

DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: On-site Inspection

B859664774

<b>FACILITY:</b> KOPPERS PERFORMANCE CHEMICALS INC.		<b>SRN / ID:</b> B8596
<b>LOCATION:</b> 52430 DUNCAN AVE M-26, HUBBELL		<b>DISTRICT:</b> Marquette
<b>CITY:</b> HUBBELL		<b>COUNTY:</b> HOUGHTON
<b>CONTACT:</b> Mark Karpinen , Production Manager		<b>ACTIVITY DATE:</b> 09/12/2022
<b>STAFF:</b> Joe Scanlan	<b>COMPLIANCE STATUS:</b> Compliance	<b>SOURCE CLASS:</b> MINOR
<b>SUBJECT:</b> Unannounced inspection to determine compliance with PTI 213-96N and all applicable air pollution control rules.		
<b>RESOLVED COMPLAINTS:</b>		

## REGULATORY AUTHORITY

Under the Authority of Section 5526 of Part 55 of NREPA, the Department of Environment, Great Lakes, and Energy may upon the presentation of their card, and stating the authority and purpose of the investigation, enter and inspect any property at reasonable times for the purpose of investigating either an actual or suspected source of air pollution or ascertaining compliance or noncompliance with NREPA, Rules promulgated thereunder, and the federal Clean Air Act.

## PROCESS DESCRIPTION

Koppers Performance Chemicals is one of the largest producers of copper carbonate in the world. The facility produces copper carbonate by leaching copper from raw materials, oxidizing, precipitating, and dewatering to produce the final product. Copper carbonate is produced for use as a wood preservative treatment for lumber used in various exterior and interior applications.

EUCUCPROCESS equipment includes 12 open-style and 3 sealed-type digestors, 6 rotary distillers, 3 oxidation towers, 3 air-oxidation towers, 1 CO<sub>2</sub> input tower, 2 water recovery units, 2 agitated flash dryers for copper carbonate production, and packaging equipment.

Raw copper is delivered to the facility in the form of copper flakes/granules. The raw copper is loaded into digestors containing lean leach, creating a copper rich liquor. The copper rich liquor is stored in tanks until it flows through oxidation towers, creating rich cupric. The rich cupric is stored in tanks until it is sent to a distiller where it is distilled into a copper slurry. The copper slurry is stored in mixing tanks before being sent to a LAROX filter press, where the slurry is filtered and pressed into basic copper carbonate cake (BCC). BCC is then dried in the Scott Dryer, creating copper carbonate dry (CCD). CCD is pneumatically conveyed and packaged into super sacks, then shipped to domestic and international clients.

The facility uses preventive maintenance computer software (EMAINT) to initiate and track completed work orders. Preventive maintenance includes inspections, scheduled replacement of parts, and maintaining an acceptable inventory of spare parts.

## REGULATORY ANALYSIS

The facility is a true minor source and operates under PTI 213-96N. The facility most recently submitted a permit application on 4-22-21 to add the 6<sup>th</sup> distiller for capacity expansion and to remove all equipment related to Cupric Oxide (CUO) production, including stack SVC1, from the permit. PTI 213-96N was approved on 8-04-21.

## EMISSIONS

EUCUCPROCESS ammonia emissions from portions of the copper carbonate process are controlled by a wet scrubber system (ammonia recovery system). The ammonia recovery system is made up of the ammonia absorber, two ammonia scrubbers operating in parallel and the ammonia distillation towers.

Unit #1 BCC baghouse/agitated flash dryer and the ammonia recovery system will exhaust through stack SVC2. Unit #2 BCC baghouse/agitated flash dryer will exhaust through SVC3.

SVC1 has been removed along with all equipment associated with CUO production.

## EMISSIONS REPORTING

This facility is not required to report to MAERS.

## COMPLIANCE

AQD has not had any compliance issues or received any complaints regarding the facility.

## INSPECTION

On 9-12-2022 AQD staff Joseph Scanlan arrived at the facility and met with Production Manager Mark Karpinen. Mr. Karpinen provided a guided tour of the facility and discussed the various emission units permitted under PTI No. 213-96N and the removal of the CUO production equipment.

## EUCUCPROCESS

### Emission Limits

#### SC I.1 (SVC2) Ammonia lb/hr limit: 44.0

- In compliance. Average August 2022 daily emissions for SVC2 were 14.4 lb/hr

#### SC I.2. (SVC3) Ammonia lb/hr limit: 41.0

- In compliance. Average August 2022 daily emissions for SVC3 were 9.2 lb/hr

#### SC I.3 (Ammonia Recovery System) Ammonia lb/hr limit: 9.0 lb/hr

- In compliance. The facility provided records for the month of August 2022. Data is based on readings taking twice daily. Readings varied from 1.1 lbs/hr to 4.0 lbs/hr for the month, with an average of 3.1 lbs/hr for the month.

#### SC I.4 through SC I.7

- In compliance. PM emission rates are verified via testing at the request of the AQD. No testing has been requested to-date, therefore PM emission rates have not been verified.

### Material Limits

**SC II.1 The fresh ammonia addition rate to EUCUCPROCESS shall not exceed the amount of ammonia contained in finished product plus 0.065 pounds of ammonia per pound of copper contained in the product, based on a 12-month rolling time period as determined at the end of each calendar month:**

- In compliance. The company has provided formulas by which the ammonia addition limit data is determined. All batches are tested for copper content. The total amount of product produced for the month is then multiplied by the average copper content of the product for the month. All batches are tested for ammonia content. The total amount of product produced for the month is then multiplied by the average ammonia content of the product for the month.
- Ammonia addition limit = lbs of Cu \* 0.065 (lb NH<sub>3</sub>/lb Cu) + lbs Ammonia
- Based on records provided by the facility, the rolling 12-month fresh NH<sub>3</sub> rate through August 2022 was 0.016 NH<sub>3</sub>/lbCu.

#### **Process/Operational Restriction(s)**

**SC III.1 Exhaust gases from all digestors, all ammonia solution storage tanks, recycle tower, vapor liquid separators, two ammonia distillation towers, all oxidation towers, and all sumps shall be vented through the ammonia absorber and the ammonia scrubbers operated in parallel, hereinafter “ammonia recovery system.”**

- In compliance. All emissions from the processes listed above are vented through the ammonia recovery system.

**SC III.2 Shall not operate any of the equipment listed in SC III.1 unless the ammonia recovery system is installed, maintained, and operated in a satisfactory manner as defined in the malfunction abatement plan:**

- In compliance. Based on visual observation of monitors in the control room, the ammonia recovery system is installed, maintained, and operated satisfactorily per MAP protocol. Equipment inspections are performed on a regular basis for all equipment. The frequency of inspections is managed using the EMAINT software. Inspections occur while operating or during scheduled outages. The frequency of scheduled replacement of parts occurs based on manufacturer’s recommendations or maintenance history. The facility has internal specifications that are alarmed so that there is time to correct an issue prior to exceeding a permit limit.

**SC III.3 Shall not operate EUCUCPROCESS unless a malfunction abatement plan (MAP) as described in Rule 911(2), for ammonia scrubbing, has been submitted and is implemented and maintained:**

- In compliance. The facility submitted an adequate MAP and it has been implemented. The MAP was created 11/2022 and has not needed to be updated. A copy of the MAP is on file.

#### **Design/Equipment Parameter(s)**

**SC IV.1 Shall equip and maintain the ammonia recovery system with liquid flow and temperature indicators on the liquid feed to each column and a vapor feed temperature indicator on the vapor feed to the first column:**

- In compliance. Liquid flow, temperature, and vapor indicator readings were observed during the inspection.

