REGULATION 5.21 Environmental Acceptability for Toxic Air Contaminants

Air Pollution Control District of Jefferson County
Jefferson County, Kentucky

Relates To: KRS Chapter 77 Air Pollution Control
Pursuant To: KRS Chapter 77 Air Pollution Control
Necessity and Function: KRS 77.180 authorizes the Air Pollution Control Board to adopt and enforce all orders, rules, and regulations necessary or proper to accomplish the purposes of KRS Chapter 77. This regulation establishes the criteria for determining the environmental acceptability of emissions of toxic air contaminants.

SECTION 1 Definitions

Terms used in this regulation that are not defined in this regulation shall have the meaning given to them in Regulation 1.02 *Definitions* or Regulation 5.01 *General Provisions*.

1.1 "Best available technology for toxics" or "T-BAT" means an emission standard that reflects the maximum degree of toxic air contaminant emission reduction that the District determines can be reasonably achieved by the process or process equipment, taking into account energy, environmental, and economic impacts and health and welfare benefits. In determining T-BAT, the District may consider work practices, raw material substitutions, production limitations, alternative processes and process design characteristics, air pollution control equipment, and pollution prevention measures.

1.2 "Environmentally acceptable" or "environmental acceptability" (EA) means the ambient concentration, including an averaging time frame, of a toxic air contaminant, or the sum of the ambient concentrations, including an averaging time frame, of multiple toxic air contaminants, that is less than or equal to the ambient goals and standards established in this regulation. These EA goals and standards are collectively referred to as "EA levels."

1.3 "Existing" process and process equipment means a process and process equipment that are not defined as "new or modified" pursuant to Regulation 5.01 section 1.10.

1.4 "Hazard quotient" or "HQ" means the ratio between the concentration of a toxic air contaminant and the benchmark ambient concentration for noncarcinogenic effects for that toxic air contaminant (BAC_{NC}).

1.5 "Permitted stationary source" means a stationary source that is subject to the permit requirements of Regulation 2.03 section 1.1 or 1.2.

1.6 "Source sector" means the general grouping of sources of air contaminants used by the District for developing anthropogenic emissions inventories. These source sectors are as follows:

1.6.1 Point source - industrial or commercial stationary source that is subject to the permit requirements in Regulation 2.03 section 1.1 or 1.2 (permitted stationary source).

1.6.2 Area source - non-permitted commercial stationary source or other anthropogenic source of emissions that is not included in section 1.6.1, 1.6.3, or 1.6.4.

1.6.3 Mobile source - motorized vehicle that is registered for use on the public roads and highways.

1.6.4 Nonroad mobile source - motorized vehicle that is not registered for use on the public roads and highways or any other equipment with a fossil fuel-fired engine that is not

included as a point source.

SECTION 2 Ambient Goals and Standards for Environmental Acceptability for Toxic Air Contaminants

2.1 The allowed emissions of toxic air contaminants from new or modified processes or process equipment at a point source, except for an Exempt stationary source as defined in Regulation 5.01 section 1.6, shall not exceed the ambient levels of environmental acceptability (EA levels) for toxic air contaminants in section 2.2, except as provided in section 2.3.

2.2 The following table establishes the EA goals for toxic air contaminants for new or modified processes or process equipment at a point source except for an Exempt stationary source:

	Applicable Source Sector	Applicable Process or Process Equipment [1]	Applicable TACs	Goal or Standard	EAL_C [2, 3] Risk	EAL_{NC} [4, 5] HQ
2.2.1	Point source	Individual stationary source, individual new or modified P/PE	Individual TAC	Goal	$1.0 \otimes 10^{-6}$	HQ = 0.20
2.2.2	Point source	Individual stationary source, all new or modified P/PE	Individual TAC	Goal		HQ = 0.38
2.2.3	Point source	Individual stationary source, all new or modified P/PE	Total for all TACs	Goal	$3.8 \otimes 10^{-6}$	

Notes for section 2.2 (also applicable to section 2.5):

[1] Process or process equipment is abbreviated P/PE.

[2] EAL_C, or the EA level for an individual toxic air contaminant that is determined to be a carcinogen, as applicable to section 2.2.1 (or section 2.5.1), means the cancer risk from an individual toxic air contaminant from an individual process or process equipment, derived from the following equation:

$$EAL_C = \frac{Maximum\ concentration_{ij}}{BAC_{C_i}} \qquad [Equation\ 1]$$

Where: i = an individual carcinogenic toxic air contaminant, from
j = an individual new or modified process or process equipment,
BAC_{Ci} = the benchmark ambient concentration for that carcinogenic toxic air contaminant, as determined pursuant to Regulation 5.20 Section 3, and
Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant,

as determined pursuant to Regulation 5.22 *Procedures for Determining the Maximum Ambient Concentration of a Toxic Air Contaminant*.

[3] EAL_C, or the EA level for all toxic air contaminants that are determined to be carcinogens, as applicable to section 2.2.3 (or section 2.5.3), means the sum of the cancer risks from all individual toxic air contaminants from all applicable individual processes or process equipment, derived from the following equation:

$$EAL_C = \sum_{i=1}^{n}\sum_{j=1}^{m} \frac{Maximum\ concentration_{ij}}{BAC_{C_i}} \qquad [Equation\ 2]$$

Where: i = an individual carcinogenic toxic air contaminant, from
j = an individual process or process equipment,
n = the total number of carcinogenic toxic air contaminants to be included in the demonstration of environmental acceptability,
m = the total number of processes or process equipment from which carcinogenic toxic air contaminant "i" may be emitted,
BAC_{Ci} = the benchmark ambient concentration for that carcinogenic toxic air contaminant, as determined pursuant to Regulation 5.20 Section 3, and
Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant, as determined pursuant to Regulation 5.22.

[4] EAL_{NC}, or the EA level for the noncarcinogenic effects of an individual toxic air contaminant, as applicable to section 2.2.1 (or 2.5.1), means the hazard quotient of the toxic air contaminant from an individual process or process equipment, derived from the following equation:

$$EAL_{NC} = HQ_i = \frac{Maximum\ concentration_{ij}}{BAC_{NC_i}} \qquad [Equation\ 3]$$

Where: i = an individual toxic air contaminant, from
j = an individual process or process equipment,
BAC_{NC} = the benchmark ambient concentration for the noncarcinogenic effects of the toxic air contaminant, as determined pursuant to Regulation 5.20 Section 4, and
Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant, as determined pursuant to Regulation 5.22.

[5] EAL_{NC}, or the EA level for the noncarcinogenic effects of an individual toxic air contaminant from all applicable individual processes or process equipment, as applicable to section 2.2.2 (or 2.5.2), means the hazard quotient of the toxic air contaminant from all applicable processes or process equipment, derived from the following equation:

$$EAL_{NC} = HQ_i = \sum_{j=1}^{m} \frac{Maximum\ concentration_{i\,j}}{BAC_{NC_i}} \quad [Equation\ 4]$$

Where: i = an individual toxic air contaminant, from
j = an individual process or process equipment,
m = the total number of processes or process equipment from which toxic air contaminant "i" may be emitted,
BAC_{NC} = the benchmark ambient concentration for the noncarcinogenic effects of the toxic air contaminant, as determined pursuant to Regulation 5.20 Section 4, and
Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant, as determined pursuant to Regulation 5.22.

2.3 Modification of the EA goals.

2.3.1 After providing an opportunity for public review and comment, the District may approve a written request from the owner or operator of a new or modified process or process equipment to exceed:

2.3.1.1 One or both of the EA goals in section 2.2.1, provided that the applicable EA goals in sections 2.2.2 and 2.2.3 are met, and

2.3.1.2 One or both of the EA goals in sections 2.2.2 and 2.2.3, provided that the applicable EA standards in sections 2.5.2 and 2.5.3 are met.

2.3.2 In making the determination whether to approve the request, the District shall consider, among other factors, whether, and the extent to which, the allowed emissions from the process or process equipment reflect the application of the best available technology for toxics (T-BAT).

2.4 The allowed emissions of toxic air contaminants from all processes and process equipment at a point source, except for an Exempt stationary source, shall not, taking into account the compliance schedule for the various categories of toxic air contaminants in section 3.5, exceed the EA levels for toxic air contaminants in section 2.5 as follows, except as provided in sections 2.6 and 2.7:

2.4.1 The EA goals for toxic air contaminants in section 2.5.1 are applicable to all existing processes and process equipment, and

2.4.2 The EA standards for toxic air contaminants in sections 2.5.2 and 2.5.3 are applicable to all processes and process equipment, including new or modified processes or process equipment.

2.5 The following table establishes the EA levels for toxic air contaminants for processes and process equipment, as specified in sections 2.4.1 and 2.4.2, at a point source except for an Exempt stationary source:

	Applicable Source Sector	Applicable Process or Process Equipment [1]	Applicable TACs	Goal or Standard	EAL_C [2,3] Risk	EAL_{NC} [4, 5] HQ
2.5.1	Point source	Individual stationary source, individual existing P/PE	Individual TAC	Goal	$1.0 \otimes 10^{-6}$	HQ = 0.20
2.5.2	Point source	Individual stationary source, all P/PE, including new or modified P/PE	Individual TAC	Standard		HQ = 0.75
2.5.3	Point source	Individual stationary source, all P/PE, including new or modified P/PE	Total for all TACs	Standard	$7.5 \otimes 10^{-6}$	

Notes for section 2.5: See the notes for section 2.2.

2.6 Modification of the EA goals.

2.6.1 After providing an opportunity for public review and comment, the District may approve a written request from the owner or operator of a process or process equipment subject to the EA goals in section 2.5.1 to exceed one or both of those EA goals, provided that the corresponding EA standards in sections 2.5.2 and 2.5.3 are met.

2.6.2 In making the determination whether to approve the request, the District shall consider, among other factors, whether, and the extent to which, the allowed emissions from the process or process equipment reflect the application of T-BAT.

2.7 The owner or operator of a new or modified process or process equipment, except for a new or modified process or process equipment that was approved by the District to exceed one or both of the EA goals in section 2.2.2 or 2.2.3 pursuant to the provisions of section 2.3, is not required to demonstrate compliance with the EA standards in sections 2.5.2 or 2.5.3 until required to do so pursuant to the provisions of section 3.1, taking into account the schedule for the various categories of toxic air contaminants.

2.8 The EA standards for toxic air contaminants applicable to all permitted stationary sources in the point source sector are as follows:

	Applicable Source Sector	Applicable Source of Emission	Applicable TACs	Goal or Standard	EAL_C[1] Risk	EAL_{NC}[2] HQ
2.8.1	Point source	All permitted stationary sources	Individual TAC	Standard		HQ = 1.00
2.8.2	Point source	All permitted stationary sources	Total for all TACs	Standard	$10.0 \otimes 10^{-6}$	

Notes for section 2.8:

[1] EAL_C, or the EA level for all toxic air contaminants that are determined to be carcinogens, as applicable to section 2.8.2, means the sum of the cancer risks from all individual toxic air contaminants from all applicable individual stationary sources, derived from the following equation:

$$EAL_C = \sum_{i=1}^{n} \sum_{j=1}^{m} \frac{Maximum\ concentration_{ij}}{BAC_{C_i}} \qquad [Equation\ 5]$$

Where: i = an individual carcinogenic toxic air contaminant, from
j = an individual source of emission,
n = the total number of carcinogenic toxic air contaminants to be included in the demonstration of environmental acceptability,
m = the total number of sources of emission from which carcinogenic toxic air contaminant "i" may be emitted,
BAC_{Ci} = the benchmark ambient concentration for that carcinogenic toxic air contaminant, as determined pursuant to Regulation 5.20 Section 3, and
Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant, as determined pursuant to Regulation 5.22.

[2] EAL_{NC}, or the EA level for the noncarcinogenic effects of an individual toxic air contaminant, as applicable to section 2.8.3, means the hazard quotient of the toxic air contaminant from all applicable stationary sources, derived from the following equation:

$$EAL_{NC} = HQ_i = \sum_{j=1}^{m} \frac{Maximum\ concentration_{ij}}{BAC_{NC_i}} \qquad [Equation\ 6]$$

Where: i = an individual toxic air contaminant, from
j = an individual source of emission,
m = the total number of sources or emission from which toxic air contaminant "i" may be emitted,
BAC_{NC} = the benchmark ambient concentration for the

noncarcinogenic effects of the toxic air contaminant, as determined pursuant to Regulation 5.20 Section 4, and

Maximum concentration = the highest concentration of a toxic air contaminant in the ambient air, taking into account the applicable averaging time frame for the toxic air contaminant, as determined pursuant to Regulation 5.22.

SECTION 3 Demonstration of Environmental Acceptability and Compliance Plans for Permitted Stationary Sources

3.1 The owner or operator of a Group 1 or Group 2 stationary source shall determine, according to the procedures in Regulation 5.22, whether the allowed emissions from all processes and process equipment at the stationary source comply with the EA levels in sections 2.5.1 to 2.5.3. The owner or operator shall, for each process or process equipment, submit to the District the results of the determination according to the following schedule:

3.1.1 For a Group 1 stationary source, the following:

3.1.1.1 For Category 1 TACs, by December 31, 2005, and

3.1.1.2 For Category 1A TACs, by June 30, 2006, and

3.1.2 For a Group 2 stationary source, the following:

3.1.2.1 For Categories 1 and 1A TACs, by June 30, 2008.

3.2 If the District determines that the concentration of a toxic air contaminant in the ambient air is, or may be, greater than the EA standard in section 2.8.1 or 2.8.2 and a potentially responsible entity for the emissions of the toxic air contaminant is identified, then the Board may require the owner or operator of an identified stationary source to submit the information identified in Section 4 of Regulation 1.06 *Stationary Source Self Monitoring, Emissions Inventory Development, and Reporting* and meet the requirements of sections 3.1, 3.4, and 3.5 of this regulation on an accelerated schedule. In this case, the District shall notify the owner or operator in writing and shall specify the dates for complying with these requirements.

3.3 If the allowed emissions of a toxic air contaminant from a process or process equipment are determined, pursuant to section 3.1, to exceed one or more of the EA levels in sections 2.5.1 to 2.5.3 but the actual emissions do not exceed these EA levels, then the owner or operator may request, in writing, that the District revise the appropriate permit conditions to reduce the allowable emissions, specifying the new level of allowed emissions.

3.4 If the allowed emissions of a toxic air contaminant from a process or process equipment are determined, pursuant to the provisions of section 3.1, to exceed one or both of the EA goals in section 2.5.1 (and the District has not given approval to exceed those EA goals pursuant to section 2.6) or the EA standards in section 2.5.2 or 2.5.3, then the owner or operator shall submit to the District a compliance plan and schedule for compliance with the applicable EA level according to the following schedule:

3.4.1 For a Group 1 stationary source, as follows:

3.4.1.1 For Category 1 TACs, by June 30, 2006, and

3.4.1.2 For Category 1A TACs, by June 30, 2007, and

3.4.2 For a Group 2 stationary source, as follows:

3.4.2.1 For Categories 1 and 1A TACs, by June 30, 2009.

3.5 A compliance plan required pursuant to section 3.4 shall provide for compliance as soon as

practicable but no later than the following dates:

3.5.1 For a Group 1 stationary source, the following:

3.5.1.1 For Category 1 TACs, December 31, 2007, and

3.5.1.2 For Category 1A TACs, June 30, 2008, and

3.5.2 For a Group 2 stationary source, the following:

3.5.2.1 For Categories 1 and 1A TACs, June 30, 2010.

3.6 A compliance plan and schedule pursuant to the provisions of section 3.4 shall, at a minimum, contain the following milestone steps and dates:

3.6.1 Perform an engineering analysis of potential solutions,

3.6.2 Prepare a bid package for vendors for equipment,

3.6.3 Submit to the District a construction permit application for new equipment and any required modifications,

3.6.4 Select a vendor and issue purchase order for equipment,

3.6.5 Commence construction,

3.6.6 Complete construction,

3.6.7 Prepare and submit a proposed compliance testing protocol to the District for approval,

3.6.8 Perform the required compliance testing,

3.6.9 Prepare and submit a final compliance testing report to the District for approval, and

3.6.10 Submit quarterly progress reports.

3.7 After providing an opportunity for public review and comment, the District may approve a compliance plan and schedule from a stationary source and the approved compliance plan and schedule shall be an enforceable requirement of the applicable District permit for the process and process equipment included in the compliance plan.

3.8 If the District determines, based upon the information submitted to the District pursuant to section 3.1 or other information, that an EA standard in section 2.8.1 or 2.8.2 would be exceeded, then the Board may, after providing an opportunity for public review and comment, require additional reductions from the stationary sources contributing to this exceedance. Any more stringent emission limit, and a schedule for complying with this emission limit, shall be an enforceable requirement of the applicable District permit for the affected process and process equipment.

3.9 In the alternative to the provisions of sections 3.1.2, 3.4.2, and 3.5.2 applicable to Group 2 stationary sources, the Board may, by regulation, establish specific requirements for a class of stationary sources. If the Board adopts a new regulation or amends an existing regulation in lieu of requiring compliance with these provisions by individual stationary sources in that class, then the District shall notify the owner or operator of each stationary source in that class that compliance with these provisions is not required.

3.10 If the District determines that the presence of 2 or more toxic air contaminants, at concentrations that comply with the EA levels in sections 2.2, 2.5, and 2.8, would result in a synergistic or additive toxicological effect that may adversely affect human health, then the Board may, after providing an opportunity for public review and comment, require additional reductions of those toxic air contaminants from the contributing processes and process equipment. Any more stringent emission limit, and a schedule for complying with this emission limit, shall be an enforceable requirement of the applicable District permit for the affected process and process equipment.

3.11 Upon written notification by the District that a benchmark ambient concentration established

pursuant to Regulation 5.20 for a toxic air contaminant that is, or may be, emitted by the stationary source has become more stringent, the owner or operator of the stationary source shall, within 6 months of this notification, make a revised determination, according to the procedures in Regulation 5.22, whether the allowed emissions from the stationary source comply with the EA levels in section 2.5 based upon the revised benchmark ambient concentration and submit the results to the District. If one or more of these EA levels is exceeded, then the owner or operator shall, within 18 months of the initial notification, submit a compliance plan and schedule meeting the provisions of section 3.6, providing for compliance as soon as practicable but no later than 36 months after the initial notification. Upon approval by the District of the compliance plan and schedule, the approved compliance plan and schedule shall be an enforceable requirement of the applicable District permit for the process and process equipment included in the compliance plan.

3.12 If a benchmark ambient concentration established pursuant to Regulation 5.20 for a toxic air contaminant becomes less stringent, the owner or operator may request that an emission limit based upon the more stringent benchmark ambient concentration be revised to reflect compliance with the EA levels based upon the revised benchmark ambient concentration. The District may approve the request and revise the emission limit, provided that the revision complies with all other applicable requirements and the effectiveness of an existing emissions control measure is not reduced or eliminated.

3.13 If the District determines that the concentration of a toxic air contaminant in the ambient air resulting from any TAC emission of a stationary source is, or may be, greater than an EA level in section 2.5 or 2.8, then the District may require emission reductions of that toxic air contaminant. In this case, the written notification shall include the date for submittal of a compliance plan and schedule to the District and the date for compliance with the EA levels. Any more stringent emission limit and the compliance schedule shall be an enforceable requirement of the applicable District permit for the affected process and process equipment.

Adopted v1/_____ ; effective _____.