



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: 102012-007

Project Number: 2012-08-015
Installation Number: 163-0031

Parent Company: Dyno Nobel, Inc.
 Parent Company Address: 2795 East Cottonwood Parkway, Suite 500,
 Salt Lake City, UT 84121
 Installation Name: Dyno Nobel, Inc.
 Installation Address: 11025 Highway D, Louisiana, MO 63353
 Location Information: Pike County, S28, T54N, R1W

Application for Authority to Construct was made for:
 Installation of a 68% nitric acid concentrator unit.. 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.

OCT 16 2012

EFFECTIVE DATE

Kyra L Moore
 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 startup of these air contaminant sources. The information must be made available within 30 days of actual startup. 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 startup of these air contaminant sources.

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 sources(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.	2012-08-015

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."

Dyno Nobel, Inc.
Pike County, S28, T54N, R1W

1. Emission Limitation
 - A. Dyno Nobel, Inc. shall install, operate and maintain a high pressure shut down loop which will initiate 68% concentrator unit shut down prior to reaching 15 pounds per square inch (psi).
 - B. Dyno Nobel, Inc. shall maintain an operating and maintenance log for the high pressure shut down loop, which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - 3) Dyno Nobel Inc. computerized maintenance tracking system (SAP) will be used to track maintenance and repairs of the unit as an ongoing record.
2. Record Keeping and Reporting Requirements
Dyno Nobel, 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.

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

Project Number: 2012-08-015
Installation ID Number: 163-0031
Permit Number:

Dyno Nobel, Inc.
11025 Highway D
Louisiana, MO 63353

Complete: August 8, 2012

Parent Company:
Dyno Nobel, Inc.
2795 East Cottonwood Parkway, Suite 500
Salt Lake City, UT 84121

Pike County, S28, T54N, R1W

REVIEW SUMMARY

- Dyno Nobel, Inc. has applied for authority to relocate, construct, and operate a 68% nitric acid concentrator unit.
- HAP emissions are not expected from the proposed equipment.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply 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 all regulated pollutants are below the de minimis levels.
- This installation is located in Pike County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- A Part 70 Operating Permit renewal application for this installation is currently under review (project number 2003-08-093). This project will be considered Off-permit and incorporated into the new operating permit.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Dyno Nobel, Inc. – LOMO plant (Dyno Nobel) operates an ammonium nitrate and nitric acid production plant located in Louisiana, Missouri. The installation is considered a major source of NO_x and PM₁₀. Dyno Nobel has a Part 70 Operating permit.

The following projects have been submitted by Dyno Nobel, Inc. to the Air Pollution Control Program.

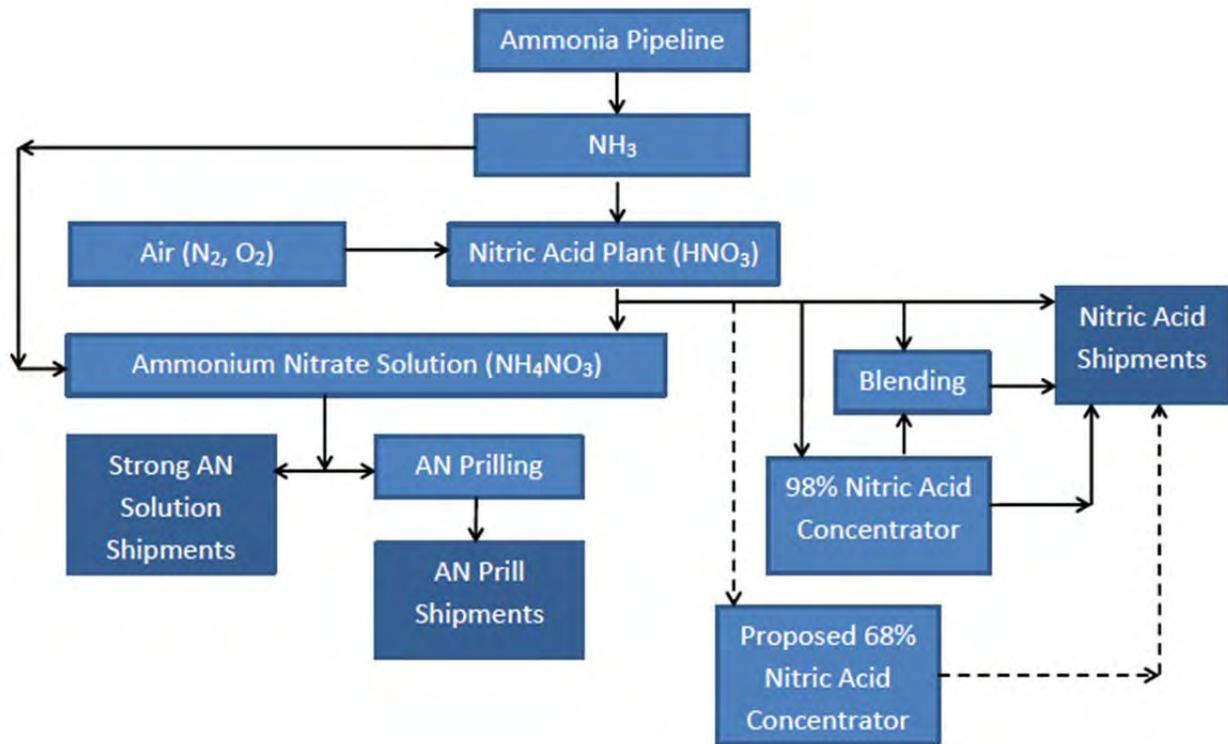
Table 1: Project History

Project ID	Project Type	Status	Completion Date	Permit No	Description
200206125	Temporary or Pilot Plant Permit	Section 5 Permit Issued	07/25/02	072002-014	Temporary Boiler
200306071	Temporary or Pilot Plant Permit	Section 5 Permit Issued	07/25/03	072003-018	Temporary Boiler
200402023	Applicability Determination Request	Application Denied	03/31/04		applicability request re: NO _x ERCs
200404122	Temporary or Pilot Plant Permit	Temporary Permit Issued	06/14/04	062004-001	Temporary Boiler
200408092	Temporary or Pilot Plant Permit	Temporary Permit Issued	09/10/04	092004-003	Boiler tension
200504034	Temporary or Pilot Plant Permit	Temporary Permit Issued	05/10/05	052005-011	Temporary boiler, generators
37000031006	Sec 5 & 6: Deminimis and Minor	Technical Review	06/24/92	0792-005	
37000031005	Sec 5 & 6: Deminimis and Minor	Technical Review	11/27/90		
37000031007	Sec 5 & 6: Deminimis and Minor	Awaiting Completeness Check	07/22/93	0893-003	
37000031008	Sec 5 & 6: Deminimis and Minor	Permit Issued	12/23/94	1294-029	
37000031009	Corrections & Amendments	Permit Issued	03/15/96	0396-002	
37000031020	Part 70 Operating Permit	Operating Permit Issued	03/18/99	OP1999-029	explosives
199807119	Corrections & Amendments	Temporary Permit Issued	08/18/98	0898-020	Temporary 60hp diesel boiler
199805628	Sec 5 & 6: Deminimis and Minor	Section 5 Permit Issued	08/14/98	0898-017	145,000 Gal Nitric Acid Tank
199907069	Corrections & Amendments	Amendment approved	09/07/99	0999-006	Temporary Boiler
200707058	Temporary or Pilot Plant Permit	No Permit Required	08/08/07		Temporary Diesel Generator
200808032	Temporary or Pilot Plant Permit	Temporary Permit Issued	09/05/08	092008-002	Temporary Generator
200905031	Temporary or Pilot	Application	06/25/09		Temporary

Project ID	Project Type	Status	Completion Date	Permit No	Description
	Plant Permit	Withdrawn by applicant			Generator
201001057	Part 70 Operating Permit Admin Amendment	Amendment approved	04/01/10	OP1999-029	Responsible official change
201007031	Sec 5 & 6: Deminimis and Minor	Section 5 Permit Issued	09/01/10	092010-001	Boiler
201009056	Temporary or Pilot Plant Permit	Temporary Permit Issued	10/28/10	102010-012	Temporary Generator
201105035	Temporary or Pilot Plant Permit	No Permit Required	06/10/11		Generator Set
201203032	Applicability Determination Request	No Permit Required	08/20/12		Cooler Replacement
201207036	Applicability Determination Request	Permit Required	08/03/12		Acid Concentrator

Figure 1.

Key Elements – LOMO Plant



PROJECT DESCRIPTION

As detailed in Permit Determination Request dated July 13, 2012 subsequently reviewed by Mr. David Little (MDNR), Dyno Nobel Inc. plans to move a 68% nitric acid concentrator unit from Maitland, Ontario Canada, reassemble the unit at LOMO, and start operation as soon as possible. The operation of this 68% nitric acid concentrator will eliminate the need to dilute 98% nitric acid to 67% nitric acid at LOMO to be sold in the market. The 68% concentrator has a capacity of 65 metric tons per day which is equivalent to 71.5 short tons per day (143,000 pounds). The unit was originally built in 1981 with a production rate of 40 tons per day and upgraded in 1995 with an increase in capacity to the current capability.

The Ammonia Oxidation Process (acid production) at LOMO will not be increased (or decreased) as the acid production runs at 100% capacity and is only influenced by atmospheric conditions and downtime. There are no additional tanks or combustion sources being added to the facility operation. Since no additional acid production will occur, no additional truck or rail traffic will be required. Under normal operations the exhaust flow from the 68% concentrator is zero or a slight intake due to vacuum caused by condensing and cooling action of the acid and water with a downward flow to the bottom of the column driven by gravity.

Although there is no expected increase in potential emissions due to this project, without the requirement for the shut down loop, there is a chance that emissions during intermittent malfunctions could result in levels above de minimis levels. Therefore, a permit was required to make the shut down condition stated in the special conditions federally enforceable.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Sections 1.4 *Natural Gas Combustion* (July 1998) and 8.3 *Ammonium Sulfate* (October 1996).

During normal operations, there are no emissions. However, there may be a small amount of NO_x emissions from the 68% concentrator caused by intermittent and infrequent process malfunctions. These infrequent emissions from the unit are controlled by the presence of a rupture disk located in the blow-off tank which prevents emissions of fumes from the re-boiler. Additionally, multiple (3) tube and shell condensers which condense vapors generated by the system limit acid fuming by controlling process temperature which in turn limits generation of NO_x. Only white nitric acid will be used for supply feed from acid production via above ground closed piping. White nitric acid contains no solids or non-condensables this will further limit potential emissions.

There are no potential emissions of criteria pollutants other than NO_x and there are no potential emissions of hazardous air pollutants. The unit is designed in contrast to LOMO's existing 98% concentrator unit (EP-14) in that it uses excess steam provided

by an existing boiler to concentrate acid rather than using salt solution for removal of water. The new concentrator will be designated EP-16 for reporting purposes. As previously noted, during normal operations the unit runs at a slight negative pressure compared to atmosphere, so no emissions actually occur. An emission factor of 10 pounds per ton produced was referenced in the previously submitted permit determination request is in error due to significant differences in design and operation. The emission factor listed in Table 8.8-1 is not applicable for this 68% concentrator as compared to the 98% concentrator.

Please refer to Attachment B for an explanation of why NSPS Subpart Ga does not apply to this unit. Please refer to Attachment C for responses to questions posed during the review. The previous discussion and emissions calculations are based on the application, responses to questions and data submitted in the annual emissions report.

The following table provides an emissions summary for this project. Existing potential emissions were taken from the annual reported sources at maximum design rate. Existing actual emissions were taken from the installation's 2011 MoEIS (annual emission report). Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Potential Emissions of the Application ¹	New Installation Conditioned Potential
PM	25.0	288.4	163.4	N/A	288.4
PM ₁₀	15.0	197.1	110.4	N/A	197.1
PM _{2.5}	10.0	91.3	53.0	N/A	91.3
SO _x	40.0	0.3	0.0	N/A	0.3
NO _x	40.0	632.1	462.4	N/A	632.1
VOC	40.0	1.7	0.2	N/A	1.7
CO	100.0	16.3	1.5	N/A	16.3
NH ₃		37.5	20.6	N/A	37.5
HAPs ²	10.0/25.0	0.8	0.1	N/A	0.8

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 of all regulated pollutants for this project are below de minimis levels.

¹ This project is not expected to have any emissions except during periods of malfunction.

² This does not include HAPs that are reported as particulate matter or volatile organic compounds.

APPLICABLE REQUIREMENTS

Dyno Nobel, Inc. shall comply with the following applicable requirements for this project. 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 the installation, please consult the operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *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 10-6.165

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.

Randy Raymond
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 7, 2012, received August 8, 2012, designating Dyno Nobel, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Dyno Nobel Americas



Mr. Randy Raymond
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

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11025 Highway D
Louisiana, MO
63353 USA
Telephone: 573-754-4501
Fax: 573-754-6525
www.dynonobel.com

Date August 24, 2012

Re: NSPS Review 40 CFR Part 60 Subpart Ga – 68% Acid Concentrator

Mr. Raymond:

Per your request, we have further evaluated New Source Performance Standards (NSPS) applicability for the facility and specifically for the proposed 68% nitric acid concentrator. The LOMO plant's Title V Operating Permit (OP1999-029) issued March 1999 and renewal submitted August 2003 (pending agency approval) Statement of Basis – Other Regulations Not to Apply to the Operating Permit states:

10 CSR 10-6.070, New Sources Performance Regulations, Subpart G, Nitric Acid Plants. The emission units at this installation related to the production of nitric acid were not constructed or modified after August 17, 1971. Therefore, the above regulation was not cited in the operating permit. If the installation should undertake any projects, in the future, which involve construction, reconstruction, or modification of any equipment related to the production of nitric acid, the installation must follow all applicable requirements of the above rule related to that specific project.

After additional review of recently issued 40 CFR Part 60 Subpart Ga New Source Performance Standards for Nitric Acid Plants (NSPS); Dyno Nobel Inc. presents the following items of note:

- 1) Under Section III. Summary of the Final NSPS Paragraph A. a Nitric Acid Production Unit (NAPU) is defined as "any facility producing weak nitric acid by either the pressure or atmospheric pressure process".

The 68% concentrator unit will not produce any weak nitric acid; it will use nitric acid (56%) produced at the ammonia oxidation process and concentrate it to 68% via the use of excess process steam to drive off moisture. The unit does not incorporate the use of either the pressure or atmospheric pressure process to produce nitric acid.

- 2) Under Section III. Summary of the Final NSPS Paragraph B. The specific pollutant listed to be regulated under the NSPS is NO_x. Dyno Nobel Inc. believes this NO_x limitation specifically applies to continuous NO_x emissions from acid producing units.

The 68% concentrator unit does not produce acid and will not produce any emissions under normal operations. Under malfunction conditions (as previously reported) the emitted



pollutant will primarily be nitric acid vapor which may cause the formation of minimal amounts of NO_x.

The proposed 68% nitric acid concentrator does not produce nitric acid, therefore the referenced NSPS rule does not apply.

If you have any questions or require further information, please contact me at 573-754-4501x3023 or via e-mail at brian.gregory@am.dynonobel.com. Thank you for your consideration in this matter.

Regards

Brian Gregory
Environmental Coordinator

Attachment C – Responses to Questions

Question: If all three condensers fail, will the emission rate of the 68% concentrator then approach the 10 pound per ton rate used on the 98% concentrator?

Response: No. As previously reported the emission factor referenced for the 98% concentrator is not applicable to this design. Currently, under normal operating conditions the unit operates under a slight vacuum compared to ambient pressure and emits no emissions.

If the system pressure exceeds 15 psi due to condenser failures or other malfunction the rupture disk will burst and nitric acid vapors may be emitted. This was controlled at Maitland by a temperature loop which would shut down the unit after the disk ruptured. Using a rough calculation provided by Maitland of a 90 second release from 10 psig to 0 psig, 350 to 500 pounds of nitric acid vapor could be emitted per malfunction event.

To further reduce the frequency and possibility of these events LOMO plans to install a high pressure shut down loop which will initiate unit shut down prior to reaching 15 psi.

Question: Are you planning to run the existing (98%) concentrator reduced hours, such that the 68% concentrator and the 98% concentrator never run at the same time?

Response: No. The purpose of the 68% concentrator is to reduce the need to concentrate 56% acid to 98% acid and then dilute 98% acid to 67% acid. As previously reported, the ammonia oxidation process (AOP) which produces weak nitric acid (56%) runs at maximum production continuously with the only variables being atmospheric conditions which may promote or limit production and down time which is determined by equipment needs, power outages, and production curtailments.

Attachment C – Continued

Question: Will you supply material (for example, steam) from any of the existing emission units or processes at your facility?

Response: Yes; to clarify, waste steam from the AOP waste heat boiler which is a byproduct of the acid production, will be used to supply steam to the new concentrator. Currently excess steam from this boiler is being vented. If no excess steam is available, then steam which is currently vented from the 99 MMBTU boiler (EP-15) will be used to supplement steam supply. No increased firing of EP-15 will be needed. There is enough excess in the steam system that is currently waste to compensate for the additional demand. No other materials other than the previously explained 56% acid will be required.

Question: If you plan on running both concentrators at the same time and you are supplying material from existing equipment at your facility, we will need to know what you anticipate the amount of additional material will be produced by the existing equipment. You should provide us with your estimate of the amount of increased emissions that will result from the additional utilization of existing equipment.

Response: As previously reported, there will be no additional weak acid (56%) produced for the unit, so no additional emissions will occur from the AOP acid production process. Excess steam previously described will be used so no additional combustion from existing boilers will be required. Since no additional acid will be produced overall, no additional handling or storage emissions will occur.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheets
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	
CFR	Code of Federal Regulations	National Emissions Standards for Hazardous Air Pollutants
CO	carbon monoxide	NO_x	nitrogen oxides
CO₂	carbon dioxide	NSPS	New Source Performance Standards
CO_{2e}	carbon dioxide equivalent	NSR	New Source Review
COMS	Continuous Opacity Monitoring System	PM	particulate matter
CSR	Code of State Regulations	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
dscf	dry standard cubic feet	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
EQ	Emission Inventory Questionnaire	ppm	parts per million
EP	Emission Point	PSD	Prevention of Significant Deterioration
EPA	Environmental Protection Agency	PTE	potential to emit
EU	Emission Unit	RACT	Reasonable Available Control Technology
fps	feet per second	RAL	Risk Assessment Level
ft	feet	SCC	Source Classification Code
GACT	Generally Available Control Technology	scfm	standard cubic feet per minute
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tpy	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Brian Gregory
Environmental Coordinator
Dyno Nobel, Inc.
P.O. Box 450
Louisiana, MO 63353

RE: New Source Review Permit - Project Number: 2012-08-015

Dear Mr. Gregory:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. 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 Randy E. Raymond, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:rrl

Enclosures

c: Northeast Regional Office
PAMS File: 2012-08-015

Permit Number: