

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: 092017-003

Project Number: 2017-05-028
Installation Number: 077-0051

Parent Company: 3M Company

Parent Company Address: 3M Center, Building 0224-05-W-03, Saint Paul, MN 55144

Installation Name: 3M Springfield

Installation Address: 3211 East Chestnut Expressway, Springfield, MO 65802

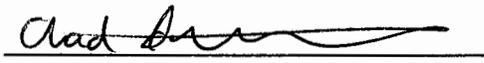
Location Information: Greene County, S16, T29N, R21W

Application for Authority to Construct was made for:

Fourth phase of multi-phase permit, where phase 4 is a site expansion. 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.


Prepared by
Chad Stephenson
New Source Review Unit


Director or Designee
Department of Natural Resources

SEP 13 2017

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 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."

3M Springfield
Greene County, S16, T29N, R21W

1. **Superseding Condition**
 - A. The conditions of this permit supersede Special Condition 2 found in the previously issued construction permit 042017-006 issued by the Air Pollution Control Program.

2. **Hazardous Air Pollutant (HAP) Emission Limitation**
 - A. 3M Springfield shall emit less than 9.9 tons individually or 24.9 tons combined of Hazardous Air Pollutants (HAPs) in any consecutive 12-month period from the entire installation. This limit applies to the HAP emissions from all equipment/ processes installed or permitted at 3M Springfield as of the issuance date of this permit.
 - 1) 3M Springfield shall develop an updated list of all HAP emission units at the installation including those that are a part of this permit and submit the list with the application to amend the Intermediate Operating Permit within 90 days as required by this permit

 - B. 3M Springfield shall use Emission Master® 8, a later software version or equivalent means to monitor HAP emissions from the entire installation.
 - 1) 3M Springfield shall maintain accurate records of the individual and combined HAP emissions from all sources. The records shall include the HAP emissions from coating operations, tanks, compounding, filling operations, combustion and any other source of HAP emissions.
 - 2) 3M Springfield shall retain copies of all Emission Master reports used to establish emission factors. Emission factors and throughputs shall be easily discernible.
 - 3) 3M Springfield shall maintain records of each emission unit's 12-month rolling total of HAP emissions and sum of all HAP emissions from startup, shutdown, and malfunction as reported to the Air Pollution Control Program's Compliance/Enforcement Section
 - 4) Where the vendor of a material, which is used in or at the emission unit, publishes a range of pollutant content for such material, 3M Springfield shall use the highest value of the range to calculate the HAP emissions unless the Director determines there is site-specific data or a site specific monitoring program to support another content within the range.

SPECIAL CONDITIONS:

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

3. **Capture Device Requirement – QA Spray Booth (EU-0403)**

3M Springfield shall capture emissions from the testing of aerosol adhesive containers filled on CAN1 and CAN2 with not more than 1 inlet face opening (e.g. 3-sided or totally enclosed booth).

 - A. All testing shall be done inside the booth and sprayed in a direction away from the inlet face opening.

4. **Control Device Requirement – QA Spray Booth Exhaust Filters**
 - A. 3M Springfield shall control emissions from the testing of aerosol adhesive containers filled on CAN1 and CAN2 with exhaust filters rated for at least 50.0 percent overspray removal efficiency as specified in the permit application.

 - B. The filters shall be operated and maintained in accordance with the manufacturer's specifications. The filters 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 shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

 - D. 3M Springfield shall monitor and record the operating pressure drop across the filters at least once every 24 hours while in operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

 - E. 3M Springfield shall maintain a copy of the filter manufacturer's performance warranty on site.

 - F. 3M Springfield shall maintain an operating and maintenance log for the filters 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.

5. **Record Keeping and Reporting Requirements**
 - A. 3M Springfield 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.

SPECIAL CONDITIONS:

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

- B. 3M Springfield shall report to the Air Pollution Control Program's Compliance/Enforcement Section, 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: 2017-05-028
Installation ID Number: 077-0051
Permit Number: 092017-003

Installation Address:

3M Springfield
3211 East Chestnut Expressway
Springfield, MO 65802

Parent Company:

3M Company
3M Center, Building 0224-05-W-03
Saint Paul, MN 55144

Greene County, S16, T29N, R21W

REVIEW SUMMARY

- 3M Springfield has applied for authority for a site expansion.
- The application was deemed complete on June 8, 2017.
- HAP emissions are expected from the site expansion. HAPs of concern from this process are toluene, phenol, methanol, manganese compounds, formaldehyde, xylene, ethylbenzene, benzene, hexane, vinyl acetate, methylene chloride, lead, chromium compounds and those from the combustion of natural gas and diesel fuel.
- Subpart CCCCCC, *National Emission Standards for Hazardous Air Pollutants for Area Sources: Paint and Allied Products Manufacturing*, of the Maximum Achievable Control Technology (MACT) regulations applies the MUL1 System (EU-0402).
- 40 CFR 60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" applies to the emergency generator.
- 40 CFR 63 Subpart ZZZZ, "National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" applies to the emergency generator.
- MERV 16 Filters are being used to control the particulate matter emissions from the MUL1 System when dry pigments and solids are being used. Booth filters are being used to control particulate matter emissions from the QA Spray Booth.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of volatile organic compounds (VOCs) of the project are below de minimis levels and potential emissions of HAPs are below major source levels. Installation-wide HAP emissions have been conditioned to below major source levels.

