

# PERMIT BOOK

STATE OF MISSOURI



## DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

### PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **122007-005** Project Number: 2007-08-046

Parent Company: Noranda Aluminum, Inc.

Parent Company Address: 391 St Jude Industrial Park, New Madrid, MO 63869

Installation Name: Noranda Aluminum, Inc.

Installation Address: 391 St. Jude Industrial Park, New Madrid, MO 63869

Location Information: New Madrid County, S32, T22N, R14E

Application for Authority to Construct was made for:

Installation of two (2) 80,000 pound holding furnaces with a maximum heat input of 20 million BTU per hour each. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

DEC 20 2007

EFFECTIVE DATE

  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

**You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review.** In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located with 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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Permit No.	
Project No.	2007-08-046

## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

Noranda Aluminum, Inc.  
New Madrid County, S32, T22N, R14E

1. Fluoride Modeling and Monitoring Requirements  
Noranda Aluminum, Inc. shall install, operate and maintain a system of ambient air monitoring stations for fluoride. Noranda Aluminum, Inc. shall install, operate and maintain this ambient fluoride monitoring network according to the following specifications:
  - A. Sampling shall commence within 90 days of the Air Pollution Control Program's approval of the monitoring location. Special Condition 10 of permit number 102004-001 must be completed.
  - B. The initial fluoride monitoring network approved under this permit shall consist of at least three (3) ambient monitors.
  - C. Noranda Aluminum, Inc. will conduct meteorological monitoring in conjunction with the fluoride monitoring plan. This meteorological monitoring will occur at a minimum of one (1) site as described by an approved Quality Assurance Project Plan (QAPP) for meteorological data and continue for the duration of the fluoride monitoring.
  - D. Noranda Aluminum, Inc. shall locate all fluoride monitors such that the monitors will measure *ambient* air quality, as approved by the department.
  - E. Noranda Aluminum, Inc. shall report the data collected in accordance with this special condition to the department on a quarterly basis.
  - F. If concentrations are monitored that exceed the Risk Assessment Level (RAL), Noranda Aluminum, Inc. shall report the monitored information (the beginning and ending date and time, and the value for the applicable standard time period) within seven (7) days of the event.
  - G. Concentrations resulting from this monitoring greater than the RAL and attributed to operations permitted herein represent cause for reopening this permit. Noranda Aluminum, Inc. shall:
    - 1) conduct a comprehensive review of the results and develop a correction plan;
    - 2) submit the corrective action plan to the permitting authority for approval; and,
    - 3) implement the corrective action plan immediately upon department approval.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- H. Noranda Aluminum, Inc. shall submit a QAPP for fluoride for department approval no more than three (3) months before commencing operation.
- I. The QAPP will contain the specifications of the monitoring program noted above and include:
  - 1) the conditions under which the monitoring may be discontinued;
  - 2) when date sampling will commence, (Sampling will begin no later than the commencing of operation); and,
  - 3) the nature of the information to be reported (e.g. hourly concentrations).
- J. In conjunction with the fluoride monitoring program above, Noranda Aluminum, Inc. shall perform a risk assessment study. Noranda Aluminum, Inc. should contact the Air Pollution Control Program to establish the minimum criteria that must be met for collection and reporting purposes. If the risk assessment indicates that adverse health impact are likely, Noranda Aluminum Inc. shall:
  - 1) conduct a comprehensive review of the results and develop a correction plan;
  - 2) submit the corrective action plan to the permitting authority for approval; and,
  - 3) implement the corrective action plan immediately upon department approval.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2007-08-046  
Installation ID Number: 143-0008  
Permit Number:

Noranda Aluminum, Inc.  
391 St. Jude Industrial Park  
New Madrid, MO 63869

Complete: August 06, 2007  
Reviewed: November 05, 2007

Parent Company:  
Noranda Aluminum, Inc.  
391 St Jude Industrial Park  
New Madrid, MO 63869

New Madrid County, S32, T22N, R14E

REVIEW SUMMARY

- Noranda Aluminum, Inc. has applied for authority to install two (2) 80,000 pound holding furnaces with a maximum heat input of 20 million BTU per hour each.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are Hydrogen Chloride (CAS# 7647-01-0) and Hydrogen Fluoride (CAS # 7664-39-3).
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment. Subpart S, *Standards of Performance for Primary Aluminum Reduction Plants*, does not apply to the proposed equipment as it is not in potroom groups or anode bake plant facilities.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart RRR, *National Emission Standards for Secondary Aluminum Production*, applies to the proposed equipment.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of the application are below de minimis levels.
- This installation is located in New Madrid County, an attainment area for all criteria air pollutants.
- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2] Number 6 Primary Aluminum Ore Reduction Plants.

