

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: 032008-009 Project Number: 2007-12-061

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

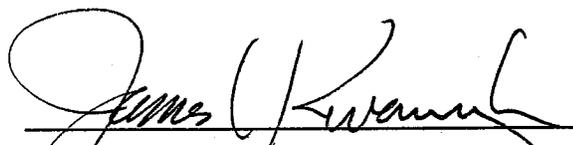
Location Information: New Madrid County, S32, T22N, R14E

Application for Authority to Construct was made for: Installation of a new 125 ton alumina storage bin (EP-115) and activation of shut down equipment which includes four 19 ton day tanks (EP-51, 52, 53 and 54) and delivery systems to supply each pot room for storage of solid cover material that has an approximate composition of 56% alumina and 44% bath. 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.

MAR 17 2008

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 within 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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## 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. **PM<sub>10</sub> Emission Limitation**
  - A. Noranda Aluminum, Inc. shall emit less than 15 tons of particulate matter less than ten microns in diameter (PM<sub>10</sub>) in any consecutive 12 month period from the following emission points EP-51, EP-52, EP-53, EP-54 and EP-115). This limitation only applies to the emissions from electrolyte recovery in rooms A , B, C, and D (EP-51, EP-52, EP-53, EP-54 ) and the fresh ore material handling, 136 intermediate silo (EP-115).
  - B. Noranda Aluminum, Inc. shall maintain an accurate record of PM<sub>10</sub> emitted into the atmosphere from the following emission points EP-51, EP-52, EP-53, EP-54 and EP-115. Attachment A or an equivalent form shall be used for this purpose. Noranda Aluminum, Inc. shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
  - C. Noranda Aluminum, Inc. shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which the records from Special Condition Number 1.B. indicate that the source exceeds the limitation of Special Condition Number 1.A.
2. **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.

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**SPECIAL CONDITIONS:**

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

- 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.
- 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).

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**SPECIAL CONDITIONS:**

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

- 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: 2007-12-061  
Installation ID Number: 143-0008  
Permit Number:

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

Complete: January 18, 2008  
Reviewed: February 29, 2008

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 a new 125 ton alumina storage bin (EP-115) and activation of shut down equipment which includes delivery systems and four 19 ton day tanks (EP-51, 52, 53 and 54). These tanks will sit on top of each pot room for storage of cover material that has an approximate composition of 56% alumina and 44% bath.
- Hazardous Air Pollutant (HAP) emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment. Subpart S, *Standards of Performance for Primary Aluminum Reduction Plants*, does apply to the proposed equipment as it is located 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.
- Dust collectors (CD-51, 52, 53, 54 and CD 115) are being used in association with the new and reactivated 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 conditioned to 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 ( $\text{Al}_2\text{O}_3$ ) 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 ( $\text{Na}_3\text{AlF}_6$ ) 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 ( $\text{CO}_2$ ). 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
N/A	Welding fume handling - No Permit Required
N/A	Homogenizing Furnace - Application withdrawn by applicant
N/A	Reverb furnace - No Permit Required
N/A	Dust Collector - No Permit Required
N/A	Re route air flow - No Permit Required
N/A	Sawing Cutting Station - No Permit Required
122007-005	Holding Furnace Section 5 permit issued

### PROJECT DESCRIPTION

There are no HAPS or VOC generated in the process. It is simply moving solid material (bath and alumina) from one location to the other. This project is the reactivation of the dense phase system for supplying cover material to potlines 1 and 2. The system has been idle for approximate 20 years, but has supplied material to pot line 3. The dense phase system for potline 1 and 2 has been included in the plants Emissions Inventory Questionnaire (EIQ) with a zero throughput. A new 125 ton alumina storage silo will be added to allow mixing alumina with crushed electrolytic bath as the anode cover material. The emission points are EP-51, EP-52, EP-53 and EP-54. The alumina silo will be added as EP-115. The remaining portions of the dense phase system have been in continuous use supplying cover material to potline 3. Baghouses (CD-51, 52, 53, 54 and CD115) are used to control the emission of PM<sub>10</sub>. A control efficiency of 99.0% was assigned to the bag houses.

