



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: **072013-001** Project Number: 2013-04-015

Installation Number: 127-0001

Parent Company: BASF Corporation Agricultural Products

Parent Company Address: P.O. Box 13528, Research Triangle Park, NC 27709-3528

Installation Name: BASF Corporation - Hannibal Plant

Installation Address: 3150 Highway JJ, Palmyra, MO 63461

Location Information: Marion County, S10,11,14,15, T58N, R5W

Application for Authority to Construct was made for:

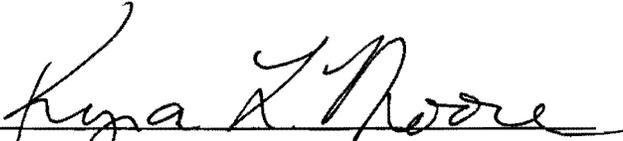
Natural gas fired boiler 6 and natural gas fired boiler 7, EU0155 and EU 0156 respectively, each 147.1 MMBtu/hr heat input. An analysis was completed for this project that determined the net increase for the project did not exceed the significant level associated with any pollutant. This review was conducted 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.

JUL 1 2013

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 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.

Page No.	3
Permit No.	
Project No.	2013-04-015

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."

BASF Corporation - Hannibal Plant
Marion County, S10,11,14,15, T58N, R5W

1. Fuel Usage Limitation
 - A. BASF Corporation - Hannibal Plant shall combust pipeline grade natural gas in boiler 6 and boiler 7 (EU0155 and EU0156, respectively) combined not exceeding 2,396.76 MMSCF in any consecutive 12-month period.
 - B. BASF Corporation - Hannibal Plant shall continuously monitor and record at least once hourly the sum of fuel flow to each boiler 6 and boiler 7.
 - C. BASF Corporation - Hannibal Plant shall develop and use forms to demonstrate compliance with Special Condition 1.A. The forms shall include, but are not limited to the following information,
 - 1) Installation name
 - 2) Installation ID
 - 3) Permit number
 - 4) Reporting date range
 - 5) Emission units
 - 6) Emission unit fuel consumption from Special Condition 1.B.
 - 7) Indication of compliance status with Special Condition 1.A.
2. Fuel Restriction

Boiler 6 and boiler 7 shall be fired exclusively with pipeline grade natural gas.
3. Shakedown Period
 - A. BASF Corporation - Hannibal Plant shall not use any steam produced by boiler 6 and boiler 7 for commercial manufacturing purposes until boiler 4 and boiler 5 (EP-UTIL-02 and EP-UTIL-03, respectively) are permanently shut down and rendered inoperable.
 - B. BASF Corporation - Hannibal Plant shall demonstrate compliance with Special Condition 3.A. by recording the initial startup date(s) of boiler 6 and boiler 7, the normal operation commencement date(s) of boiler 6 and boiler 7, and the permanent shutdown date(s) of boiler 4 and boiler 5.

Page No.	4
Permit No.	
Project No.	2013-04-015

SPECIAL CONDITIONS:

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

4. Record Keeping and Reporting Requirements
 - A. BASF Corporation - Hannibal 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. These records shall include MSDS for all materials used.
 - B. BASF Corporation - Hannibal 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 shows an exceedance of a limitation imposed by this permit.

5. Emission Testing
 - A. BASF Corporation - Hannibal Plant shall conduct initial emission testing of boiler 6 and boiler 7 according to methods preapproved by the Air Pollution Control Program Compliance/Enforcement Section.
 - 1) Each boiler shall be operating at or within 10% below the respective MHDR. If tested operation rates are above or below this range then BASF Corporation - Hannibal Plant shall submit a revised construction permit application per Special Condition 5.G.
 - 2) Testing shall demonstrate individual boiler emission rates not exceeding those in Table 1.

Table 1: Emission Testing Rates (lb/hr)

Pollutant	Emission Rate
NO _x	12.356
CO	5.296
CO ₂	17,305.882
CH ₄	0.332
N ₂ O	0.092

- B. The parameters in Table 2 shall be monitored and recorded during the test.

Table 2: Test Parameters

Parameter	Units
Fuel input	MMBtu/hr
Steam output	MMBtu/hr
	Lb/hr
	°F
	psig

Page No.	5
Permit No.	
Project No.	2013-04-015

SPECIAL CONDITIONS:

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

- C. These tests shall be performed within 60 days after achieving normal commercial operation of boiler 6 and boiler 7, but not later than 180 days after initial start-up of either boiler 6 or boiler 7.
- D. A completed Proposed Test Plan Form (enclosed) must be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
- E. Two copies of a written report of the performance test results shall be submitted to the Director within 60 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one sample run.
- F. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations. For pollutant emission rates not recorded by CEMS, the test report shall establish emission factors.
- G. If the results of the performance testing show that the emission rates exceed those in Table 1, then BASF Corporation - Hannibal Plant shall evaluate what effects these higher emission rates would have had on the permit applicability of this project. BASF Corporation - Hannibal Plant shall submit the results of any such evaluation in a construction permit application within 30 days of submitting the Performance Test Results report required in Special Condition 5.E. of this permit.

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

Project Number: 2013-04-015
Installation ID Number: 127-0001
Permit Number:

BASF Corporation - Hannibal Plant
3150 Highway JJ
Palmyra, MO 63461

Complete: April 1, 2013

Parent Company:
BASF Corporation Agricultural Products
P.O. Box 13528
Research Triangle Park, NC 27709-3528

Marion County, S10,11,14,15, T58N, R5W

REVIEW SUMMARY

- BASF Corporation - Hannibal Plant has applied for authority to construct natural gas fired boiler 6 and natural gas fired boiler 7, EU0155 and EU 0156 respectively, each 147.1 MMBtu/hr heat input.
- HAP emissions are expected from the combustion of natural gas.
- NSPS 40 CFR 60 Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units* applies to each boiler. Among other requirements, each boiler must be operated with a NO_x and oxygen or NO_x and CO₂ CEMS (§60.48b(b)).
- None of the NESHAPs under 40 CFR 61 apply to the boilers.
- MACT 40 CFR 63 Subpart DDDDD, *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters* applies to each boiler. However, no emission standards apply.
- Each boiler is individually equipped with both low NO_x burners and flue gas recirculation (FGR) for the control of NO_x emissions. The control devices are not directly required by this permit's special conditions, but may be needed to meet performance testing emission factors and the NSPS Subpart Db NO_x emission limitation.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of GHG (CO₂e) are conditioned below the NSR major source level using a fuel usage limit and netting analysis. Other pollutants are indirectly conditioned. Potential emissions of NO_x are below the de minimis level using a netting analysis.

- This installation is located in Marion County, an attainment area for all criteria pollutants.
- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 20. Chemical process plants. The installation's major source level is 100 tons per year and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are conditioned below respective de minimis levels.
- Emissions testing is required for each boiler.
- Submittal of an application to amend the Part 70 Operating Permit is required for this installation within 1 year of either boiler's startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

BASF Corporation – Hannibal Site is a major source of all criteria pollutants and has a Part 70 operating permit. The installation manufactures agricultural chemicals. The following New Source Review permits have been issued to BASF Corporation - Hannibal Plant from the Air Pollution Control Program.

Table 3: Permit History

Permit Number	Description
1179-EPA	Major Source permit for a Nitric Acid plant
0380-002	Installation of an Animal Feed Intermediate spray drying system
0385-002	Installation of a solid waste incinerator for herbicide wastes generated during processing
0885-005	Construction of SCEPTER and ARSENEL herbicide production lines
0887-003	Construction of ASSERT herbicide production line
0488-001	Construction of a sulfuric acid regeneration facility
0588-007	Installation of a packaging operation for THIMET and COUNTER insecticides
0988-004	Installation of a back-up flare for odor control
0489-004	Addition of bulk herbicide blending and storage facility
1189-001	Installation of the PROWL-“C” incinerator and waste storage tank
0690-005	Modification of existing equipment to increase PROWL herbicide production
0491-002	Addition of a fermenter to expand pharmaceutical plant
0392-006	Construction of bulk lime and dicalite handling equipment and storage
0393-001	Modification of existing Animal Feed Intermediate Plant
0793-001	Construction of a pellet-coating plant
0694-008	Addition of a centrifuge to increase PROWL herbicide production
0894-010	Modification to increase COUNTER insecticide production
0696-013	Modification to imidazoline (IMI-2) line
122000-003	Addition of pyrrole production plant
0997-003	Modification to increase PROWL herbicide production
062000-019	Modification to increase PROWL herbicide production
082005-014	Modification of the IMI-2 herbicide manufacturing facility to allow the production of three new pesticide active ingredient intermediates for imidazolinone herbicides
022006-005	Modification of the Pyrrole/MMPDC manufacturing facility to allow for the production of a new broad-spectrum insecticide called 320I. Production will use existing equipment and a new potassium methoxide (KCOH3) scrubber
102008-001	Allow production of a new active ingredient, 800H and expand production capacity of three (3) diacids
102009-007	Debottlenecking the IMI-1 facility to produce more imidazolinone herbicides
092009-005	Increase the production of 5-methoxymethyl-2,3-pyridine dicarboxylic acids (MMPDC)
092010-009	Conversion of a herbicide storage tank to store and supply ortho-xylene
022011-009	Addition of Intermediate Tank 150-021 into the PROWL herbicide process

PROJECT DESCRIPTION

The installation proposes to install two natural gas fired boilers. The boilers will supply steam to manufacturing processes. Each boiler is a Cleaver Brooks model NB-600D-95 equipped with a NATCOM burner model NCB-22-G. Each burner's maximum heat input rating is 147.1 MMBtu/hr of fuel. Each boiler is equipped with low NO_x burner and flue gas recirculation technology. No cooling towers are proposed.

EMISSIONS/CONTROLS EVALUATION

Potential PM, PM₁₀, PM_{2.5}, SO_x, VOC, HAPs, CO₂, CH₄, and N₂O emissions from boiler 6 and boiler 7 were calculated with emission factors obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion*, July 1998. Potential NO_x and CO emissions were calculated using emission guarantees obtained from the manufacturer. These will be performance tested.

Unconditioned potential NO_x, GHG (mass), and GHG (CO₂e) emissions exceed respective major source applicability levels in 40 CFR 52.21. Therefore the project results in a significant emissions increase. However, the project does not result in a significant net emissions increase of NO_x, based upon this permit's netting analysis. GHG (CO₂e) potential emissions are indirectly conditioned below the major source threshold by a fuel usage limit and netting analysis. Therefore this permit is not a PSD review.

NO_x netting:

Projects within the contemporaneous period as it is defined at the time of permit issuance are listed in Table 4. This project's contemporaneous period extends from 5 years before construction of the boilers commences to the end of the shakedown period / start of normal operation. Construction is expected to commence immediately upon permit issuance, approximately June 2013. Operation is expected in 2014. The contemporaneous period and thus the netting analysis are subject to change based upon construction and operating dates. Actual emission increases from existing units could have been used in the netting analysis, however usage of the higher potential emissions increases resulted in conservatively higher net emissions. Potential emissions were cited from the respective issued projects. Actual emissions were used to represent the NO_x decrease from shutting down boiler 4 and boiler 5. Baseline actual emissions were cited from the installation's EIQ. The highest consecutive 24-month period for boiler 4 and boiler 5 was 2008-2009.

Table 4: Contemporaneous Project Increases

Issuance Date	Project Description	NO _x PTE (tpy)	GHG (CO ₂ e) PTE (tpy)
8/10/2012	npr, project 2012-06-027, change in tank usage	-	-
6/3/2011	npr, project 2011-04-060, use carbon filtration for odors while incinerator is down	-	-
2/23/2011	permit 022011-009, add a tank, increase VOC	-	-
9/10/2010	permit 092010-009, convert a tank, increase VOC and HAP	-	-
10/19/2010	npr, update wording for flare npr 2010-06-021	-	-
7/13/2010	npr, project 2010-06-021, increase flare mhdr	3.10	5,878.71
5/3/2010	npr, project 2010-02-090, change tanks, increase VOC and HAP	-	-
2/3/2010	npr, project 2009-09-058, repair incinerators	-	-
9/16/2009	permit 092009-005, debottleneck MMPDC, has existing t.o. and incinerator	1.43	1,260.26
10/16/2009	permit 102009-007, debottleneck IMI, has existing incinerator	-	-
6/29/2009	amendment 062000-019B, limit SAR and heat exchanger cleaning to 244.0 tpy NO _x	-	-
1/29/2009	amendment 062000-019A, reduced SAR reporting	-	-
10/10/2008	permit 102008-001, new ingredient, increase at IMI, has existing incinerator	-	-

npr = no permit required

This permit's NO_x and GHG (CO₂e) netting analysis rely upon the permanent shutdown of existing coal fired boiler 4 and boiler 5. For the emission reductions to be used in the netting analysis, the shutdown must take place within the contemporaneous period, i.e. before boiler 6 and boiler 7 are used for normal commercial operation. Normal operation of boiler 6 and boiler 7 commences upon completion of their shakedown period. Shakedown is the period beginning with initial startup and ending no later than initial performance testing, during which the installation conducts operational and contractual testing and tuning to ensure the safe, efficient and reliable operation of boiler 6 and boiler 7. This initial operational and contractual testing is not the emission testing. Normal operation can also be defined as when boiler 6 and boiler 7 first supply steam to dependent manufacturing processes. This permit includes a special condition for the shakedown period.

GHG (CO₂e) Analysis:

The GHG (CO₂e) PSD applicability level for a modification at an existing major GHG source is 75,000 tpy. Netting for GHG (CO₂e) at boiler 6 and boiler 7 at unconditioned operation showed a significant net emissions increase, above 75,000 tpy. Therefore boiler 6 and boiler 7 fuel usage were limited to avoid PSD review. GHG (CO₂e) emissions will be performance tested. 100 year GWPs cited from 40 CFR 98, Table A-1, October 30, 2009 were used for this permit. A revised, higher CH₄ 100 yr GWP has been proposed in the Federal Register, but is not final as of this permit's issuance date. If the proposed GWP for CH₄ is finalized, the permit will not have to be amended to require a lower fuel usage limit as the netting will still shows a mass basis decrease. (In other words, the methane mass emissions decrease from combustion of coal is greater than the methane increase from the new boilers. If multiplied by a higher GWP, the netting analysis will still not result in a net emissions increase.)

Debottlenecking:

Each new boiler is manufacturer rated at 105,000 lb steam/hr output, while each existing coal boiler was originally rated at approximately 100,000 lb/hr. The new boilers can provide more steam than the existing boilers to the dependent manufacturing processes. These processes could theoretically emit more if they were bottlenecked by the steam rate. However, the following statement was provided by the installation,

“Over time, the coal-fired boilers have lost the ability to achieve the original design rate in practice. There are currently no steam-limited processes at the installation, so the boilers aren’t being installed to add any steam capacity for production use at this time. Among other reasons, the boilers are for more redundancy and reliability. This will enable the installation to only have to run one new boiler for situations where currently both of the coal-fired units are needed to generate the same amount of steam. If, in the future, additional process units are added or existing processes are debottlenecked, such that the steam demand on the new boilers will increase, the associated emissions increase from the boilers will be included in any permit applicability determination or permit application at that time.” Any future manufacturing projects that use steam from boiler 6 or boiler 7 are subject to evaluation of combined permit applicability with this project.

Tables 5 and 6 provide an emissions summary for this project. Existing actual emissions were cited from the installation’s 2012 EIQ. Unconditioned potential emissions of the application represent the potential of the new boilers, assuming continuous operation (8,760 hours per year). Conditioned potential emissions of the application represent a voluntary fuel usage limit on the new boilers to avoid PSD review for GHG (CO₂e). Potential emissions of other pollutants are indirectly conditioned based upon the fuel usage limit.

Table 5: Netting Emissions Summary (tpy)

Pollutant	Unconditioned Potential Emissions of the Application	Conditioned Potential Emissions of the Application	Contemporaneous Increase, Project 2010-06-021	Contemporaneous Increase, Permit 092009-005	Contemporaneous Decrease, Shutdown Boiler 4 and 5	Net Emissions
NOx	108.24	102.68	3.10	1.43	126.11	-18.90
GHG (CO ₂ e)	151,911.19	< 144,101.12	5,878.71	1,260.26	76,240.08	< 75,000

Table 6: Emissions Summary (tpy)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2012 EIQ)	Unconditioned Potential Emissions of the Application	Conditioned Potential Emissions of the Application
PM	25.0	Major	N/D	2.40	2.28
PM ₁₀	15.0	Major	144.47	9.60	9.11
PM _{2.5}	10.0	Major	134.16	9.60	9.11
SOx	40.0	Major	1,278.11	0.76	0.72
NOx	40.0	Major	361.85	108.24	¹ 102.68
VOC	40.0	Major	27.82	6.95	6.59
CO	100.0	Major	110.41	46.39	44.00
Combined HAPs	25.0	Major	20.94	2.39	2.26
Hexane	10.0	N/D	N/D	2.27	2.16
CO ₂	N/A	N/A	N/A	151,599.53	143,805.48
CH ₄	N/A	N/A	N/A	2.91	2.76
N ₂ O	N/A	N/A	N/A	0.81	0.77
GHG (mass)	0.0 / 100.0 / 250.0	Major	N/A	151,603.24	143,809.00
GHG (CO ₂ e)	75,000 / 100,000	Major	N/A	151,911.19	¹ 144,101.12

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

¹ The netting analysis resulting emissions are below the PSD significant emission rate.

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 GHG (CO₂e) are conditioned below the NSR major source level using a fuel usage limit and netting analysis. Other pollutants are indirectly conditioned. Potential emissions of NO_x are directly conditioned below the de minimis level using a netting analysis.

APPLICABLE REQUIREMENTS

BASF Corporation - Hannibal 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 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 Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Db
- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standards for Industrial, Commercial, and Institutional Boilers and Process Heaters*, 40 CFR Part 63, Subpart DDDDD
- *Restriction of Particulate Matter Emissions From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-6.405. The boilers are natural gas fired and deemed in compliance.

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.

David Little
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 March 28, 2013, received April 1, 2013, designating BASF Corporation Agricultural Products as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

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	
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	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		

Mr. Curt Gardner
Sr. EHS Specialist
BASF Corporation - Hannibal Plant
3150 Highway JJ
Palmyra, MO 63461

RE: New Source Review Permit - Project Number: 2013-04-015

Dear Mr. Gardner:

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 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 David Little, 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:dll

Enclosures

c: Northeast Regional Office
PAMS File: 2013-04-015

Permit Number: