Chapter NR 445

CONTROL OF HAZARDOUS POLLUTANTS

NR 445.01 Applicability; purpose. (1) APPLICABILITY. This chapter applies to all air contaminant sources and to all owners or operators of an air contaminant source. The emission limitations and control requirements of this chapter do not apply to a source of a hazardous air contaminant regulated under chs. NR 446 to 449 for the specific hazardous air contaminants regulated under those chapters or to a source which must meet a national emission standard for a hazardous air pollutant promulgated under section 112 of the federal clean air act for the specific air pollutant regulated under that standard.

(2) PURPOSE. This chapter is adopted under ss. 144.31, 144.375 and 144.38, Stats., to establish emission limitations for hazardous pollutants.

History: Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. (1), Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.02 Definitions. The definitions in this section apply to the terms used in chs. NR 445 to 484. In addition, the definitions in ch. NR 400 apply to the terms used in this chapter.

(1) "Approved material safety data sheet" means a material safety data sheet which meets the reporting requirements of the superfund amendments reauthorization act of 1986 (42 USCS §§ 9671-9675) or the occupational safety and health act of 1970 (29 USCS §§ 660).

(2) "Asbestos" means any of the 6 naturally occurring hydrated mineral silicates: actinolite, amosite, anthophyllite, chrysotile, crocidolite, and temolite.

(3) "Beryllium" means the element beryllium. Where weights or concentrations are specified, such weights or concentrations apply to beryllium only, excluding the weight or concentration of any other elements.

(4) "Best available control technology" means an emission limit for a hazardous air contaminant based on the maximum degree of reduction practically achievable as specified by the department on an individual case-by-case basis taking into account energy, economic and environmental impacts and other costs related to the source.

(5) "Downwash minimization stack height" means a stack height equal to (H + 1.5D) where H is the height of the structure and D is the lesser of the structure height or structure cross-wind horizontal dimension in the immediate vicinity of the stack.

(6) "Hazardous air contaminant" means any air contaminant for which no ambient air quality standard is set in ch. NR 404 and which the department determines may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating

reversible illness, or may pose a significant threat to human health or the environment. The term hazardous air contaminant includes, but is not limited to, the substances listed in Tables 1 to 4 in s. NR 445.04.

(7) "Indoor fugitive emissions" means an air contaminant present in a workplace which is emitted to the ambient air from general ventilation sources.

(8) "Lowest achievable emission rate" means the rate of emission of a hazardous air contaminant which reflects the more stringent of the following:

(a) The most stringent emission limitation for the hazardous air contaminant which is contained in the air pollution regulatory program of any state for this class or category of source, unless an applicant for a permit demonstrates that this limitation is not achievable; or

(b) The most stringent emission limitation for the hazardous air contaminant which is achieved in practice by the class or category of source.

(9) "Mercury" means the element mercury, excluding any other elements, and includes mercury in particulates, vapors, aerosols and compounds.

(9m) "Reference method" means any method of sampling and analyzing for an air pollutant, as described in 40 C.F.R. part 61, Appendix B.

(10) "Refuse derived fuel" means municipal solid waste which has undergone a process to, at a minimum, remove hazardous waste, minimize metals, glass and other non-combustible material; and has been processed for use as a fuel. Refuse derived fuel does not include tires, tire fragments, waste oils, waste solvents, and other material not normally contained in household solid waste.

(11) "Virgin fossil fuel" means any solid, refined liquid or refined gaseous fossil fuel with a BTU content greater than 7,000 BTU/lb which is not blended with reprocessed or recycled fuels. Group 1 virgin fossil fuels consist of natural gas, liquid petroleum gas, distillate fuel oil, gasoline and diesel fuel. Group 2 virgin fossil fuels consist of coal and residual fuel oil.

History: Renum. from NR 154.01 (19), (28e) and (116e), cr. (intro.), Register, September, 1986, No. 369, eff. 10-1-86; renum. (1) to (3) to be (2), (3) and (9), cr. (1), (4) to (8), (10) and (11), Register, September, 1988, No. 393, eff. 10-1-88; (9m) renum. from NR 400.02 (77), Register, December, 1988, No. 396, eff. 1-1-89.

NR 445.03 General limitations. No person may cause, allow, or permit emissions into the ambient air of any hazardous substance in such quantity, concentration, or duration as to be injurious to human health, plant or animal life unless the purpose of that emission is for the control of plant or animal life. Hazardous substances include but are not limited to hazardous air contaminants listed in Tables 1 to 4 of s. NR 445.04.

History: Renum. from NR 154.19 (1), Register, September, 1986, No. 369, eff. 10-1-86; am. Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.04 Emission limits for new or modified sources. (1) TABLE 1 AND TABLE 4 SUBSTANCES. Except as provided in par. (c) or s. NR 406.07 (2), no owner or operator of a stationary source on which construction or modification commenced after October 1, 1988 may cause, allow or permit emissions from a source of a hazardous air contaminant listed in Ta-

ble 1 or Table 4 in such quantity or duration as to cause ambient air concentrations off the source's property which exceed the limits in par. (a) or (b).

(a) *24-hour.* 1. Two and four tenths percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists, in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any consecutive 24-hour averaging period; or

2. Ten percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists, in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any 24-hour averaging period if the hazardous air contaminant is emitted no more than 5 days in any consecutive 30-day period and if the department determines after complying with s. NR 445.06 (1) that such limits will not pose a threat to public health or welfare.

(b) *One-hour.* Ten percent of the threshold limit value—ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any one-hour averaging period.

(c) *Exemptions.* The following emissions are exempt from the emission limits of Table 1 and Table 4 substances:

1. Emissions from the combustion of group 1 virgin fossil fuels.

2. Emissions from the combustion of group 2 virgin fossil fuels vented from a stack which has downwash minimization stack height or a height approved by the department.

3. Emissions from a laboratory.

4. Indoor fugitive emissions.

(2) TABLE 2 SUBSTANCES. Except as provided in par. (c), no owner or operator of a stationary source which manufactures or processes pesticides, rodenticides, insecticides, herbicides or fungicides and on which construction or modification commenced after October 1, 1988, may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 2 in such quantity or duration as to cause ambient concentrations which exceed the limits in par. (a) or (b).

(a) *24-hour.* Two and four-tenths percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any 24-hour averaging period.

(b) *One-hour.* Ten percent of the threshold limit value—ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any one-hour averaging period.

(c) *Exemptions.* The following emissions are exempt from emission limits for Table 2 substances:

1. Emissions from a laboratory.

2. Indoor fugitive emissions.

(3) TABLE 3 SUBSTANCES. (a) *Group A.* Except as provided in par. (c), the owner or operator of any facility on which construction or modification commenced after October 1, 1988 and which emits any hazardous air contaminant listed in group A of Table 3 in amounts greater than those listed in group A of Table 3 shall control emissions of those hazardous air contaminants to a level which is the lowest achievable emission rate. The lowest achievable emission rate shall be met by the emissions units at the facility which emits the greatest amount of the hazardous air contaminant. If application of the lowest achievable emission rate to this emissions unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group A of Table 3 for the hazardous air contaminant, then the lowest achievable emission rate shall be met by other emissions units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group A of Table 3 or until all emissions units at the facility which emit at least 10% of the rate listed in group A of Table 3 for the hazardous air contaminant have met the lowest achievable emissions rate. If application of lowest achievable emissions rate to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of lowest achievable emission rate on a reasonable array of smaller emissions units which emit the hazardous air contaminant.

(b) *Group B.* Except as provided in par. (c), the owner or operator of any facility on which construction or modification commenced after October 1, 1988 and which emits any hazardous air contaminant listed in group B of Table 3 in amounts greater than those listed in group B of Table 3 shall control emissions of those hazardous air contaminants to a level which is the best available control technology. The best available control technology shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the best available control technology to this emissions unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group B of Table 3 for the hazardous air contaminant, then best available control technology shall be met by other emissions units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group B of Table 3 or until all emissions units at the facility which emit at least 10% of the rate listed in group B of Table 3 for the hazardous air contaminant have met best available control technology. If application of best available control technology to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of best available control technology on a reasonable array of smaller emissions units which emit the hazardous air contaminant.

(c) *Exemptions.* The following emissions are exempt from the emission limits for Table 3 substances:

1. Emissions from the combustion of group 1 virgin fossil fuels.

2. Emissions from the combustion of group 2 virgin fossil fuels vented from a stack which has downwash minimization stack height or a height approved by the department.

3. Emissions from a laboratory.

4. Emissions from any gasoline dispensing facility which meets the requirements of s. NR 420.04 (3) (b) to (i) and which dispenses less than 2 million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it will not exceed an emission limitation for a Table 3 hazardous air contaminant.

5. Emissions from any gasoline dispensing facility which does not meet the requirements of s. NR 420.04 (3) (b) to (i) and which dispenses less than 1.25 million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it will not exceed an emission limitation for a Table 3 hazardous air contaminant.

6. Indoor emissions which are exhausted to the ambient air through general building ventilation and which have a threshold limit value established by the American conference of governmental industrial hygienists and for which the source demonstrates to the department that it is in compliance with applicable occupational safety and health administration requirements.

(4) INCINERATORS. Any owner or operator of a stationary source on which construction or modification commenced after October 1, 1988 and which combusts municipal solid waste as defined in s. NR 500.03 (86) or infectious waste shall comply with sub. (1) and shall control emissions of hazardous air contaminants listed in Table 3 to a level which is the lowest achievable emission rate. A source which combusts refuse derived fuel in a boiler and obtains less than 50% of its heat input from the refuse derived fuel is not subject to this subsection.

(5) COMPLIANCE REQUIREMENTS. (a) *Compliance timing.* Any source which commences construction or modification on or after October 1, 1988 shall meet the emission limitations in this section upon start-up.

(b) *Compliance determination.* For the purpose of determining compliance with this section:

1. The department shall allow credit for the emission reduction capability of in-place control devices; and

2. The owner or operator of a source may demonstrate compliance with emission limitations of sub. (1), (2) or (4) by demonstrating that the concentration of the substance in Table 1 or 2 in the stack is less than the ambient concentration allowed under sub. (1) or (2).

3. The owner or operator of a source is not required to consider emissions resulting directly from naturally occurring constituents in windblown soil.

(c) *Subsequent requirements.* The owner or operator of a source which has achieved compliance with this section by installing emission control equipment may not be required to install additional control equipment to achieve compliance with this section for a period of 10 years after the installation of the control equipment or the useful life of the control equipment as determined by the department, whichever is less. For the purposes of this paragraph, increasing stack height, other dilution mea-

sures, or material reformulation may not be construed as installation of control equipment. Material reformulation which requires substantial capital expenditures for process equipment which was made with prior department approval and which results in a reduction of emissions of hazardous air contaminants which is sufficient to comply with the limitations of this section may be construed as installation of control equipment under this paragraph.

(6) VARIANCE. The owner or operator of a source may apply for and the department may grant a variance from an emission limitation of sub. (3) (a) or (4) if the applicant demonstrates to the satisfaction of the department that compliance with sub. (3) (a) or (4) would be economically infeasible, and that residual emissions of the hazardous air contaminant in question would not cause significant harm to the environment or public health, and the source's emissions are controlled to a level which is the best available control technology. The department shall publish a notice of and hold a public hearing on any preliminary determination to approve a variance request under this subsection. The department shall grant or deny a variance request within 90 business days after the close of the public hearing on the request. The department shall review any variance granted under this subsection on a 5 year basis. Following its review and after notice and an opportunity for a public hearing and public comment, the department may modify, extend or rescind the variance.

Table 1
Hazardous Air Contaminants With Acceptable Ambient Concentrations

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
ACIDS			
Acetic acid	64-19-7	2.083200	8.760000
Hydrogen chloride	7647-01-0	0.355200(c)	1.368000(c)
Hydrogen fluoride	7664-39-3	0.127200(c)	0.480000(c)
Nitric acid	7697-37-2	0.417600	1.752000
Phosphoric acid	7664-38-2	0.084000	0.336000
Sulfuric acid	7664-93-9	0.084000	0.336000
CYANIDES			
Acetonitrile	75-05-8	5.829600	24.480000
Cyanides, (inorganics) as CN	151-50-8 143-33-9	0.417600	1.752000
Hydrogen cyanide	74-90-8	0.506400(c)	1.944000(c)
Methyl acrylate	96-33-3	2.916000	12.240000
Methylacrylonitrile	126-98-7	0.249600	1.032000
INDUSTRIAL GASES			
Ammonia	7664-41-7	1.500000	6.288000
Arsine	7784-42-1	0.016560	0.067200
Bromine	7726-95-6	0.057600	0.240000
Chlorine	7782-50-5	0.249600	1.032000
Fluorine	7782-41-4	0.165600	0.672000

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
CHEMICAL INTERMEDIATES			
Acetaldehyde	75-07-0	14.990400	62.952000
Acrolein	107-02-8	0.020880	0.086400
Acrylamide	79-06-1	0.024000	0.100800
Acrylic acid	79-10-7	2.498400	10.488000
Allyl alcohol	107-18-6	0.417600	1.752000
Allyl chloride	107-05-1	0.249600	1.032000
Aniline	62-53-3	0.832800	3.480000
Benzyl chloride	100-44-7	0.417600	1.752000
Butyl acrylate	141-32-2	4.581600	19.224000
Butylamine	109-73-9	0.760800(c)	2.928000(c)
Cresol, all isomers	1319-77-3	1.831200	7.680000
Crotonaldehyde	123-73-9	0.672000	2.088000
Cyclohexylamine	108-91-8	3.3312	13.968000
Diethanolamine	111-42-2	1.250400	5.232000
Diethylamine	109-89-7	2.498400	10.488000
Dinitrobenzene	528-29-0		
	99-65-0		
	100-25-4	0.084000	0.336000
Methylamine	74-89-5	0.998400	4.176000
Methyl chloride	74-87-3	8.745600	36.720000
Methyl isocyanate	624-83-9	0.004080	0.017040
p-Nitroaniline	100-01-6	0.249600	1.032000
Nitrobenzene	98-95-3	0.417600	1.752000
Phenol	108-95-2	1.581600	6.624000
Phosphine	7803-51-2	0.033600	0.139200
Propargyl alcohol	107-19-7	0.165600	0.672000
1,2,4-Trichlorobenzene	120-82-1	2.025600(c)	7.848000(c)
PLASTICIZING COMPOUNDS			
Dimethylphthalate	131-11-3	0.417600	1.752000
Isophorone diisocyanate	4098-71-9	0.007440	0.031200
Methylene bisphenyl isocyanate	101-68-8	0.010080(c)	0.038400(c)
Toluene-2,4-diisocyanate (TDI)	584-84-9	0.003360	0.013920
METALS AND COMPOUNDS			
Aluminum alkyls	7429-90-5	0.165600	0.672000
Antimony & compounds, as Sb	7440-36-0	0.040800	0.170400
Barium sol cmpds, as Ba	7440-39-3	0.040800	0.170400
Chromium (III) compounds, as Cr	7440-47-3	0.040800	0.170400
Chromium (VI) compounds, as Cr water soluble	7440-47-3	0.004080	0.017040
Manganese, as Mn dust and compounds	7439-96-5	0.254400(c)	0.984000(c)

