47.0 GOOD ENGINEERING PRACTICE STACK HEIGHT

47.1 General Provisions

A. This section provides that the degree of emission limitation required of any source for control of any air pollutant must not be affected by that portion of any source's stack height that exceeds good engineering practice (GEP) or by any other dispersion technique, except as provided in Section 47.1.B of this rule. Before a new or revised emission limitation is based on a stack height which exceeds the height allowed by the definitions of GEP stack height, the Director must notify the public of the availability of the demonstration study and must provide opportunity for public hearing on it. This section does not restrict in any manner the actual stack height of any source.

B. The provisions of this section shall not apply to stack heights in existence, or dispersion techniques implemented on or before December 31, 1970, except where pollutants are being emitted from such stacks or using such dispersion techniques by stationary sources which were constructed, or reconstructed, or for which modifications were carried out after December 31, 1970.

47.2 Definitions

A. Within the context of this section the following definitions apply:

1. "Dispersion technique" means any technique which attempts 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 stack; or other selective handling of exhaust gas streams so as to increase the exhaust gas plume rise.

(1) The preceding sentence 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 facility generating the gas stream;

(b) The merging of exhaust gas streams where:

1. The source owner or operator demonstrates that the facility was originally designed and constructed with such merged gas streams;

2. After July 8, 1983, such merging is part of a change in operation at the facility that includes the installation of pollution controls and is accompanied by a net reduction in the allowable emissions of a pollutant. This exclusion from the definition of "dispersion techniques" shall apply only to the emission limitation for the pollutant affected by such change in operation; or

3. Before July 8, 1985, such merging was part of a change in operation at the facility 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 emissions limitation or, in the event that no emission limitation was in existence prior to the merging, an increase in the quantity of pollutants actually emitted prior to the merging, the Director shall presume that merging was significantly motivated by an intent to gain emissions credit for greater dispersion. Absent a demonstration by the source owner or operator that merging was not significantly motivated by such intent, the Director shall deny credit for the effects of such merging in calculating the allowable emissions for the source;

4. Smoke management in agricultural or silvicultural prescribed burning programs;

5. Episodic restrictions on residential woodburning and open burning; or

6. Techniques under Section 47.2.A.1.c, which increase final exhaust gas plume rise where the resulting plant-wide allowable emissions of sulfur dioxide do not exceed 5000 tons per year.

2. "Emission limitation" and "emission standard" mean a requirement established by the Director, which limits the quantity rate or concentration of emission of air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.

3. "Good engineering practice" (GEP) stack height means the greater of:

   a. 65 meters (213 feet), measured from the ground-level elevation at the base of the stack:

   b. Considering other stack criteria, the following formulae apply:

      (1) For stacks in existence on January 12, 1979, and for which the owner or operator had obtained all applicable permits or approvals required,

      $$Hg = 2.5H$$

      provided the owner or operator produces evidence that this equation was actually relied on in establishing an emission limitation;

      (2) For all other stacks:

      $$Hg = H+1.5L,$$

      where

      Hg = good engineering practice 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,

      L = lesser dimension, height (H) or projected width, of 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 source; or

   c. The height demonstrated by a fluid model or a 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.

4. "Nearby" is defined for a specific structure or terrain feature and

   a. For the purposes of applying the GEP stack height formulae means that distance up to five times the lesser of the height or the width dimension of a structure, but not greater than 0.8 km (1/2 mile), and

   b. For conducting fluid model or field study demonstrations means not greater than 0.8 km (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 10 times the maximum height (H_t) of the feature, not to exceed 2 miles if such feature achieves a height (H_t) 0.8 km from the stack that is a least 40 percent of the GEP stack height formulae or 26 meters (85 feet), 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.

5. "Excessive concentration" is defined:

   a. For sources seeking credit for stack height exceeding GEP stack height, maximum ground-level concentration due to emissions from a stack due in part to a downwash, wakes, and eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard. For sources subject to the prevention of significant deterioration program, an excessive concentration alternatively means 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 individually is at least 40 percent in excess of downwash, wakes, or eddy effects and greater than a prevention of significant deterioration increment. The allowable emission rate to be used in making demonstrations under this rule will be prescribed by the new source performance standard (NSPS) that is applicable to the source category unless the owner or operator demonstrates that this emission rate is infeasible. Where such demonstrations are approved by the director, an alternative emission rate shall be established in consultation with the source owner or operator;

   b. For sources seeking credit after October 1, 1983, for increases in existing stack height established under this regulation, either;

(1) A maximum ground-level concentration due in whole or part to downwash, wakes, or eddy effects as provided in Section 47.2.A.5.a, except that the emission rate specified by the State Implementation Plan (or, in absence of such a limit, the actual emission rate) shall be used, or

(2) The actual presence of a local nuisance caused by the existing stack, as determined by the Director; and

c. For sources seeking credit after January 12, 1979, for a stack height determined under this regulation where the Director requires the use of a field study or fluid model to verify GEP stack height, for sources seeking stack height credit after November 9, 1984, based on the aerodynamic influence of cooling towers, and for sources seeking stack height credit after December 31, 1970, based on the aerodynamic influence of structures not adequately represented by the equations in GEP stack height, a maximum ground level concentration due in whole or part to downwash, wakes, or eddy effects that is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects.

6. "Stack" for the purpose of good engineering practice means any point in a source designed to emit solids, liquids, or gases into the air, including a pipe or duct but not including flares.

7. "A Stack in Existence" means that the owner or operator had: (1) begun, or caused to begin, a continuous program of physical on-site construction of the stack; or (2) entered into binding agreements or contractual obligations, which could not be canceled or modified without substantial loss to the operator, to undertake a program of construction of the stack to be completed in a reasonable time.

8. "Plume Impaction" means concentration measured or predicted to occur when the plume interacts with elevated terrain.

9. "Elevated Terrain" within the context of this section means terrain which exceeds the elevation of good engineering practice stack height.

47.3 Good Engineering Practice Stack Height Regulations Standards

A. No person shall cause, suffer, allow, or permit emissions in excess of the standards in this section.

B. The possession of a valid permit shall not protect the source from enforcement actions if permit conditions are not met.

C. Upon mutual agreement of any air contaminant source and the Director, an emission limit more restrictive than that otherwise specified in the Knox County Air Quality Management Regulations may be established. Also, upon mutual agreement of any air contaminant source and the Director, operating hours, process flow rates, or any other operating parameter may be established as a binding limit which the source must adhere to. Any items mutually agreed to shall be stated as a special condition for any permit or order concerning the source. Violations of this mutual agreement shall result in revocation of the issued permit. In addition to these provisions the following criteria must be met by any such agreements and the associated permits:

1. Operating permit holders must adhere to the terms and limitations of such permits (or subsequent revision of the permit made in accordance with the approved operating permit program), and any such permits which do not confirm to the operating permit program requirements and the requirements of EPA's underlying regulations may be deemed not "federally enforceable" by EPA.

2. All emission limitations, controls, and other requirements imposed by such permits will be at least as stringent as any other applicable limitations and requirements contained in the State Implementation Plan (SIP) or enforceable under the SIP, the Department may not issue permits that waive, or make less stringent, any limitations or requirements contained in or issued pursuant to the SIP, or that are otherwise "federally enforceable" (e.g. standards established under Sections 111 and 112 of the Clean Air Act).

3. The limitations, controls, and requirements in the operating permits are permanent, quantifiable, and otherwise enforceable as a practical matter.

4. The permits are issued subject to public participation. This means that the Department will provide EPA and the public with a timely notice of the proposal and issuance of such permits, and to provide EPA, on a timely basis, with a copy of each proposed (or draft) and final permit intended to be federally enforceable. This process must also provide for an opportunity for public comment on the permit applications prior to issuance of the final permit. Timely notice will be at least 30 days.

47.4 Specific Emission Standards

For any affected air contaminant source(s) at a facility, the Director shall specify on the construction and/or operating permit(s) as permit conditions the emission limitation that is determined to be necessary under the provisions of this section.