

Regulation 5.21 Environmental Acceptability for Toxic Air Contaminants

Louisville Metro Air Pollution Control District

Jefferson County, Kentucky

Pursuant To: KRS Chapter 77 Air Pollution Control

Relates To: District Regulations 1.02, 1.06 and Part 5

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 Applicability

This regulation applies to any process or process equipment at a stationary source that emits, or may emit, a toxic air contaminant (TAC). This regulation does not apply to stationary sources defined as exempt in Regulation 5.00.

Section 2 De Minimis Emissions

In determining whether emissions from a process or process equipment meet the environmental acceptability goals of this regulation, the owner or operator may exclude the following “de minimis” emissions:

- 2.1 Emissions of a TAC contained in a purchased mixture of chemicals, if the TAC is not listed in the Material Safety Data Sheet, or if the concentration of the TAC is listed in the Material Safety Data Sheet as “trace” or as less than:
 - 2.1.1 For a TAC determined to be a carcinogen, 0.1% by weight, or
 - 2.1.2 For any other TAC, 1.0% by weight.
- 2.2 Emissions from a “trivial activity” defined in Regulation 2.16.
- 2.3 Emissions from an “insignificant activity” defined in Regulation 2.16.
- 2.4 Allowed emissions of a noncarcinogenic TAC that are less than or equal to both the pound-per-hour de minimis value and the applicable pound-per-averaging time de minimis value.
 - 2.4.1 To derive the pound-per-hour de minimis value, multiply the BAC_{NC} (in $\mu\text{g}/\text{m}^3$) by the applicable 1-Hour Factor in Regulation 5.22, Section 2, Table 1.
 - 2.4.2 To derive the pound-per-averaging time de minimis value, multiply the BAC_{NC} (in $\mu\text{g}/\text{m}^3$) by the applicable Annual, 24-Hour, or 8-Hour Factor in Regulation 5.22, Section 2, Table 1.
- 2.5 Allowed emissions of a carcinogenic TAC that are less than or equal to both the pound-per-hour de minimis value and the corresponding averaging time de minimis value.
 - 2.5.1 To derive the pound-per-hour de minimis value, multiply the BAC_C (in $\mu\text{g}/\text{m}^3$) for the TAC by 0.54 (the 1-Hour Factor in Regulation 5.22, Section 2, Table 1).
 - 2.5.2 To derive the pound-per-year de minimis value, multiply the BAC_C (in $\mu\text{g}/\text{m}^3$) by 480 (the Annual Factor in Regulation 5.22, Section 2, Table 1).
- 2.6 Emissions from motor vehicle fueling or refueling.
- 2.7 Emissions from the combustion of natural gas, liquefied petroleum gas, methane (including landfill gas), or propane.

Section 3 EA Goals

3.1 Unless modified pursuant to Section 5, the risk resulting from emissions of TACs at a stationary source shall not exceed the EA goals in this section or section 3.2.

	Process or Process Equipment (P/PE)	Applicable TACs	EAG_C Risk^{1,2} (010⁻⁶)	EAG_{NC} HQ^{3,4}
3.1.1	Individual stationary source, individual P/PE	Individual TAC	1.0	1.0
3.1.2	Individual stationary source, all P/PE	Individual TAC		1.0
3.1.3	Individual stationary source, all P/PE	Total for all applicable TACs	7.5	
3.2	Individual stationary source, all new and modified P/PE	Total for all applicable TACs	3.8	

See Appendix for explanation of notes and equations.

3.3 In determining compliance with the EA goals of section 3.1.3 or 3.2 the owner or operator may exclude emissions of Category 3 and 4 TACs permitted pursuant to section 4.11.2.2.

3.4 The EA goals in section 3.1 shall apply to the following emissions from a processes or process equipment that the District determines does not comply with the general duty clause of Regulation 5.01:

3.4.1 Emissions of a TAC not listed in Regulation 5.23, or

3.4.2 Emissions from a process or process equipment at a stationary source that is not a Group 1 or 2 source.

3.5 The EA goals applicable to the risk resulting from emissions of all Category 1-4 TACs from all processes and process equipment at multiple sources shall not exceed the following EA goals:

	Source of Emission	Applicable TACs	EAG_C Risk (010⁻⁶)⁵	EAG_{NC} HQ⁶
3.5.1	Applicable processes and process equipment	Individual TAC		1.0
3.5.2	Applicable processes and process equipment	Total for all applicable TACs	10.0	

See Appendix for explanation of notes and equations.

3.6 The EA goals of sections 3.1, 3.2 and 3.5 applicable to the ambient air on industrial property or public roadways shall be increased by:

- 3.6.1 A factor of 10 for carcinogenic risks (EAG_C); and
- 3.6.2 A factor of 3 for noncarcinogenic risks (EAG_{NC}).
- 3.7 The increases in EA goals in section 3.6 shall have no effect on:
 - 3.7.1 The EA goals applicable to any other location, or
 - 3.7.2 A modified EA goal approved pursuant to Section 5.
- 3.8 If the risk resulting from the emissions of TACs is determined to be environmentally acceptable because the maximum ambient concentration occurs on industrial property or a public roadway, the owner or operator of the process or process equipment shall notify the District within 30 days of a change in land use of the property from industrial or public roadway to residential, retail, agricultural or commercial and submit a compliance demonstration and schedule that includes the actions in section 4.18.

Section 4 EA Demonstrations and Compliance Plans for Permitted Stationary Sources

- 4.1 In determining environmental acceptability of the emissions of a TAC:
 - 4.1.1 The benchmark ambient concentration (BAC) is determined pursuant to Regulation 5.20, and
 - 4.1.2 The maximum ambient concentration is determined pursuant to Regulation 5.22.
- 4.2 Environmental acceptability (EA) of the emissions of a TAC, including a determination that emissions of a TAC are de minimis, may be demonstrated based on:
 - 4.2.1 an emission standard,
 - 4.2.2 uncontrolled potential to emit (PTE), or
 - 4.2.3 an alternative measure, which may include:
 - 4.2.3.1 controlled PTE,
 - 4.2.3.2 actual emissions,
 - 4.2.3.3 limited emissions, or
 - 4.2.3.4 throughput or production rate.
- 4.3 An alternative measure that demonstrates EA shall be established as a new emission standard and incorporated in the permit for the process or process equipment.
- 4.4 Documentation supporting the EA demonstration for each process or process equipment shall be submitted, including:
 - 4.4.1 For any Tier 3 modeling, the printed summary, and
 - 4.4.2 For any Tier 4 modeling, the printed output summary and, in electronic format, the input and output files.
- 4.5 If a process or process equipment does not emit an applicable TAC, the EA demonstration shall state that no applicable TAC is emitted from that process or process equipment.
- 4.6 If the emission of an applicable TAC is de minimis, the applicable provision of Section 2 shall be specified. Processes and process equipment that are trivial or insignificant activities may be identified as groups rather than as individual processes or process equipment.
- 4.7 When making the EA demonstration, the owner or operator may include the effect of a Clean Air Act 112(d) maximum achievable control technology (MACT) standard with a future compliance date on the emissions from a process or process equipment, provided that the change in emissions and the compliance deadline are identified.
- 4.8 In the alternative to the provisions of this section applicable to Group 2 stationary sources, the Board may, by regulation, establish specific requirements for a class of

stationary sources. The District shall notify the owner or operator of each stationary source in that class of the Board's action.

- 4.9 The owner or operator of a stationary source may submit a revised demonstration of compliance with one or more of the EA goals in sections 3.1 and 3.2 based on the use of an EPA-approved dispersion model update or replacement model. If the revised EA demonstration justifies a change to an applicable emission standard, the District may revise the permitted emission standard accordingly.
- 4.10 The owner or operator of a stationary source shall maintain records, including but not limited to monitoring data, production data and purchasing records, sufficient to demonstrate compliance with applicable EA goals. This information shall be maintained for five years on a rolling basis and submitted to the District on request.