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels
- Emissions testing is required for the equipment to determine compliance with MACT Standards and emission limitations set forth in this construction permit.
- A Revision to the Part 70 operating Permit is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

Noranda Aluminum, Inc. operates a primary aluminum refining operation in New Madrid County. The company is an existing primary aluminum reduction installation but is also involved in secondary aluminum production. Alumina ( $Al_2O_3$ ) is received at the plant and undergoes electrolytic reduction, known as the Hall-Heroult process, to obtain aluminum. The electrolytic reduction takes place in shallow carbon-lined steel shells called pots. The anodes are carbon electrodes extending into the pot, and the cathode is the carbon lining within the pot.

In the reduction of alumina, carbon, in the form of an anode, is negatively charged to react with the alumina. The anode, also called green anode, is continuously depleted until it is a stub. These anodes are prepared with petroleum coke mixed with pitch binder to make a paste. The coke is crushed, ground, and screened before being mixed with the pitch binder. The paste is added directly to the anode casings and baked in a pre-bake furnace. This type of aluminum reduction cell is most common because it is more efficient electrically and it emits fewer organic compounds than other forms of reduction cells.

The electrolyte is molten cryolite ( $Na_3AlF_6$ ) which also serves as the solvent for alumina. The electrolytic reduction of alumina by the carbon from the electrode forms elemental aluminum and carbon dioxide ( $CO_2$ ). The aluminum is deposited around the carbon-lined steel shell, where it remains as a molten metal below the surface of the cryolitic bath. Using a vacuum siphon, the aluminum is removed from the pots every 24 to 48 hours and transferred to a reverberatory holding furnace. From there, it is either cast or transported to the holding facilities.

Noranda Aluminum, Inc. is considered a major source under construction and operating permits. Four separate Part 70 Operating Permits were issued to Noranda Aluminum, Inc. for the entire installation. The following permits have been issued to Noranda Aluminum, Inc. from the Air Pollution Control Program.

Table 1: Permitting Activity at Installation 143-0008 Noranda Aluminum, Inc.

Permit Number	Description
0679-008	Potline I
0679-009	Alumina handling facilities associated with potline III
0679-010	Potline III
0679-011	Carbon baking furnace for potline III
1282-007A	Dross cooling system
1288-003A	Dross cooling system
0990-013	Additional melting furnace
0194-008	Reverberatory melting furnace
0894-022	Filtered exhaust system
OP2001-066	Part 70 Operating Permit Primary Aluminum Reduction Facility
OP2001-032	Part 70 Operating Permit Primary Aluminum Reduction Facility
OP2001-062	Part 70 Operating Permit Primary Aluminum Reduction Facility
OP2001-033	Part 70 Operating Permit Primary Aluminum Reduction Facility
0298-001	Replacement of existing batch mixers for anode paste with continuous mixer and the replacement of the existing hydraulic press anode mold with a turntable vibratory anode former to produce a larger single piece anode
0799-017	Addition of a downdraft welding table
082001-005	Installation of two 80,000 pound holding furnaces, 20 MMBTU per hour each
N/A	Project number 2002-03-097 roof ventilators no permit required
N/A	Project number 2002-06-114 application withdrawn by applicant
N/A	Project number 2002-09-056 Closed out per policy
102004-001	Increase Production Section 8 Permit Issued
OP-2001-033A	Responsible Official Change
OP2001-066A	Responsible Official Change
OP2001-062A	Responsible Official Change
OP2001-032A	Responsible Official Change

## PROJECT DESCRIPTION

This project involves the installation of two (2) additional 80,000 pound rectangular holding furnaces in the rod mill department, to supply the Number 2 Rod Mill (Properzi). The furnaces have individual maximum heat input capacities of 20 million BTU per hour. These furnaces will allow for increased production through the Number 2 Rod Mill. The rod mills are a mechanical operation applied to the cast aluminum products. Emission impact resulting from de-bottlenecking of this mill was considered in the truck traffic. No other de-bottlenecking was identified or considered. An estimated 400 trucks would be necessary to haul the 16,000,000 pounds of additional production. Molten aluminum from the melting furnace will be the primary input source into these holding furnaces. The furnaces will have the capacity to remelt 10,000 pounds per hour of aluminum rod not within customer specification. The primary fuel source is natural gas, with propane as a secondary fuel supply. No control devices are proposed for this equipment.

Of particular concern for this project is the ambient fluoride emissions. However, there is uncertainty surrounding the transformation of the fluoride particles to other chemical species as this project adds to the fluoride emitted from this installation. Currently CALPUFF modeling system is not capable of handling such complex chemical transformations for all pollutants and assumes that all of the fluoride emissions remain fluoride. Given this uncertainty, the Departments Air Pollution Control Program feels that monitoring is necessary to determine the ambient impact from the Noranda Aluminum, Inc. facility. Because of the complex nature of determining the site locations

for monitoring stations, the limited availability of specialized staff and computer modeling equipment, the monitoring of fluoride as established in Permit 102004-001 with project number 2003-11-053 has not yet produced information concerning fluoride concentrations.

This project's Potential To Emit calculation (0.03670 tons per year hydrogen fluoride) does not trip the Screen Modeling Action Levels of 0.1 tons per year of hydrogen fluoride and therefore modeling is not required for this project.

Project 2001-02-055 with permit number 082001-005 was not constructed. Since that project was not constructed, this project 2007-08-046 is essentially the authorization of project 2001-02-055. The site revised the application to the equipment specifications to reflect the equipment as authorized in project 2001-02-055.

### EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, Natural Gas Combustion, (7/1998) was used to evaluate emissions arising from the combustion of natural gas and Section 1.5, 1996 was used to evaluate the emissions arising from combustion of liquefied petroleum gas in the furnaces. Hydrogen chloride emissions were developed from testing done in 2003 for NESHAP testing. Hydrogen chloride emissions were used as a surrogate to estimate hydrogen fluoride emissions as allowed in Subpart RRR. This equipment will be tested in accordance with Subpart RRR. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year). The following table provides an emissions summary for this project.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2006 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM <sub>10</sub>	15.0	1,466	597.53	4.99	N/A
SO <sub>x</sub>	40.0	5,243	4904.62	0.10	N/A
NO <sub>x</sub>	40.0	170.04	34.81	35.41	N/A
VOC	40.0	79.5	228.85	0.92	N/A
CO	100.0	37,942	30722.88	14.02	N/A
HAPs	10.0/25.0	N/D	136.21	6.96	N/A
Fluorides	3.0	394	N/D	0.04	N/A

N/A = Not Applicable; N/D = Not Determined

Existing emissions are from permit 102004-001 with project number 2003-11-053.

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions are below de minimis levels.

### APPLICABLE REQUIREMENTS

Noranda Aluminum, Inc. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110*  
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *Operating Permits, 10 CSR 10-6.065*
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin, 10 CSR 10-6.170*
- *Restriction of Emission of Visible Air Contaminants, 10 CSR 10-6.220*
- *Restriction of Emission of Odors, 10 CSR 10-3.090*

### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400*
- *Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, National Emission Standards for Secondary Aluminum Production, 40 CFR Part 63, Subpart RRR.*
- *Restriction of Emission of Sulfur Compounds, 10 CSR 10-6.260*

### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be

granted with special conditions.

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Timothy Paul Hines Environmental Engineer II	Date
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#### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated July 08, 2007, received August 06, 2007, designating Noranda Aluminum, Inc. as the owner and operator of the installation.
- Revision of application via email October 18, 2007 from Don Backfisch
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey, dated August 23, 2007.

Mr. Don Backfisch  
Environmental Superintendent  
Noranda Aluminum, Inc.  
391 St. Jude Industrial Park  
New Madrid, MO 63869

RE: New Source Review Permit - Project Number: 2007-08-046

Dear Mr. Backfisch:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact me at (573) 751-4817, or you may write to me at the Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

Thank you,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH:TPH

Enclosures

c: Southeast Regional Office  
PAMS File 2007-08-046