**SC IV.2 Shall not operate the agitated flash dryer unless the baghouse is installed, maintained, and operated in a satisfactory manner as defined in the malfunction abatement and preventative maintenance program:**

- In compliance. The baghouses are installed, maintained, and are operating in a satisfactory manner. The units have PM indicators and records are reviewed weekly. If readings are near operating range limits than filter/cartridges are inspected and replaced if necessary. Pulse valves are inspected monthly. The units are also equipped with broken bag detectors. Critical spare parts are kept in inventory.

**SC IV.3 Shall not operate the BCC filter operations unless the particulate filter is installed, maintained, and operated in a satisfactory manner as defined in the malfunction abatement and preventative maintenance program:**

- In compliance. The baghouses are installed, maintained, and are operating in a satisfactory manner. The units have PM indicators and records are reviewed weekly. If readings are near operating range limits than filter/cartridges are inspected and replaced if necessary. Pulse valves are inspected monthly. The units are also equipped with broken bag detectors. Critical spare parts are kept in inventory.

### **Testing/Sampling**

**SC V.1 Shall test each batch from EUCUCPROCESS to determine the quantity of ammonia and copper contained in the product:**

- In compliance. Batch is defined as composite truckload sample (22 lots of product). Copper and ammonia percent are completed by lab testing of the finished product. Each batch produced is tested in the lab as it is completed on the production floor. Average lb NH<sub>3</sub>/lb Copper for the month of August 2022 was 0.0043 lb.

**SC V.2 Upon request by AQD District Supervisor, facility may be required to verify PM emission rates from EUCUCPROCESS:**

- Not applicable at this time. The AQD has not required the facility to evaluate particulate matter emissions by testing.

### **Monitoring/Recordkeeping**

**SC VI.1 Shall complete all required calculations in a format acceptable to the AQD District Supervisor by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping:**

- In compliance. The facility has provided all calculations upon request for the month of August 2022. Records are on file.

**SC VI.2 Shall monitor and record the total feed rate to the agitated flash dryer and the ammonia concentration in the feed to the agitated flash dryer on a daily basis:**

- In compliance. Production records were available for immediate review; additional electronic data for August 2022 was submitted in a timely manner. Average daily feed rate to the agitated flash dryer for August 2022 was 94,083 lbs/day. Average daily ammonia concentration for August 2022 was 232 NH<sub>3</sub> lbs/day.
- A sample is taken from the feed into the agitated dryer every 4 hours and brought to the lab for testing of ammonia and moisture. The feed rate to the dryer is determined by the amount of dry product packaged from the production line converted to wet weight with the moisture.

**SC VI.3 Shall monitor the liquid flow rate and temperature of each of the columns of the ammonia recovery system and the vapor feed temperature of the first column of the ammonia recovery system every four hours:**

- In compliance. The production team monitors and records the liquid flow rate and the temperature of all columns and the vapor feed temperature every four hours. These values are recorded on a record sheet and maintained by the production supervisor.
- Operating range for liquid flow rate in the MAP is >0.6 gallons per minute (gpm) for both Scrubber A and Scrubber B. Review of daily records from August 2022 showed readings were performed every 4 hours and flow was fairly consistent for each unit, 0.7 gpm for Scrubber A and 1.0 gpm for Scrubber B.
- Operating range for temperature in the MAP is <50 F for both Scrubber A and Scrubber B. Review of daily records from August 2022 showed the readings were performed every 4 hours. Temperature for Scrubber B was fairly consistent in the mid-40 F range. Scrubber A temperature varied between the mid-to upper 40 F range and had a small number of temperature spikes over the 50 F range limit. The facility will need to address this.
- Operating range for the vapor feed temperature in the MAP is <75 F for Scrubber A and Scrubber B and a review of daily records from August 2022 showed the temperatures were consistently in the mid-60 F range and readings were performed every 4 hours.