Sections 4.11 - 4.13 apply to new or modified processes or process equipment (as defined in Regulation 5.00):

- 4.11 Unless modified pursuant to Section 5 or subject to a compliance plan pursuant to this section, a construction permit for a new or modified process or process equipment at a Group 1 or 2 stationary source shall contain:
 - 4.11.1 An emission standard for each Category 1 or 2 TAC emitted that has been demonstrated to comply with an applicable EA goal in section 3.1 or 3.2;
 - 4.11.2 An emission standard for each Category 3 or 4 TAC emitted that has been demonstrated to comply with either:
 - 4.11.2.1 The EA goals in sections 3.1 and 3.2, or
 - 4.11.2.2 The general duty clause of Regulation 5.01.
- 4.12 The District shall provide an opportunity for public review and comment prior to issuing a construction permit pursuant to section 4.11.2.2.
- 4.13 A permitted stationary source that becomes a Group 1 or 2 source shall obtain a construction permit that contains an emission standard for each Category 1 or 2 TAC that has been demonstrated to comply with the EA goals in section 3.1.

Sections 4.14 - 4.21 apply to existing Group 1 and 2 stationary sources:

- 4.14 An existing Group 1 or 2 stationary source shall determine whether emissions of Category 1 and 2 TACs from all processes and process equipment at the source comply with the EA goals in section 3.1 and submit this determination to the District (the EA demonstration). The source may exclude emissions of a Category 2 TAC that:
 - 4.14.1 The Group 1 source did not report to EPA for the 2006 TRI, or
 - 4.14.2 The Group 2 source did not report to EPA for the 2007 TRI.
- 4.15 EA demonstrations shall be submitted on the following schedule (past dates are retained for reference only):
 - 4.15.1 By Group 1 stationary sources:
 - 4.15.1.1 For Category 1 TACs, by December 31, 2006, and
 - 4.15.1.2 For Category 2 TACs and all other applicable TACs, by March 31, 2008.
 - 4.15.2 By Group 2 stationary sources:
 - 4.15.2.1 For Category 1 TACs, by September 30, 2008, and
 - 4.15.2.2 For Category 2 TACs and all other applicable TACs, by September 30, 2012.
- 4.16 If the emissions of a TAC from a process or process equipment are determined to exceed one or more of the EA goals in section 3.1, and the District has not approved a modification of those goals pursuant to Section 5, the owner or operator shall submit to

the District a compliance plan and schedule by: (past dates are retained for reference only):

- 4.16.1 From a Group 1 stationary source:
 - 4.16.1.1 For Category 1 TACs, June 30, 2007, and
 - 4.16.1.2 For Category 2 TACs and all other applicable TACs, by March 31, 2009.
- 4.16.2 From a Group 2 stationary source:
 - 4.16.2.1 For Category 1 TACs, September 30, 2012, and
 - 4.16.2.2 For Category 2 TACs and all other applicable TACs, by September 30, 2013.
- 4.17 A compliance plan required by section 4.16 shall provide for compliance no later than the following dates (past dates are retained for reference only):
 - 4.17.1 For a Group 1 stationary source:
 - 4.17.1.1 For Category 1 TACs, December 31, 2008, and
 - 4.17.1.2 For Category 2 TACs and all other applicable TACs, by March 31, 2010.
 - 4.17.2 For a Group 2 stationary source:
 - 4.17.2.1 For Category 1 TACs, September 30, 2013, and
 - 4.17.2.2 For Category 2 TACs and all other applicable TACs, by September 30, 2014.
- 4.18 A compliance plan required by section 4.16 shall propose a schedule by which the source will:
 - 4.18.1 Perform an engineering analysis of potential solutions,
 - 4.18.2 Prepare a bid package for vendors for equipment,
 - 4.18.3 Submit a permit application for new equipment and any required modifications to the District,
 - 4.18.4 Select a vendor and issue a purchase order for equipment,
 - 4.18.5 Commence construction,
 - 4.18.6 Complete construction,
 - 4.18.7 Prepare and submit a proposed compliance testing protocol to the District for approval,
 - 4.18.8 Perform the required compliance testing,
 - 4.18.9 Prepare and submit a final compliance testing report to the District for approval, and
 - 4.18.10 Submit quarterly progress reports.
- 4.19 The District may extend a compliance date in section 4.17 pursuant to a written request from the owner or operator that includes:
 - 4.19.1 An explanation of why the extension is necessary;
 - 4.19.2 Any actions that have been taken to minimize the needed extension; and
 - 4.19.3 A compliance plan and schedule.
- 4.20 After providing an opportunity for public review and comment, the District may approve the compliance plan. The approved compliance plan shall be incorporated into the permit for the affected process or process equipment.
- 4.21 The District may extend a compliance date in section 4.18 for a process or process equipment that is subject to a MACT standard in effect at the time the compliance plan is due. The owner or operator shall timely and fully comply with the MACT standard. This extension shall not affect the compliance date for any other process or process equipment at the stationary source.

Sections 4.22 - 4.24 apply to all sources subject to this regulation:

- 4.22 A new EA demonstration or de minimis determination shall be performed at the time that:

- 4.22.1 An application to construct or modify a process or process equipment at a Group 1 or 2 stationary source is submitted to the District pursuant to Regulation 2.03, 2.04 or 2.05. The EA demonstration shall be submitted with the construction permit application.
- 4.22.2 Modification of any physical modeling parameters, such as fencelines or building heights, that are not otherwise subject to the permit requirements for that facility that affects the demonstration of compliance, occurs. The EA demonstration shall be submitted with the operating permit renewal application.
- 4.22.3 A change in a process or process equipment, including raw material or fuel type substitution, occurs, unless the change meets the conditions of Section 4.23.
- 4.23 Prior approval by the District is not required for a change pursuant to section 4.22.3 if:
 - 4.23.1 The change does not result in emissions that exceed an EA goal in either section 3.1 or 3.2;
 - 4.23.2 The change does not cause emissions of a TAC to no longer be de minimis;
 - 4.23.3 A permit modification is not required for the change by the District's regulations; and
 - 4.23.4 The owner or operator maintains records demonstrating compliance at the time of the change and thereafter. Records shall be maintained for 5 years on a rolling basis and submitted to the District on request.
- 4.24 An updated EA demonstration or de minimis determination for changes pursuant to this section shall be submitted within 6 months of the change.

Section 5 Modification of an EA Goal

- 5.1 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 to modify one or more of the EA goals in section 3.1 or 3.2. As part of the request, the owner or operator shall submit a demonstration that the affected process or process equipment complies with, or, pursuant to a proposed plan and schedule, will comply with, T-BAT.
- 5.2 The T-BAT demonstration shall:
 - 5.2.1 Include a review of the practices and measures potentially applicable to the process or process equipment, including technology transfer, identified from readily available air pollution control information, including EPA's RACT/BACT/LAER Clearinghouse,
 - 5.2.2 Document that the proposed T-BAT reflects the maximum reduction of emissions of, and risk from, a TAC that can reasonably be achieved, and
 - 5.2.3 Justify why another method identified in the review required in section 5.2.1 that would achieve a greater reduction in TAC emissions or risk was not chosen.
- 5.3 T-BAT is not required for a process or process equipment that does not individually, or when aggregated with other processes and process equipment, contribute to the exceedance of an EA goal in section 3.1.2, 3.1.3, or 3.2. However, a stationary source may, at its discretion, implement T-BAT for any process or process equipment to meet an EA goal.
- 5.4 A request to modify an EA goal in section 3.1.1 or 3.2 shall be approved if the District determines that the T-BAT requirement of section 5.2 is met, or will be met in a timely manner. Any resulting emission standard and approved plan and schedule for compliance with T-BAT shall be incorporated into the permit for the affected process or process equipment.

- 5.5 A request to modify an EA goal in section 3.1.2 or 3.1.3 shall include an evaluation of costs, technical feasibility, and relevant (including current and up to 25 years in the future) demographic and land use factors. Relevant factors include the frequency and duration of public access to the area where the EA goal is exceeded; the nature, type, and use of the area; and how each relevant factor may change over the 25-year period. In evaluating future changes, available land use, population, and transportation horizon projections shall be included. The evaluation may include the results of an EPA-approved human exposure model and any other relevant factors.
- 5.6 A request to modify the noncancer EA goal (EAC_{NC}) in section 3.1.2 shall include a determination of the target-organ-specific hazard index (TOSHI).
- 5.7 In determining whether to approve a request to modify an EA goal pursuant to section 5.5, the District shall determine whether the T-BAT requirement of section 5.2 is met and consider, among other factors, costs, technical feasibility, the demographic and land use factors in section 5.5, the TOSHI, the results (if included) of an EPA-approved human exposure model, and any other relevant factor.
- 5.8 For requested modifications with a hazard quotient that exceeds 1.0 or a cancer risk of up to 25010^{-6} , the District shall approve the requested modification if the District determines that the T-BAT requirement of section 5.2 is met, or will be met in a timely manner, and the resulting emission standard would provide an ample margin of safety to the exposed population.
- 5.9 For requested modifications with a cancer risk between 25010^{-6} and 100010^{-6} , the District may approve the requested modification, following an opportunity for public review and comment and a public hearing, if the District determines that the T-BAT requirement of section 5.2 is met, or will be met in a timely manner, and the resulting emission standard would provide an ample margin of safety to the exposed population.
- 5.10 If the District approves a request to modify an EA goal, any resulting emission standard and approved plan and schedule for compliance with T-BAT shall be incorporated into the permit for the affected process or process equipment.
- 5.11 If the District approves a modified EA goal, the owner or operator of the affected process or process equipment shall re-evaluate T-BAT and submit to the District a determination, meeting the requirements of section 5.2, of whether the approved practices and measures continue to constitute T-BAT for that process or process equipment. The re-evaluation of T-BAT shall be included with the next operating permit renewal application that is required to be submitted to the District at least 3 years after the date of approval of the current T-BAT requirement, and with the operating permit renewal application every 5 years thereafter.
- 5.12 If the District determines, at any time after approving a modified EA goal, that a revised T-BAT would achieve greater compliance with the EA goal, the District may require the owner or operator to implement the revised T-BAT. In making this determination, the District shall consider the factors in Regulation 5.00 section 1.3 and the costs relative to the useful life of emission reduction measures previously required and installed as T-BAT.
- 5.13 If the District requires implementation of a revised T-BAT pursuant to section 5.12, the District shall notify the owner or operator of the affected process or process equipment of this determination. The owner or operator shall submit to the District a proposed plan and schedule for implementing the revised T-BAT. Upon approval by the District, the

compliance plan and schedule shall be incorporated into the permit for the affected process or process equipment. The revised T-BAT shall be implemented on or before the expiration date of the current operating permit that expires at least 3, but no more than 5, years after the date of approval of the current T-BAT requirement and at least 3 years after notification by the District.

- 5.14 If a process or process equipment subject to T-BAT is modified and the hourly or annual emissions of a TAC increase, the owner or operator shall submit a construction permit application with a revised T-BAT demonstration.

Section 6 District-initiated Determinations

- 6.1 If the District determines, based on ambient air monitoring or modeling of emissions, that the ambient concentration of a TAC emitted by a stationary source exceeds an EA goal in section 3.1 or 3.5, the District may require the source to reduce emissions of that TAC. The District shall notify the owner or operator in writing, specifying a date for the source to submit a compliance plan and schedule with a date to achieve compliance with the EA goal. Any resulting emission standard and compliance plan shall be incorporated into the permit for the affected facility.
- 6.2 The District may propose a Risk Reduction Plan (Plan) if it determines that:
- 6.2.1 An EA goal in section 3.5 or a modified EA goal approved by the District pursuant to Section 5 is exceeded,
- 6.2.2 The presence of two or more TACs at concentrations that comply with the EA goals of sections 3.1, 3.2 and 3.5 would result in a synergistic or additive toxicological effect that may adversely affect human health, or
- 6.2.3 There is human exposure from routes other than direct inhalation.
- 6.3 The Plan shall include:
- 6.3.1 The information the District relied on in making its determination,
- 6.3.2 The assumptions and calculations in support of the Plan,
- 6.3.3 The stationary sources that emit the TAC or TACs that contribute to an exceedance of the EA goal,
- 6.3.4 The additional emission reductions necessary to:
- 6.3.4.1 Achieve compliance with the EA goal,
- 6.3.4.2 Reduce the cancer risk to a level, not to exceed 100×10^{-6} , that would provide an ample margin of safety to the exposed population, or
- 6.3.4.3 Reduce the noncancer risk to a target-organ-specific hazard index that would provide an ample margin of safety to the exposed population.
- 6.4 In determining the additional reductions, the District shall consider the extent to which each contributing process or process equipment has applied T-BAT, the factors in sections 5.5 and 5.6, and any other factor necessary and appropriate for a fair, equitable, and effective apportionment of the responsibility for additional reductions.
- 6.5 In considering the apportionment of additional reductions, the District shall, in general and in the absence of other relevant factors, apply the following hierarchy:
- 6.5.1 Processes and process equipment that do not apply T-BAT and that contribute significantly to the exceedance of the EA goal, based on the relative contribution of the process or process equipment to the exceedance;

- 6.5.2 Processes and process equipment that apply T-BAT and that contribute significantly to the exceedance of the EA goal, based on the relative contribution of the process or process equipment to the exceedance;
- 6.5.3 Processes and process equipment that do not apply T-BAT and do not contribute significantly to the exceedance of the EA goal, based on the relative contribution of the process or process equipment to the exceedance;
- 6.5.4 Processes and process equipment that apply T-BAT and do not contribute significantly to the exceedance of the EA goal, based on the relative contribution of the process or process equipment to the exceedance.
- 6.6 The District shall provide an opportunity for the public to review and comment on the proposed Plan.
- 6.7 Within 180 days of the effective date of a Plan, the owner or operator of each source required to make additional emission reductions shall submit a compliance plan that includes the actions in section 4.18. The required reductions shall be achieved no later than 18 months after the District approves the compliance plan.
- 6.8 After providing an opportunity for public review and comment, the District may approve a compliance plan submitted pursuant to section 6.7. Any more stringent emission standard and compliance schedule shall be incorporated into the permit for the affected process or process equipment.
- 6.9 Upon written notification by the District that a BAC established pursuant to Regulation 5.20 for a TAC that is emitted by a stationary source has become more stringent, the owner or operator shall, within 6 months of this notification, submit a revised EA demonstration to the District. If one or more of the EA goals in section 3.1 is exceeded, the owner or operator shall, within 18 months of the initial notification, submit a compliance plan with a schedule for coming into compliance no later than 36 months after the initial notification. Upon approval by the District, the compliance plan shall be incorporated into the permit for the affected process or process equipment.
- 6.10 If a BAC established pursuant to Regulation 5.20 for a TAC becomes less stringent, the owner or operator of a source that emits the TAC may request that an emission standard based on the more stringent BAC be revised. If the revised standard complies with all other applicable requirements, the District shall approve the request.

Section 7 Public Review

- 7.1 The District shall maintain a list of persons who request to be notified when the District receives a request to modify an EA goal and of the opportunities for public review and comment provided by this regulation. Notification may be made by email.
- 7.2 An opportunity for public review and comment shall be provided for the following:
 - 7.2.1 A compliance plan required pursuant to section 4.17, 6.1 or 6.7;
 - 7.2.2 A Risk Reduction Plan pursuant to section 6.2; or
 - 7.2.3 A request to modify an EA goal pursuant to Section 5.
- 7.3 A public hearing noticed in accordance with KRS Chapter 424 *Legal Notices* shall be provided for a modification requested pursuant to section 5.9.
- 7.4 Costs associated with public notice and a public hearing shall be paid by the owner or operator of the stationary source, except public notice pursuant to section 6.2 (District-initiated Risk Reduction Plan).

APPENDIX

NOTES AND EQUATIONS FOR SECTIONS 3.1, 3.2, AND 3.5

3.1	Process or Process Equipment (P/PE)	Applicable TACs	EAG_C Risk^{1,2} (10⁻⁶)	EAG_{NC} HQ^{3,4}
3.1.1	Individual stationary source, individual P/PE	Individual TAC	1.0	1.0
3.1.2	Individual stationary source, all P/PE	Individual TAC		1.0
3.1.3	Individual stationary source, all P/PE	Total for all applicable TACs	7.5	
3.2	Individual stationary source, all new and modified P/PE	Total for all applicable TACs	3.8	

¹The risk from an individual TAC determined to be a carcinogen from an individual process or process equipment is derived from the following equation:

$$R_C = \frac{\text{Maximum concentration}_{ij}}{BAC_{C_i}} \quad [\text{Equation 1}]$$

Where: R_C = The risk of cancer
 i = an individual TAC, from
 j = an individual new or modified process or process equipment,

BAC_C = the BAC for the carcinogenic effects of the TAC, and
 Maximum concentration = the highest ambient concentration of the TAC, taking into account the applicable averaging time.

²The risk from all TACs determined to be carcinogens is the sum of the cancer risks at a single point from all individual TACs from all applicable processes or process equipment, derived from the following equation:

$$R_C = \sum_{i=1}^n \sum_{j=1}^m \frac{\text{Maximum concentration}_{ij}}{BAC_C} \quad [\text{Equation 2}]$$

Where: R_C = The risk of cancer,
 i = an individual TAC, from
 j = an individual process or process equipment,
 n = the total number of carcinogenic TACs included in the EA demonstration,
 m = the total number of processes or process equipment from which the TAC may be emitted,
 BAC_C = the BAC for the carcinogenic effects of the TAC, and
Maximum concentration = the ambient concentration of a TAC at the point of maximum risk of all applicable “i” emissions of the TAC from all applicable “j” processes or process equipment, taking into account the applicable averaging time.

³The risk from the noncarcinogenic effects of an individual TAC from an individual process or process equipment is the hazard quotient (HQ) derived from the following equation:

$$R_{NC} = HQ_i = \frac{\text{Maximum concentration}_{ij}}{BAC_{NCi}} \quad [\text{Equation 3}]$$

Where: R_{NC} = The noncarcinogenic risk
 i = an individual TAC, from
 j = an individual process or process equipment,
 BAC_{NC} = the BAC for the noncarcinogenic effects of the TAC, and

Maximum concentration = the highest ambient concentration of a TAC, taking into account the applicable averaging time.

⁴The risk from the noncarcinogenic effects of an individual TAC at a single point from all applicable processes or process equipment is the hazard quotient (HQ) derived from the following equation:

$$R_{NC} = HQ_i = \sum_{j=1}^m \frac{\text{Maximum concentration}_{ij}}{BAC_{NCi}} \quad [\text{Equation 4}]$$

i = an individual TAC, from
 j = an individual process or process equipment,
 m = the total number of processes or process equipment from which the TAC may be emitted,
 BAC_{NC} = the benchmark ambient concentration for the noncarcinogenic effects of the TAC determined pursuant to Regulation 5.20, and

Maximum concentration = the ambient concentration of a TAC at the point of maximum concentration of the “i” emissions of the TAC from all applicable “j” processes or process equipment, taking into account the applicable averaging time.

⁵The EAG_C Risk is in units of risk in one million.

3.5	Source of Emission	Applicable TACs	EAG _C Risk (010 ⁻⁶) ⁵	EAG _{NC} HQ ⁶
3.5.1	Applicable processes and process equipment	Individual TAC		1.0
3.5.2	Applicable processes and process equipment	Total for all applicable TACs	10.0	

¹The risk from all TACs determined to be carcinogens at a single point from all applicable processes and process equipment is derived from the following equation:

$$R_C = \prod_{i=1}^n \prod_{j=1}^m \frac{\text{Maximum concentration}_{ij}}{BAC_{Ci}} \quad [\text{Equation 5}]$$

Where: R_C = the risk of cancer
i = an individual carcinogenic TAC, from
j = an individual source of emission,
n = the total number of carcinogenic TACs included in the EA demonstration,
m = the total number of emission sources from which carcinogenic TAC “i” may be emitted,
BAC_C = the BAC for the carcinogenic effects of the TAC, and

Maximum concentration = the ambient concentration of a TAC at the point of maximum risk of all applicable “i” emissions from all applicable “j” sources of emission, taking into account the applicable averaging time .

²The risk from the noncarcinogenic effects of an individual TAC from all applicable processes and process equipment is the Hazard Quotient (HQ) derived from the following equation:

$$R_{NC} = HQ_i = \prod_{j=1}^m \frac{\text{Maximum concentration}_{ij}}{BAC_{NCi}} \quad [\text{Equation 6}]$$

Where: R_{NC} = the noncarcinogenic risk
i = an individual TAC, from
j = an individual source of emission,

m = the total number of sources of emission from which TAC “i” may be emitted,

BAC_{NC} = the BAC for the noncarcinogenic effects of the TAC, and

Maximum concentration = the ambient concentration of the TAC at the point of maximum concentration of the “i” emissions from all applicable “j” emission sources, taking into account the applicable averaging time.

³The EAG_C Risk is in units of risk in one million.

Adopted v1/6-21-05; effective 7-1-05; amended v2/1-17-07, v3/4-18-07, v4/9-16-09, v5/9-15-10, v6/7-20-11