Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

December 29, 2020

Minh Hoac
Sr. EHS Specialist
BASF Corporation Agricultural Products
3150 Highway JJ
Palmyra, MO 63461

RE: New Source Review Permit - Project Number: 2020-08-012

Dear Minh Hoac:

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 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.

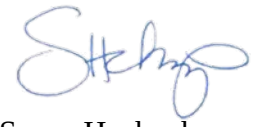
This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request 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 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.oa.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



Susan Heckenkamp
New Source Review Unit Chief

SH:cya

Enclosures

c: Northeast Regional Office
PAMS File: 2020-08-012

Permit Number: 122020-007

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: 122020-007

Project Number: 2020-08-012
Installation Number: 127-0001

Owner/Operator Name: BASF Corporation Agricultural Products

Owner/Operator Address: 3150 Highway JJ, Palmyra, MO 63461

Location Information: Marion County, S14, T53N, R5W

Application for Authority to Construct was made for:

Increasing the capacity of the Imadazolinone process through physical and process modifications. 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.

Kendall B. Hall

Director or Designee
Department of Natural Resources

December 29, 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."

BASF Corporation Agricultural Products
Marion County, S14, T53N, R5W

1. Superseding Condition
   The conditions of this permit supersede all of the special conditions found in the previously issued construction permits 0885-005A, 0694-008, 102009-007, and 052015-012 issued by the Air Pollution Control Program.

2. Control Device Requirement – Baghouse, HEPA Filters, and Bag Filters
   A. The permittee shall control emissions from the emission sources in Table 1 using the indicated control devices as specified in the permit application. The control devices shall be in operation at all times the associated emission sources are in operation.

Table 1: Required Particulate Control Devices

Emission Source	Description	Required Control Device(s)(ID Numbers)
IMI-1 05	Diacid Charge System	Baghouse and HEPA Filter (631-018/631-024)
IMI-1 09	Rework Hopper	Baghouse and HEPA Filter (190-019X, 190-003X)
	Packaging Operations	
IMI-1 10	Supersack Charging	Baghouse and HEPA Filter (631-310/631-312X)
IMI-1 12	Solids Handling	Baghouse (190-019X)
IMI-1 22	Product Rework Pneumatic Transfer System	Baghouse (190-019X)
IMI-1 23	Powder Pneumatic Transfer System	Baghouse (631-310)

   B. The baghouses, HEPA Filters, and bag filters shall be operated and maintained in accordance with the manufacturer's specifications. Each device, except for the baghouse for IMI-1 22 and 23, shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.

   C. Replacement filters for the baghouses, HEPA filters, and the bag filter shall be kept on hand at all times. The filters shall be made of fibers

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

appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

D. The permittee shall monitor and record the operating pressure drop across the baghouses for emission points IMI-1 05, 09, 10, and 12 at least once every 24 hours when the associated equipment is in operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty. Baghouses for emission point IMI-1 22 and 23 do not have pressure drop monitoring and recording requirements.

E. The permittee shall maintain a copy of the manufacturer's specifications for each baghouse, HEPA filter, and bag filter on site.

F. The permittee shall maintain an operating and maintenance log for the baghouses 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. Control Device Requirement – PR-47 Incinerator(s)
   A. The permittee shall control VOC and HAP emissions from the IMI-1. Process using PR-47 incinerator(s) as specified in the permit application.

   B. PR-47 Incinerator(s) shall be maintained and operated in accordance with the requirements of 40 CFR Part 63, Subpart EEE.

4. Control Requirement – Leak Detection and Repair (LDAR)
   The permittee shall control fugitive emissions from equipment leaks in accordance with the LDAR requirements of 40 CFR Part 63, Subpart MMM.

5. Record Keeping and Reporting Requirements
   The permittee 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.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW
Project Number: 2020-08-012
Installation ID Number: 127-0001
Permit Number:122020-007

Owner/Operator Address:
BASF Corporation Agricultural Products
3150 Highway JJ
Palmyra, MO 63461

Marion County, S14, T53N, R5W

REVIEW SUMMARY

- The permittee has applied for authority to increase the production capacity of Imidazolinone herbicides at its IMI-1 facility.

- The application was deemed complete on September 1, 2020.

- HAP emissions are expected from the proposed equipment. HAPs of concern from this process are toluene and methyl isobutyl ketone (MIBK).

- None of the New Source Performance Standards (NSPS) apply to the installation. The following subparts of the NSPS do not apply. Some of the tanks are not within the size requirements for applicability. The rest of the tanks are subject to 40 CFR 63, Subpart MMM, and are only required to comply with the provisions of the MACT.
  - 40 CFR 60, Subpart K, *Standards of Performance for Storage Vessels for Petroleum Liquid for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978*
  - Subpart Ka, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984,* and
  - Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.*

- None of the NESHAPs apply to this installation.

- The following equipment at IMI-1 are Subject to 40 CFR 63, Subpart MMM, *National Emission Standards for Hazardous Air Pollutants for Pesticide Active Ingredient Production.*

Table 2: Equipment Subject to MACT Subpart MMM

Emission Unit	Emission Point	Description
0061	IMI-1 6A/B	30,000 Gallon Storage Tank, Installed In 1986
0062	IMI-1 6A/B	Process Section 120
0063	IMI-1 6A/B	Process Section 130
0064	IMI-1 6A/B	Process Section 140/150
0065	IMI-1 6A/B	Process Section 160
0066	IMI-1 6A/B	Process Section 170
0067	IMI-1 6A/B	Solvent Recovery Section 180
0068	IMI-1 6A/B	Formulation Vessel
0069	IMI-1 6A/B	Formulation Vessel
0070	IMI-1 6A/B	Aqueous Waste Hold Tank
0071	IMI-1 6A/B	Organic Waste Hold Tank
0072	IMI-1 6A/B	IMI1 Facility Fume Bypass
0076	IMI-1 15	Drain Tank
0077	IMI-1 16	Drain Hold Tank
0078	IMI-1 17	Building Vents (Fugitives)

- 40 CFR 63, Subpart EEE, *National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors,* applies to the PR-47 incinerator.

- The following control devices are used to control the emissions from the equipment in this permit.

Table 3: Required Control Devices for Equipment of This Project[1]

EU #	Description	Control	Pollutants
IMI-1 05	Diacid Charge System	Baghouse and HEPA Filter	Particulates
IMI-1 09	Rework Hopper	Baghouse and HEPA Filter	Particulates
	Packaging Operations		
IMI-1 22	Product Rework Pneumatic Transfer System	Baghouse[2]	Particulates
IMI-1 23	Powder Pneumatic Transfer System	Baghouse[2]	Particulates
-	IMI-1 Process	Incinerator	VOC and HAP

Note 1: The IMI-1 facility has more equipment with control devices than those listed. However, they are not considered part of this project since they are not used in the production of imidazolinone herbicides. .
Note 2: HEPA filters are also used to control emission, but they are voluntarily installed. There are no special conditions in the permit requiring their use.

- 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 for this project are below de minimis levels.

- This installation is located in Marion County, an attainment/unclassifiable 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, Item No 9, *Hydrofluoric, Sulfuric, or Nitric Acid 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 for criteria pollutants was not performed since potential emissions of the application are below de minimis levels. Ambient air quality modeling for HAPs was not performed as the potential emissions of each individual HAP are below their respective SMALs and the IMI-1 Process is subject to MACT Subpart MMM for which a Risk and Technology Review (RTR) has been performed.

- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules.

- A modification to the installation's Part 70 operating permit is required within one year of starting the construction outlined in this permit.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

BASF Corporation – Hannibal Site is an agricultural chemical manufacturing installation in Marion County. The installation is a major source for both construction and operating permits. The following NSR permits have been issued to BASF Corporation Agricultural Products from the Air Pollution Control Program.

Table 4: NSR Permit History

Permit Number	Description	Permit Status
0276-003	Installation of PROWL, HERBICIEDE, THIMET, and COUNTER plants	Active permit
0778-038 through 0778-041	Installation of Nitric Acid Plant, storage tank, and lime storage silo	Active permit
0878-001	Installation of a temporary incinerator	Unit(s) removed
1179-EPA	Major source permit for a Nitric Acid Plant	Unit(s) removed
0380-002	Installation of an Animal Feed Intermediate spray drying system	Unit(s) removed
0385-002	Installation of a solid waste incinerator	Unit(s) removed

Permit Number	Description	Permit Status
0885-005A	Construction of SCEPTER and ARSENEL herbicide production lines	Active permit
0887-003	Construction of ASSERT herbicide production line	Active permit
0488-001	Construction of a sulfuric acid regeneration facility	Active permit
0588-007A	Installation of a packaging operation for THIMET and COUNTER insecticides	Unit(s) removed
0988-004	Installation of a backup flare for odor control	Active permit
0489-004	Addition of a bulk herbicide blending and storage facility	Active permit
1189-001	Installation of the PROWL “C” Incinerator and waste storage tank	Active permit
0690-005	Modification of existing equipment to increase PROWL herbicide production	Active permit
0491-002	Addition of a fermenter to expand pharmaceutical plant	Unit(s) removed
0392-006	Construction of bulk time and dicalite handling equipment and storage	Unit(s) removed
0393-001	Modification of existing Animal Feed Intermediate Plant	Unit(s) removed
0694-008	Addition of a centrifuge to increase PROWL herbicide production	Active permit
0894-010	Modification to increase COUNTER insecticide production	Active permit
0696-013	Modification to Imidazoline (IMI-2) line	Active permit
122000-003	Addition of pyrrole production plant	Superseded by permit 092009-005
0997-003	Modification to increase PROWL herbicide production	Active permit
062000-019	Modification to increase PROWL herbicide production	Active permit
082005-014	Modification of the IMI-2 herbicide manufacturing facility to allow the production of three new pesticide active ingredient intermediates for Imidazolinone herbicides	Superseded by Permit 102008-001
022006-005	Modification of the Pyrrole/MMPDC facility to allow for the production of a new 320I insecticide	Superseded by permits 012017-006 and 122017-011
102008-001	Allow production of a new active ingredient 800H and expand production capacity of three diacids	Active permit

Permit Number	Description	Permit Status
062000-019A	Reduce reporting requirements	Special Condition No. 1 superseded by Permit 062000-019C
062000-019B	Account for cleaning emissions	Active permit
102009-007	Increasing production of Imidazolinone	Superseded by Permit 052015-012
092009-005	Increasing production of MMPDC	Superseded by Permits 012017-006 and 122017-011
092010-009	Conversion of herbicide storage tank to store xylene	Active permit
022011-009	Addition of tank into existing process	Active permit
072013-001	Construct natural gas fired boilers	Portions of Special condition 5.A.2 superseded by permit 072013-001A
092014-007	Increase in production of 800H herbicide	Active permit
052015-012	Replacement of centrifuges for IMI-1	Expired, installation did not install equipment
062000-019C	Reducing reporting requirements for excess SO_2 emissions during startup	Active permit
072013-001A	Eliminating GHG emission rate limit	Active permit
032016-002	Temporary permit to vent fumes to the atmosphere via incineration bypass vent	Replaced by Permit 097-003A
012017-006	Increasing production of Chlorfenapyr active ingredient	Supersede by Permit 122017-011
122017-011	Modification of the existing Pyrrole plant to accommodate a new Revysol active ingredient	Active permit
0997-003A	Vent fumes to the atmosphere via the incineration bypass vent	Active permit
082019-012	Increase production of PROWL plant	Active permit
012020-001	Installation of new backup flare to replace existing flare	Active permit
062000-019D	Removal of start-up reporting requirements for SO_2	Superseded all conditions in Permit 062000-019C
072020-012	Temporary permit for a water chilling system	Expires July 1, 2022

PROJECT DESCRIPTION

BASF Corporation Agricultural Products proposes to expand its current Imidazolinone production process at the IMI-1 plant through physical and process modifications. The increase in capacity

will utilize existing equipment, along with the installation of miscellaneous piping to accommodate a larger batch size in dehydration, which will cascade down through the rest of the different sections of the process. Other process modifications include, but are not limited to, the optimization of the performance of the existing centrifuges for higher yields and the reduction of cycle time in the condensation and the solvent recovery sections.

The production of four (4) products at IMI-1 will be increased. Other formulations, such as the Liberty, will not be affected. The installation was issued a permit (102009-007) in 2009 that increased the maximum production capacity of Imidazolinone herbicides to 6,036,384 pounds per year. In 2015, the installation was issued another permit (052015-012) that increased the maximum production level at IMI-1 through the replacement of an existing centrifuge. This centrifuge was never installed. This current project will increase the maximum production capacity at IMI-1 for Imidazolinone herbicides. The facility asked for the final production capacity to be kept as confidential information. Therefore, the maximum production capacity is not given here in this permit. This is the public version of the permit. The facility only asked for a few pieces of information (i.e. the total capacity, throughput rates of certain chemicals, as well as the batch times) to be kept confidential. Therefore, no confidential version of the permit will be issued.

Particulate emissions from the Diacid Charge System (IMI-1 05) and from the Rework Hopper/Packaging Operations (IMI-1 09) are controlled by a baghouse and HEPA filter, required by Special Condition 2. Particulate emissions from the Product Rework Pneumatic Transfer System (IMI-1 22) and from the Powder Pneumatic Transfer System (IMI-1 23) are also controlled by a baghouse and HEPA filter. These baghouses are required by Special Condition 2, but the HEPA filters were installed by the installation voluntarily and were not made practically enforceable by this permit. Furthermore, at the time of construction for the baghouses for emission points IMI-1 22 and 23, the Missouri Air Pollution Control Program determined that monitoring and recording of pressure drop for these baghouses would not be required (See letter issued for Project 2016-05-007). Therefore, this permit also does not require the monitoring and recording of pressure drops for these baghouses.

EMISSIONS/CONTROLS EVALUATION

$PM_{2.5}$, PM_{10}, PM, VOC, and HAPs are expected from the project. When calculating project emissions, the potential emissions before the project is subtracted from the potential emissions after the project. However, since the potential emissions after the project are already below the de minimis levels, it was unnecessary to determine the potential emissions before the project. The potential emissions from all four products were calculated and product resulting in the highest emissions of each pollutant were used as the potential emissions of the project.

Storage Tanks (IMI1 01, IMI1 02, IMI-1 03, IMI-1 04, IMI-1 15, IMI1 16)

The breathing and working losses from these tanks were calculated using the equations from EPA document AP-42, Chapter 7.1, *Organic Liquid Storage Tanks.* Storage Tanks IMI-1 01 and IMI-2 02 are controlled using voluntary chilled water vent condensers and the emissions reductions due to the condensers are not included in the calculations. Control devices are not used to control

other storage tanks. All of the tanks are fixed roof tanks and they are used to store toluene, MIBK, acetic anhydride, and sulfuric acid.

Material Handling/Transfer (IMI-1 05, IMI-1 09, and IMI-1 10)

Emissions factors specific to the material being handled were not available. Therefore potential emissions were calculated using an emission factor for lime transfer and conveying (SCC 3-050-016-15) from AP-42, Chapter 11.17, *Lime Manufacturing,* (2/1998). These emission sources use negative pressure dust collection systems to capture emissions, which should have a very high capture efficiency. A capture efficiency of 95% was assumed for the system. Captured emissions are routed to baghouses and then to HEPA filters. The baghouses were given a control efficiency of 99%, which is the default value used by the APCP. The HEPA filters were given a control efficiency of 99%. Although a HEPA filter should have a greater control efficiency, 99% was used in the previous permit issued to the IMI-1 plant (Permit No. 052015-012) and should yield very conservative results. Since the emissions sources are located inside a building, uncaptured emissions were given a 3.7% control efficiency for the enclosure, also used in Permit 052015-012.

Equipment Leaks (IMI-1 17)

VOC emissions from equipment leaks were estimated using equations for the SOCMI industry from Table 2-3 of EPA document "Protocol for Equipment Leak Emissions Estimates" (November 1995). Since these sources are subject to the LDAR requirement of MACT MMM, control efficiencies of 93% for connectors, 88% for light liquid valves, 92% for gas valves, and 75% for pump seals, agitator seals, and relief valves were used. These values were obtained from Table 5-2 of the same EPA document with the exception for agitator seals and relief valves. Table 5-2 does not give efficiency for agitator seals and relief valves. The lowest efficiency from the Table was used to estimate emissions from these sources for a conservative analysis.

Pneumatic Transfer (IMI-1 22 and IMI-1 23)

Emission factors for pneumatic transfer were not available. Therefore, $PM_{2.5}$, PM_{10} and PM emissions from these sources were calculated using the emission factor for lime transfer and conveying from AP-42, Chapter 11.17, *Lime Manufacturing,* (2/1998). A capture efficiency of 100% was assumed for these sources since the process is pneumatic. Captured emissions are routed to a baghouse given a control efficiency of 99%. The facility uses a HEPA filter downstream of the baghouse to control emissions, but the devices were voluntarily installed and are not made practically enforceable. Therefore, any emissions reduction due to the use of these devices were not taken into account for this project.

IMI-1 Process Vessels

The vapors from the IMI-1 process vessels are captured and routed to PR-47 incinerators. The IMI-1 production increase will not cause the incinerators to be loaded up with more fume or liquid waste than they are currently allowed to handle as determined by Comprehensive Performance Testing under 40 CFR 63,Subpart EEE. Therefore, there should be no increase in the potential emissions from incineration of fumes or liquid wastes beyond what the incinerators already emit at

full permitted rate. However, the VOC, NOx, and CO emissions from incinerating the imidazolinone production vapors are still considered part of this project and therefore, are accounted for in the emissions analysis for this project.

VOC and HAPs emissions were calculated using facility data from the 1992 arsenal campaign and scaled to the current process. According to the installation, the process chemistry has not changed since 1992, so the data should still be representative. The incinerator(s) were given a destruction efficiency of 99.99% because MACT Subpart EEE requires the facility to achieve a VOC destruction efficiency of at least 99.99%.

The incineration of the vapors are not expected to generate SO_2 emissions. The IMI-1 process does not include sulfur-bearing organic compounds. The ammonia in the vapors should produce mostly nitrogen (N_2) and water after the incineration process. However, small amount of NOx emissions may be produced depending on the operating conditions. Therefore, mass balances were used to calculate NOx emissions from this project. It was assumed, very conservatively, that all of the nitrogen in NH_3 are converted to NOx.

The incineration of carbon-containing organics is expected to generate mostly carbon dioxide (CO_2) and water. However, CO may be generated through incomplete combustion. There are no emission factors available for the incineration of volatile organic compounds processed by BASF. Therefore, CO emissions were calculated using the emission factors for flaring of organics given in AP-42, Chapter 13.5, *Industrial Flares*, (2/2018). This should give a very conservative value for emissions since a flare is not as well controlled as an incinerator. The emissions are also very low (4.02 tpy) compared to the de minimis level of 100 tpy that any variations should not increase the CO emissions to greater than 100 tpy.

Dryer System (IMI-1 07)

The dryer system is equipped with a baghouse to separate solid material from the dryer gases before the baghouse exhaust enters the direct condenser. The condenser removes moisture from the baghouse exhaust gas stream prior to the stream being recycled back to the process. The process is a closed loop system with no emissions to atmosphere under normal operations.

Other Equipment at IMI-1 not involved in this project (IMI-1 11, 12, 13, 14, 18, 20, 21, and 24)

There is other equipment at IMI-1 that does not participate in the production of the Imadazolinone but are used for other formulations at the plant. Emissions from these sources were not calculated since they are not considered part of this project. These sources include the Surfactant Storage Tank (IMI-1 11), Powder Transfer (IMI-1 12), Aqueous Premix Storage Tank (IMI-1 13), Final Product Storage Tank (IMI-1 14), Solvent Storage Tank (IMI-1 18), and Di-Propylene Glycol (DPG) Storage Tanks (IMI-1 20 and IMI-1 21)

The following table provides an emissions summary for this project. Existing potential emissions have never been calculated but it is known that this facility is a major source for construction permits based on actual emissions. Existing actual emissions were taken from the installation's 2019 EIQ. Potential toluene emissions are very close to the major source level/SMAL of 10.0 tpy.

However, this facility is subject to MACT Subpart MMM for which a Risk and Technology Review has been performed. Even if the toluene emissions would have exceeded 10.0 tpy, no additional requirements or modeling review would have been needed in this permit.

Table 4: Emissions Summary (tpy)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emissions (2019 EIQ)	Potential Emissions of the Project	New Installation Conditioned Potential
PM	25.0	N/D	N/D	0.51	N/A
PM_{10}	15.0	N/D	82.9	0.51	N/A
$PM_{2.5}$	10.0	N/D	82.9	0.51	N/A
SOx	40.0	Major	158.74	N/A	N/A
NOx	40.0	Major	403.50	10.01	N/A
VOC	40.0	N/D	18.67	22.67	N/A
CO	100.0	Major	1,189.57	4.02	N/A
GHG (CO_2e)	N/A	N/D	N/D	N/A	N/A
GHG (mass)	N/A	N/D	N/D	N/A	N/A
Toluene	10.0	N/D	N/D	9.97	N/A
MIBK	10.0	N/D	N/D	6.50	N/A
HAPs	10.0/25.0	Major	19.62	16.52	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

BASF Corporation Agricultural Products 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.
    - A full EIQ is required each year for Part 70 sources.

- *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

- *MACT Regulations*, 10 CSR 10-6.075
    - *National Emission Standards for Hazardous Air Pollutants for Pesticide Active Ingredient Production,* 40 CFR Part 63, Subpart MMM
    - *National Emission Standards for HAPs from Hazardous Waste Combustors,* 40 CFR Part 63, Subpart EEE

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 August 11, 2020, received August 12, 2020, designating BASF Corporation Agricultural Products as the owner and operator of the installation.

APPENDIX A

Abbreviations and Acronyms

%.....percent
ºF.....degrees Fahrenheit
acfm.....actual cubic feet per minute
BACT.....Best Available Control Technology
BMPs.....Best Management Practices
Btu.....British thermal unit
CAM.....Compliance Assurance Monitoring
CAS.....Chemical Abstracts Service
CEMS.....Continuous Emission Monitor System
CFR.....Code of Federal Regulations
CO.....carbon monoxide
CO_2.....carbon dioxide
CO_2e.....carbon dioxide equivalent
COMS.....Continuous Opacity Monitoring System
CSR.....Code of State Regulations
dscf.....dry standard cubic feet
EIQ.....Emission Inventory Questionnaire
EP.....Emission Point
EPA.....Environmental Protection Agency
EU.....Emission Unit
fps.....feet per second
ft.....feet
GACT.....Generally Available Control Technology
GHG.....Greenhouse Gas
gpm.....gallons per minute
gr.....grains
GWP.....Global Warming Potential
HAP.....Hazardous Air Pollutant
hr.....hour
hp.....horsepower
lb.....pound
lbs/hr.....pounds per hour
MACT.....Maximum Achievable Control Technology
$\mu g/m^3$.....micrograms per cubic meter
m/s.....meters per second
Mgal.....1,000 gallons
MW.....megawatt
MHDR.....maximum hourly design rate
MMBtu....Million British thermal units
MMCF.....million cubic feet
MSDS.....Material Safety Data Sheet
NAAQS....National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NO_x.....nitrogen oxides
NSPS.....New Source Performance Standards
NSR.....New Source Review
PM.....particulate matter
$PM_{2.5}$.....particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}.....particulate matter less than 10 microns in aerodynamic diameter
ppm.....parts per million
PSD.....Prevention of Significant Deterioration
PTE.....potential to emit
RACT.....Reasonable Available Control Technology
RAL.....Risk Assessment Level
SCC.....Source Classification Code
scfm.....standard cubic feet per minute
SDS.....Safety Data Sheet
SIC.....Standard Industrial Classification
SIP.....State Implementation Plan
SMAL.....Screening Model Action Levels
SO_x.....sulfur oxides
SO_2.....sulfur dioxide
SSM.....Startup, Shutdown & Malfunction
tph.....tons per hour
tpy.....tons per year
VMT.....vehicle miles traveled
VOC.....Volatile Organic Compound