



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: 082020-012 Project Number: 2020-04-049
Installation Number: 031-0064

Parent Company: Kyowa Hakko Bio

Parent Company Address: PO Box 1550, Cape Girardeau, MO 63702

Installation Name: BioKyowa, Inc. Main Production Plant

Installation Address: 5469 Nash Road, Cape Girardeau, MO 63702

Location Information: Cape Girardeau County, S28, T18N, R13E

Application for Authority to Construct was made for:
Installation of eight (8) new natural gas-fired package boilers. 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.



Director or Designee
Department of Natural Resources

August 26, 2020
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 Enforcement and Compliance Section of 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 Enforcement and Compliance Section of 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 within 30 days of actual startup. Also, you must notify the Department's 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 the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's 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 using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

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 to 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 (3)(E). "Conditions required by permitting authority."

BioKyowa, Inc.
Cape Girardeau County, S28, T18N, R13E

1. Nitrogen Oxide Emission Limitations
 - A. BioKyowa, Inc. shall emit less than 40.0 tons of NO_x in any consecutive 12-month period from the eight (8) natural gas-fired boilers (EP-55 to EP-62). The installation shall include all actual emissions in the limit including SSM emissions as well as any excess SSM emissions as reported to the Air Pollution Control Program's Compliance/Enforcement Section in accordance with the requirements of 10 CSR 10-6.050 *Start-Up, Shutdown, and Malfunction Conditions*.
 - B. Attachment A, or equivalent forms, such as electronic forms, containing the same information and using the same emission factors in Attachment A, shall be used to demonstrate compliance with Special Conditions 1.A.
2. Fuel Usage Restrictions
BioKyowa, Inc. shall only use natural gas as fuel for the eight (8) boilers (EP-55 to EP-62).
3. Record Keeping and Reporting Requirements
 - A. BioKyowa, 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. These records shall include SDS for all materials used.
 - B. BioKyowa, Inc. shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

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

Project Number: 2020-04-049
Installation ID Number: 031-0064
Permit Number: 082020-012

Installation Address:

BioKyowa, Inc. Main Production Plant
5469 Nash Road
Cape Girardeau, MO 63702

Parent Company:

Kyowa Hakko Bio
PO Box 1550
Cape Girardeau, MO 63702

Cape Girardeau County, S28, T28N, R13E

REVIEW SUMMARY

- BioKyowa, Inc. Main Production Plant has applied for authority to construct eight (8) new natural gas-fired package boilers. Each of the boilers has a maximum heat input capacity of 11.678 MMBtu/hr
- The application was deemed complete on April 21, 2020.
- HAP emissions are expected from the proposed equipment. HAPs of concern from this process are products of natural gas combustion and are expected to be less than their respective Screening Model Action Levels (SMAL).
- Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, of 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS) applies to the boilers because the boilers each has maximum design heat input capacity less than 100 MMBtu/hr, but greater than 10 MMBtu/hr. There are no emission limits in this subpart for units combusting only natural gas.
- The following subparts of the NSPS do not apply to the boilers.
 - Subpart D, *Standards of Performance for Fossil-Fuel-Fired Steam Generators*, of the NSPS does not apply because the boilers do not have a maximum heat input rate of greater than 250 MMBtu/hr.
 - Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, of the NSPS does not apply because the boilers do not have maximum heat input rate of greater than 100 MMBtu/hr.

- None of the currently promulgated MACT regulations apply to the proposed equipment.
 - Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, of the MACT does not apply to the boilers because this installation is not a major source of HAP.
 - Subpart JJJJJ, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boiler Area Sources*, of the MACT does not apply to the boilers because this subpart does not apply to gas-fired boilers.
- None of the NESHAPs apply to this installation.
- 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 pollutants are conditioned below de minimis levels.
- This installation is located in Cape Girardeau County, an attainment/unclassifiable 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 as a part of this permit.
- A Part 70 Operating Permit modification is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Biokyowa, Inc. – Main Production Facility is an existing manufacturer of feed additives for domestic animals. The manufacturing process consists of two amino acid production plants (Plant 1 and Plant 2); a natural gas/fuel oil fired utility plant to produce process steam for operations; an evaporation plant; and a wastewater treatment plant. The method of production involves fermentation to produce the feed additives and subsequent processing and handling of the product.

The following NSR permits have been issued to BioKyowa, Inc. - Main Production Plant from the Air Pollution Control Program.

Table 1: NSR Permit History

Permit Number	Description
0983-006...009	Construction of a new l-lysine production installation
0284-020	Addition of a new boiler
0190-002	New boiler and drying system
0693-020	Approval to combust fuel oil #2 in the existing natural gas-fired boilers
1099-021	Expansion to increase l-lysine production and to add FNA line
1099-021A	Wording correction
1099-021B	Wording change
122002-002	Modification of an existing FNA feed additive process line to allow for the production of argentine, glutamine and other amino acids in the BFK process line
082008-017	Installation of four 11.56 MMBtu/hr natural gas-fired boilers and the addition of an aftercooler to Plant 2, resulting in increased throughput
112011-002	Installation of two conical dryer and associated handling equipment at Plant 2
072012-010	An increase in amino acid production at Plant 1 and modification to the amino production process t Plant 2.
052012-002	Temporary generator, expired May 15, 2012

Before the issuance of Permit No.082008-017, the installation was considered a major source for construction permits. The installation was on the list of named installations due to the total boiler input capacity exceeding 250 MMBtu/hr. It also had potential SOx emissions in excess of the 100 tpy major source level for named installations. However, during the review for Permit No. 082008-017, the facility indicated that it had removed Boiler No. 1 (EP-01). Therefore, the boiler input capacity is now less than 250 MMBtu/hr. Furthermore, the removal of Boiler No. 1 allowed the facility's installation-wide PTE to be less than the major source level of 250 tons per year. Therefore, the installation was reclassified as a minor source.

The installation is considered a major source (Part 70) for operating permits. The installation has submitted a Part 70 operating permit renewal application, project 2017-10-062, that is currently undergoing review by the program. Within one year of the startup of the equipment of this permit, the installation shall modify its Part 70 operating permit.

PROJECT DESCRIPTION

The installation will be installing eight (8) new natural-gas fired package boilers (EP-55 to EP-62), each with a maximum heat input of 11.678 MMBtu/hr. The new boilers will allow the facility to limit the operation of larger, less efficient boilers. Eventually, smaller package boilers will completely replace the larger, less efficient boilers. The addition of the boilers will not debottleneck any other part of the installation. The facility cannot produce more amino acids due to the new boilers.

Originally, the installation proposed to add only six (6) natural-gas fired boilers. However, the installation was issued a no permit required letter in March, 2019, (2018-12-012) for the addition of two boilers (each with maximum heat input of 11.678 MMBtu/hr, EP-55 and EP-56) to replace the capacity of larger, less efficient boilers. Those boilers are also included in this project since they are being added for the same purpose. In the future, if the installation adds more boilers, a determination must be made on whether the new boilers need to be included as part of this current project. The 40 tpy NO_x emissions limit may also need to be expanded to include the new boilers as well.

EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion*, (7/1998). Since the NO_x emissions are calculated to be greater than the de minimis levels of 40.0 tpy, the eight (8) boilers are limited to 40.0 tpy of NO_x to avoid modeling.

The following table provides an emissions summary for this project. Existing potential emissions were calculated by adding the potential emissions calculated for operating permit OP2013-028 and the potential emissions of any projects that came after that has not been included. There is only one project (Permit 112011-002) where the emissions were not included in the PTE calculated for OP2013-028. Existing actual emissions were taken from the installation's 2019 EIQ. Potential emissions of the application represent the potential of the eight (8) boilers assuming continuous operation (8760 hours). The project conditioned potential emissions reflect the 40 tpy NO_x limit.

Table 2: Emissions Summary (tpy)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2019 EIQ)	Potential Emissions of the Project	Project Conditioned Potential
¹ PM	25.0	11.7	N/D	0.76	0.76
PM ₁₀	15.0	11.7	2.69	3.05	3.04
PM _{2.5}	10.0	11.7	2.15	3.05	3.04
SO _x	40.0	221.97	2.47	0.24	0.24
NO _x	40.0	119.93	10.98	40.12	<40.0
VOC	40.0	97.07	9.08	2.21	2.20
CO	100.0	71.68	22.61	33.7	33.6
GHG (CO _{2e})	N/A	138,326.1	N/D	48,426.91	48,285.24
GHG (mass)	N/A	N/D	N/D	48,142.64	48,001.80
HAPs	10.0/25.0	7.44	0.59	0.76	0.76

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

Note 1: PM only includes the filterable portion, while PM_{2.5} and PM₁₀ contains both filterable and condensable portions.

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 conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

BioKyowa, Inc. Main Production 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

- *Operating Permits*, 10 CSR 10-6.065
- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation. Does not apply if DemPAL.
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required every year for Part 70 installations.
- *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

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Dc

- *Control of Sulfur Dioxide Emissions*, 10 CSR 10-6.261
 - Units combusting natural gas fit the exception in this rule if the installation complies with the record keeping requirements in Section (4) of this rule.
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405

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*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated April 14, 2020, received April 21, 2020, designating Kyowa Hakko Bio as the owner and operator of the installation.

Attachment A – Nitrogen Oxides (NO_x) Compliance Worksheet

BioKyowa, Inc. Main Production Plant
 Cape Girardeau County, S27 T28N. R13E
 Project Number: 2020-04-049
 Installation ID Number: 031-0064

This sheet covers the period from _____ to _____.
(month, year) (month, year)

Month, Year	¹ Natural Gas Usage (mmscf)	² Emission Factor (lb/mmscf)	³ Monthly Emissions (lbs)	⁴ Monthly SSM Emissions (lbs)	⁵ Monthly Total Emissions (tpy)	⁶ 12-Month Rolling Total Emissions (tpy)
		100				
		100				
		100				
		100				
		100				
		100				
		100				
		100				
		100				
		100				

Note 1: Input the natural gas usage of the month in mmscf.

Note 2: Emission factor taken from EPA document AP-42, *Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and area sources*, Fifth Edition, Chapter 1.4, *Natural Gas Combustion*, (July 1998).

Note 3: Monthly Emissions (lbs) calculated by multiplying the Natural Gas Usage (mmscf) by the Emission Factor (lb/mmscf).

Note 4: Include Startup, Shutdown, and Malfunction (SSM) emissions as well as any excess SSM emissions as reported to the Air Pollution Control Program's Compliance/Enforcement Section according to the provisions of 10 CSR 10-6.050.

Note 5: Monthly Total Emissions (tpy) calculated by summing the Month Emissions (lbs) and the Monthly SSM Emissions (lbs) and dividing the sum by 2,000 lb/ton

Note 6: 12-Month Rolling Total Emissions (tpy) calculated by summing the current Monthly Total Emissions (tpy) by the Monthly Total Emissions (tpy) of the previous eleven (11) months. A 12-Month Rolling Total Emissions less than **40.0 tons per year** of NO_x indicates compliance.

APPENDIX A

Abbreviations and Acronyms

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



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

August 26, 2020

Dave Jennings
Superintendent of Environmental Affairs
BioKyowa, Inc. Main Production Plant
PO Box 1550
Cape Girardeau, MO 63702

RE: New Source Review Permit - Project Number: 2020-04-049

Dear Dave Jennings:

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.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

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, United States Post Office



Dave Jennings
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Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102,
phone: 573-751-2422, fax: 573-751-5018, website: www.oe.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, 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

A handwritten signature in blue ink, appearing to read "S. Heckenkamp", written in a cursive style.

Susan Heckenkamp
New Source Review Unit Chief

SH:cya

Enclosures

c: Southeast Regional Office
PAMS File: 2020-04-049

Permit Number: 082020-012