

STATE OF MISSOURI

PERMIT BOOK



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:

05 2015 - 013

Project Number: 2015-05-030

Installation Number: 007-0003

Parent Company: HarbisonWalker International

Parent Company Address: 1305 Cherrington Parkway, Suite 100, Moon Township, PA 15108

Installation Name: Harbison-Walker Refractories - Vandalia Plant

Installation Address: 1000 Booker Street, Vandalia, MO 63382

Location Information: Audrain County, S8, T52N, R5

Application for Authority to Construct was made for:

The restart of the Monoliths: Rollo Mixer (DC-54). This unit was originally permitted under Permit No. 082000-008; however, it has been idle for over 5 years and therefore is being re-permitted. 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.

S. Heckenkamp

Prepared by
Susan Heckenkamp
New Source Review Unit

Kyra L. Brown

Director or Designee
Department of Natural Resources

MAY 22 2015

Effective Date

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 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 start up 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.

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."

Harbison-Walker Refractories - Vandalia Plant
Audrain County, S8, T52N, R5

1. Control Device Requirement-Baghouse
 - A. Harbison-Walker Refractories - Vandalia Plant shall control emissions from the Monoliths Rollo Mixer using a baghouse (DC-54) as specified in the permit application.
 - B. The baghouse shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. The gauge or meter shall be located such that Department of Natural Resources' employees may easily observe them.
 - C. Replacement filters for the baghouse shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - D. Harbison-Walker Refractories - Vandalia Plant shall monitor and record the operating pressure drop across the baghouse at least once every 24 hours. The operating pressure drop shall be maintained within 1 to 6 inches water column.
 - E. Harbison-Walker Refractories - Vandalia Plant shall maintain an operating and maintenance log for the baghouse 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.
2. Record Keeping and Reporting Requirements
 - A. Harbison-Walker Refractories - Vandalia Plant 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.

Permit No.

Project No. 2015-05-030

SPECIAL CONDITIONS:

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

- B. Harbison-Walker Refractories - Vandalia Plant shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 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.

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

Project Number: 2015-05-030

Installation ID Number: 007-0003

Permit Number:

Installation Address:

Harbison-Walker Refractories
Vandalia Plant
1000 Booker Street
Vandalia, MO 63382

Parent Company:

HarbisonWalker International
1305 Cherrington Parkway, Suite 100
Moon Township, PA 15108

Audrain County, S#, T#N/S,

REVIEW SUMMARY

- Harbison-Walker Refractories - Vandalia Plant has applied for authority to restart the Monoliths: Rollo Mixer (DC-54). The unit was original permitted under Permit No. 082000-008; however, it has been idle for over 5 years and therefore is required to be re-permitted.
- The application was deemed complete on Date May 4, 2015.
- HAP emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- A baghouse is being used to control the particulate emissions from the equipment in this permit.
- 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 pollutants are below de minimis levels.
- This installation is located in Audrain 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.

- Emissions testing is not required for the equipment.
- An amendment to your Part 70 permit is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

The installation manufactures predominantly high percentage alumina and minor quantities of silica refractory shapes and specialty products such as refractory plastics, mortars and taphole ramming mixes. A wide variety of conveying, drying, milling, mixing, shaping equipment and firing kilns are used in the process. The facility received an Intermediate operating permit (OP2007-012) in May of 2007. The facility currently has a Part 70 operating permit that has undergone public comment, but has not yet been issued. The installation has the potential to emit major levels (greater than 100 tpy) of Volatile Organic Compounds (VOC), Particulate Matter less than or equal to 10 microns (PM₁₀), and Particulate Matter less than or equal to 2.5 microns (PM_{2.5}).

The following New Source Review permits have been issued to Harbison-Walker Refractories - Vandalia Plant from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
0581-014A	New shuttle kiln
1296-009	Special ties ball mill line
0199-015	Installation of additional grinding, screening, and mixing systems
0699-029	Installation of a new kiln
082000-008	Installation of a blending-station, transfer-station, mixer, hopper, conveyors, and bulk bag filling stations
032014-007	Temporary permit: The purpose of the trial was to test the consistency of the mixed material for final production.
102014-004	Temporary permit: The purpose of the trial was to test the consistency of the mixed material for final production using a different configuration.

PROJECT DESCRIPTION

The previously permitted emission unit, EU0039 Monoliths: Rollo Mixer has not shown production in over 5 years. The Harbison-Walker Refractories; Vandalia Plant (H-W Vandalia Plant) is seeking authority to reinstate this emission unit so that production can be resumed through this system.

The purpose of the mixer is to produce dry monolith products for several industrial uses. The system is a standalone process and does not produce any brick mixes for pressing and firing. Therefore, this process does not involve any kiln and does not debottleneck any other process at the plant. The maximum hourly design rate of the Monolith mixer is 6 tons per hour. The emission unit will be controlled by a baghouse (DC-54) with a minimum control efficiency of PM₁₀ greater than 99%.

The uncontrolled emissions of this project are above the insignificant exemption level of 1.0 pound PM₁₀ per hour given in Table 1 of Missouri State Rules 10 CSR 10-6.061 (3)(A)3.A. Therefore, a permit is needed. The Air Pollution Control Program does not take into account control devices when determining permit applicability.

Note that the naming designation has changed from Zirconia Mixer, DC-55D as stated in the original construction permit, Permit No. 082000-008, to EU0039 Monoliths Rollo Mixer (EP-DC-54).

EMISSIONS/CONTROLS EVALUATION

Potential particulate emissions were estimated using an emission factor for raw material mixing/weighing for fiberglass manufacturing that was obtained from EPA Technology Transfer Network Clearinghouse for Inventories & Emissions Factors (WebFIRE SCC 3-05-012-23). There is no emission factor for PM_{2.5}; therefore, all PM₁₀ is assumed to equal PM_{2.5}.

The following table provides an emissions summary for this project. Existing potential emissions were based on the Part 70 draft operating permit undergoing public comment (Project No. 2011-11-010). Existing actual emissions were taken from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the mixer considering the use of the baghouse and 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 (2014 EIQ)	Potential Emissions of the Application
PM	25.0	N/D	N/D	0.16
PM ₁₀	15.0	>100.0	15.90	0.079
PM _{2.5}	10.0	>100.0	11.21	0.079
SO _x	40.0	Minor	13.93	N/A
NO _x	40.0	Minor	8.45	N/A
VOC	40.0	>100.0	1.50	N/A
CO	100.0	Minor	21.48	N/A
GHG (CO ₂ e)	--	N/D	N/D	N/A
GHG (mass)	--	N/D	N/D	N/A
HAPs	10.0/25.0	Minor	1.87	N/A

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

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 pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Harbison-Walker Refractories - Vandalia Plant 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
- *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

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.

Susan Heckenkamp
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated April 29, 2015, received May 4, 2015, designating HarbisonWalker International as the owner and operator of the installation.

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 Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SDS	Safety Data Sheet
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	tph	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		

Ms. Rhonda Vete
Director Corporate EHS
Harbison-Walker Refractories - Vandalia Plant
1305 Cherrington Parkway, Suite 100
Moon Township, PA 15108

RE: New Source Review Permit - Project Number: 2015-05-030

Dear Ms. Vete:

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 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 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 were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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 administrative hearing commission, whose contact information is: Administrative Hearing Commission, Truman State Office Building, P.O. Box 1557, Jefferson City, MO 65102, website: www.ao.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact me, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:shl

Enclosures

c: Northeast Regional Office
PAMS File: 2015-05-030

Permit Number: