Kansas Administrative Regulations

Department of Health and Environment

Article 19.—Ambient Air Quality Standards and Air Pollution Control—General Requirements.

28-19-210. Calculation of actual emissions.

(a) Whenever required to be determined by the Kansas air quality regulations, the quantity of actual emissions from any emissions unit or stationary source shall be calculated by the owner or operator of an emissions unit or stationary source using:

(1) Data generated from continuous monitoring systems as specified in subsection (c) of this regulation;

(2) approved emission factors as specified in subsection (d) of this regulation;

(3) material balances as specified in subsection (e) of this regulation;

(4) any other method specifically approved by the department in writing, specified in a permit issued to the owner or operator by the department for the particular emission unit or stationary source using such method, or specified in the Kansas air quality regulations for the particular emissions unit or stationary source;

(5) the potential to emit if the emission unit or stationary source fails to qualify for any other method; or

(6) any combination of the above which most accurately demonstrates actual emissions from each emissions unit.

(b) Actual emissions shall be calculated in a manner which most accurately reflects the actual emissions of each emissions unit using the best available data for that emissions unit under current operating conditions. Where a specific actual emissions calculation procedure is required for any other purpose by the Kansas air quality regulations or 40 CFR part 75, as promulgated at 58 FR 3590 on January 11, 1993, that calculation procedure shall also be used to calculate actual emissions for purposes of this regulation.

(c) Data generated by continuous monitoring systems may be used to calculate actual emissions for any emissions unit if the requirements of this subsection are met.

(1) For sources subject to 40 CFR part 75, actual emissions shall be calculated as required by 40 CFR part 75.

(2) For sources not subject to 40 CFR part 75, the owner or operator shall:

(A) Obtain approval from the department prior to using data generated by a continuous monitoring system for the purpose of calculating actual emissions;

(B) develop and follow a written quality assurance procedure for the continuous monitoring system which is appropriate for purposes of this regulation as determined by the department; and

(C) submit the data to the department in a format approved by the department.

(3) For sources not subject to 40 CFR part 75, actual emissions during periods of missing data shall be calculated as follows.

(A) For periods of missing data of one hour or less, data for the hour immediately preceding the missing data and data for the hour immediately following the missing data shall be averaged and submitted to the department as actual emissions for the missing data. For purposes of this subsection, periods of operation of less than one hour between periods of missing data shall be included as part of the period of missing data.

(B) For periods of missing data of more than one hour but equal to or less than 24 consecutive hours, actual emissions reported to the department shall be the greater of:

(i) the data determined by the method specified in subsection (c)(3)(A) of this regulation; or

(ii) the average of the actual emission data for the applicable reporting time period during which the continuous monitoring system was properly operating.

(C) For periods of missing data of more than 24 consecutive hours, actual emissions shall be determined using other appropriate calculation methods specified by this regulation.

(D) For periods during upsets, start-up, shutdown, control equipment malfunctions, and other abnormal operating conditions, actual emissions shall be determined using other appropriate calculation methods specified in this regulation.

(d) Actual emissions determined using emission factors shall be calculated using the following formula:

$$\text{Actual emissions} = \text{OR} \times \text{EF} \times (1 - (\text{CE} \times \text{CDE})) *$$

Where:

OR	=	the operating rate as documented through records kept at the emissions unit or stationary source. If insufficient records are kept to determine the actual operating rate of the emissions unit or stationary source during the reporting period, the operating rate shall be determined using the maximum operating capacity during the known hours of operation. If the known hours of operation cannot be determined, the hours of operation shall be the maximum number of hours the facility is permitted to operate during the reporting period.
EF	=	an appropriate emission factor obtained from an approved publication listed in subsection (g) unless the permittee demonstrates to the satisfaction of the department that an alternative emission factor is applicable to the relevant emissions unit or stationary source.
CE	=	capture efficiency of the control device emissions collection system determined according to subsection (f) of this regulation or through performance testing.
CDE	=	control device efficiency determined according to subsection (f) of this regulation or through performance testing.
*		This formula assumes a single overall

control efficiency has been developed for situations where emissions are controlled by a series of air emissions control devices. If a single overall control efficiency has not been developed, actual emissions shall be calculated as follows:

$$\text{Actual emissions} = \text{OR} \times \text{EF} \times (1 - (\text{CE} \times \text{CDE}))_{\text{D1}} \times (1 - (\text{CE} \times \text{CDE}))_{\text{D2}} \times \ldots (1 - (\text{CE} \times \text{CDE}))_{\text{Dn}}$$

where D is an emissions control device (or devices) for which an overall control efficiency is available.

Prior approval by the department shall be obtained before the development of an alternative emission factor or control device efficiency based upon performance testing of an emissions unit or stationary source.

(e) Actual emissions determined using material balances shall be calculated using one of the following formulas:

(1) For volatile organic compound emissions;

$$\text{Actual emissions} = (\text{Q}_{\text{added}} - \text{Q}_{\text{recovered}}) \times (1 - (\text{CE} \times \text{CDE})) *$$

(2) for sulfur dioxide emissions;

$$\text{Actual emissions} = (\text{F}_{\text{burned}} \times (\backslash\%\text{S}/100) \times \text{CF}) \times (1 - (\text{CE} \times \text{CDE})) *$$

(3) for all other emissions for which a material balance procedure is appropriate;

$$\text{Actual emissions} = (\text{Q}_{\text{added}} - \text{Q}_{\text{consumed}} - \text{Q}_{\text{recovered}}) \times (1 - (\text{CE} \times \text{CDE})) *$$

Where:

Q_{added} = the total quantity of the regulated substance which enters the process or operation;

$Q_{recovered}$	=	the total quantity of the regulated substance recovered for reuse which is not accounted for by the emission control device calcuations;
$Q_{consumed}$	=	the total quantity of the regulated substance which becomes an integral part of the product;
F_{burned}	=	the quantity of sulfur containing fuel by weight;
%S	=	percent sulfur, by weight, in the sulfur containing fuel;
CE	=	capture efficiency of the control device emissions collection system determined according to subsection (f) of this regulation or through performance testing;
CDE	=	control device efficiency determined according to subsection (f) of this regulation or through performance testing; and
CF	=	a conversion factor of 1.95 for coal and 2.00 for natural gas, oil and other fuels.
*		See footnote * at subsection (d) of this regulation.

(f) Calculation of credits for actual emissions reductions due to air emission control equipment capture efficiencies and control device efficiencies may be taken in accordance with this subsection.

(1) All emissions during startup, shut down, control equipment malfunctions or by-passes, or other periods of greater than normal emissions, shall be calculated as if the emissions unit or stationary source was being operated without air emission control equipment unless a more accurate manner of calculating actual emissions is demonstrated by the owner or operator and approved by the department.

(2) Unless otherwise specifically approved in writing by the department or stated in an air quality permit issued by the department for the emissions unit or stationary source, the following air emission control equipment control device efficiencies shall be used when calculating actual emissions:

(A) Particulate matter, in the absence of information to the contrary, all particulate matter emissions from any control equipment shall be assumed to be PM_{10}.

(i) electrostatic precipitator or baghouse	0.90
(ii) high energy wet scrubber	0.80
(iii) low energy wet scrubber	0.70
(iv) cyclonic separator	0.50
(B) Acid gases:	
(i) wet scrubber	0.90
(ii) dry scrubber	0.70
(C) Volatile organic compounds:	
(i) incinerator (operating at a temperature 1400°Fahrenheit or greater)	0.98
(ii) carbon adsorber	0.95

(3) Unless otherwise specifically approved in writing by the department or stated in an air quality permit issued by the department for the emissions unit or stationary source, the following air emission control equipment control device capture efficiencies shall be used when calculating actual emissions:

(A) The capture efficiency for a totally enclosed emissions source operating under negative pressure shall be 1.00.

(B) The capture efficiency for an emissions source which is not totally enclosed or which is not operated under negative pressure shall be 0.50.

(4) Capture efficiencies and control device efficiencies for other types of air emission control equipment not listed in paragraphs (f)(2) and (f)(3) shall be determined by the department on a case by case basis based upon an appropriate demonstration by the owner or operator of the capture efficiency and control device efficiency of the air emission control equipment.

(5) Capture efficiencies and control device efficiencies alternative to those specified in paragraphs (f)(2) and (f)(3) may be approved by the department upon an appropriate demonstration by the owner or operator of capture efficiency and control device efficiency of the air emission control equipment.

(6) Each owner or operator which uses an air emission control equipment capture efficiency or control device efficiency, or both, when calculating actual emissions shall maintain the air emission control equipment in accordance with any applicable Kansas air quality regulation, permit requirement or manufacturer's recommendation. Beginning January 1, 1994, the owner or operator shall also keep a written log recording the date and type of action taken when performing preventive or other maintenance on the air emission control equipment. Failure of the owner or operator to maintain the air emission control equipment or to keep a written record as required by this subsection shall be considered a control equipment malfunction for purposes of subsection (f)(1).

(g) Appropriate emission factors obtained from the following publications or data bases are approved for determining emissions from emission units or stationary sources:

(1) AP-42 compilation of air pollution emission factors—4th edition—September, 1985. United States environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.

(2) AIRS facility subsystem source classification codes (SCCs) and emission factor listing for criteria pollutants (EPA-450/4-90-003). United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.

(3) Locating and estimating air emissions from sources of acrylonitrile. EPA #450/4-84-007A, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(4) Locating and estimating air emissions from sources of carbon tetrachloride. EPA #450/4-84-007B, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(5) Locating and estimating air emissions from sources of chloroform. EPA #450/4-84-007C, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(6) Locating and estimating air emissions from sources of ethylene dichloride. EPA #450/4-84-007D, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(7) Locating and estimating air emissions from sources of nickel. EPA #450/4-84-007F, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(8) Locating and estimating air emissions from sources of chromium. EPA #450/4-84-007G, March, 1984. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(9) Locating and estimating air emissions from sources of epichlorohydrin. EPA #450/4-84-007J, September, 1985. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(10) Locating and estimating air emissions from sources of vinylidene chloride. EPA #450/4-84-007K, September, 1985. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(11) Locating and estimating air emissions from sources of manganese. EPA #450/4-84-007H, September, 1985. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(12) Locating and estimating air emissions from sources of phosgene. EPA #450/4-84-007I, September, 1985. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.

(13) Locating and estimating air emissions from sources of ethylene oxide. EPA #450/4-84-007L, September, 1986. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(14) Locating and estimating air emissions from sources of chlorobenzenes. EPA #450/4-84-007M, September, 1986. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(15) Locating and estimating air emissions from sources of polychlorinated biphenyls (PCB's). EPA #450/4-84-007N, May, 1987. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(16) Locating and estimating air emissions from sources of polycyclic organic matter (POM). EPA #450/4-84-007P, September, 1987. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(17) Locating and estimating air emissions from sources of benzene. EPA #450/4-84-007Q, March, 1988. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(18) Estimating air toxics emissions from organic liquid storage tanks. EPA #450/4-88-004, October, 1988. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(19) Locating and estimating air toxics emissions from municipal waste combustors. EPA #450/2-89-006, April, 1989. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(20) Locating and estimating air emissions from sources of chromium (supplement). EPA #450/2-89-002, August, 1989. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(21) Locating and estimating air emissions from sources of perchloroethylene and trichloroethylene. EPA #450/2-89-013, August, 1989. United states environmental

protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(22) Locating and estimating air emissions from sources of 1, 3-butadiene. EPA #450/2-89-021, December, 1989. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(23) Locating and estimating air toxics emissions from sewage sludge incinerators. EPA #450/2-90-009, May, 1990. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(24) Locating and estimating air emissions from sources of formaldehyde (revised). EPA #450/4-91-012, March, 1991. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
(25) Locating and estimating air emissions from sources of styrene, interim report. EPA #450/4-91-029, October, 1991. United states environmental protection agency, office of air quality planning and standards, research triangle park, North Carolina 27711.
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***** Authenticated Kansas Administrative Regulation *****