- This installation is located in Greene County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules.
- 3M Springfield plans to retain their Intermediate Operating Permit. Submittal of an application to amend your Intermediate Operating Permit is required for this installation within 90 days of producing the new products. 3M Springfield also has the option of applying for a Part 70 Operating Permit.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

The 3M Springfield plant manufactures adhesives, sealants, coating and coated products. Raw materials are shipped to the plant by truck and rail car. They are stored in the warehouse or in bulk tanks. Raw materials are mixed and, in some cases, reacted in process vessels. Further processing includes coating applications, extruding, milling, additional mixing and slitting. Two boilers and a thermal oxidizer are also operated on site.

3M Springfield was issued an Intermediate Operating Permit (Permit No. OP2006-056) on August 11, 2006. In this operating permit, 3M Springfield took a 9.9 individual and 24.9 combined HAP limit. The Statement of Basis included in OP2006-056 contains a complete list of all 3M Springfield's construction permits issued by the Air Pollution Control Program and by the Springfield Air Pollution Control Authority. Since the completion of OP2006-056, 3M Springfield has received construction permit 072011-002 and currently has an Operating Permit Application under review as part of project 2011-06-004. 3M Springfield has also received construction permit numbers 1182-007 and 0802-231.

PROJECT DESCRIPTION

3M Springfield is seeking authority for a site expansion occurring at their facility in Springfield, Missouri. This is the fourth phase of a multi-phased permit. The emissions of this project have been added with the first three phases (Permit No. 022017-003,

Permit No. 032017-005, and Permit No. 042017-006) and will be combined with future projects. A phased permit was chosen since the fate of the future projects is uncertain at this time, but more importantly to avoid the possibility of PSD circumvention if the future project is undertaken.

Phase 4 will comprise the following actions:

1. Installation of five (5) storage tanks for propellants: difluoroethane (DFE), dimethyl ether (DME), isobutane, propane, and tetrafluoroethane (TFE);
2. Shuffling materials stored within several existing storage tanks;
3. Replacement of two (2) raw material storage tanks, with the replacement tanks to be used for methylene chloride and pentane;
4. Installation of the MUL1 System, used to manufacture adhesives;
5. Installation of the Filling House CAN1 and CAN2 lines, used for the filling of small canisters, and larger cylinders, with aerosol adhesives;
6. Installation of the Filling House QA Spray Booth;
7. Installation of a 400kW diesel-fueled emergency generator;
8. Installation of seven (7) natural gas-fired space heating units;
9. Installation of two (2) natural gas-fired water heating units;
10. Installation of one (1) natural gas-fired 4.2 MMBtu boiler; and,
11. Installation and/or introduction of a temperature and humidity controlled laboratory, a portable 2,000 liter CO₂ storage tank, three new tote mixer (EU-0406-EU-0408), a new pail mixer (EU-0409), and a new standard mixer (EU-0410)
12. Powder-handling activity within the existing Compounding Room (IA-008)

PROCESS DESCRIPTIONS

1. Propellant Tank Farm

Five new storage tanks will be installed as part of a new tank farm, located near the North building, for the storage of propellants. Basic information on the tank parameters and their respective contents is summarized in the following table. All tanks to be installed will be pressure storage tanks (i.e., designed to operate in excess of 204.9 kPa).

Table 1 - New Propellant Tanks

Tank ID / Name	Contents	Capacity (gal)
Propellant Tank 01 (TK 888-41)	Difluoroethane (DFE) 12,000	12,000
Propellant Tank 02 (TK 888-42)	Dimethyl ether 18,000	18,000
Propellant Tank 03 (TK 888-43)	Isobutane 12,000	12,000
Propellant Tank 04 (TK 888-44)	Propane 18,000	18,000
Propellant Tank 05 (TK 888-45)	Tetrafluoroethane (TFE) 12,000	6,800

As pressure vessels, these tanks are designed to prevent product loss (i.e., emissions) during normal operation. The tanks that operate under pressure have vents, but they only operate during emergency situations. The vapor is balanced with the tanker during filling. Therefore, emissions from these tanks were assumed to be zero.

None of the proposed propellant tanks will be subject to NSPS Subpart K-b, because, irrespective of the contents of the tanks, the rule does not apply to storage vessels less than 75 m³ (19,813 gallons) in size; additionally this subpart exempts pressure vessels designed to operate in excess of 204.9 kPa without emissions to the atmosphere. None of these tanks will emit any hazardous air pollutants (HAPs), as none will store any HAP-containing materials. Therefore, none of these tanks will be subject to any MACT subparts.

2. & 3. Raw Material Storage Tanks & Tank Farm Reorganization

Two new storage tanks will be installed, replacing two existing storage tanks at the facility's tank farm located near the South building. As part of this effort, 3M Springfield will also change how it handles raw materials currently stored in these tanks. Table 2, below, provides a summary of the tank farm:

Table 2 - New and Affected Storage Tanks

Tank ID / Name	Current State	Future State	Capacity (gal)
Solvent Tank 01 (TK 888-01)	MIBK	Removed	12,000
Solvent Tank 01 Replacement	N/A	Methylene chloride	12,000
Solvent Tank 02 (TK 888-02)	Empty	Removed	12,000
Solvent Tank 02 Replacement	N/A	Pentane	12,000
Solvent Tank 03 (TK 888-03)	Acetone	Acetone	12,000
Solvent Tank 04 (TK 888-04)	Toluene	Toluene	12,000
Solvent Tank 05 (TK 888-05)	Heptane RX	MIBK	12,000
Solvent Tank 06 (TK 888-06)	MEK	MEK	12,000
Solvent Tank 07 (TK 888-07)	Isohexane	Heptane	12,000
Solvent Tank 08 (TK 888-08)	Isohexane	Textile Spirits	12,000
Solvent Tank 09 (TK 888-09)	Textile spirits	Methyl acetate	12,000
Solvent Tank 10 (TK 888-10)	Heptane	Isohexane	12,000
Solvent Tank 11 (TK 888-11)	Cyclohexane	Cyclohexane	12,000
Solvent Tank 12 (TK 888-12)	PM Acetate	PM Acetate	12,000
Solvent Tank 13 (TK 888-13)	Toluene, reclaimed	Toluene, reclaimed	12,000
Solvent Tank 14 (TK 888-14)	Acetone	Acetone	12,000

Existing Solvent Storage Tanks 01 and 02 will be physically removed. In their same footprints, replacement tanks of equal size will be installed to store the materials listed in Table 2. The current contents of Storage Tank 01 will be moved to Tank 05; Heptane RX, currently stored in Tank 05, will no longer be stored in this tank farm and will, instead, be received & handled in totes. To facilitate other changes in raw material needs, the contents of Storage Tanks 07, 08, 09, and 10 will be changed, as listed in Table 2.

The replacement Solvent Tanks 01 and 02 will operate under pressure; these pressurized storage tanks are designed to operate in excess of 204.9 kPa, and without emissions to the atmosphere during normal operation so emissions are assumed to be zero. Additionally, Solvent Tank 5 emissions were not evaluated, as the post-project state of the tank farm is not functionally affected by this material change: the same material will be stored in the same tank farm in the same size tank and the project will not affect the use of MIBK.

Emissions from Solvent Tanks 07, 08, 09, and 10 have been modeled using Emission Master software and a conservatively-high estimate of annual throughput.

Replacement Storage Tanks 01 and 02, and Solvent Tanks 07 and 08, when used to store a different solvent, will not be subject to New Source Performance Standards (NSPS) Subpart K-b because, irrespective of the contents of the tanks, the rule does not apply to storage vessels less than 75 m³ (19,813 gallons) in size; additionally this subpart does not apply to pressure vessels designed to operate in excess of 204.9 kPa without emissions to the atmosphere. The future state of Solvent Tanks 09 and 10 will not be subject to NSPS Subpart K-b because, although the vessels are greater than 75 m³ in size, they were constructed prior to July 23, 1984, and changing the materials stored without an accompanying physical change is not an NSPS-qualifying modification. Replacement Storage Tank 01, contains the MACT Subpart CCCCCC target HAP methylene chloride, but the rule does not apply to this storage vessel because it is an exempt pressure vessel designed to operate in excess of 204.9 kPa without emissions to atmosphere. Replacement Storage Tank 02, and the future state of Solvent Storage Tanks 07, 08, 09, and 10, will not be subject to MACT Subpart CCCCCC because none of these storage tanks contain benzene or methylene chloride.

4. MUL1 System (EU-0402)

The new MUL1 System includes the installation of the new MUL1 Mixer, a dry-solids hopper feeding the mixer, a process condenser, and some ancillary items (e.g., pumps, piping, etc.). The MUL1 mixer is the primary component of this system, used to create new adhesive products.

Dry solids (non-HAP) are added to a hopper via super-sacks; while adding material, the airspace in the immediate vicinity is captured and vented to atmosphere through a particulate filter. Solvents are pumped from bulk storage to the MUL1 mixer and dry

solids are transported via hopper, to the MUL1 mixer. These additions to the MUL1 mixer are done through an enclosed system while the vessel is operated under pressure. Once all materials are added, production occurs, also under pressure. Finished products are dispensed into totes. The process condenser will be employed during this filling step to capture any filling-related emissions; condensed product will be returned to the tote.

Emissions of particulates from the MUL1 System are expected to occur only when loading the hopper; however, for the purpose of the calculations, particulates have been modeled associated with the mixing steps to reflect any bottlenecks associated with its potential emissions. 3M Springfield will use filters greater than or equal to MERV 16 control efficiency when the pigments and other solids are not in a paste, slurry, or liquid form; however these filters were not accounted for in the emission calculations.