**SC VI.4 Shall keep, in a satisfactory manner, records of the daily fresh ammonia addition to EUCUCPROCESS, daily production records with the amount of copper contained in each product produced and calculations showing the monthly fresh ammonia addition to EUCUCPROCESS in pounds of ammonia per pound of copper contained in product:**

- In compliance. The company has provided formulas by which the ammonia addition limit data is determined. All batches are tested for copper content. The total amount of product produced for the month is then multiplied by the average copper content of the product for the month. All batches are tested for ammonia content. The total amount of product produced for the month is then multiplied by the average ammonia content of the product for the month.
- Ammonia addition limit = lbs of Cu \* 0.065 (lb NH<sub>3</sub>/lb Cu) + lbs Ammonia

- Records of daily fresh ammonia addition, daily production records with Cu concentrations, and monthly fresh ammonia addition were provided for August 2022. Fresh ammonia addition in lbs of NH<sub>3</sub> per lb of Cu for August 2022 was 0.0043 NH<sub>3</sub>/lb of Cu.

**SC VI.5 Shall keep records of each batch produced, including the amount of copper and ammonia contained in the finished product of each batch as determined by testing:**

- In compliance. Batch is defined as composite truckload sample (22 lots of product). Copper and ammonia percent are completed by lab testing of the finished product. Each batch produced is tested in the lab as it is completed on the production floor. Average lb NH<sub>3</sub>/lb Copper for the month of August 2022 was 0.0043 lb.

**SC VI.6 Shall measure and record the ammonia recovery rate of the ammonia recovery system when modifications are made to the equipment and/or operation of the process:**

- In compliance. Baseline data is calculated daily and kept internally for tracking purposes. No modifications have been made to the equipment and/or operation of the process.

**SC VI.7 Shall keep records of the readings taken every four hours of the liquid flow rate and temperature for each of the columns of the ammonia recovery system and the vapor feed temperature of the first column of the ammonia recovery system:**

- In compliance. The production team monitors and records the liquid flow rate and the temperature of all columns and the vapor feed temperature every four hours. These values are recorded on a record sheet and maintained by the production supervisor.
- Operating range for liquid flow rate in the MAP is >0.6 gallons per minute (gpm) for both Scrubber A and Scrubber B. Review of daily records from August 2022 showed readings were performed every 4 hours and flow was fairly consistent for each unit, 0.7 gpm for Scrubber A and 1.0 gpm for Scrubber B.
- Operating range for temperature in the MAP is <50 F for both Scrubber A and Scrubber B. Review of daily records from August 2022 showed the readings were performed every 4 hours. Temperature for Scrubber B was fairly consistent in the mid-40 F range. Scrubber A temperature varied between the mid-to upper 40 F range and had a small number of temperature spikes over the 50 F range limit. The facility will need to address this.
- Operating range for the vapor feed temperature in the MAP is <75 F for Scrubber A and Scrubber B and a review of daily records from August 2022 showed the temperatures were consistently in the mid-60 F range and readings were performed every 4 hours.

**SC VI.8 Shall keep records, on a daily basis, of the calculations for determining the hourly ammonia emissions from the equipment vented through stack SVC2, the equipment vented through stack SVC3, and the ammonia recovery system:**

- In compliance. Scrubber emission rates are measured at a defined frequency to confirm they are within limits. Hourly rates are determined by testing the ammonia concentration in the scrubber exhaust vapor streams and multiplying by the flow rate of the stream.
- For NH<sub>3</sub> in product, a sample is taken from the feed into the agitated dryer every 4 hours and brought to the lab for testing of ammonia and moisture. This is used to determine the amount of NH<sub>3</sub> in product. For SVC2 emissions rate, NH<sub>3</sub> in the product is divided by the

hours of operation for Dryer 1 and added to the total scrubber emission rate. For SVC3, the emission rate is simply NH3 divided by the hours of Dryer 2 operation.

- Average daily NH3 emissions from SVC2 for August 2022 were 14.4 lb/hr. Average daily NH3 emissions from SVC3 for August 2022 were 9.2 lb/hr.

**CONCLUSION**

**The facility has had no previous compliance issues and emissions are well below permitted limits. Based on the inspection and the records provided, the facility is in compliance with PTI No. 213-96N.**

NAME 

DATE 10/7/2022

SUPERVISOR 