

**PUBLIC HEARING ON  
PROPOSED AMENDMENT TO**

**10 CSR 10-5.442**

**CONTROL OF EMISSIONS FROM LITHOGRAPHIC AND LETTERPRESS  
PRINTING OPERATIONS**

This amendment will change the rule purpose, subsections (1)(A)–(1)(C), section (2), subsections (3)(A), (3)(B), (3)(D), (4)(A), (5)(A), (5)(C), and (5)(E).

The rule purpose is being amended to clarify rule applicability by emphasizing that the rule is to limit volatile organic compound emissions in the St. Louis 1997 eight (8)-hour ozone nonattainment area.

Subsection (1)(A) is being amended to remove restrictive words, make administrative updates, and add an applicability date for existing sources.

Subsections (1)(B), (1)(C), (3)(D), and (4)(A) are being amended to remove restrictive words.

Section (2) is being amended to make administrative updates and add definitions specific to this rule.

Subsections (3)(A) and (5)(C) are being amended to update references to federal methods.

Subsections (3)(A) and (5)(A) are being amended to update references to federal methods and remove restrictive words.

Subsection (5)(E) is being amended to update incorporation by reference information.

*NOTE 1 - Legend for rule actions to be presented at public hearing is as follows:*

- \* Shaded Text - Rule sections or subsections not proposed for amendment. This text is only for reference.*
- \* Unshaded Text - Rule sections or subsections that are proposed for change.*

*NOTE 2 - All unshaded text below this line is printed in the Missouri Register.*

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**Title 10—DEPARTMENT OF  
NATURAL RESOURCES**

**Division 10—Air Conservation Commission**

**Chapter 5—Air Quality Standards and Air Pollution Control Rules Specific to the  
St. Louis Metropolitan Area**

## PROPOSED AMENDMENT

### 10 CSR 10-5.442 Control of Emissions From Lithographic and Letterpress Printing

**Operations.** The commission proposes to amend the rule purpose, subsections (1)(A)–(1)(C), section (2), subsections (3)(A), (3)(B), (3)(D), (4)(A), (5)(A), (5)(C), and (5)(E). If the commission adopts this rule action, the department intends to submit this rule amendment to the U.S. Environmental Protection Agency to replace the current rule that is in the Missouri State Implementation Plan. The evidence supporting the need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources’ Air Pollution Control Program at the address listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources’ Proposed Rules website [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules).

*PURPOSE: The purpose of this proposed rulemaking is to update incorporation by reference information, add definitions specific to this rule, remove the unnecessary use of restrictive words, and make administrative updates. The evidence supporting the need for this proposed rulemaking, per 536.016, RSMo, is 536.175 RSMo; and Executive Order 17-03 Red Tape Reduction Review and related comments.*

*PURPOSE: This rule restricts volatile organic compound emissions from lithographic and letterpress printing operations in the St. Louis 1997 eight (8)-hour ozone nonattainment area.*

- (1) Applicability.
  - (A) This rule [~~shall apply~~]**applies** to installations that operate offset lithographic **printing presses**, [~~or~~]letterpress printing presses, **or both**, including heatset web, non-heatset web (newspaper and non-newspaper), and non-heatset sheet-fed presses in [~~the City of~~] St. Louis **City** and Jefferson, St. Charles, Franklin, and St. Louis Counties **existing on November 30, 2019**.
  - (B) This rule [~~shall apply~~]**applies** only to installations described in subsection (1)(A) of this rule, with total actual emissions from lithographic and letterpress printing operations, including related cleaning activities, before consideration of controls, of more than three (3) tons per twelve (12)-month rolling period of volatile organic compounds (VOCs).
  - (C) This rule [~~shall~~]**does** not apply to printing on fabric, metal, or plastic.
  - (D) Once the installation exceeds the applicability level of this rule, it shall remain subject to this rule even if its actual emissions drop below the applicability level of this rule until it can demonstrate, to the satisfaction of the director, that the total actual VOC emissions from lithographic and letterpress printing operations including related cleaning activities, before consideration of controls, is less than three (3) tons per twelve (12)-month rolling period for sixty (60) consecutive months.
  - (E) VOC emissions calculations guidance may be found in subsection (5)(D) of this rule. As an alternative, the material use guidance in subsection (5)(E) of this rule may be used to determine applicability.

- (2) Definitions. [~~Definitions of certain terms specified in this rule may be found in 10 CSR 10-6.020.~~]
- (A) **Alcohol**—Refers to isopropanol, isopropyl alcohol, normal propyl alcohol, or ethanol.
  - (B) **Alcohol substitutes**—Nonalcohol additives that contain volatile organic compounds and are used in fountain solution.
  - (C) **Automatic blanket wash system**—Equipment used to clean lithographic blankets which can include, but is not limited to, those utilizing a cloth and expandable bladder, brush, spray, or impregnated cloth system.
  - (D) **Cleaning solution**—A liquid solvent used to remove printing ink and debris from the surfaces of the printing press and its parts. Cleaning solutions include, but are not limited to, blanket wash, roller wash, metering roller cleaner, plate cleaner, impression cylinder washes, and rubber rejuvenators.
  - (E) **Fountain solution**—The solution which is applied to the image plate to maintain the hydrophilic properties of the nonimage areas. It is primarily water containing an etchant, a gum arabic, and a dampening aid (commonly containing alcohol and alcohol substitutes).
  - (F) **Fountain solution reservoir**—The collection tank that accepts fountain solution recirculated from printing unit(s). In some cases, the tanks are equipped with cooling coils for refrigeration of the fountain solution.
  - (G) **Heatset**—A class of web-offset lithographic and letterpress printing in which the setting of the printing inks requires a heated dryer to evaporate the ink oils. The setting or curing of inks using only radiation (e.g., infrared, ultraviolet light, or electron beam) is not heatset and is classified as nonheatset.
  - (H) **Letterpress printing**—A printing process in which the image area is raised relative to the nonimage area, and the ink is transferred to the substrate directly from the image surface.
  - (I) **Lithographic printing**—A planographic printing process where the image and nonimage areas are chemically differentiated; the image area is oil receptive and the nonimage area is water receptive. This method differs from other printing methods, where the image is typically printed from a raised or recessed surface. Offset lithographic printing is the only common type of lithographic printing used for commercial printing.
  - (J) **Offset lithographic printing**—A printing process that transfers the ink film from the lithographic plate to an intermediary surface (rubber-covered blanket cylinder), which, in turn, transfers the ink film to the substrate.
  - (K) **Press**—A printing production assembly that can be made up of one (1) or many units to produce a finished product. This includes any associated coating, spray powder application, heatset web dryer, ultraviolet or electron beam curing units, or infrared heating units.
  - (L) **Printing**—Any operation that imparts color, images, or text onto a substrate using printing inks.
  - (M) **Printing ink**—Any fluid or viscous composition used in printing, impressing, or transferring an image onto a substrate. Varnishes and coatings applied with offset lithographic and letterpress printing presses are inks and are part

**of the applicable printing process, not a separate operation such as paper coating.**

- (N) Sheet-fed—A printing press where individual sheets of substrate are fed into the press sequentially.**
- (O) Web—A printing process where a continuous roll of substrate is fed into the press.**
- (P) Definitions of certain terms in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.**

**(3) General Provisions.**

**(A) Fountain Solutions.** This subsection applies only to offset lithographic presses with a total fountain solution reservoir capacity of one (1) gallon or more.

1. No owner or operator shall use or permit the use of any applicable offset lithographic printing press unless—
  - A. For each heatset web press—
    - (I) The fountain solution, as applied, contains one and six-tenths percent (1.6%) or less by weight of alcohol; or
    - (II) The fountain solution, as applied, contains three percent (3.0%) or less by weight of alcohol and is refrigerated to a temperature of sixty degrees Fahrenheit (60 °F) or less; or
    - (III) The fountain solution, as applied, contains five percent (5.0%) or less by weight of alcohol substitutes; and
    - (IV) The fountain solution mixing tanks are covered for alcohol-based solutions;
  - B. For each sheet-fed press with a maximum sheet size greater than eleven inches by seventeen inches (11" × 17")—
    - (I) The fountain solution, as applied, contains five percent (5.0%) or less by weight of alcohol; or
    - (II) The fountain solution, as applied, contains eight and five-tenths percent (8.5%) or less by weight of alcohol and is refrigerated to a temperature of sixty degrees Fahrenheit (60 °F) or less; or
    - (III) The fountain solution, as applied, contains five percent (5.0%) or less by weight of alcohol substitutes or a combination of alcohol and alcohol substitutes; and
    - (IV) The fountain solution mixing tanks containing alcohol-based solutions are covered; and
  - C. For each non-heatset web press, the fountain solution, as applied, contains no alcohol and five percent (5.0%) or less by weight of alcohol substitutes.
2. Direct measurement of the alcohol content of the fountain solution, as applied, shall be performed and recorded with a hydrometer, equipped with temperature correction or with readings adjusted for temperature, at least once per day or once per batch, whichever is longer. A standard solution shall be used to calibrate the hydrometer once per month for the type of alcohol used in the fountain.

3. For fountain solutions, as applied, containing alcohol substitutes or nonalcohol additives and, as an alternative to paragraph (3)(A)2. of this rule, the VOC content shall be established with proper record keeping which may include, as necessary to determine compliance, the amount of concentrated substitute added per quantity of fountain water, date of preparation, calculated VOC content of the final solution, or by measurement using ~~[U.S. Environmental Protection Agency (EPA)]~~ **40 CFR 60, Appendix A, Method 24, as specified in 10 CSR 10-6.030(22)**, analysis as outlined in paragraph (5)(C)1. of this rule. For automatic mixing systems, verification and record keeping of the mixer settings shall be performed at least once each month.
  4. The fountain solution temperature for each ~~[required]~~ refrigerated fountain reservoir containing alcohol-based solutions shall be measured at least once per day or once per batch, whichever is longer, by a thermometer or other temperature detection device capable of reading to one-half degree Fahrenheit (0.5 °F).
- (B) Press Cleaning. No owner or operator shall use or permit the use of any applicable offset lithographic or letterpress printing press unless—
1. All cleaning solutions, excluding a quantity not to exceed one hundred ten (110) gallons per facility in any twelve (12) consecutive months, shall have a VOC content of seventy percent (70%) or less, by weight, or a composite partial vapor pressure less than or equal to ten (10) millimeters of mercury (Hg) at twenty degrees Celsius (20 °C);
  2. The cleaning solutions are kept in tightly-covered containers at all times except when being dispensed as needed for cleaning operations;
  3. The used cleaning cloths contaminated with cleaning solutions are placed in tightly-closed containers while awaiting off-site transportation. The cleaning cloths should be properly cleaned and disposed; and
  4. The VOC content or composite partial vapor pressure of the cleaning solution, as applied, shall be established with proper record keeping which may include, as necessary to determine compliance, the amount of concentrated cleaning solution added per quantity of water, date of preparation, calculated VOC content, composite partial vapor pressure of the final solution, by measurement using ~~[EPA]~~ **40 CFR 60, Appendix A, Method 24, as specified in 10 CSR 10-6.030(22)**, analysis as outlined in paragraph (5)(C)2. of this rule, or the formula in paragraph (5)(C)3. of this rule. For automatic blanket wash systems, verification and record keeping of the mixer settings shall be performed at least once each month.
- (C) Heatset Web Press Emission Control Systems. This subsection applies only to heatset web lithographic and letterpress printing presses with the potential to emit (PTE) VOCs from ink oil greater than twenty-five tons per year (25 tpy) unless any such press is used for book printing or has a maximum web width of twenty-two inches (22") or less.
1. No owner or operator shall use or permit the use of any press without a dryer which has one hundred percent (100%) of its exhaust ducted to a control device that is maintained and operated to achieve, at all times

while the press is operating, at least the indicated percentage by weight control efficiency.

VOC Control Device First Installed	VOC Control Percentage
Prior to March 1, 2012	90
On or after March 1, 2012	95

The dryer pressure shall be maintained below the pressure of the press room at all times while the press is operating. Continuous dryer air flow monitoring is not required.

2. As an alternative to achieving the applicable control efficiency in paragraph (3)(C)1. of this rule, any press shall operate its control device to maintain a maximum VOC outlet concentration of twenty parts per million by volume (20 ppmv) as hexane (C<sub>6</sub>H<sub>14</sub>) on a dry basis.

- (D) Use of emission control equipment under subsection (3)(C) of this rule ~~shall~~ requires that continuous temperature monitors be installed, calibrated, maintained, and operated at all times while a connected printing press is operating. Temperatures shall be measured with an accuracy of plus or minus seventy-five hundredths of one percent ( $\pm 0.75\%$ ) measured in degrees Celsius, or two and one-half degrees Celsius (2.5 °C). The operating temperatures to be used as the parameters for demonstrating continuous compliance shall be determined per subsection (5)(A) of this rule. The monitors continuously shall measure—
  1. For catalytic oxidizers, the gas temperature upstream of the catalyst bed;
  2. For thermal and regenerative oxidizers, the oxidizer operating temperature; and
  3. Any other parameters considered necessary by the director to verify compliance and proper operation of emission control equipment.

(4) Reporting and Record Keeping.

- (A) All persons subject to this rule shall maintain records as required by this section sufficient to determine continuous compliance with this rule. These records shall be kept for at least five (5) years, or longer if enforcement action is pending~~[- These records shall be]~~, and made available immediately upon request for review by the Department of Natural Resources' personnel and other air pollution control agencies upon presentation of proper credentials.

- (B) All persons subject to subsection (3)(C) of this rule shall maintain records for each control device sufficient to demonstrate that the control efficiency is being maintained. These records shall include, but are not limited to:
  1. The temperature readings, logged at least once every fifteen (15) minutes, from the monitors required by paragraphs (3)(D)1. and (3)(D)2. of this rule; and

2. The operating parameters of any required control device determined from any initial or subsequent control efficiency compliance testing as outlined in subsection (5)(A) of this rule.
- (C) For each applicable printing press, records shall be maintained to show—
1. For each fountain solution whose VOC content is modified, the calculation or direct measurement data that indicates the resultant VOC content by weight. The calculation or measurement need only be performed once for each batch of fountain solution used except that it need not be performed at all for the dilution of a fountain solution containing alcohol substitutes purchased with less than five percent (5.0%) VOC content before dilution or for alcohol containing fountain solutions requiring refrigeration purchased with less than three percent (3%) or eight and five tenths percent (8.5%) VOC content, for heatset web and sheet-fed presses, respectively;
  2. For each fountain solution, a manufacturer's formulation data sheet or Material Safety Data Sheet (MSDS) listing the physical properties of alcohol or alcohol substitute(s) such as density and percent VOC as purchased from the supplier;
  3. Results of any testing conducted on an emission unit at a regulated facility;
  4. Maintenance records and inspection results of any air pollution control equipment; and
  5. The temperature, as required by paragraph (3)(A)1. of this rule, at least once per day or once per batch, whichever is longer.
- (D) For each lithographic and letterpress printing installation subject to this rule, records shall be maintained to show—
1. A Material Safety Data Sheet or manufacturer's formulations data listing the percentage by weight of VOC in the cleaning solution, the composite partial vapor pressure of VOC in the cleaning solution, or the necessary data to make a determination thereof as outlined in subsection (5)(C) of this rule;
  2. For each cleaning solution whose VOC content is modified, the calculation that indicates the resultant VOC content by weight or composite partial vapor pressure. The calculation need only be performed once for each batch of cleaning solution used except that it need not be performed at all for the dilution of a cleaning solution which does not exceed the VOC limits of paragraph (3)(B)1. of this rule; and
  3. The quantity of all cleaning solution used which does not meet the VOC limits set forth in paragraph (3)(B)1. of this rule on a twelve (12)-consecutive-month basis.
- (E) The director may require other records as reasonable and necessary to carry out the provisions of the Missouri Air Conservation Law.

- (5) Test Methods. Certain test methods mentioned in this rule may be found in 10 CSR 10-6.030. Other ~~[EPA-]~~**U.S. Environmental Protection Agency** test methods specific to this rule may be found in 40 CFR 60, Appendix A **as specified in 10 CSR 10-6.030(22)**.

- (A) Control Efficiency Testing. To demonstrate compliance with the emission limits of subsection (3)(C) of this rule, an initial emission test shall be performed after any required control equipment is installed. The emission limits ~~[shall]~~are not ~~[have been]~~met until compliance has been verified through this testing. Testing ~~[shall]~~is also ~~[be]~~required within one hundred eighty (180) days after significant modifications to any control equipment required by this rule. Significant modifications include any repairs or changes that might substantially alter or affect the overall control efficiency. This subsection outlines the methods to be used for any such testing.
1. The emission unit shall be run at typical operating conditions and flow rates compatible with scheduled production during any emission testing.
  2. Capture efficiency testing for heatset dryers is not required if it is demonstrated that pressure in the dryer is negative relative to the surrounding press room and the airflow is into the dryer. This test may be performed with a differential pressure gauge or an airflow direction indicator (e.g., smoke stick or aluminum ribbons).
  3. EPA Method 1 or 1A, **as specified in 10 CSR 10-6.030(22)**, as appropriate, shall be used to select the sampling sites.
  4. EPA Method 2, 2A, 2C, or 2D, **as specified in 10 CSR 10-6.030(22)**, as appropriate, shall be used to determine the velocity and volumetric flow rate of the exhaust stream.
  5. EPA Method 3 or 3A, **as specified in 10 CSR 10-6.030(22)**, as appropriate, shall be used to determine the concentration of oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>).
  6. EPA Method 4, **as specified in 10 CSR 10-6.030(22)**, shall be used to determine moisture content.
  7. EPA Method **25**, 18, ~~[25,]~~or 25A, **as specified in 10 CSR 10-6.030(22)**, shall be **used** to determine the VOC concentration of the exhaust stream entering and exiting the control device, unless the alternate limit in paragraph (3)(C)2. of this rule is being used for compliance, in which case only the VOC concentration of the exit exhaust shall be determined. In cases where the anticipated outlet VOC concentration of the control device is less than fifty (50) ppmv as carbon, EPA Method 25A, **as specified in 10 CSR 10-6.030(22)**, shall be used.
  8. If EPA Method 25A, **as specified in 10 CSR 10-6.030(22)**, is used—
    - A. The outlet readings from a thermal or catalytic oxidizer may be corrected by using EPA Method 18 or 25, **as specified in 10 CSR 10-6.030(22)**, to determine non-VOC components (methane and ethane) and subtracting these from the Method 25A result; and
    - B. The director may require a retest by EPA Method 18 or 25, **as specified in 10 CSR 10-6.030(22)**, if the average corrected outlet reading is greater than fifty (50) ppmv VOC as carbon.
  9. A compliance test shall consist of up to three (3) separate runs, each lasting a minimum of sixty (60) minutes unless the director determines that the circumstances dictate shorter sampling times.
  10. EPA Method 25, **as specified in 10 CSR 10-6.030(22)**, specifies a

minimum probe temperature of two hundred sixty-five degrees Fahrenheit (265 °F). To prevent condensation, the probe should be heated to at least the gas stream temperature, typically close to three hundred fifty degrees Fahrenheit (350 °F).

11. EPA Method 25A, **as specified in 10 CSR 10-6.030(22)**, specifies a minimum temperature of two hundred twenty degrees Fahrenheit (220 °F) for the sampling components leading to the analyzer. To prevent condensation when testing heatset printing presses, the sampling components and flame ionization detector lock should be heated to at least the gas stream temperature, typically close to three hundred fifty degrees Fahrenheit (350 °F).
12. The oxidizer operating temperature or the temperature of the gas upstream of the catalyst bed may be used as the operating parameter for determining continuous compliance with the emission standard of subsection (3)(C) of this rule. This temperature shall be computed as the time-weighted average of the temperature values recorded during the test. The owner or operator must maintain the oxidizer at a three (3)-hour average temperature equal to or greater than a temperature fifty degrees Fahrenheit (50 °F) below the average temperature observed during the most recent stack test to demonstrate continuous compliance.
13. Use of an adaptation to any of the methods specified in this subsection may be approved by the director on a case-by-case basis. The owner or operator shall submit sufficient documentation for the director to find that the methods specified in this subsection will yield inaccurate results and that the proposed adaptation is appropriate.

(B) Control Device Inspection. For catalytic oxidizers, the catalyst bed material shall be inspected annually for general catalyst condition and any signs of potential catalyst depletion. The owner or operator shall also collect a representative sample of the catalyst from the oxidizer, per manufacturer's recommendations, and have it tested to evaluate the catalyst's capability to continue to function at or above the required control efficiency. An evaluation of the catalyst bed material shall be conducted whenever the results of the inspection indicate signs of potential catalyst depletion or poor catalyst condition based on manufacturer's recommendations, but not less than once per year.

(C) VOC Content Testing.

1. Fountain solutions. Compliance with the VOC content limits for fountain solutions established in subsection (3)(A) of this rule shall be determined by one (1) of the following:
  - A. If fountain solution is diluted prior to use, a calculation that combines EPA Method 24, **as specified in 10 CSR 10-6.030(22)**, analytical data for the concentrated materials used to prepare the fountain solution and the proportions in which they are mixed to make the as-applied material. The analysis of the concentrated materials may be performed by the supplier of those materials. Owners or operators may use formulation information provided

- with the concentrated materials used to prepare the fountain solution, such as the container label, the product data sheet, or the MSDS sheet to document the VOC content of the concentrated material;
- B. If fountain solution is not diluted prior to use, MSDS or manufacturer's formulation data sheet may be used; or
  - C. EPA Method 24, **as specified in 10 CSR 10-6.030(22)**, of a sample of fountain solution, as applied.
2. Cleaning solutions. The VOC content or VOC composite partial vapor pressure of cleaning solutions shall be determined by one (1) of the following:
- A. Analysis by EPA Method 24, **as specified in 10 CSR 10-6.030(22)**, for VOC content or by an appropriate method for VOC composite partial vapor pressure of a sample of the cleaning solution. See formula in paragraph (5)(C)3. of this rule. The analysis may be performed by the supplier of those materials; or
  - B. Calculation for VOC content that combines EPA Method 24, **as specified in 10 CSR 10-6.030(22)**, analytical data for the concentrated materials used to prepare the cleaning solution and the proportions in which they are mixed to make the cleaning solution as applied. Owners or operators may use formulation information provided with the concentrated materials used to prepare the cleaning solution, such as the container label, the product data sheet, or the MSDS sheet to document the VOC content of the concentrated material;
  - C. If cleaning solution is not diluted prior to use, MSDS or manufacturer's formulation data sheet may be used.
3. Calculations. The VOC composite partial vapor pressure is the sum of the partial pressure of the compounds defined as VOCs. VOC composite partial vapor pressure is calculated as follows:

$$PP_c = \sum_{i=1}^n \frac{(W_i)(VP_i)/MW_i}{\frac{W_w}{MW_w} + \frac{W_c}{MW_c} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where:

- $W_i$  = Weight of the  $i^{\text{th}}$  VOC compound, in grams
- $W_w$  = Weight of water, in grams
- $W_c$  = Weight of exempt compound, in grams
- $MW_i$  = Molecular weight of the  $i^{\text{th}}$  VOC compound, in g/g-mole
- $MW_w$  = Molecular weight of water, in g/g-mole

- MW<sub>c</sub> = Molecular weight of exempt compound, in g/g-mole
- n = Number of VOC compounds
- PP<sub>c</sub> = VOC composite partial vapor pressure at 20 °C (68 °F), in mmHg
- VP<sub>i</sub> = Vapor pressure of the i<sup>th</sup> VOC compound at 20 °C (68 °F), in mmHg

- (D) VOC Emission Calculations, Retention Factors, and Capture Efficiencies. For purposes of determining VOC emissions from lithographic and letterpress printing operations, the following retention factors and capture efficiencies and formula shall be used:
1. A portion of the VOC contained in inks and cleaning solution is retained in the printed web or in the shop towels used for cleaning. The following retention factors shall be used:
    - A. For heatset inks printed on absorptive substrates, a twenty percent (20%) VOC retention factor shall be used meaning eighty percent (80%) of the VOC in the ink is emitted during the printing process and is available for capture and control by an add-on pollution control device;
    - B. For sheet-fed and non-heatset web inks printed on absorptive substrates, a ninety-five percent (95%) VOC retention factor shall be used, meaning five percent (5%) of the VOC in the ink is emitted during the printing process; and
    - C. For cleaning solution VOC emissions from shop towels using cleaning solutions with a VOC composite vapor pressure of no more than ten (10) mmHg at twenty degrees Celsius (20 °C) (sixty-eight degrees Fahrenheit (68 °F)), a fifty percent (50%) VOC retention factor shall be used if the contaminated shop towels are kept in closed containers;
  2. A portion of the VOC contained in inks, fountain solutions, and automatic blanket washes on heatset presses is captured in the press dryer for control by add-on pollution control devices. The following capture factors shall be used:
    - A. For inks, a one hundred percent (100%) VOC capture efficiency shall be used. All the VOC in the ink that is not retained is assumed to be volatilized in the press dryer if it is demonstrated that the pressure in the dryer is negative relative to the surrounding press room and the airflow is into the dryer;
    - B. For fountain solutions containing alcohol substitutes, a seventy percent (70%) VOC capture factor shall be used; and
    - C. For automatic blanket wash solutions with a VOC composite partial vapor pressure of no more than ten (10) mmHg at twenty degrees Celsius (20 °C) (sixty-eight degrees Fahrenheit (68 °F)), a

- forty percent (40%) VOC capture factor shall be used; and
3. For calculating VOC emissions, the following equations shall be used:
- A. For total VOC emissions from an offset lithographic printing facility, including all related cleaning activities—

$$VOC_{TOT} = \sum_{i=1}^m W_{INK_i} * VOC_{INK_i} * \left(1 - \frac{RF_{INK_i}}{100}\right) + \sum_{i=1}^n VOL_{FS_i} * VOC_{FS_i} + \sum_{i=1}^p VOL_{CS_i} * VOC_{CS_i} * \left(1 - \frac{RF_{CS_i}}{100}\right)$$

Where:

- $VOC_{TOT}$  = Total VOC emissions, expressed as pounds
- $W_{INK}$  = Weight of ink used, expressed as pounds
- $VOC_{INK}$  = Weight fraction of VOC in the ink
- $RF_{INK}$  = Retention factor of the ink, expressed as a percent
- $m$  = Number of inks
- $VOL_{FS}$  = Volume of fountain solution used, expressed as gallons
- $VOC_{FS}$  = VOC content of fountain solution, expressed as pounds per gallon
- $n$  = Number of fountain solutions
- $VOL_{CS}$  = Volume of cleaning solution used, expressed as gallons
- $VOC_{CS}$  = VOC content of cleaning solution, expressed as pounds per gallon
- $RF_{CS}$  = Retention factor of the cleaning solution, expressed as a percent
- $p$  = Number of cleaning solutions

and

- B. For VOC ink oil emissions from a heatset web lithographic or letterpress printing press—

$$VOC_{TOT} = \sum_{i=1}^n W_{INK_i} * VOC_{INK_i} * \left(1 - \frac{RF_{INK_i}}{100}\right)$$

Where:

VOC <sub>TOT</sub>	= Total VOC emissions, expressed as pounds
W <sub>INK</sub>	= Weight of ink used, expressed as pounds
VOC <sub>INK</sub>	= Weight fraction of VOC in the ink
RF <sub>INK</sub>	= Retention factor of the ink, expressed as a percent
n	= Number of inks

(E) Material Use Guidance: Applicability Determination. Based on EPA's *Potential to Emit (PTE) Guidance for Specific Source Categories* (April 14, 1998), **published by EPA April 1998 and hereby incorporated by reference in this rule**, and the equations of paragraph (5)(D)3. of this rule, the methods in this subsection may be used for determining if a facility or press meets the corresponding applicability thresholds. **Copies can be obtained from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield VA 22161. This rule does not incorporate any subsequent amendments or additions.**

1. For determining if a facility meets the applicability limits of subsection (1)(B) of this rule, the material use thresholds are as follows:

Type of Printing Operation	12-Month Rolling Material Use Threshold
Sheet-fed	768 gallons of cleaning solvent and fountain solution additives
Non-heatset Web	768 gallons of cleaning solvent and fountain solution additives
Heatset Web	5,400 pounds of ink, cleaning solvent, and fountain solution additives

2. For determining if a web heatset press is subject to subsection (3)(C) of this rule, the material use thresholds are as follows:

Type of Printing Press	Annual Material Use Threshold
Heatset Web	55,800 pounds of ink

*AUTHORITY: section 643.050, RSMo [~~2000~~]2016. Original rule filed Oct. 7, 1994, effective May 28, 1995. Amended: Filed Nov. 30, 2010, effective Aug. 30, 2011. Amended: Filed March 20, 2019.*

*PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.*

*PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate.*

*NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed amendment will begin at 9:00 a.m., July 25, 2019. The public hearing will be held at the St. Louis Regional Office, 7545 South Lindbergh, Suite 220, DESE Conference Room, St. Louis,, Missouri. Opportunity to be heard at the hearing shall be afforded to any interested person. Interested persons, whether or not heard, may submit a statement of their views until 5:00 p.m., August 1, 2019. Send online comments via the proposed rules web page [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules), email comments to [apcprulespn@dnr.mo.gov](mailto:apcprulespn@dnr.mo.gov), or written comments to Chief, Air Quality Planning Section, Missouri Department of Natural Resources' Air Pollution Control Program, PO Box 176, Jefferson City, MO 65102-0176.*

**PUBLIC HEARING ON  
PROPOSED AMENDMENT TO  
10 CSR 10-5.550**

**CONTROL OF VOLATILE ORGANIC COMPOUND EMISSIONS FROM REACTOR  
PROCESSES AND DISTILLATION OPERATIONS PROCESSES IN THE SYNTHETIC  
ORGANIC CHEMICAL MANUFACTURING INDUSTRY**

This amendment will change the rule purpose, subsections (1)(A), (1)(C), (2)(I), (2)(M), (2)(N), (3)(A), and (3)(B).

The rule purpose is being amended to clarify rule applicability by emphasizing that the rule is to limit volatile organic compound emissions in the St. Louis 1997 eight (8)-hour ozone nonattainment area.

Subsection (1)(A) is being amended to clarify rule applicability by emphasizing that the rule applies to vent streams from reactor processes or distillation operations located in St. Louis City and Jefferson, St. Charles, Franklin, and St. Louis Counties on November 30, 2019.

Subsection (1)(C) is being amended to remove the unnecessary use of a restrictive word.

Subsections (2)(I), (2)(M), (2)(N), (3)(A), and (3)(B) are being amended to update incorporation by reference information.

*NOTE 1 - Legend for rule actions to be presented at public hearing is as follows:*

- \* Shaded Text - Rule sections or subsections not proposed for amendment. This text is only for reference.*
- \* Unshaded Text - Rule sections or subsections that are proposed for change.*

*NOTE 2 - All unshaded text below this line is printed in the Missouri Register.*

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**Title 10—DEPARTMENT OF  
NATURAL RESOURCES**

**Division 10—Air Conservation Commission**

**Chapter 5—Air Quality Standards and Air Pollution Control Rules Specific to the  
St. Louis Metropolitan Area**

**PROPOSED AMENDMENT**

**10 CSR 10-5.550 Control of Volatile Organic Compound Emissions From Reactor  
Processes and Distillation Operations Processes in the Synthetic Organic Chemical**

**Manufacturing Industry.** The commission proposes to amend the rule title, subsections (1)(A), (1)(C), (2)(I), (2)(M), (2)(N), (3)(A), and (3)(B). If the commission adopts this rule action, the Department intends to submit this rule amendment to the U.S. Environmental Protection Agency to replace the current rule that is in the Missouri State Implementation Plan. The evidence supporting the need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources' Air Pollution Control Program at the address listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources' Proposed Rules website [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules).

*PURPOSE: This amendment updates the incorporation by reference of material and removes the unnecessary use of restrictive words. The evidence supporting the need for this proposed rulemaking, per 536.016, RSMo, is Executive Order 17-03 Red Tape Reduction Review and related comments.*

*PURPOSE: This rule limits volatile organic compound emissions from reactor processes and distillation operations **in the St. Louis 1997 eight (8)-hour ozone nonattainment area.***

(1) Applicability.

(A) The provisions of this rule apply to any vent stream originating from a process unit ~~[in which]~~**with** a reactor process or distillation operation~~[s is]~~**located in St. Louis City and Jefferson, St. Charles, Franklin and St. Louis Counties existing on November 30, 2019.**

(B) Exemptions from the provisions of this rule are as follows:

1. Any reactor process or distillation operation that is designed and operated in a batch mode is not subject to the provisions of this rule;
2. Any reactor process or distillation operation that is part of a polymer manufacturing operation is not subject to the provisions of this rule;
3. Any reactor process or distillation operation operating in a process unit with a total design capacity of less than one (1) gigagram (1,100 tons) per year for all chemicals produced within that unit is not subject to the provisions of this rule except for the reporting and record keeping requirements listed in subsection (4)(D) of this rule; and
4. Any vent stream for a reactor process or distillation operation with a flow rate less than 0.0085 standard cubic meter per minute or a total volatile organic compound (VOC) concentration less than five hundred (500) parts per million by volume is not subject to the provisions of this rule except for the performance testing requirement listed in subparagraph (3)(B)3.B., paragraph (3)(B)9. and the reporting and record keeping requirements listed in subsection (4)(C) of this rule.

(C) In the event that other rules in Title 10 Division 10 of the *Code of State Regulations* are also applicable to reactor processes and distillation operation processes in the chemical manufacturing industry, the more stringent rule ~~[shall apply]~~**applies.**

(2) Definitions.

- (A) Batch mode—A noncontinuous operation or process in which a discrete quantity or batch of feed is charged into a process unit and distilled or reacted at one time.
- (B) Boiler—Any enclosed combustion device that extracts useful energy in the form of steam.
- (C) By compound—By individual stream components, not carbon equivalents.
- (D) Continuous recorder—A data recording device recording an instantaneous data value at least once every fifteen (15) minutes.
- (E) Distillation operation—An operation separating one (1) or more feed stream(s) into two (2) or more exit stream(s), each exit stream having component concentration different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid- and vapor-phase as they approach equilibrium within the distillation unit.
- (F) Distillation unit—A device or vessel in which distillation operations occur, including all associated internals (such as trays or packing) and accessories (such as reboiler, condenser, vacuum pump, stream jet, etc.), plus any associated recovery system.
- (G) Flame zone—The portion of the combustion chamber in a boiler occupied by the flame envelope.
- (H) Flow indicator—A device that indicates whether gas flow is present in a vent stream.
- (I) Halogenated vent stream—Any vent stream determined to have a total concentration of halogen atoms (by volume) contained in organic compounds of two hundred (200) parts per million by volume or greater determined by Method 18 of 40 CFR part 60, Appendix A, **as specified in 10 CSR 10-6.030(22)**, or other test or data validated by Method 301 [¶]of 40 CFR part 63, Appendix A, or by engineering assessment or process knowledge that no halogenated organic compounds are present. **40 CFR 63 promulgated as of July 1, 2018 is hereby incorporated by reference in this rule, as published by the Office of the Federal Register. Copies can be obtained from the U.S. Publishing Office Bookstore, 710 N. Capitol Street NW, Washington DC 20401. This rule does not incorporate any subsequent amendments or additions.** For example, one hundred fifty (150) parts per million by volume of ethylene dichloride would contain three hundred (300) parts per million by volume of total halogen atoms.
- (J) Incinerator—Any enclosed combustion device that is used for destroying organic compounds. Auxiliary fuel may be used to heat waste gas to combustion temperatures. Any energy recovery section present is not physically formed into one section; rather, the energy recovery system is a separate section following the combustion section and the two are joined by ducting or connections that carry fuel gas.
- (K) Primary fuel—The fuel that provides the principal heat input to the device. To be considered primary, the fuel must be able to sustain operation without the addition of other fuels.
- (L) Process heater—A device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that is heated to produce steam.
- (M) Process unit—Equipment assembled and connected by pipes or ducts to produce,

as intermediates or final products, one or more SOCOMI chemicals (see Appendix A of Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry, EPA-450/4-91-031, ~~incorporated by reference~~ **as published by EPA August 1993 and hereby incorporated by reference in this rule. Copies can be obtained from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield VA 22161. This rule does not incorporate any subsequent amendments or additions**). A process unit can operate independently if supplied with sufficient feed or raw materials and sufficient product storage facilities.

- (N) Product—Any compound or SOCOMI chemical (see Appendix A of Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry, EPA-450/4-91-031, **as incorporated by reference in subsection (2)(M) of this rule**) that is produced as that chemical for sales as a product, by-product, co-product, or intermediate or for use in the production of other chemicals or compounds.
- (O) Reactor processes—Unit operations in which one (1) or more chemicals, or reactants other than air, are combined or decomposed in such a way that their molecular structures are altered and one or more new organic compounds are formed.
- (P) Recovery device—An individual unit of equipment, such as an adsorber, carbon adsorber, or condenser, capable of and used for the purpose of recovering chemicals for use, reuse, or sale.
- (Q) Recovery system—An individual recovery device or series of such devices applied to the same vent stream.
- (R) Total organic compounds or "TOC"—Those compounds measured according to the procedures of Method 18 of 40 CFR part 60, Appendix A. For the purposes of measuring molar compositions as required in subparagraph (3)(B)3.D.; hourly emissions rate as required in subparagraph (3)(B)5.D. and paragraph (3)(B)2.; and TOC concentration as required in paragraph (4)(A)4. The definition of TOC excluded those compounds that the administrator designates as having negligible photochemical reactivity. The administrator has designated the following organic compounds negligibly reactive: methane; ethane; 1,1,1-trichloroethane; methylene chloride; trichlorofluoromethane; dichlorodifluoromethane; chlorodifluoromethane; trifluoromethane; trichlorotrifluoroethane; dichlorotetrafluoroethane; and chloropenta-fluoroethane.
- (S) Total resource effectiveness index value or "TRE index value"—A measure of the supplemental total resource requirement per unit reduction of organic hazardous air pollutants associated with a process vent stream, based on vent stream flow rate, emission rate of volatile organic compound, net heating value, and corrosion properties (whether or not the vent stream contains halogenated compounds) as quantified by the given equations. The TRE index is a decision tool used to determine if the annual cost of controlling a given vent gas stream is acceptable when considering the emissions reduction achieved.
- (T) Vent stream—Any gas stream discharge directly from a distillation operation or

reactor process to the atmosphere or indirectly to the atmosphere after diversion through other process equipment. The vent stream excludes relief valve discharges and equipment leaks including, but not limited to, pumps, compressors, and valves.

- (U) Definitions of certain terms specified in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.

(3) General Provisions.

(A) Control Requirements.

1. For individual vent streams within a process unit with a TRE index value less than or equal to one (1.0), the owner or operator shall—
  - A. Reduce emissions of TOC (less methane and ethane) by ninety-eight (98) weight-percent, or to twenty (20) parts per million by volume, on a dry basis corrected to three percent (3%) oxygen, whichever is less stringent. If a boiler or process heater is used to comply with this paragraph, then the vent stream shall be introduced into the flame zone of the boiler or process heater; or
  - B. Combust emissions in a flare. Flares used to comply with this paragraph shall comply with the requirements of 40 CFR 60.18 as **specified in 10 CSR 10-6.070(1)(A)**. The flare operation requirement does not apply if a process, not subject to this rule, vents an emergency relief discharge into a common flare header and causes the flare servicing the process subject to this rule to be out of compliance with one or more of the provisions of the flare operation rule.
2. For each individual vent stream(s) within a process unit with a TRE index value greater than one (1.0), the owner or operator shall maintain vent stream parameters that result in a calculated total resource effectiveness greater than one (1.0) without the use of a volatile organic compound control device. The TRE index shall be calculated at the outlet of the final recovery device.

(B) Total Resource Effectiveness Determination, Performance Testing, and Exemption Testing.

1. For the purpose of demonstrating compliance with the TRE index value in paragraph (3)(A)2. of this rule, engineering assessment may be used to determine process vent stream flow rate, net heating value, and TOC emission rate for the representative operating condition expected to yield the lowest TRE index value.
  - A. If the TRE value calculated using such engineering assessment and the TRE equation in subparagraph (3)(B)6.A. of this rule is greater than four (4.0), then it is not recommended that the owner or operator perform the measures specified in paragraph (3)(B)5. of this rule.
  - B. If the TRE value calculated using such engineering assessment and the TRE equation in subparagraph (3)(B)6.A. of this rule is less than or equal to four (4.0), then it is recommended that the owner

or operator perform the measurements specified in paragraph (3)(B)5. of this rule.

- C. Engineering assessment includes, but is not limited to, the following:
- (I) Previous test results proved the test is representative of current operating practices at the process unit;
  - (II) Bench-scale or pilot-scale test data representative of the process under representative operating conditions;
  - (III) Maximum flow rate specified or implied within a permit limit applicable to the process vent;
  - (IV) Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples for analytical methods include, but are not limited to:
    - (a) Use of material balances based on process stoichiometry to estimate maximum VOC concentration;
    - (b) Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities;
    - (c) Estimation of TOC concentrations based on saturation conditions; and
    - (d) Estimation of maximum expected net heating value based on the stream concentration of each organic compound, or, alternatively, as if all TOC in the stream were the compound with the highest heating value; and
  - (V) All data, assumptions, and procedures used in the engineering assessment shall be documented.
2. For the purpose of demonstrating compliance with the control requirements of this rule, the process unit shall be run at representative operating conditions and flow rates during any performance test.
3. The following methods in 40 CFR part 60, Appendix A, **as specified in 10 CSR 10-6.030(22)**, shall be used to demonstrate compliance with the emission limit or percent reduction efficiency requirement listed in subparagraph (3)(A)1.A. of this rule:
- A. Method 1 or 1A, as appropriate, for selection of the sampling sites. The control device inlet sampling site for determination of vent stream molar composition or TOC (less methane and ethane) reduction efficiency shall be located after the last recovery device but prior to the inlet of the control device, prior to any dilution of the process vent stream, and prior to release to the atmosphere;
  - B. Method 2, 2A, 2C, or 2D, as appropriate, for determination of gas stream volumetric flow rate;
  - C. The emission rate correction factor, integrated sampling, and analysis procedure of Method 3 to determine the oxygen

concentration (%O<sub>2d</sub>) for the purpose of determining compliance with the twenty (20) parts per million by volume limit. The sampling site shall be the same as that of the TOC samples, and samples shall be taken during the same time that the TOC samples are taken. The TOC concentration corrected to three percent (3%) oxygen (C<sub>c</sub>) shall be computed using the following equation:

$$C_c = C_{TOC} \times \left( \frac{17.9}{20.9 - \%O_{2d}} \right)$$

where:

C<sub>c</sub> = Concentration of TOC (minus methane and ethane) corrected to three percent (3%) O<sub>2</sub>, dry basis, parts per million by volume;

C<sub>TOC</sub> = Concentration of TOC (minus methane and ethane), dry basis, parts per million by volume; and

%O<sub>2d</sub> = Concentration of oxygen, dry basis, percent by volume;

D. Method 18 to determine the concentration of TOC (less methane and ethane) at the outlet of the control device when determining compliance with the twenty (20) parts per million by volume limit, or at both the control device inlet and outlet when the reduction efficiency of the control device is to be determined.

(I) The minimum sampling time for each run shall be one (1) hour in which either an integrated sample or four (4) grab samples shall be taken. If grab sampling is used then the samples shall be taken at fifteen (15)-minute intervals.

(II) The emission reduction (R) of TOC (less methane and ethane) shall be determined using the following equation:

$$R = \frac{E_i - E_o}{E_i} \times 100$$

where:

R = Emission reduction, percent by weight.

E<sub>i</sub> = Mass rate of TOC (minus methane and ethane) entering the control device, kilogram TOC per hour.

E<sub>o</sub> = Mass rate of TOC (minus methane and ethane) discharged to the atmosphere, kilogram TOC per hour.

(III) The mass rates of TOC (E<sub>i</sub>, E<sub>o</sub>) shall be computed using the following equations:

$$E_i = K_2 \left( \sum_{j=1}^n C_{ij} M_{ij} \right) Q_i$$

; and

$$E_o = K_2 \left( \sum_{j=1}^n C_{oj} M_{oj} \right) Q_o$$

where:

$C_{ij}, C_{oj}$  = Concentration of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, dry basis, parts per million by volume;

$M_{ij}, M_{oj}$  = Molecular weight of sample component "j" of the gas stream at the inlet and outlet of the control device, respectively, grams per gram-mole;

$Q_i, Q_o$  = Flow rate of gas stream at the inlet and outlet of the control device, respectively, dry standard cubic meters per minute;

$K_2$  =  $2.494 \times 10^{-6}$  (liters per minute) (gram-mole per standard cubic meter)(kilogram per gram)(minute per hour), where standard temperature for (gram-mole per standard cubic meter) is twenty degrees Celsius (20°C); and

$n$  = Number of components in the sample.

- (IV) The TOC concentration ( $C_{TOC}$ ) is the sum of the individual components and shall be computed for each run using the following equation:

$$C_{TOC} = \sum_{j=1}^n C_j$$

where:

$C_{TOC}$  = Concentration of TOC (minus methane and ethane), dry basis, parts per million by volume;

$C_j$  = Concentration of sample component "j", dry basis, parts per million by volume; and

$N$  = Number of components in the sample; and

- E. When a boiler or process heater with a design heat input capacity of forty-four (44) megawatts or greater, or a boiler or process heater into which the process vent stream is introduced with the primary fuel, is used to comply with the control requirements, an initial performance test is not required.
4. When a flare is used to comply with the control requirements of this rule, the flare shall comply with the requirements of 40 CFR part 60.18.
5. The following test methods shall be used to determine compliance with the TRE index value:
- A. Method 1 or 1A, as appropriate, for selection of the sampling site.
- (I) The sampling site for the vent stream molar composition

determination and flow rate prescribed in subparagraph (3)(B)5.B. and subparagraph (3)(B)5.C. of this rule shall be, except for the situations outlined in part (3)(B)5.A.(II) of this rule, after the final recovery device, if a recovery system is present, prior to the inlet of any control device, and prior to any post-reactor or post-distillation unit introduction of halogenated compounds into the process vent stream. No traverse site selection method is needed for vents smaller than ten (10) centimeters in diameter.

- (II) If any gas stream other than the reactor or distillation vent stream is normally conducted through the final recovery device—
  - (a) The sampling site for vent stream flow rate and molar composition shall be prior to the final recovery device and prior to the point at which any nonreactor or nondistillation stream or stream from a nonaffected reactor or distillation unit is introduced. Method 18 shall be used to measure organic compound concentrations at this site;
  - (b) The efficiency of the final recovery device shall be determined by measuring the organic compound concentrations using Method 18 at the inlet to the final recovery device after the introduction of all vent streams and at the outlet of the final recovery device; and
  - (c) The efficiency of the final recovery device determined according to subpart (3)(B)5.A.(II)(b) of this rule shall be applied to the organic compound concentrations measured according to subpart (3)(B)5.A.(II)(a) of this rule to determine the concentrations of organic compounds from the final recovery device attributable to the reactor or distillation vent stream. The resulting organic compound concentrations are then used to perform the calculations outlined in subparagraph (3)(B)5.D. of this rule;
- B. The molar composition of the vent stream shall be determined as follows:
  - (I) Method 18 to measure the concentration of organic compounds including those containing halogens; and
  - (II) ASTM [~~D1946-77~~]**D1946-90(2015)e1, as specified in 10 CSR 10-6.040(16)**, to measure the concentration of carbon monoxide and hydrogen;
- C. The volumetric flow rate shall be determined using Method 2, 2A, 2C, or 2D, as appropriate;
- D. The emission rate of TOC (minus methane and ethane), ( $E_{\text{TOC}}$ ), in

the vent stream shall be calculated using the following equation:

$$E_{\text{TOC}} = K_2 \sum_{j=1}^n C_j M_j Q_s$$

where:

$E_{\text{TOC}}$  = Emission rate of TOC (minus methane and ethane) in the sample, kilograms per hour;

$K_2$  = Constant,  $2.494 \times 10^{-6}$  (liters per parts per million)(gram-moles per standard cubic meter)(kilogram per gram)(minute per hour), where standard temperature for (gram-mole per standard cubic meter)(g-mole/scm) is twenty degrees Celsius ( $20^\circ\text{C}$ );

$C_j$  = Concentration of compound "j", on a dry basis, in parts per million as measured by Method 18, as indicated in subparagraph (3)(B)3.C. of this rule;

$M_j$  = Molecular weight of sample "j", grams per gram-mole;

$Q_s$  = Vent stream flow rate (standard cubic meters per minute) at a temperature of twenty degrees Celsius ( $20^\circ\text{C}$ ); and

$n$  = Number of components in the sample;

- E. The total process vent stream concentration (by volume) of compounds containing halogens (parts per million by volume, by compound) shall be summed from the individual concentrations of compounds containing halogens which were measured by Method 18; and
- F. The net heating value of the vent stream shall be calculated using the equation:

$$H_T = K_1 \sum_{j=1}^n C_j H_j (1 - B_{ws})$$

where:

$H_T$  = Net heating value of the sample (megajoule per standard cubic meter), where the net enthalpy per mole of vent stream is based on combustion at twenty-five degrees Celsius ( $25^\circ\text{C}$ ) and seven hundred sixty (760) millimeters of mercury, but the standard temperature for determining the volume corresponding to one mole is twenty degrees Celsius ( $20^\circ\text{C}$ ), as in the definition of  $Q_s$  (vent stream flow rate);

$K_1$  = Constant,  $1.740 \times 10^{-7}$  (parts per million)<sup>-1</sup> (gram-mole per standard cubic meter), (megajoule per kilocalorie), where standard temperature for (gram-mole per standard cubic meter) is twenty degrees Celsius ( $20^\circ\text{C}$ );

$B_{ws}$  = Water vapor content of the vent stream, proportion by volume: except that if the vent stream passes through a final stream jet and is not condensed, it shall be assumed that  $B_{ws} = 0.023$  in order to correct to 2.3 percent moisture;

$C_j$  = Concentration on a dry basis of compound "j" in parts per million, as measured for all organic compounds by Method 18 and measured for hydrogen and carbon monoxide by the American Society for Testing and Materials [~~D1946-77~~]**D1946-90(2015)e1, as specified in 10 CSR 10-6.040(16)**;

$H_j$  = Net heat of combustion of compound "j", kilocalorie per gram-mole, based on combustion at twenty-five degrees Celsius (25°C) and seven hundred sixty (760) millimeters of mercury. The heat of combustion of vent stream components shall be determined using ASTM [~~D2382-76~~]**D4809-13, as specified in 10 CSR 10-6.040(25)**, if published values are not available or cannot be calculated; and

$n$  = Number of components in the sample.

6. The Total Resource Effectiveness (TRE) index.

A. The TRE index value of the vent shall be calculated using the following equation:

$$TRE = \frac{1}{E_{TOC}} [a + b (Q_s) + c (H_t) + d (E_{TOC})]$$

where:

TRE = TRE index value;

$E_{TOC}$  = Hourly emission rate of TOC (minus methane and ethane), (kilograms per hour) as calculated in subparagraph (3)(B)5.D. of this rule;

$Q_s$  = Vent stream flow rate standard cubic meters per minute at a standard temperature of twenty degrees Celsius (20°C);

$H_T$  = Vent stream net heating value (megajoules per standard cubic meter), as calculated in subparagraph (3)(B)5.F. of this rule; and

a,b,c,d = Coefficients presented in Table 1.

**Table 1**  
Coefficients for Total Resource Effectiveness for Nonhalogenated and Halogenated Vent Streams

Values of Coefficients		Values of Coefficients			
Type of Stream	Control Device Basis	a	b	c	d

Values of Coefficients					
Nonhalogenated	Flare	2.129	0.183	-0.005	0.359
	Thermal incinerator 0 percent heat recovery	3.075	0.021	-0.037	0.018
	Thermal incinerator 70 Percent heat recovery	3.803	0.032	-0.042	0.007
Halogenated and scrubber	Thermal incinerator	5.470	0.181	-0.040	0.004

Values of Coefficients

- B. The owner or operator of a vent stream shall use the applicable coefficients in Table 1 to calculate the TRE index value based on a flare, a thermal incinerator with zero percent (0%) heat recovery, and a thermal incinerator with seventy percent (70%) heat recovery, and [shall]select the lowest TRE index value.
  - C. The owner or operator of a unit with a halogenated vent stream, determined as any stream with a total concentration of halogen atoms contained in organic compounds of two hundred (200) parts per million by volume or greater, shall use the applicable coefficients in Table 1 to calculate the total resource effectiveness index value based on a thermal incinerator and scrubber.
7. Each owner or operator of an affected facility seeking to comply with paragraph (3)(A)2. of this rule shall recalculate the flow rate and TOC concentration for that affected facility whenever process changes are made. Examples of process changes include changes in production capacity, feedstock type, or catalyst type, or whenever there is replacement, removal, or addition of recovery equipment. The flow rate and VOC concentration shall be recalculated based on test data, or on best engineering estimates of the effects of the change to the recovery system.
  8. Where the recalculated values yield a TRE index  $\leq 1.0$ , the owner or operator shall notify the state Air Pollution Control Program within one (1) week of the recalculation and [shall]conduct a performance test according to the methods and procedures required by subsection (3)(B) of this rule.
  9. For the purpose of demonstrating that a process vent stream has a VOC concentration below five hundred (500) parts per million by volume, the following procedures shall be followed:
    - A. The sampling site shall be selected as specified in subparagraph (3)(B)3.A. of this rule;
    - B. Method 18 or Method 25A of 40 CFR part 60, Appendix A, as **specified in 10 CSR 10-6.030(22)**, shall be used to measure concentration; alternatively, any other method or data that has been validated according to the protocol in Method 301 of 40 CFR part 63, Appendix A may be used.

- (I) Where Method 18 is used, the following procedures shall be used to calculate parts per million by volume concentration:
    - (a) The minimum sampling time for each run shall be one (1) hour in which either an integrated sample or four (4) grab samples shall be taken. If grab sampling is used, then the samples shall be taken at approximately equal intervals in time, such as fifteen (15)-minute intervals during the run; and
    - (b) The concentration of TOC (minus methane and ethane) shall be calculated using Method 18 according to subparagraph (3)(B)3.D. of this rule.
  - (II) Where Method 25A is used, the following procedures shall be used to calculate parts per million by volume TOC concentration:
    - (a) Method 25A shall be used only if a single VOC is greater than fifty percent (50%) of total VOC, by volume, in the process vent stream;
    - (b) The process vent stream composition may be determined by either process knowledge, test data collected using an appropriate EPA method or a method of data collection validated according to the protocol in Method 301 of 40 CFR part 63, Appendix A. Examples of information that could constitute process knowledge include calculations based on material balances, process stoichiometry, or previous test results provided the results are still relevant to the current process vent stream conditions;
    - (c) The VOC used as the calibration gas for Method 25A shall be the single VOC present at greater than fifty percent (50%) of the total VOC by volume;
    - (d) The span value for Method 25A shall be fifty (50) parts per million by volume;
    - (e) Use of Method 25A is acceptable if the response from the high-level calibration gas is at least twenty (20) times the standard deviation of the response from the zero calibration gas when the instrument is zeroed on the most sensitive scale; and
    - (f) The concentration of TOC shall be corrected to three percent (3%) oxygen using the procedures and equation in subparagraph (3)(B)3.C. of this rule; and
- C. The owner or operator shall demonstrate that the concentration of TOC including methane and ethane measured by Method 25A is below two hundred fifty (250) parts per million by volume with

VOC concentration below five hundred (500) parts per million by volume to qualify for the low concentration exclusion.

(C) Monitoring Requirements.

1. The owner or operator of an affected facility that uses an incinerator to seek to comply with the TOC emission limit specified under subparagraph (3)(A)1.A. of this rule shall install, calibrate, maintain, and operate according to manufacturer's specifications: a temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of plus or minus one percent ( $\pm 1\%$ ) of the temperature being measured expressed in degrees Celsius or plus or minus ( $\pm$ )  $0.5^{\circ}\text{C}$ , whichever is more accurate.
  - A. Where an incinerator other than a catalytic incinerator is used, a temperature monitoring device shall be installed in the firebox.
  - B. Where a catalytic incinerator is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.
2. The owner or operator of an affected facility that uses a flare to seek to comply with subparagraph (3)(A)1.B. of this rule shall install, calibrate, maintain, and operate according to manufacturer's specifications, a heat-sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light to indicate continuous presence of a flame.
3. The owner or operator of an affected facility that uses a boiler or process heater with a design heat input capacity less than forty-four (44) megawatts to seek to comply with subparagraph (3)(A)1.A. of this rule shall install, calibrate, maintain, and operate according to the manufacturer's specifications, a temperature monitoring device in the firebox. The monitoring device should be equipped with a continuous recorder and have a minimum accuracy of plus or minus one percent ( $\pm 1\%$ ) of the temperature being measured expressed in degrees Celsius or plus or minus ( $\pm$ )  $0.5^{\circ}\text{C}$ , whichever is more accurate. Any boiler or process heater in which all vent streams are introduced with primary fuel is exempt from this requirement.
4. The owner or operator of an affected facility that seeks to demonstrate compliance with the total resource effectiveness index limit specified under paragraph (3)(A)2. of this rule shall install, calibrate, maintain, and operate according to manufacturer's specifications the following equipment:
  - A. Where an absorber is the final recovery device in the recovery system—
    - (I) A scrubbing liquid temperature monitor equipped with a continuous recorder; and
    - (II) Specific gravity monitor equipped with continuous recorders;
  - B. Where a condenser is the final recovery device in the recovery system, a condenser exit (product side) temperature monitoring device equipped with a continuous recorder and having a minimum

accuracy of plus or minus one percent ( $\pm 1\%$ ) of the temperature being monitored expressed in degrees Celsius or plus or minus ( $\pm$ )  $0.5^{\circ}\text{C}$ , whichever is more accurate;

- C. Where a carbon adsorber is the final recovery device unit in the recovery system, in integrating regeneration stream flow monitoring device having a minimum accuracy of plus or minus ten percent ( $\pm 10\%$ ), capable of recording the total regeneration stream mass flow for each regeneration cycle; and a carbon bed temperature monitoring device having a minimum accuracy of plus or minus one percent ( $\pm 1\%$ ) of the temperature being monitored expressed in degrees Celsius or plus or minus ( $\pm$ )  $0.5^{\circ}\text{C}$ , whichever is more accurate, and capable of recording the carbon bed temperature after each regeneration and within fifteen (15) minutes of completing any cooling cycle; or
- D. Where an absorber scrubs halogenated streams after an incinerator, boiler, or process heater, the following monitoring equipment is required for the scrubber—
  - (I) A pH monitoring device equipped with a continuous recorder; and
  - (II) Flow meters equipped with continuous recorders to be located at the scrubber influent for liquid flow and the scrubber inlet for gas stream flow.

5. The owner or operator of a process vent using a vent system that contains bypass lines that could divert a vent stream away from the combustion device used shall either—

- A. Install, calibrate, maintain, and operate a flow indicator that provides a record of vent stream flow at least once every fifteen (15) minutes. The flow indicator shall be installed at the entrance to any bypass line that could divert the vent stream away from the combustion device to the atmosphere; or
- B. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and the vent stream is not diverted through the bypass line.

(4) Reporting and Record Keeping.

(A) Each reactor process or distillation operation subject to this rule shall keep records of the following parameters measured during a performance test or TRE determination required under subsection (3)(B) of this rule and required to be monitored under subsection (3)(C) of this rule.

1. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subparagraph (3)(A)1.A. of this rule through the use of either a thermal or catalytic incinerator—

- A. The average firebox temperature of the incinerator (or the average temperature upstream and downstream of the catalyst bed for a

- catalytic incinerator), measured at least every fifteen (15) minutes and averaged over the same time period of the performance testing; and
- B. The percent reduction of TOC determined as specified in paragraph (3)(B)3. of this rule achieved by the incinerator, or the concentration of TOC (parts per million by volume, by compound) determined as specified in paragraph (3)(B)3. of this rule at the outlet of the control device on a dry basis corrected to three percent (3%) oxygen.
2. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subparagraph (3)(A)1.A. of this rule through the use of a boiler or process heater and the boiler or process heater is not exempt from these requirements due to all vent streams being introduced with primary fuel—
    - A. A description of the location at which the vent stream is introduced into the boiler or process heater; and
    - B. The average combustion temperature of the boiler or process heater with a design heat input capacity of less than forty-four (44) megawatts measured at least every fifteen (15) minutes and averaged over the same time period of the performance test.
  3. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with subparagraph (3)(A)1.B. of this rule through the use of a smokeless flare; flare design (i.e., steam-assisted, air-assisted, or nonassisted), all visible emission readings, heat content determinations, flow rate measurements, and exit velocity determinations made during the performance test, continuous records of the flare pilot flame monitoring, and records of all periods of operations during which the pilot flame is absent.
  4. Where an owner or operator subject to the provisions of this rule seeks to demonstrate compliance with paragraph (3)(A)2. of this rule—
    - A. All measurements and calculations performed to determine the flow rate, and volatile organic compound concentration, heating value, and TRE index value of the vent stream; and
    - B. Records shall be kept of the following final recovery device parameters:
      - (I) Where an absorber is the final recovery device in the recovery system, the exit specific gravity (or alternative parameter which is a measure of the degree of absorbing liquid saturation, if approved, by the permitting authority), and average exit temperature of the absorbing liquid measured at least fifteen (15) minutes and averaged over the same time period of the performance testing (both measured while the vent stream is normally routed and constituted);
      - (II) Where a condenser is the final recovery device in the recovery system, the average exit (product side)

temperature measured at least every fifteen (15) minutes and averaged over the same time period of the performance testing while the vent stream is routed and constituted normally; or

- (III) Where a carbon adsorber is the final recovery device in the recovery system, the total stream mass or volumetric flow measured at least every fifteen (15) minutes and averaged over the same time period of the performance test (full carbon bed cycle), temperature of the carbon bed after regeneration (and within fifteen (15) minutes of completion of any cooling cycle(s)), and duration of the carbon bed steaming cycle (all measured while the vent stream is routed and constituted normally).
5. As an alternative to subparagraphs (4)(A)4.A. or (4)(A)4.B. of this rule, the concentration level or reading indicated by the organics monitoring device at the outlet of the absorber, condenser, or carbon adsorber, measured at least every fifteen (15) minutes and averaged over the same time period as the performance testing while the vent stream is normally routed and constituted.
- (B) Each reactor process or distillation operation seeking to comply with paragraph (3)(A)2. of this rule shall also keep records of the following information:
    - 1. Any changes in production capacity, feedstock type, or catalyst type, or of any replacement, removal, and addition of recovery equipment or reactors and distillation units; and
    - 2. Any recalculation of the flow rate, TOC concentration, or TRE value performed according to paragraph (3)(B)7. of this rule.
  - (C) Each reactor process or distillation operation seeking to comply with the flow rate or concentration exemption level in paragraph (1)(B)4. of this rule shall keep records to indicate that the stream flow rate is less than 0.0085 standard cubic meters per minute or the concentration is less than five hundred (500) parts per million by volume.
  - (D) Each reactor process or distillation operation seeking to comply with the production capacity exemption level of one (1) gigagram per year shall keep records of the design production capacity and changes in equipment or process operation that may affect design production capacity to the affected process unit.
  - (E) All records must be kept on-site for a period of five (5) years and made available to the department upon request.
- (5) Test Methods. See section (3) of this rule for applicable test methods.

*AUTHORITY: section 643.050, RSMo Supp. [1998]2016. Original rule filed July 15, 1999, effective Feb. 29, 2000. Amended: Filed March 20, 2019.*

*PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.*

*PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate.*

*NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed amendment will begin at 9:00 a.m., July 25, 2019. The public hearing will be held at the St. Louis Regional Office, 7545 South Lindbergh, Suite 220, DESE Conference Room, St. Louis,, Missouri. Opportunity to be heard at the hearing shall be afforded to any interested person. Interested persons, whether or not heard, may submit a statement of their views until 5:00 p.m., August 1, 2019. Send online comments via the proposed rules web page [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules), email comments to [apcprulespn@dnr.mo.gov](mailto:apcprulespn@dnr.mo.gov), or written comments to Chief, Air Quality Planning Section, Missouri Department of Natural Resources' Air Pollution Control Program, PO Box 176, Jefferson City, MO 65102-0176.*

**PUBLIC HEARING ON  
PROPOSED AMENDMENT TO**

**10 CSR 10-6.050**

**START-UP, SHUTDOWN, AND MALFUNCTION CONDITIONS**

This amendment will change section (2) and subsections (3)(A) and (3)(B).

Section (2) is being amended to add definitions specific to this rule.

Subsections (3)(A) and (3)(B) are being amended to update the notification process and remove any unnecessary restrictive words.

*NOTE 1 - Legend for rule actions to be presented at public hearing is as follows:*

- \* *Shaded Text - Rule sections or subsections not proposed for amendment. This text is only for reference.*
- \* *Unshaded Text - Rule sections or subsections that are proposed for change.*

*NOTE 2 - All unshaded text below this line is printed in the Missouri Register.*

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**Title 10—DEPARTMENT OF  
NATURAL RESOURCES**

**Division 10—Air Conservation Commission**

**Chapter 6—Air Quality Standards, Definitions, Sampling and Reference Methods and Air  
Pollution Control Regulations for the Entire State of Missouri**

**PROPOSED AMENDMENT**

**10 CSR 10-6.050 Start-Up, Shutdown, and Malfunction Conditions.** The commission proposes to amend section (2) and subsections (3)(A) and (3)(B). If the commission adopts this rule action, the department intends to submit this rule amendment to the U.S. Environmental Protection Agency to replace the current rule that is in the Missouri State Implementation Plan. The evidence supporting the need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources' Air Pollution Control Program at the address listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources' Proposed Rules website [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules).

*PURPOSE: This rule, applicable to all installations in Missouri, provides the owner or operator of an installation the opportunity to submit data regarding conditions which result in excess emissions. This amendment is to comply with Executive Order 17-03 criteria and update the*

notification process per U.S. Environmental Protection Agency (EPA) comments received during the 2010 rulemaking, add definitions specific to this rule, and remove any unnecessary restrictive words. The evidence supporting the need for this proposed rulemaking, per 536.016, RSMo, is Executive Order 17-03 and an EPA email dated January 19, 2010.

*PURPOSE: This rule, applicable to all installations in Missouri, provides the owner or operator of an installation the opportunity to submit data regarding conditions which result in excess emissions. These submittals will be used by the director to determine whether the excess emissions were due to a start-up, shutdown or malfunction condition. These determinations will be used in deciding whether or not enforcement action is appropriate.*

- (1) Applicability. This regulation applies to all installations in the state of Missouri.
- (2) Definitions. ~~[Definitions of certain terms in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.]~~
  - (A) **Excess emissions**—The emissions which exceed the requirements of any applicable emission control regulation.
  - (B) **Malfunction**—A sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal and usual manner. Excess emissions caused by improper design is not a malfunction.
  - (C) **Shutdown**—The cessation of operation of any air pollution control equipment or process equipment, except the routine phasing out of process equipment.
  - (D) **Start-up**—The setting into operation of any air pollution control equipment or process equipment, except the routine phasing in of process equipment.
  - (E) **Definitions of certain terms in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.**
- (3) General Provisions.
  - (A) In the event of a malfunction[;] which results in excess emissions that exceeds one (1) hour, the owner or operator of such facility shall notify the Missouri Department of Natural Resources' Air Pollution Control Program in the form of a written report [~~which shall be~~]submitted [~~within~~]**as-soon-as-possible, but no more than** two (2) business days. The written report shall include, at a minimum, the following:
    1. Name and location of installation;
    2. Name and telephone number of person responsible for the installation;
    3. Name of the person who first discovered the malfunction and precise time and date that the malfunction was discovered;
    4. Identity of the equipment causing the excess emissions;
    5. Time and duration of the period of excess emissions;
    6. Cause of the excess emissions;
    7. Air pollutants involved;
    8. Estimate of the magnitude of the excess emissions expressed in the units of the applicable requirement and the operating data and calculations used

- in estimating the magnitude;
- 9. Measures taken to mitigate the extent and duration of the excess emissions; and
- 10. Measures taken to remedy the situation which caused the excess emissions and the measures taken or planned to prevent the recurrence of these situations.

(B) The owner or operator shall notify the Missouri Department of Natural Resources' Air Pollution Control Program at least ten (10) days prior to any maintenance, start-up, or shutdown activity, which is expected to cause an excess release of emissions that exceeds one (1) hour. If notification cannot be given ten (10) days prior to any maintenance, start-up, or shutdown activity, which is expected to cause an excess release of emissions that exceeds one (1) hour, notification shall be given as soon as practicable prior to the maintenance, start-up, or shutdown activity. If prior notification is not given for any maintenance, start-up, or shutdown activity which resulted in an excess release of emissions that exceeded one (1) hour, notification shall be given [~~within~~] **as-soon-as-possible, but no more than** two (2) business days of the release. In all cases, the notification shall be a written report and [~~shall~~] include, at a minimum, the following:

- 1. Name and location of installation;
- 2. Name and telephone number of person responsible for the installation;
- 3. Identity of the equipment involved in the maintenance, start-up, or shutdown activity;
- 4. Time and duration of the period of excess emissions;
- 5. Type of activity and the reason for the maintenance, start-up, or shutdown;
- 6. Type of air contaminant involved;
- 7. Estimate of the magnitude of the excess emissions expressed in the units of the applicable emission control regulation and the operating data and calculations used in estimating the magnitude;
- 8. Measures taken to mitigate the extent and duration of the excess emissions; and
- 9. Measures taken to remedy the situation which caused the excess emissions and the measures taken or planned to prevent the recurrence of these situations.

(C) Upon receipt of a notice of excess emissions issued by the Missouri Department of Natural Resources or an agency holding a certificate of authority under section 643.140, RSMo, the source to which the notice is issued may provide information showing that the excess emissions were the consequence of a malfunction, start-up, or shutdown. Based upon any information submitted by the source operator and any other pertinent information available, the director or the commission shall make a determination whether the excess emissions constitute a malfunction, start-up, or shutdown and whether the nature, extent, and duration of the excess emissions warrant enforcement action under section 643.080 or 643.151, RSMo.

- 1. In determining whether enforcement action is warranted, the director or commission shall consider the following factors:
  - A. Whether the excess emissions during start-up, shutdown, or

- malfunction occurred as a result of safety, technological, or operating constraints of the control equipment, process equipment, or process;
- B. Whether the air pollution control equipment, process equipment, or processes were, at all times, maintained and operated to the maximum extent practical, in a manner consistent with good practice for minimizing emissions;
  - C. Whether repairs were made as expeditiously as practicable when the operator knew or should have known when excess emissions were occurring;
  - D. Whether the amount and duration of the excess emissions were limited to the maximum extent practical during periods of this emission;
  - E. Whether all practical steps were taken to limit the impact of the excess emissions on the ambient air quality;
  - F. Whether all emission monitoring systems were kept in operation if at all possible;
  - G. Whether the owner or operator's actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence;
  - H. Whether the excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and
  - I. Whether the owner or operator properly and promptly notified the appropriate regulatory authority.
2. The information provided by the source operator under subsection (3)(C) of this rule shall include, at a minimum, the following:
- A. Written notification per subsection (3)(A) of this rule for malfunctions which resulted in excess emissions that exceeded one (1) hour; or
  - B. Written notification per subsection (3)(B) of this rule for maintenance, start-up, or shutdown activities which resulted in excess emissions that exceeded one (1) hour.
- (D) Nothing in this rule shall be construed to limit the authority of the director or the commission to take appropriate action, under sections 643.080, 643.090, and 643.151, RSMo, to enforce the provisions of the Air Conservation Law and the corresponding rule.
- (E) Compliance with this rule does not automatically absolve the owner or operator of such facility of liability for the excess emissions reported.
- (4) Reporting and Record Keeping.
- (A) The information specified in paragraph (3)(C)2. of this rule shall be submitted to the director not later than fifteen (15) days after receipt of the notice of excess emissions. Information regarding the type and amount of emissions and time of the episode shall be recorded and kept on file. This data shall be included in emissions reported on any required Emissions Inventory Questionnaire.
  - (B) The information submitted according to subsections (3)(A) and (3)(B) of this rule

and paragraph (3)(C)2. of this rule shall be kept on file at the installation for a period of five (5) years. This data shall be included in emissions reported on any required Emissions Inventory Questionnaire. The information shall be available to the director upon request.

(5) Test Methods (*Not Applicable*)

*AUTHORITY: section 643.050, RSMo [2000]2016. Original rule filed March 15, 1979, effective Nov. 11, 1979. Amended: Filed April 2, 1987, effective Aug. 27, 1987. Amended: Filed June 15, 2001, effective Feb. 28, 2002. Amended: Filed Nov. 13, 2009, effective July 30, 2010. Amended: Filed May 1, 2019.*

*PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.*

*PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate.*

*NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed amendment will begin at 9:00 a.m. July 25, 2019. The public hearing will be held at the St. Louis Regional Office, 7545 South Lindbergh, Suite 220, DESE Conference Room, St. Louis, Missouri. Opportunity to be heard at the hearing shall be afforded to any interested person. Interested persons, whether or not heard, may submit a statement of their views until 5:00 p.m., August 1, 2019. Send online comments via the proposed rules web page [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules), email comments to [apcprulespn@dnr.mo.gov](mailto:apcprulespn@dnr.mo.gov), or written comments to Chief, Air Quality Planning Section, Missouri Department of Natural Resources' Air Pollution Control Program, PO Box 176, Jefferson City, MO 65102-0176.*



**PUBLIC HEARING ON  
PROPOSED AMENDMENT TO**

**10 CSR 10-6.140**

**RESTRICTION OF EMISSIONS CREDIT FOR REDUCED POLLUTANT  
CONCENTRATIONS FROM THE USE OF DISPERSION TECHNIQUES**

This amendment will change sections (1) thru (3) and add sections (4) and (5).

Section (1) is being amended to add a reference in the applicability section, make changes as a result of rule comment forms concerning incorporation by reference, add rule language currently found in section (3), and remove any unnecessary restrictive words.

Section (2) is being amended to add definitions specific to this rule and remove rule language being moved to section (3).

Section (3) is being amended to add rule language currently found in section (2).

Sections (4) and (5) are being added to be consistent with standard rule format and for any future rule additions.

*NOTE 1 - Legend for rule actions to be presented at public hearing is as follows:*

- \* *Shaded Text - Rule sections or subsections not proposed for amendment. This text is only for reference.*
- \* *Unshaded Text - Rule sections or subsections that are proposed for change.*

*NOTE 2 - All unshaded text below this line is printed in the Missouri Register.*

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**Title 10—DEPARTMENT OF  
NATURAL RESOURCES**

**Division 10—Air Conservation Commission**

**Chapter 6—Air Quality Standards, Definitions, Sampling and Reference Methods and Air  
Pollution Control Regulations for the Entire State of Missouri**

**PROPOSED AMENDMENT**

**10 CSR 10-6.140 Restriction of Emissions Credit for Reduced Pollutant Concentrations From the Use of Dispersion Techniques.** The commission proposes to amend sections (1) thru (3) and add sections (4) and (5). If the commission adopts this rule action, the department intends to submit this rule amendment to the U.S. Environmental Protection Agency to replace the current rule that is in the Missouri State Implementation Plan. The evidence supporting the

need for this proposed rulemaking is available for viewing at the Missouri Department of Natural Resources' Air Pollution Control Program at the address listed in the Notice of Public Hearing at the end of this rule. More information concerning this rulemaking can be found at the Missouri Department of Natural Resources' Proposed Rules website [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules).

*PURPOSE: This rule implements provisions of federal regulations which restrict credit in the calculation of emission limitations for reduced pollutant concentrations due to the use of dispersion techniques. This amendment is to comply with Executive Order 17-03 criteria by adding a reference in the applicability section, adding definitions specific to this rule, making changes as a result of rule comment forms, and removing any unnecessary restrictive words. The evidence supporting the need for this proposed rulemaking, per 536.016, RSMo, is Executive Order 17-03 Red Tape Reduction Review and rule comment forms dated May 29, 2013 and February 25, 2016.*

*PURPOSE: This rule implements provisions of federal regulations which restrict credit in the calculation of emission limitations for reduced pollutant concentrations due to the use of dispersion techniques.*

(1) Applicability.

- (A) This rule ~~[shall apply]~~ **applies** to the procedures to account for emission dispersion techniques used in the calculation of any emission limitation or any revision of any limitation to be established by the director or to be considered for establishment by the Missouri Air Conservation Commission (MACC). This rule also requires that all emission limitations established by the director or by the MACC after December 31, 1970, be reviewed for compliance with this rule.
- (B) **40 CFR 51, Appendix W, promulgated as of July 1, 2017 shall apply and is hereby incorporated by reference in this rule, as published by the Office of the Federal Register. Copies can be obtained from the U.S. Publishing Office Bookstore, 710 N. Capitol Street NW, Washington DC 20401. This rule does not incorporate any subsequent amendments or additions.**
- (C) **Exemptions. The provisions of section (3) of this rule do not apply to emission limitation credits from—**
  - 1. **Stack heights on which construction commenced on or before December 31, 1970, except where pollutants are being emitted from the stacks by source operations which were constructed, reconstructed, or on which major modifications were carried out after December 31, 1970; or**
  - 2. **Dispersion techniques implemented before December 31, 1970, except where these dispersion techniques are being applied to source operations which were constructed, reconstructed, or on which major modifications were carried out after December 31, 1970.**

~~[(2) General.~~

~~(A) The degree of emission limitation required of any installation for control of any air pollutant must not be affected by that portion of any installation's stack height that exceeds good engineering practice (GEP) or by any other dispersion~~

~~technique, except as provided in section (3).~~

- ~~(B) Before the director or the MACC establishes an emission limitation that is based on a GEP stack height that exceeds the formula GEP height allowed by 10 CSR 10-6.020 (2)(G)2.B., the director must notify the public of the availability of the demonstration study and must provide opportunity for public hearing on it.~~
- ~~(C) This rule does not restrict the actual stack height of any installation or the use of any dispersion technique by any installation.]~~

**(2) Definitions.**

**(A) Commence—**For the purposes of major stationary source construction or major modification, the owner or operator has all necessary preconstruction approvals or permits and—

- 1. Began, or caused to begin, a continuous program of actual on-site construction of the source, to be completed within a reasonable time; or**
- 2. Entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of actual construction of the source to be completed within a reasonable time.**

**(B) Dispersion technique—**

- 1. Any technique designed to affect the concentration of a pollutant in the ambient air by—**
  - A. Using that portion of a stack which exceeds good engineering practice stack height;**
  - B. Varying the rate of emission of a pollutant according to atmospheric conditions or ambient concentrations of that pollutant; or**
  - C. Increasing final exhaust gas plume rise by manipulating source process parameters, exhaust gas parameters, stack parameters, or combining exhaust gases from several existing stacks into one (1) stack; or other selective handling of exhaust gas streams so as to increase the exhaust gas plume rise; and**
- 2. This definition does not include:**
  - A. The reheating of a gas stream, following use of a pollution control system, for the purpose of returning the gas to the temperature at which it was originally discharged from the installation generating the gas stream;**
  - B. The merging of exhaust gas streams where—**
    - (I) The installation owner or operator demonstrates that the installation was originally designed and constructed with the merged gas streams;**
    - (II) After July 8, 1985, the merging is part of a change in operation at the installation that includes the installation of emissions control equipment and is accompanied by a net reduction in the allowable emissions of a pollutant. This exclusion from the definition of dispersion technique shall apply only to the**

- emission limitation for the pollutant affected by a change in operation; or
- (III) Before July 8, 1985, the merging was part of a change in operation at the installation that included the installation of emissions control equipment or was carried out for sound economic or engineering reasons. Where there was an increase in the emission limitation or in the event that no emission limitation was in existence prior to the merging, the director shall presume that merging was significantly motivated by an intent to gain emissions credit for greater dispersion. Without a demonstration by the source owner or operator that merging was not significantly motivated by that intent, the director shall deny credit for the effects of merging in calculating the allowable emissions for the source;
- C. Smoke management in agricultural or silvicultural prescribed burning programs;
- D. Episodic restrictions on residential woodburning and open burning; or
- E. Techniques under subparagraph (2)(B)1.C. of this rule which increase final exhaust gas plume rise where the resulting allowable emissions of sulfur dioxide from the installation do not exceed five thousand (5,000) tons per year.
- (C) Emission limitation—A regulatory requirement, permit condition, or consent agreement which limits the quantity, rate, or concentration of emissions on a continuous basis, including any requirement which limits the level of opacity, prescribes equipment, sets fuel specifications, or prescribes operation or maintenance procedures for an installation to assure continuous emission reduction.
- (D) Excessive concentration—
1. For installations seeking credit for reduced ambient pollutant concentrations from stack height exceeding that defined in paragraph (2)(E)2. of this rule, an excessive concentration is a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes, or eddy effects produced by nearby structures or nearby terrain features which are at least forty percent (40%) in excess of the maximum concentration experienced in the absence of the downwash, wakes, or eddy effects, and that contributes to a total concentration due to emissions from all installations that is greater than an ambient air quality standard. For installations subject to the prevention of significant deterioration program as set forth in 10 CSR 10-6.060(8), an excessive concentration means a maximum ground-level concentration due to emissions from a stack due to the same conditions as mentioned previously and is greater than a prevention of significant deterioration increment. The allowable emission rate to

be used in making demonstrations under this definition shall be prescribed by the new source performance regulation as referenced by 10 CSR 10-6.070 for the source category unless the owner or operator demonstrates that this emission rate is infeasible. Where demonstrations are approved by the director, an alternative emission rate shall be established in consultation with the source owner or operator;

2. For installations seeking credit after October 11, 1983, for increases in stack heights up to the heights established under paragraph (2)(E)2. of this rule, an excessive concentration is either—
    - A. A maximum ground-level concentration due in whole or part to downwash, wakes, or eddy effects as provided in paragraph (2)(D)1. of this rule, except that the emission rate used shall be the applicable emission limitation (or, in the absence of this limit, the actual emission rate); or
    - B. The actual presence of a local nuisance caused by the stack, as determined by the director; and
  3. For installations seeking credit after January 12, 1979, for a stack height determined under paragraph (2)(E)2. of this rule where the director requires the use of a field study of fluid model to verify good engineering practice stack height, for installations seeking stack height credit after November 9, 1984, based on the aerodynamic influence of cooling towers, and for installations seeking stack height credit after December 31, 1970, based on the aerodynamic influence of structures not represented adequately by the equations in paragraph (2)(E)2. of this rule, a maximum groundlevel concentration due in whole or part to downwash, wakes, or eddy effects that is at least forty percent (40%) in excess of the maximum concentration experienced in the absence of downwash, wakes, or eddy effects.
- (E) Good engineering practice (GEP) stack height—The greater of—
1. Sixty-five meters (65 m) measured from the ground-level elevation at the base of the stack;
  2. For stacks on which construction commenced on or before January 12, 1979, and for which the owner or operator had obtained all applicable permits or approvals required under 40 CFR 51 and 52,

$$H_g = 2.5H$$

provided the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation; and for all other stacks,

$$H_g = H + 1.5L$$

Where:

$H_g$  = GEP stack height, measured from the ground-level elevation at

the base of the stack;

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack; and

L = lesser dimension, height, or projected width of the nearby structure(s). Provided that the director may require the use of a field study or fluid model to verify GEP stack height for the installation; or

3. The height demonstrated by a fluid model or field study approved by the director, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures, or nearby terrain features.

(F) Major modification—Any physical change or change in the method of operation at an installation or in the attendant air pollution control equipment that would result in a significant net emissions increase of any pollutant. A physical change or a change in the method of operation, unless previously limited by enforceable permit conditions, shall not include:

1. Routine maintenance, repair, and replacement of parts;
2. Use of an alternative fuel or raw material by reason of an order under sections 2(a) and (b) of the Energy Supply and Environmental Coordination Act of 1974, a prohibition under the Power Plant and Industrial Fuel Use Act of 1978, or by reason of a natural gas curtailment plan pursuant to the Federal Power Act;
3. Use of an alternative fuel or raw material, if prior to January 6, 1975, the source was capable of accommodating the fuel or material, unless the change would be prohibited under any enforceable permit condition which was established after January 6, 1975;
4. An increase in the hours of operation or in the production rate unless the change would be prohibited under any enforceable permit condition which was established after January 6, 1975; or
5. Use of an alternative fuel by reason of an order or rule under section 125 of the Clean Air Act.

(G) Nearby—Nearby, as used in the definition good engineering practice (GEP) stack height in paragraph (2)(E)2. of this rule, is defined for a specific structure or terrain feature—

1. For purposes of applying the formula provided in paragraph (2)(E)2. of this rule, nearby means that distance up to five (5) times the lesser of the height or the width dimension of a structure, but not greater than one-half (1/2) mile; and
2. For conducting fluid modeling or field study demonstrations under paragraph (2)(E)3. of this rule, nearby means not greater than one-half (1/2) mile, except that the portion of a terrain feature may be considered to be nearby which falls within a distance of up to ten (10) times the maximum height of the feature, not to exceed two (2) miles if feature achieves a height one-half (1/2) mile from the stack that is at least forty percent (40%) of the GEP stack height determined by the formula provided in paragraph (2)(E)2. of this rule, or twenty-six

meters (26 m), whichever is greater, as measured from the ground-level elevation at the base of the stack. The height of the structure or terrain feature is measured from the ground-level elevation at the base of the stack.

- (H) **Stack**—Any spatial point in an installation designed to emit air contaminants into ambient air. An accidental opening such as a crack, fissure, or hole is a source of fugitive emissions, not a stack.
- (I) **Definitions of certain terms in this rule, other than those specified in this rule section, may be found in 10 CSR 10-6.020.**

~~[(3) Exemptions. The provisions of section (2) shall not apply to emission limitation credits from—~~

~~—(A) Stack heights on which construction commenced on or before December 31, 1970, except where pollutants are being emitted from the stacks by source operations which were constructed, or reconstructed or on which major modifications were carried out after December 31, 1970; or~~

~~—(B) Dispersion techniques implemented before December 31, 1970, except where these dispersion techniques are being applied to source operations which were constructed, or reconstructed or on which major modifications were carried out after December 31, 1970.]~~

**(3) General Provisions.**

- (A) **The degree of emission limitation required of any installation for control of any air pollutant must not be affected by that portion of any installation's stack height that exceeds good engineering practice (GEP) or by any other dispersion technique, except as provided in section (1).**
- (B) **Before the director or the MACC establishes an emission limitation that is based on a GEP stack height that exceeds the formula GEP height allowed by this rule, the director must notify the public of the availability of the demonstration study and must provide opportunity for public hearing on it.**
- (C) **This rule does not restrict the actual stack height of any installation or the use of any dispersion technique by any installation.**

**(4) Reporting and Recordkeeping. (*Not applicable*)**

**(5) Test Methods. (*Not applicable*)**

*AUTHORITY: section 643.050, RSMo Supp. [1992]2016. Original rule filed Jan. 6, 1986, effective May 11, 1986. Amended: Filed May 1, 2019.*

*PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.*

*PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate.*

*NOTICE OF PUBLIC HEARING AND NOTICE TO SUBMIT COMMENTS: A public hearing on this proposed amendment will begin at 9:00 a.m., July 25, 2019. The public hearing will be held at the St. Louis Regional Office, 7545 South Lindbergh, Suite 220, DESE Conference Room, St. Louis, Missouri. Opportunity to be heard at the hearing shall be afforded to any interested person. Interested persons, whether or not heard, may submit a statement of their views until 5:00 p.m., August 1, 2019. Send online comments via the proposed rules web page [www.dnr.mo.gov/proposed-rules](http://www.dnr.mo.gov/proposed-rules), email comments to [apcprulespn@dnr.mo.gov](mailto:apcprulespn@dnr.mo.gov), or written comments to Chief, Air Quality Planning Section, Missouri Department of Natural Resources' Air Pollution Control Program, PO Box 176, Jefferson City, MO 65102-0176.*