



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

## DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

MAY 30 2013

Mr. Gary Davis  
Compliance Manager  
Palmaras Corporation  
1468 Hoff Industrial Drive  
O'Fallon, MO 63366

RE: New Source Review Temporary Permit Request - Project Number: 2012-12-040

Installation ID Number: 183-0253

Temporary Permit Number: 052013-015

Expiration Date: March 15, 2015

Dear Mr. Davis:

The Missouri Department of Natural Resources' Air Pollution Control Program has completed a review of your request to install a pilot batch sulfuric acid pre-processing system and methane sulfonic acid (MSA) digester at Palmaras Corporation, located in O'Fallon, Missouri. The Air Pollution Control Program is hereby granting your request to conduct this temporary operation at this location in accordance with Missouri State Rule 10 CSR 10-6.060(3).

Palmaras Corporation (Palmaras) intends to install a pilot batch sulfuric acid pre-processing system and MSA digester at their precious metal recovery plant to determine the feasibility of system. The sulfuric acid pre-processing system will operate similarly to their current nitric acid system. The sulfuric acid digester will convert copper, iron, and nickel into metal sulfates, which the existing electrowinning process would convert to high purity metal tubes. The metal sulfates would be individually removed from the sulfuric acid digester and pumped to the electrowinning process. Undissolved metals, such as silver and tungsten, will be recovered from the sulfuric acid digester and be processed in either a nitric acid digester or a pilot MSA digester. Operating the sulfuric acid pre-processing system would reduce the amount nitric acid necessary to recover the elemental metals from metal alloys. If the pilot sulfuric acid and MSA system perform as expected, Palmaras would likely remove the nitric acid system from operation.

The pollutant of concern from the sulfuric acid pre-processing system is sulfuric acid mist. The system introduces air into the bottom of the sulfuric acid digester to facilitate mixing in the digester. The mixing air causes bubbling inside the digester, and the bubbling entrains sulfuric acid in the digester exhaust. Palmaras plans to reduce the sulfuric acid loss from entrainment by implementing a packed bed scrubber and possibly a mist eliminator that in turn would reduce the sulfuric acid mist emissions.

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No regulated pollutants are expected from the reaction within MSA digester. Unlike the sulfuric acid digester the MSA digester does not utilize air injection which would cause MSA mist. MSA mist would be regulated as a particulate matter but in this case it is not a pollutant of concern.

The potential emissions from the sulfuric acid pre-processing system are difficult to estimate as it is unknown how much of the sulfuric acid is entrained in the digester exhaust. This pilot plant will serve as a testing ground to estimate the emissions from this type of process. Palmaras estimates that they will use 0.2 tons sulfuric acid per day based on digester volume and reaction time. Palmaras would like to keep that information as confidential as possible so for this temporary permit it will be assumed that all sulfuric acid lost in the system will be entrained within the digester exhaust and emitted to the atmosphere.

The de minimis level for sulfuric acid mist is 7.0 tons per year. Sulfuric acid also has a 24 hour and 1 hour ambient air standard of  $10 \mu\text{g}/\text{m}^3$  and  $30 \mu\text{g}/\text{m}^3$  respectively. Palmaras must stay below the de minimis level for sulfuric acid mist in order to avoid any type of modeling requirements to show compliance with the ambient air quality standards. Palmaras has agreed to track all sulfuric acid losses within the sulfuric acid pre-processing system. These losses shall be considered the actual sulfuric acid mist emissions and remain below 7.0 tons per year on a 12-month rolling total.

The purpose of the pilot batch sulfuric acid pre-processing system and MSA digester is to determine feasibility of the process. This temporary permit gives Palmaras two years to complete the feasibility study. However, upon the completion of the feasibility determination of the process Palmaras must cease operation of the pilot plant. If the determination of feasibility has not yet been completed before the expiration date of this temporary permit, Palmaras must contact the Department of Natural Resources' Air Pollution Control Program and request an extension of the temporary permit with adequate justification as to why the feasibility determination was not completed. If Palmaras wishes to operate the pilot batch sulfuric acid pre-processing system and MSA digester on a permanent basis after the feasibility determination is made they must submit an application for authority to construct to the program in order to receive a construction permit.

Subsequent notification should be made to the Air Pollution Control Program once the feasibility determination period of the pilot batch sulfuric acid pre-processing system and MSA digester is complete. The following conditions apply to this temporary activity:

1. Palmaras shall not emit more than 7.0 tons of sulfuric acid mist per year on a 12-month rolling total.
  - a. Sulfuric acid mist emissions shall be calculated using a mass balance approach. Any sulfuric acid losses during the process shall be considered emitted into the atmosphere.

- b. Palmaras shall operate a packed bed scrubber while operating the pilot batch sulfuric acid pre-processing system to control sulfuric acid mist emissions
  - c. Palmaras shall maintain all records required by this temporary permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets for all materials used.
  - d. Palmaras shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.
2. No later than 90 days following the expiration of this permit or completion of the feasibility determination whichever date comes first, Palmaras shall submit a project report to the Air Pollution Control Program. This report shall include:
- a. The start date, start time, and duration of each time the pilot batch sulfuric acid pre-processing system and MSA digester is operated.
  - b. The quantity in tons of the sulfuric acid used for each time the pilot batch sulfuric acid pre-processing system and MSA digester is operated.
  - c. A table of emission factors developed as a result of feasibility determination while using the pilot batch sulfuric acid pre-processing system and MSA digester is operated. The developed emission factor table shall be complete with sample calculations and assumptions.
  - d. The emission factors shall be reported in units of pounds pollutant per ton of sulfuric acid used.
  - e. A summary and discussion of the methods used to develop the emission factors.
  - f. Conclusions reached concerning the long term feasibility of using the pilot batch sulfuric acid pre-processing system and MSA digester as opposed using the current nitric acid system.

Palmaras is still obligated to meet all other applicable air pollution control rules, Department of Natural Resources' rules, or any other applicable federal, state, or local agency regulations.

Specifically, you shall not violate:

- 10 CSR 10-6.165, *Restriction of Emission of Odors*
- 10 CSR 10-6.170, *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*
- 10 CSR 10-6.220, *Restriction of Emission of Visible Air Contaminants*
- 10 CSR 10-6.260, *Restriction of Emission of Sulfur Compounds*

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A copy of this letter should be kept with the unit and be made available to Department of Natural Resources' personnel upon request. If you have any questions regarding this determination, please do not hesitate to contact Gerad Fox at the departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 75 1-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

A handwritten signature in cursive script that reads "Kyra L. Moore". The signature is written in black ink and is positioned above the printed name and title.

Kyra L. Moore  
Director

KLM:gfl

c: PAMS File: 2012-12-040  
Saint Louis Regional Office