

DEP - DEPT. OF ENVIRONMENTAL
PROTECTION
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**INTERIM OPERATING GUIDANCE FOR
AIR TOXIC SUBSTANCES:
NEW AND MODIFIED SOURCES**

Revised: 3-02-84
9-27-85

Purpose:

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9-27-85

The purpose of this guidance is: (a) to improve the level of protection provided the general public from air toxic substances, and (b) to provide a consistent procedure for permitting new and modified sources that emit air toxic substances.

Effective Date:

Plan approval applications submitted after December 31, 1983 shall be reviewed for conformance with this guidance. All new sources and modifications to existing sources subject to the provisions of Chapter 122 (New Source Performance Standards), Chapter 124 (National Emission Standards for Hazardous Air Pollutants) and Chapter 127 (Construction, Modification, Reactivation and Operation of Sources) shall be reviewed for conformance with this operating guidance. The guidance shall remain in force until the adoption and implementation of a formal air toxics program.

Background:

Existing Departmental regulations substantially reduce the amount of air toxic substances released to the atmosphere. These regulations include the provisions for plan approval under Chapter 127, the emission limitation provisions for particulates, sulfur oxides and volatile organic compounds (VOC) under Chapters 123 and 129, the New Source Performance Standards under Chapter 122, and National Emission Standards for Hazardous Air Pollutants (NESHAP) under Chapter 124.

The Department, however, is concerned that these existing regulations may not adequately protect public health in all situations because, for the most part, they address the criteria pollutants: ozone (VOC), particulates and sulfur oxides. An exception is Chapter 124 relating to NESHAP. However, the NESHAP program addresses a small list of substances and imposes requirements on only a few specifically identified source categories.

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Authority to Regulate Air Toxic Substances:

Authority to require plan approval applications for new and modified sources that would emit air toxic substances is provided under the Pennsylvania Air Pollution Control Act (the Act of January 8, 1960, P.L. 2119 (1959), as amended 35 P.S. §4001 et seq.). Section 6.1 of the Act provides that no person may construct, assemble, install or modify an air contamination source without approval of the Department. The Department has the authority to refuse to grant approval to new or modified air contaminant sources when the sources are likely to cause air pollution. Subsection (d) states:

"(d) The department may refuse to grant approval for any stationary air contamination source...If it appears, from the data available to the department that the proposed source, or proposed changes in such source, are likely either to cause air pollution or to violate any board rule or regulation applicable to such source...." [emphasis added]

The Department's authority to regulate air contaminants is not limited to those air contaminants specifically identified in the regulations. "Air pollution" is broadly defined in Section 3.(5) of the Act to include any contaminant that is or may be harmful to public health, or which may unreasonably interfere with the comfortable enjoyment of life or property:

"Air Pollution." The presence in the outdoor atmosphere of any form of contaminant including but not limited to the discharging from stacks, chimneys, openings, buildings, structures, open fires, vehicles, processes, or any other source of any smoke, soot, fly ash, dust, cinders, dirt, noxious or obnoxious acids, fumes, oxides, gases, vapors, odors, toxic or radioactive substances, waste, or any other matter in such place, manner, or concentration inimical or which may be inimical to the public health, safety, or welfare or which is, or may be injurious to human, plant or animal life, or to property, or which unreasonably interferes with the comfortable enjoyment of life or property. 35 P.S. §4003(5). [emphasis added]

Appellate courts have upheld the Commonwealth's authority to prevent "air pollution" without a regulation directed against the specific activity. [*Midway Coal Company v. Commonwealth*, 50 Pa. Commonwealth Court 326, 413 A.2d 1139 (1980); *Rushton Mining Company v. Commonwealth*, 16 Pa. Commonwealth Court 135, 328 A.2d 135 (1974)] Courts have also directed the Department to require plan approvals and permits when Departmental regulations did not specifically require plan approvals for certain construction and modification activities. [*Mignatti Construction Company v. Commonwealth*, 49 Pa. Commonwealth Court 497, 411 A.2d 860 (1980)]

The Department has broad statutory powers to regulate air toxics. When the sections of the Act mentioned above are considered together, the Department can require plan approvals for sources that would emit air toxic substances that present or may present a hazard to public health, safety or welfare. Further, the Department can grant or refuse approval even though the Environmental Quality Board has not adopted specific rules and regulations governing air toxic substances.

Interim Operating Guidance:

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The air toxic interim operating guidance will be implemented through the Department's on-going activities under Chapters 133, 134 and 137. Each plan approval application submitted shall be reviewed to assess the potential for public health hazards from the emission of air toxic substances.¹ This assessment shall be in addition to the review conducted for the air contaminants specified in Chapter 131 and other applicable standards of Article III. The assessment shall focus on the air toxic substances listed in Table 1.²

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The assessment shall include a comparison of the potential maximum ambient concentration of the toxic substance with an air quality guideline for that substance. A chronic (annual) low-level exposure air quality guideline is specified in Table 1 for most of the substances that will be included in the assessment.³ Documentation supporting each guideline is contained in Appendix A. For those substances in Table 1 that do not have a chronic air quality guideline, contact the Bureau's Air Toxic Coordinator for guidance.

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3/2/84

In addition to the chronic assessment an acute (weekly) exposure assessment shall be conducted for "Formaldehyde" and "Nickel and Compounds."

¹Given the general lack of information on air toxics and the considerable uncertainty associated with assessing the public health hazards, judgments must be based on the specific facts available in each case. This assessment is not intended to provide a precise point around which unqualified decisions can be made. Rather, a framework is provided from which decisions can be made based on informed judgment. The methodology used in the assessment, however, should ensure consistency in fairness and rationality by precluding the arbitrary application of uninformed opinions.

The methodology also should ensure predictability in the review of plan approval applications. Industry needs predictability to assess its own activities, to have assurance that Department judgments will not change unexpectedly and to ensure that one region's judgments will not be substantially different from another's.

²The list was developed by the Philadelphia County Department of Health; Air Management Services (AMS).

³AMS developed the chronic (annual) air quality guideline for each listed substance. They were assisted in this matter by an Ad Hoc Advisory Committee for Toxic Air Contaminants. The Ad Hoc Committee consisted of health professionals from academia, industry and public interest groups in the fields of toxicology, occupational medicine and industrial hygiene.

The acute exposure air quality guidelines shall be a factor of 3 times the chronic air quality guidelines.⁴ These substances are noted in Table 1 with the letter "A".⁵

The air quality guidelines should be used only as a guide in decision-making. Also, the Department will consider information, submitted by the permit applicant or anyone else, that may support an air quality guideline different from a guideline specified in this interim operating guidance. To sustain a different air quality guideline the information must demonstrate that larger concentrations of the toxic substance will not present a health hazard to the most sensitive members of society. All such information must be submitted to the Bureau's Air Toxic Coordinator for review prior to approval or denial of the plan approval application. The Air Toxic Coordinator shall use the best available expertise to evaluate the information.

Each source subject to the assessment shall be reviewed in accordance with the step-by-step procedure contained in Appendix B. Both chronic and acute exposures shall be reviewed. In the procedure, the terms "substantially less than" and "substantially greater than" shall be equated to a factor of 3. (A maximum ambient concentration greater than three times the air quality guideline shall be considered "substantially greater than." A maximum ambient concentration less than one-third the air quality guideline shall be considered "substantially less than." A maximum ambient concentration within a factor of three of the air quality guideline shall be considered "near.")

⁴The factors used to calculate the acute exposure air quality guidelines were established by the Department of Environmental Resources in consultation with the Pennsylvania Department of Health, Division of Environmental Health.

⁵The Department of Environmental Resources has determined that "Formaldehyde" and "Nickel and Compounds" should be included in the acute exposure assessment. These substances have been shown to cause a sensitization reaction in humans. Since some of the population may already be sensitized, these substances have been included in the acute exposure assessment to provide additional protection.

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Approved:

James M. Schlegel
Chief
Division of Abatement & Compliance

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GLOSSARY

A

ACGIH - American Conference of Governmental Industrial Hygienists
ADI - acceptable daily intake
AMS - Air Management Services
bw₃ - body weight
cm³ or cc - cubic centimeter(s)
d or D - day(s)
EPA - Environmental Protection Agency
FAO/WHO - Food and Agricultural Organization/World Health Organization
g or G - grams(s)
hr - hour(s)
IARC - International Agency for Research on Cancer
kg - kilogram(s)
l or L - liter(s)
LOEL - lowest observed effect level
M³ - cubic meter(s)
mg - milligram(s)
min - minute(s)
ml - milliliter(s)
NAAQS - national ambient air quality standard
NESHAP - national emission standard for hazardous air pollutant
ng - nanogram(s)
NIOSH - National Institute for Occupational Safety and Health
NOEL - no observed effect level
NTP - National Toxicology Program
OSHA - Occupational Safety and Health Administration
PEL - permissible exposure limit
ppb - parts per billion [by volume]
ppm - parts per million [by volume]
ppt - parts per trillion [by volume]
STEL - short-term exposure limit
TLV - threshold limit value
TWA - time-weighted average
ug - Microgram(s)
um - micrometer(s)
wk - week(s)

TABLE 1

Summary of Recommended Ambient Air Quality Guidelines

<u>Substance</u>	<u>Ambient Air Quality Guideline (Annual Average Unless Otherwise Noted) With Protocol Reference</u>
Acrylonitrile	5 ppb, TLV/420 (II.B.)
Aldrin	0.035 ug/M ³ , ADI/10 (III.D.)
4-Aminodiphenyl	0.8 ug/M ³ , LEL/4200 (II.C.)
3-Amino-1,2,4-triazole	1.8 ug/M ³ , LEL/1000 (II.C.)
Antimony and compounds	1.2 ug/M ³ , TLV/420 (II.B.)
Arsenic and compounds	0.024 ug/M ³ , PEL/420 (II.B.)
Asbestos	(0.005 fibers > 5 um/cc), TLV/420 (II.B.)
Benzene	24 ppb, TLV/420 (II.B.)
Benzidine	30 ug/M ³ , LEL/1000 (II.C.)
Benzo(a)pyrene	0.0007 ug/M ³ , LEL/100 (II.A.)
Beryllium and compounds	0.01 ug/M ³ , (I.)
BHC	1.2 ug/M ³ , TLV/420 (II.B.)
Lindane and isomers	1.2 ug/M ³ , TLV/420 (II.B.)
Bis(2-chloroethyl)ether	120 ppb, TLV/42 (III.B.)
Bis(chloromethyl)ether	0.0024 ppb, TLV/420 (II.B.)
Bis(2-hydroxyethyl)-dithiocarbamic acid, potassium salt	No guideline due to insufficient scientific evidence
Cadmium and compounds	0.12 ug/M ³ , TLV/420 (II.B.)
Captan	35 ug/M ³ , ADI/10 (III.D.)
Carbaryl	3.5 ug/M ³ , ADI/10 (III.D.)
Carbon tetrachloride	12 ppb, TLV/420 (II.B.)
Chloramben	1333 ug/M ³ , LEL/4200 (II.C.)
Chlordane	0.35 ug/M ³ , ADI/10 (III.D.)
Chlorobenzilate	7 ug/M ³ , ADI/10 (III.D.)
Chloroform	24 ppb, TLV/420 (II.B.)
Chloromethyl methyl ether	0.02 ppb, NOEL/4200 (II.C.)
Chromium and compounds (hexavalent)	0.12 ug/M ³ , TLV/420 (II.B.)
DDT/DDD	1.8 ug/M ³ , ADI/10 (III.D.)
1,2-Dibromo-3-chloropropane (DBCP)	0.1 ppb, NOEL/1000 (II.C.)
3,3'-Dichlorobenzidine	No guideline due to insufficient scientific evidence; noted to be carcinogenic
2,4-Dichlorophenoxy acetic acid (2,4 D)	105 ug/M ³ , ADI/10 (III.D.)

TABLE 1 (Cont'd)

Ambient Air
Quality Guideline (Annual
Average Unless Otherwise
Noted) With Protocol Reference

Substance	
Dieldrin	0.035 ug/M ³ , ADI/10 (III.D.)
Di(2-ethyl hexyl)phthalate	120 ug/M ³ , TLV/42 (III.B.)
Dimethylcarbonyl chloride	0.24 ppb, LEL/4200 (II.C.)
1,1-Dimethyl hydrazine	1.2 ppb, TLV/420 (II.B.)
Dimethyl sulfate	2.4 ppb, NOEL/420 (II.A.)
Dioxane	24 ppb, NOEL/4200 (II.C.)
Endosulfan	2.4 ug/M ³ , TLV/42 (III.B.)
Endrin	0.07 ug/M ³ , ADI/10 (III.D.)
Ethylenebisdithiocarbamic acid salts	18 ug/M ³ , ADI/10 (III.D.)
Ethylene dibromide	2.4 ppb, LEL/4200 (II.C.)
Ethylene dichloride (1,1 ethylene dichloride)	37 ppb, LEL/1000 (II.C.)
Ethylene oxide	2.4 ppb, LEL/4200 (II.C.)
Ethylene thiourea	0.7 ug/M ³ , ADI/10 (III.D.)
Epichlorohydrin	2.4 ppb, NOEL/4200 (II.C.)
A Formaldehyde	4.8 ppb, TLV/420 (II.B.)
Heptachlor	0.18 ug/M ³ , ADI/10 (III.D.)
Hexachlorobenzene	0.48 ppb, NOEL/4200 (II.C.)
Hexachlorobutadiene	0.06 ppb, NOEL/1000 (II.C.)
Hexamethyl phosphoramide	0.0024 ppb, NOEL/4200 (II.C.)
Hydrazine	0.24 ppb, TLV/420 (II.B.)
Kelthane	8.8 ug/M ³ , ADI/10 (III.D.)
Kepone	0.88 ug/M ³ , LEL/1000 (II.C.)
Lead and compounds	1.5 ug/M ³ , (I.)
Manganese and compounds	24 ug/M ³ , TLV/42 (III.B.)
Mercury and compounds	0.24 ug/M ³ , TLV/42 (III.B.)
Methoxychlor	35 ug/M ³ , ADI/10 (III.D.)
Methyl bromide	120 ppb, TLV/42 (III.B.)
Methyl chloride	1200 ppb, TLV/42 (III.B.)
4,4'-Methylene bis(2-chloroaniline)	0.05 ppb, TLV/420 (II.B.)
Methylene chloride	2400 ppb, TLV/42 (III.B.)
Methyl iodide	5 ppb, TLV/420 (II.B.)
Mirex	0.88 ug/M ³ , LEL/1000 (II.C.)
Monomethyl hydrazine	0.5 ppb, TLV/420 (II.B.)
0-Naphthylamine	19 ug/M ³ , LEL/1000 (II.C.)
A Nickel and compounds	0.24 ug/M ³ , TLV/420 (II.B.)
4-Nitrodiphenyl	2.7 ug/M ³ , NOEL/1000 (II.C.)

TABLE 1 (cont'd)

Substance	Ambient Air Quality Guideline (Annual Average Unless Otherwise Noted) With Protocol Reference
Nitrofen	0.75 ug/M ³ , 24-hr TWA, NOEL/1000 considering teratogenicity, (II.C.)
2-Nitropropane	6 ppb, NOEL/4200 (II.C.)
N-Nitrosodimethylamine	0.0004 ppb, NOEL/4200 (II.C.)
Parathion	1.8 ug/M ³ , ADI/10 (III.D.)
Particulate polycyclic aromatic hydrocarbons	0.48 ug/M ³ , TLV/420 (II.B.)
Pentachlorophenol (PCP)	12 ug/M ³ , TLV/42 (III.B.)
Perchloroethylene	1200 ppb, TLV/42 (III.B.)
Phenol	120 ppb, TLV/42 (III.B.)
N-Phenyl-β-Naphthylamine	45 ug/M ³ , NOEL/4200 (II.C.)
Polybrominated biphenyls	No guideline due to insufficient scientific evidence
Polychlorinated biphenyls	0.18 ug/M ³ , NOEL/4200 (II.C.)
Propane sultone	No guideline due to insufficient scientific evidence; noted to be highly carcinogenic
β-Propiolactone	No guideline due to insufficient scientific evidence; noted to be carcinogenic
Propylene Imine	4.8 ppb, TLV/420 (II.B.)
Propylene Oxide	250 ppb, NOEL/420 (III.C.)
Quintozone	2.4 ug/M ³ , ADI/10 (III.D.)
Strobane	7.7 ug/M ³ , LEL/1000 (II.C.)
2-(p-tert-Butylphenoxy)-isopropyl-2-chloroethyl sulfite	10 ug/M ³ , LEL/1000 (II.C.)
Tetrachlorinated dibenzo-p-dioxins	0.000035 ug/M ³ , NOEL/1000 (II.C.)
Tetrachloroethane	24 ppb, TLV/42 (III.B.)
Tetrachlorovinphos	3360 ug/M ³ , LEL/1000 (II.C.)
Thallium and compounds	2.4 ug/M ³ , TLV/42 (III.B.)
o-Tolidine	No guideline due to insufficient scientific evidence
Trichloroethylene	1200 ppb, TLV/42 (III.B.)
Trichlorophenol isomers	3500 ug/M ³ , NOEL/100 (III.C.)
2,4,5-Trichlorophenoxy acetic acid (2,4,5 T)	1 ug/M ³ , ADI/10 (III.D.)
Trifluralin	1150 ug/M ³ , LEL/1000 (II.C.)
Toxaphene	1.2 ug/M ³ , TLV/420 (II.B.)
Vinyl bromide	12 ppb, NOEL/4200 (II.C.)
Vinyl chloride	2.4 ppb, PEL/420 (II.B.)

76 (2.4) ~ 10 ug/m³ *enclosed*
24.45 *as mobile*
in M.