The MUL1 System will be subject to MACT Subpart CCCCCCC (7C), for "Paints and Allied Products Manufacturing," while it is used to manufacture a paint or allied product that involves processing, using, or generating materials containing one of the rule's target HAP. The MUL1 system and associated equipment are part of the facility-wide collection of equipment that forms the 3M Springfield facility's MACT 7C existing affected source.

Table 3: MUL1 System Product Family Descriptions

Product Family	Description*	Control Device	Pollutants
1	EC-4479	N/A	VOC, Particulates, Hexane, Benzene, Vinyl Acetate
2	PM-11181	N/A	VOC, Particulates, Hexane, Vinyl Acetate, Methanol, Benzene
3	PM-11182	N/A	VOC, Particulates, Hexane, Methanol, Vinyl Acetate, Benzene
4	PM-171274	N/A	VOC, Particulates, Hexane
5	PM-171276	N/A	VOC, Particulates, Hexane, Benzene
6	PM-171277	N/A	VOC
7	PM-171278	N/A	VOC, Benzene
8	PM-171300	N/A	VOC, Particulates, Methanol, Toluene
9	PM-171305	N/A	VOC, Particulates, Methanol
10	PM-171324	N/A	VOC, Particulates, Methylene chloride
11	PM-171345	N/A	VOC, Particulates
12	PM-171349	N/A	VOC, Particulates, Hexane, Toluene, Benzene
13	PM-171352	N/A	VOC, Particulates, Toluene
14	PM-171922	N/A	VOC, Particulates, Hexane, Toluene, Xylene, Ethylbenzene, Benzene
15	PM-171953	N/A	VOC, Particulates, Hexane, Benzene

*Product families are explained in the Emissions/Controls Evaluation Section

5. Filling House

The new "Filling House" will include two new lines, CAN1 and CAN2, for the filling of finished products: pressurized, aerosol adhesive canisters or cylinders. CAN1 and CAN2 will operate identically, filling the same products; the only difference between these two lines is the size of the container being filled.

The actual filling operations of CAN1 and CAN2 are designed as a closed system. Totes of adhesive (e.g., from the MUL1System) are connected via piping to a container. The container is filled with adhesive, then with propellant, and then with a blanket of nitrogen, before closing the container. No emissions are expected to occur from these filling operations. The filling operations from the lines are designed as a closed system and any emissions are expected to be negligible.

6. Filling House QA Spray Booth (EU-0403)

The Filling House QA Spray Booth will be installed to test aerosol adhesive containers filled on CAN1 and CAN2. The testing is for quality-assurance (QA) purposes only, to ensure proper operation of the containers. The intent is *not* to test every container; the testing will occur for a small number of containers, on an as-needed basis.

Potential emissions use a maximum throughput based on a maximum spray rate of 0.2 gallons per minute, ten seconds of testing per container, and 150 containers tested per day, 365 days per year. Transfer efficiency and filtration are, both, considered for particulate emissions. No control will be employed for VOCs or any volatile HAPs.

The spray booth is not subject to MACT Subpart CCCCCC (7C) because the rule does not apply to quality-assurance activities.

7. 400kW Diesel-Fueled Emergency Generator (EU-0404)

One 400kWe diesel-fueled emergency generator will be installed to provide emergency power. This unit will be subject to NSPS Subpart IIII, for "Stationary Compression Ignition Internal Combustion Engines," as it is a stationary compression ignition internal combustion engine which is manufactured after April 1, 2006 and which will be installed after July 11, 2005. This unit will also be subject to MACT ZZZZ.

8., 9., & 10. Natural Gas-Fired Space Heating, Water Heating, and Boiler

A total of seven (7) natural gas-fired space heating units, two (2) natural gas-fired water heating units, and one 4.2 MMBtu, natural gas-fired boiler will be installed, as detailed in Table 3, below:

Table 4 - New Natural Gas-Fired Units

Unit ID / Name	Location	Capacity (MMBtu)
018-AHU-1	H2 Bumpout	1.1
018-AHU-3	H2/H3	2.0
018-AHU-4	H2/H3	2.0
018-AHU-5	Gas House	0.24
018-AHU-6	Filling House	0.24
018-AHU-7	F1/S1	2.05
018-AHU-8	Office Area Locker and Break	0.1
Tempered Water Heater	Plant	0.3
Domestic Hot Water Heater	Plant	0.3
<i>Subtotal 8.33</i>		<i>8.33</i>
EU-0405 Natural Gas-Fired Boiler	Plant	4.2
<i>Total Capacity</i>		<i>12.53</i>

Emission calculations for these units, as an aggregate total of natural gas combustion, are based on emission factors from EPA AP-42 Chapter 1.4.

None of these units are subject to NSPS Subparts D, D-b, or D-c, because none of these units has a capacity of at least 10 MMBtu. The boiler will not be subject to MACT Subpart DDDDD (“Industrial, Commercial, and Institutional Boilers and Process Heaters”) because the rule applies only to major sources of HAP emissions, while 3M Springfield has synthetic minor limits to ensure that it is an area source of HAP emissions. The boiler additionally is not subject to MACT Subpart JJJJJ (“Industrial, Commercial, and Institutional Boilers Area Sources”) because it an exempt "gas-fired boiler."

11. Other Miscellaneous Activities

A portable, 2,000 liter (529 gallon) carbon-dioxide (CO₂) storage tank will be set up for use as a propellant.

Three new tote mixers (EU-0406-EU-0408) will be used. Potential emissions from mixing totes comprise of non-HAP VOCs, only. Emissions from the tote mixers were modeled using Emission Master software. The facility intends to operate only one at a time; however since all three can be operated simultaneously the emissions from all three were added together.

A new pail mixer (EU-0409) will be used. Potential emissions from mixing totes comprise of VOCs and volatile HAPs (Methanol, Xylene, and Ethylbenzene). Emissions from the pail mixer were modeled using Emission Master software.

A product experiment will be conducted on the existing 64LM and 416S units. Potential emissions from this activity comprise of non-HAP VOCs. Emissions were modeled using Emission Master software.

A new mixer (EU-0410) will be used. The unit is a standard mixer – a blade attached to a shaft attached to a motor – used to mix the contents of 55-gallon drums. Mixer 55 will be used to mix new products from the DM25 mixer. As such, some of these products will contain manganese compounds and therefore, Mixer 55 will be subject to MACT 7C.

12. Powder-Handling Activity (IA-008)

A small powder-handling activity with hand additions will occur within the existing compounding room (IA-008). One of the powders that may be handled contains a chromium (III) compound.

3M Springfield has requested confidentiality as allowed per 10 CSR 10-6.210 with regards to process flow diagram, process rates, emission factors and safety data sheets (SDS) due to the proprietary nature of the information. This information can only be obtained by the public with written permission from 3M Springfield. This permit is a public version and there is no confidential version of the permit.

EMISSIONS/CONTROLS EVALUATION

The project's potential emissions include, particulates, VOCs, CO, CO₂, NO_x, SO₂ and HAPs. Emission factor data for MUL1 system, the pail mixer (EU-0407), tote mixer (EU-0406), the standard mixer (EU-0410) and the working/breathing of the storage tanks (TK 888-07 – TK 888-10) was calculated using the Emission Master® program, which calculates emission for batch and continuous processes using one or more computerized Environmental Protection Agency (EPA) models. The products for the MUL1 System were grouped into 15 different product families. For the purpose of evaluating emissions the worst case product for each pollutant was used. The worst case emissions from the system were added together. The product family with the worst case emissions from the MUL1 System is summarized in the table below. There are a few species including benzene, ethylbenzene, and xylene that exist solely as impurities. The emission rates for these species are not included in Table 3; however the emissions have been included in the emission summary for the project in Table 4.

Table 5: Worst Case MUL1 Emissions

Pollutant	Worst Case Product Family Description	Emission Rate (lb/hr)
Particulates	2 (PM-11181)	0.41
VOC	11 (PM-171345)	0.33
Hexane	12 (PM-171349)	6.51E-02
Vinyl Acetate	3 (PM-11182)	3.54E-05
Methanol	3 (PM-11182)	7.24E-05
Toluene	14 (PM-171922)	1.57E-04
Methylene Chloride	10 (PM-171324)	3.17E-01
Combined HAPs	10 (PM-171324)	3.17E-01

Subpart CCCCCC requires that particulate emissions be captured and routed to a particulate control device when using dry pigments and solids. This requirement does not apply to pigments and other solids that are in paste, slurry, or liquid form. 3M Springfield will be using filters greater than or equal to MERV 16 control efficiency when the pigments and other solids are not in a paste, slurry, or liquid form. The filters were not considered in the potential emission calculations.

Potential emissions from the emergency generator was calculated using emission factors obtained from AP-42 Section 3.3 *Gasoline and Diesel Industrial Engines*, October 1996. SO_x emissions were calculated by mass balance. PM, PM₁₀, PM_{2.5}, NO_x, and CO emissions were calculated using applicable emission standards from NSPS IIII. Annual potential emissions were calculated based on 500 hours per year of operation. The 500 hours per year operation was obtained from the EPA document, *Calculating Potential to Emit (PTE) for Emergency Generators*, September 1995.

The emission factors for the combustion of natural gas (018-AHU-1 – 018-AHU-8 and EU-0405) were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, Natural Gas Combustion (07/98).

Emissions from the QA Spray Booth finishing line (EU-0403) were calculated using the maximum material usage and SDS supplied by 3M Springfield. The coating transfer rate and filter capture efficiency for the finishing line was also provided by 3M Springfield. The coating transfer efficiency is 50 percent and the filter capture efficiency is 50 percent for PM, PM₁₀ and PM_{2.5}. All available VOCs and HAPs were considered to be emitted. The capture efficiency for the three-sided paint booth was assumed to be 70%. The MHDR of the QA Spray Booth line was determined using an estimated nozzle flow rate 0.2 gallons per minute, an approximate density of 7.5 lbs/gal, 150 tests per day, and a test duration of 10 seconds.