Of particular concern for this installation are the ambient fluoride emissions. However, there is uncertainty surrounding the transformation of the fluoride particles to other chemical species. This project does not add 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 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 limited 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.

### EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were obtained from the Environmental Protection Agency (EPA) Technology Transfer Network web page with the WebFIRE database. The emission factor 5.8 pounds of PM<sub>10</sub> per ton of aluminum produced is from material handling for the electroduction of aluminum (SCC #30300104). 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 <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2006 EIQ)	Potential Emissions of the Application	New Equipment Conditioned Potential
PM <sub>10</sub>	15.0	1,471	597.53	50.80	<15
SO <sub>x</sub>	40.0	5,243	4904.62	N/A	N/A
NO <sub>x</sub>	40.0	205.41	34.81	N/A	N/A
VOC	40.0	80.42	228.85	N/A	N/A
CO	100.0	37,956.02	30722.88	N/A	N/A
HAPs	10.0/25.0	N/D	136.21	N/A	N/A
Fluorides	3.0	394	N/D	N/A	N/A

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

Note: Existing emissions are from permit 102004-001 with project number 2003-11-053 and permit number 122007-005 with project number 2007-08-046.

### 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*

## 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.

\_\_\_\_\_  
Timothy Paul Hines  
Environmental Engineer II

\_\_\_\_\_  
Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated December 17, 2007, received December 26, 2007, designating Noranda Aluminum, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Site Survey.

**Attachment A – PM<sub>10</sub> Compliance Worksheet**

Noranda Aluminum Company  
 New Madrid County, S32, 22N, 14E  
 Project Number: 2007-12-061  
 Installation ID Number: 143-0008

This sheet covers the month of \_\_\_\_\_ in the year \_\_\_\_\_.  
 Copy this sheet as needed

Column 1	Column 2	Column 3	Column 4	Column 5
Equipment	Amount of Material Processed (tons)	Emission Factor (lbs. PM <sub>10</sub> / ton of Aluminum processed)	Collection Removal Efficiency	PM <sub>10</sub> Emissions (Tons) (A)
EP-115		5.8	0.99	
EP-51		5.8	0.99	
EP-52		5.8	0.99	
EP-53		5.8	0.99	
EP-54		5.8	0.99	
(B) Total PM <sub>10</sub> Emissions from calculated for this Month in Tons:				
(C) 12-Month PM <sub>10</sub> Emissions Total from Previous Years Month Attachment A in Tons				
(D) 12-Month PM <sub>10</sub> emissions from last month's Attachment A, in Tons				
(E) Current 12-month Total of PM <sub>10</sub> Emissions in Tons: [(D) - (C) + (B)]				

**INSTRUCTIONS:**

- (A): [Column 2] x [Column 3] x [1-Column 4] x [0.0005] = [Column 5];
- (B): Summation of [Column 5] for PM<sub>10</sub> emissions in Tons;
- (C): 12-Month PM<sub>10</sub> Emissions Total from Previous Years Month Attachment A in Tons;
- (D): 12-Month PM<sub>10</sub> emissions from last month's Attachment A, in Tons;
- (E): **A 12-Month PM<sub>10</sub> emissions total (E) of less than 15.0 tons indicates compliance.**

Mr. Don Backfisch  
Environmental Superintendent  
Noranda Aluminum, Inc.  
P.O. Box 170  
New Madrid, MO 63869

RE: New Source Review Permit - Project Number: 2007-12-061

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, Tim Hines at the departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

**AIR POLLUTION CONTROL PROGRAM**

Kendall B. Hale  
New Source Review Unit Chief

KBH:thl

Enclosures

c: Southeast Regional Office  
PAMS File 2007-12-061

Permit Number: