make the following changes:

- Refine language regarding the use of bill of lading.
- Add an exemption from the definition of solid waste K171 and K172 when in transit between AMG owned/operated facilities but not with any other transit scenarios within the State of Ohio.
- Update the Variance application to reflect the authorized storage capacity in RMSBs is based on the financial assurance and may be less than the total design storage capacity.

To issue this modified Variance, Ohio EPA determined that the application is complete and meets appropriate standards. Enclosed is the final Variance issued by the Director. Please note that the Variance remains in effect until it is renewed, withdrawn, suspended or revoked.

You are hereby notified that this action of the Director of Ohio EPA (Director) is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 made payable to "Treasurer, State of Ohio." The Commission, in its discretion, may reduce the fee if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission  
30 East Broad St., 4th Floor  
Columbus, Ohio 43215

The record related to this action can be retrieved from the Agency's eDocument Search web site: <http://edocpub.epa.ohio.gov/publicportal/edochome.aspx>. Click **Show Advanced** and then search under the document type of **Non-permit Related Variance**. Refine the search using the facility's RCRA ID number (Secondary ID) which is noted in the RE: block above.

If you have any questions concerning this Variance, please contact Chloé Mercier of Ohio EPA's Central Office, Division of Environmental Response and Revitalization, at (614) 644-2924.

Sincerely,



Chloé Mercier, Environmental Specialist III  
Division of Environmental Response and Revitalization

Enclosures

cc: Brad Mitchell, DERR, CO  
Emily Deshaies, DERR, SEDO  
Kristy Hunt, DERR, SEDO  
Scott Bergreen, DERR, SEDO

6/11/2021

**BEFORE THE  
OHIO ENVIRONMENTAL PROTECTION AGENCY**

**IN THE MATTER OF:**

**AMG Vanadium LLC**  
2295 Innovation Way  
Zanesville, Ohio 43701

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**Variance from Classification as a  
Waste**

Applicant

**PREAMBLE**

It is agreed by the parties hereto as follows:

**I. JURISDICTION**

This Variance from Classification as a Waste (Variance) is issued to AMG Vanadium LLC (Applicant) located at 2295 Innovation Way in Zanesville, Ohio 43701 pursuant to the authority vested in the Director of the Ohio Environmental Protection Agency (Ohio EPA) under Ohio Revised Code (ORC) §§ 3734.02, 3734.14, 3745.01 and Ohio Administrative Code (OAC) rule 3745-50-23.

**II. PARTIES BOUND**

This Variance shall apply only to the Applicant. No change in ownership of the Applicant or of the Facility shall in any way alter the Applicant's obligations under this Variance.

**III. DEFINITIONS**

1. Unless otherwise stated, all terms used in this Variance shall have the same meaning as defined in ORC Chapter 3734 and the rules promulgated thereunder. Whenever the terms listed below are used in this Variance, the following definitions shall apply:

- a. “Accepted at Facility” shall mean that time when Reclaimed Catalyst is within the Facility security fence.
- b. “Applicant” shall mean AMG Vanadium LLC located at 2295 Innovation Way in Zanesville, Ohio 43701.
- c. “Application” shall mean the responses to the criteria listed in OAC rule 3745-50-24(C) and supporting documents for a Variance submitted by Applicant on November 1, 2019, and as revised on January 9, 2020 Revision 0.1. The Application is attached hereto and incorporated herein this Variance.
- d. “Baghouse Dust or Cyclone Dust” is a Process Residual that is generated from the electric arc furnaces (EAFs) and collected in the baghouse or cyclone.
- e. “Cambridge Facility” shall mean the metal reclamation site at 60790 Southgate Road in Cambridge, Ohio 43725 and all contiguous, land, and structures used for storing and processing Reclaimed Catalyst or Roasted Catalyst.
- f. “Circulating Dry Scrubber” or “CDS” is a Flue Gas Desulfurization (FGD) unit that utilizes dry lime to react with acid gases, specifically sulfur dioxide (SO<sub>2</sub>) in the combined offgas from the Roaster and primary EAF. The product of the reaction of the hydrated lime and acid gases is LimeAdd™.
- g. “EAF Feed Building” is a building at the Facility where Roasted Catalyst is stored or blended prior to processing in the EAFs.
- h. “Emergency Spill” is defined as any on-site release of Reclaimed Catalyst that could result in or pose an imminent danger which requires prompt action to mitigate or minimize the impact of the incident on human health or the environment; or any release that Applicant is required to report to Ohio EPA's Spill Hotline or the National Response Center.
- i. “Facility” or “Zanesville Facility” or “Company” shall mean the metals reclamation site at 2295 Innovation Way in Zanesville, Ohio and all contiguous land, and structures used for storing and processing Reclaimed Catalyst or Roasted Catalyst.
- j. “Free Liquid” means liquids which readily separate from the solid portion of a material under ambient temperature and pressure. Free Oil that runs off from Reclaimed Catalyst is considered Free Liquid.
- k. “Free Oil” means the residual oil that coats the Reclaimed Catalyst until the Reclaimed Catalyst is processed through the Roaster



catalyst. The catalyst is then substantially partially reclaimed outside of the refining process to reclaim crude oil product producing Reclaimed Catalyst. The Reclaimed Catalyst is shipped to the Applicant's Facility for further reclamation. Once at Applicant's Facility, the Reclaimed Catalyst is reclaimed further in Applicant's proprietary process as the raw material to produce the Products Roasted Catalyst, Ferrovan®, FeNiMoly®, and Revan™.

- iii. Reclaimed Catalyst is delivered to the Applicant primarily in bulk railcars or trucks. This material is then, as demand requires, transported to storage areas in a RMSB by heavy equipment, or transported directly to the roaster feed hoppers without prior storage in a RMSB. The Reclaimed Catalyst may also be loaded into a truck or railcar for transport to the Cambridge Facility for further reclamation. Once in the roaster feed hoppers, the Reclaimed Catalyst is transferred to the Roaster by enclosed conveyor, where it is roasted. The roasting process is primarily to convert the metal sulfides in the Reclaimed Catalyst to metal oxides and to reduce the amount of carbon in the material. The Roasted Catalyst exits the bottom of the Roaster where it may be screened to remove oversize material. The Roasted Catalyst may be transported by enclosed conveyor to the silo system that blends feed for the EAFs, discharged to an enclosed truck for transport to the Cambridge facility for further reclamation, discharged to an enclosed truck for transport to the EAF Feed Building for later loading into feed hoppers, transported and stored prior to being sold as a Product. Alternatively, Roasted Catalyst can be blended with other raw materials for processing in the EAFs. The blended material is transferred to the furnace room and then fed through the furnace feed hoppers to the EAFs for the melting process. The EAFs generate ferrovanadium alloy, Ferrovan®, as the major product as well as two co-products; Revan™, which is sold as a metallurgical slag for steelmaking, and FeNiMoly®, which is sold based on its metal content. Intermediate product Slag is also generated, which is re-processed through the EAFs into one of these three products or can be sold.

**b. The value of the material after it has been reclaimed.**

- i. The Reclaimed Catalyst is of significant economic value due to its vanadium, nickel and molybdenum content. The Applicant enters into long term contractual purchase agreements with suppliers to ensure its supply of this raw material feedstock. Applicant purchases the Reclaimed Catalyst based upon the market price of the vanadium, nickel and molybdenum contained in the catalyst.
- ii. The Applicant further processes the catalyst to produce four Products. Three Products are used in the iron and steelmaking industry. Ferrovan® is a ferro vanadium alloy that is used to make steel stronger which can

3745-51-02 when Accepted at the Facility for further reclamation, and managed according to the conditions of this Variance.

#### **V. GENERAL CONDITIONS**

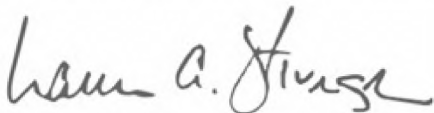
1. All activities undertaken by Applicant pursuant to this Variance shall be performed in accordance with the requirements of all applicable federal, state and local laws, regulations and ordinances.
2. Reclaimed Catalyst that is recycled by reclamation according to 3745-51-01(C)(4) for its metal content is not defined as a waste or a hazardous waste.
3. Applicant shall construct, operate, and maintain all the equipment and storage units associated with the reclamation process so as to minimize loss or release to the environment of Reclaimed Catalyst, as generally described in the Application. Nothing in the preceding sentence, however, shall prohibit Applicant from constructing, operating, maintaining, repairing, improving, enhancing, or changing equipment or the structures of the physical plant associated with the reclamation process so long as Applicant's equipment, structures and reclamation process remain generally consistent and functionally equivalent to those described in the Application. In addition, the Applicant shall comply with the following specific conditions:
  - a. **Manifest and Bill of Lading System:** Applicant shall, when accepting shipments of K171/K172 at the Facility, except as provided for in iii.:
    - i. Sign the manifest and comply with OAC rule 3745-65-71, Use of manifest system, regarding the manifest. Manifest shall be retained on-site at the Facility for three years.
    - ii. Comply with OAC rule 3745-65-76, Unmanifested waste report, when hazardous waste K171/K172 is received at the Facility not accompanied by a hazardous waste manifest.
    - iii. Shipments of K171/K172 that originate from AMG owned/operated facilities within the State of Ohio will utilize a Bill of Lading as the K171/K172 remains a Reclaimed Catalyst once it has entered the fence line of AMG owned/operated facilities.
  - b. **Storage:** Applicant shall store Reclaimed Catalyst that does not contain Free Liquid as defined by the paint filter test, Method 9095B, SW-846, either in piles, tanks, railcars and/or containers at the Facility.
    - i. Containers, railcars and tanks shall be nonleaking and compatible with the Reclaimed Catalyst. Containers shall be kept closed when Reclaimed Catalyst is not being added or removed.
    - ii. Piles shall only be used for storage provided the piles are located in a RMSB and the floor of that RMSB is compatible with the Reclaimed Catalyst.

**XVII. SIGNATORY AUTHORITY**

Each undersigned representative of a party to this Variance certifies that he or she is fully authorized to enter into this Variance and to legally bind such party to this Variance.

**IT IS SO ORDERED AND AGREED:**

**Ohio Environmental Protection Agency**



Laurie A. Stevenson  
Director

6/11/2021

Date

**IT IS SO AGREED:**

**AMG Vanadium LLC**



Signature



Printed or Typed Name



Title

4/19/2021

Date