Emissions from the handling of chromium compounds in the compounding room (IA-008) were calculated using emission factors from the EPA document AP-42, Section 6.4, Paint and Vanish (05/83) from AP-42. The emissions are controlled by a particulate filter, however the control device was not considered in the calculation. There are no particle size distributions available so all of the PM₁₀ was considered PM_{2.5}. The percent chromium in the additive product was obtained from the SDS supplied by 3M Springfield.

The following table provides an emissions summary for this project. Existing actual emissions were taken from the installation's 2016 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year), except for the emergency generator which is for operation at 500 hours per year. All HAPs for the project are currently below the SMAL, but if future projects exceed the SMAL, modeling may be required.

Table 6: Emissions Summary (tpy)

Pollutant	Regulatory De Minimis Levels	Existing Actual Emissions (2016 EIQ)	Potential Emissions of Phase I, II and III	Potential Emissions of Phase IV	Conditioned Project (Phase I, II, III and IV) Potential Emissions	New Installation Conditioned Potential
PM	25.0	N/D	0.78	4.01	4.79	N/A
PM ₁₀	15.0	0.46	0.78	4.00	4.78	N/A
PM _{2.5}	10.0	0.46	0.78	4.00	4.78	N/A
SO ₂	40.0	0.03	N/A	0.03	0.03	N/A
NO _x	40.0	6.05	N/A	6.79	6.79	N/A
VOC	40.0	47.78	1.67	12.11	13.78	N/A
CO	100.0	5.09	N/A	5.29	5.29	N/A
HAPs	10.0/25.0	0.0012	1.31	12.98	<9.9/24.9	<9.9/24.9
Toluene	10.0	N/D	0.55	0.71	1.26	<9.9
Manganese Compounds	0.8	N/D	0.12	N/A	0.12	N/A
Formaldehyde	2	N/D	1.29	0.0041	1.294	N/A
Methanol	10	N/D	0.0036	0.072	0.076	<9.9
Phenol	0.1	N/D	0.019	N/A	0.019	N/A
Xylene	10	N/D	0.0001	0.00017	0.00027	<9.9
Ethylbenzene	10	N/D	0.003	0.00001	0.003	<9.9
Benzene	2	N/A	0.0005	0.0014	0.0019	N/A
Hexane	10	N/D	N/A	5.20	5.20	<9.9
Vinyl Acetate	1	N/D	N/A	0.00016	0.00197	N/A
Methylene Chloride	10	N/D	N/A	7.20	7.20	<9.9
Chromium Compounds	5	N/D	N/A	0.053	0.053	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 volatile organic compounds (VOCs) of the project are below de minimis levels and potential emissions of HAPs are below major source levels. Installation-wide HAP emissions have been conditioned to below major source levels

APPLICABLE REQUIREMENTS

3M Springfield 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.
- *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

- Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, "National Emission Standards for Hazardous Air Pollutants for Area Sources: Paint and Allied Products Manufacturing", 40 CFR Part 63, Subpart CCCCCC
- 40 CFR 60 Subpart III, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" applies to the emergency generator.
- 40 CFR 63 Subpart ZZZZ, "National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" applies to the emergency generator.

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 May 9, 2017, received May 12, 2017, designating 3M Company as the owner and operator of the installation. The addendum to the Application for Authority to Construct form, dated May 18, 2017, received June 6, 2017.

APPENDIX A

Abbreviations and Acronyms

%percent	m/smeters per second
°Fdegrees Fahrenheit	Mgal1,000 gallons
acfmactual cubic feet per minute	MWmegawatt
BACTBest Available Control Technology	MHDRmaximum hourly design rate
BMPsBest Management Practices	MMBtuMillion British thermal units
BtuBritish thermal unit	MMCFmillion cubic feet
CAMCompliance Assurance Monitoring	MSDSMaterial Safety Data Sheet
CASChemical Abstracts Service	NAAQSNational Ambient Air Quality Standards
CEMSContinuous Emission Monitor System	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CFRCode of Federal Regulations	NO_xnitrogen oxides
COcarbon monoxide	NSPSNew Source Performance Standards
CO₂carbon dioxide	NSRNew Source Review
CO_{2e}carbon dioxide equivalent	PMparticulate matter
COMSContinuous Opacity Monitoring System	PM_{2.5}particulate matter less than 2.5 microns in aerodynamic diameter
CSRCode of State Regulations	PM₁₀particulate matter less than 10 microns in aerodynamic diameter
dscfdry standard cubic feet	ppmparts per million
EIQEmission Inventory Questionnaire	PSDPrevention of Significant Deterioration
EPEmission Point	PTEpotential to emit
EPAEnvironmental Protection Agency	RACTReasonable Available Control Technology
EUEmission Unit	RALRisk Assessment Level
fpsfeet per second	SCCSource Classification Code
ftfeet	scfmstandard cubic feet per minute
GACTGenerally Available Control Technology	SDSSafety Data Sheet
GHGGreenhouse Gas	SICStandard Industrial Classification
gpmgallons per minute	SIPState Implementation Plan
grgrains	SMALScreening Model Action Levels
GWPGlobal Warming Potential	SO_xsulfur oxides
HAPHazardous Air Pollutant	SO₂sulfur dioxide
hrhour	tphtons per hour
hphorsepower	tpytons per year
lbpound	VMTvehicle miles traveled
lbs/hrpounds per hour	VOCVolatile Organic Compound
MACTMaximum Achievable Control Technology	
µg/m³micrograms per cubic meter	

EU	Description	Pollutant Name	Max Rate	Max Rate Units	Em Factor lb/units	Em factor units	Uncontrolled PTE (lb/hr)	Overall Control Eff Controlled PTE (ppb)
TX 888-07	Solvent Tank 7	VOC		gal/hr	See Verified Calcs		0.09	0.3942
TX 888-07	Solvent Tank 7	Toluene		gal/hr	See Verified Calcs		0.007846689	0.0124885
TX 888-08	Solvent Tank 8	VOC		gal/hr	See Verified Calcs		0.113	0.48494
TX 888-08	Solvent Tank 8	Hexane		gal/hr	See Verified Calcs		0.006802667	0.302505
TX 888-08	Solvent Tank 8	Toluene		gal/hr	See Verified Calcs		0.003428198	0.0150155
TX 888-08	Solvent Tank 8	Ethylbenzene		gal/hr	See Verified Calcs		1.40411E-08	0.00000615
TX 888-08	Solvent Tank 8	Benzene		gal/hr	See Verified Calcs		0.000344977	0.000035
TX 888-09	Solvent Tank 9	VOC		gal/hr	See Verified Calcs		0.000054997	0.002744885
TX 888-09	Solvent Tank 9	Methanol		gal/hr	See Verified Calcs		0.000454997	0.002744885
TX 888-10	Solvent Tank 10	VOC		gal/hr	See Verified Calcs		0.81	3.5478
TX 888-10	Solvent Tank 10	Hexane		gal/hr	See Verified Calcs		0.020550776	0.0900124
EU-0403	QA Spray Booth	PM	1.6	lb/hr	% by weight		0.4886	0.175 1.6932861
EU-0403	QA Spray Booth	PM10	1.6	lb/hr	% by weight		0.4886	0.175 1.6932861
EU-0403	QA Spray Booth	PM2.5	1.6	lb/hr	% by weight		0.4886	0.175 1.6932861
EU-0403	QA Spray Booth	VOC	1.6	lb/hr	% by weight		1.3277	5.815326
EU-0403	QA Spray Booth	Hexane	1.6	lb/hr	% by weight		1.03092	4.5154296
EU-0403	QA Spray Booth	Methanol	1.6	lb/hr	% by weight		0.03182	0.0684156
EU-0403	QA Spray Booth	Methylene chloride	1.6	lb/hr	% by weight		1.3377	5.815326
EU-0403	QA Spray Booth	Toluene	1.6	lb/hr	% by weight		0.1582	0.684156

Filter Control Efficiency 50%
Transfer Efficiency 50%
Filter Capture Efficiency - 3 sided booth 70%

The MHDR of the QA Spray Booth line was determined using an estimated nozzle flow rate 0.2 gallons per minute, an approximate density of 7.5 lb/gal, 150 tests per day, and a test duration of 10 seconds.

EU-0402	Worst Case MULL Emissions	Product Family with worst case	Uncontrolled PTE (lb/hr)	Controlled PTE (ppb)
EU-0402	MULL System	PM	4.14E-01	1.812017325
EU-0402		PM10	4.14E-01	1.812017325
EU-0402		PM2.5	4.14E-01	1.812017325
EU-0402		VOC	0.33	1.4854
EU-0402		Hexane	6.51E-01	2.851-01
EU-0402		Vinyl Acetate	3.54E-05	1.55E-04
EU-0402		Methanol	7.24E-05	3.17E-04
EU-0402		Toluene	1.57E-04	6.89E-04
EU-0402		Methylene Chloride	3.37E-01	1.39E+00
EU-0402		Benzene	1.02E-06	4.52E-08
EU-0402		Ethylbenzene	1.51E-08	6.62E-08
EU-0402		Xylene	6.47E-09	2.84E-08
EU-0402		Combine HAPs	3.17E-01	1.39E+00

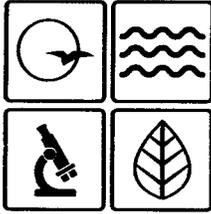
EU-0406-0408	Tote Mixer	VOC	See Verified Calcs	3.62E-03	1.59E-02
EU0410	Standard mixer	VOC	See Verified Calcs	5.53E-04	2.41E-05
EU-0409	Pail Mixer	VOC	See Verified Calcs	1.84E-03	8.08E-03
		Methanol	See Verified Calcs	3.32E-05	1.43E-04
		Ethylbenzene	See Verified Calcs	1.25E-07	5.81E-07
		Xylene	See Verified Calcs	3.11E-07	1.38E-08

6LM/A185	Product Department	VOC	See Verified Calcs	3.62E-03	1.59E-02
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EU-0404	Misc. Natural Gas Sources/Boiler	PM	12.53	MMBtu/hr	See Natural Gas Calcs	0.093360784	4.05E-01
		PM10	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.093360784</td> <td>4.05E-01</td>	MMBtu/hr	See Natural Gas Calcs	0.093360784	4.05E-01
		PM2.5	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.093360784</td> <td>4.05E-01</td>	MMBtu/hr	See Natural Gas Calcs	0.093360784	4.05E-01
		VOC	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.067883725</td> <td>2.86E-01</td>	MMBtu/hr	See Natural Gas Calcs	0.067883725	2.86E-01
		Combined HAPs	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.023192271</td> <td>1.01E-01</td>	MMBtu/hr	See Natural Gas Calcs	0.023192271	1.01E-01
		Benzene	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>2.58E-05</td> <td>1.13E-04</td>	MMBtu/hr	See Natural Gas Calcs	2.58E-05	1.13E-04
		Toluene	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>4.18E-05</td> <td>1.83E-04</td>	MMBtu/hr	See Natural Gas Calcs	4.18E-05	1.83E-04
		Hexane	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.022111765</td> <td>9.68E-02</td>	MMBtu/hr	See Natural Gas Calcs	0.022111765	9.68E-02
		SOx	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>0.007370588</td> <td>3.21E-02</td>	MMBtu/hr	See Natural Gas Calcs	0.007370588	3.21E-02
		NOx	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>1.228431373</td> <td>5.38E+00</td>	MMBtu/hr	See Natural Gas Calcs	1.228431373	5.38E+00
		CO	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>1.031882253</td> <td>4.52E+00</td>	MMBtu/hr	See Natural Gas Calcs	1.031882253	4.52E+00
		Formaldehyde	12.53 <th>MMBtu/hr</th> <td>See Natural Gas Calcs</td> <td>9.21E-04</td> <td>4.04E-03</td>	MMBtu/hr	See Natural Gas Calcs	9.21E-04	4.04E-03
EU-0404	Emergency Generator	PM	See Emergency Generator Calcs		0.178368798	4.41E-02	
		PM10	See Emergency Generator Calcs		0.168769066	4.22E-02	
		PM2.5	See Emergency Generator Calcs		0.16393312	4.10E-02	
		SOx	See Emergency Generator Calcs		0.005648547	1.41E-03	
		NOx	See Emergency Generator Calcs		5.648335339	1.41E+00	
		CO	See Emergency Generator Calcs		3.086471466	7.72E-01	
		VOC	See Emergency Generator Calcs		0.294342514	7.36E-02	
		Xylene	See Emergency Generator Calcs		0.002953628	1.77E-04	
		Toluene	See Emergency Generator Calcs		0.001009803	2.52E-04	
		Benzene	See Emergency Generator Calcs		0.002788886	6.97E-04	
		Formaldehyde	See Emergency Generator Calcs		0.000283561	7.06E-05	
		Combined HAPs	See Emergency Generator Calcs		0.006123977	1.53E-03	

IA-028	Compounding Room	PM		lb/hr	20 lb/ton	0.012	5.26E-02
		PM10		lb/hr	17 lb/ton	0.0102	4.47E-02
		PM2.5		lb/hr	17 lb/ton	0.0102	4.47E-02
		Chromium Compounds		lb/hr	20 lb/ton	0.012	5.26E-02

Pollutant	Regulatory De Minimis Levels	Potential Emissions of Phase IV
PM	25	4.01
PM10	15	4.00
PM2.5	10	4.00
SO2	40	0.03
NOx	40	6.79
VOC	40	12.11
CO	100	5.29
HAPs	10.0/25.0	12.88290
Toluene	10	0.71276
Manganese Compounds	0.8	0.00000
Formaldehyde	2	0.00411
Methanol	10	0.07248
Phenol	0.1	0.00000
Xylene	10	0.00017
Ethylbenzene	10	0.00001
Benzene	2	0.00145
Hexane	10	5.19778
Vinyl Acetate	1	0.00016
Methylene Chloride	10	7.20172
Chromium Compounds	5	0.05256



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

SEP 13 2017

Mr. Andrew Willing
Environmental Specialist
3M Springfield
3M Center, Building 0224-05-W-03
Saint Paul, MN 55144

RE: New Source Review Permit - Project Number: 2017-05-028

Dear Mr. Willing:

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.

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.



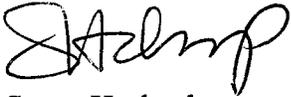
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Mr. Andrew Willing
Page Two

If you have any questions regarding this permit, please do not hesitate to contact Chad Stephenson, 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:csj

Enclosures

c: Southwest Regional Office
PAMS File: 2017-05-028

Permit Number: 092017-003