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Mercury alkyl compounds	7439-97-6	0.000840	0.003360
Mercury all forms except alkyl, vapor	7439-97-6	0.004080	0.017040
Mercury (ex. alkyl) aryl & inorganic compounds	7439-97-6	0.008400	0.033600
Tin organic compounds, as Sn	7440-31-5	0.008400	0.033600
MONOMERS			
Methyl methacrylate	80-62-6	34.144800	143.400000
Phenylhydrazine	100-63-0	0.87456	3.67200
Styrene, monomer	100-42-5	17.906400	75.192000
Vinyl cyclohexene dioxide	106-87-6	1.50000	6.288000
FUMIGANTS			
p-Dichlorobenzene	106-46-7	15.62400	65.7000
SOLVENTS			
Carbon disulfide	75-15-0	2.498400	10.488000
Chlorobenzene (Monochlorobenzene)	108-90-7	29.148000	122.400000
Cyclohexanone	108-94-1	8.328000	34.968000
o-Dichlorobenzene	95-50-1	15.192000(c)	58.944000(c)
1,1-Dichloroethane	75-34-3	67.456800	283.296000
1,2-Dichloroethylene	540-59-0	65.791200	276.312000
Diethyl phthalate	84-66-2	0.417600	1.752000
Dimethylamine	124-40-3	1.500000	6.288000
Dimethylaniline (N,N-Dimethylaniline)	121-69-7	2.083200	8.736000
2-Ethoxyethanol	110-80-5	0.748800	3.144000
Ethyl acrylate	140-88-5	1.665600	6.984000
Ethyl benzene	100-41-4	36.228000	152.136000
Ethylene chlorohydrin	107-07-3	0.151200(c)	0.576000(c)
Ethylenediamine	107-15-3	2.083200	8.736000
Ethylene glycol vapor	107-21-1	6.331200(c)	24.552000(c)
Furfural	98-01-1	0.667200	2.784000
n-Hexane	110-54-3	14.990400	62.952000
Isobutyl alcohol	78-83-1	12.492000	52.464000
Isophorone	78-59-1	1.267200(c)	4.896000(c)
2-Methoxyethanol	109-86-4	1.332000	5.592000
N-Methyl aniline	100-61-8	0.165600	0.672000
Methyl n-butyl ketone	591-78-6	1.665600	6.984000
Methylene chloride	75-09-2	29.148000	122.400000
Methyl hydrazine	60-34-4	0.076800(c)	0.288(c)
Methyl isobutyl ketone	108-10-1	17.073600	71.688000
Perchloroethylene	127-18-4	27.900000	117.168000
Pyridine	110-86-1	1.2504	5.232000
1,1,2,2-Tetrachloroethane	79-34-5	0.583200	2.448000

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Tetrahydrofuran	109-99-9	49.135200	206.352000
Toluene (Toluol)	108-88-3	31.231200	131.160000
1,1,2-Trichloroethane	79-00-5	3.748800	15.744000
Trichloroethylene	79-01-6	22.485600	94.416000
Xylene	1330-20-7	36.228000	152.136000
GENERAL USE CHEMICALS			
n-Butyl alcohol	71-36-3	7.596000(c)	29.472000(c)
Chlorine dioxide	10049-04-4	0.024000	0.100800
Fluorides, (inorganics) as F		0.208800	0.864000
Naphthalene	91-20-3	4.164000	17.472000
Pentachlorophenol	87-86-5	0.040800	0.170400
Selenium compounds, as Se	7782-49-2	0.016560	0.067200
SUPPLEMENTAL LIST OF CHEMICALS			
Biphenyl	92-52-4	0.124800	0.504000
1,3-Butadiene	106-99-0	4.16400	17.472000
Dichloroethyl ether	111-44-4	2.498400	10.488000
Diglycidyl ether (DGE)	2238-07-5	0.040800	0.170400

*The notation (c) indicates those contaminants with ceiling limits which are emission rates averaged over a one-hour period. Those contaminants without such a notation are emission rates per hour averaged over a twenty-four hour period.

Table 2
Hazardous Air Contaminants Which Are Pesticides, Rodenticides, Insecticides, Herbicides or Fungicides with Acceptable Ambient Concentrations

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Aldrin	309-00-2	0.020880	0.086400
Amitrole	61-82-5	0.016560	0.067200
ANTU	86-88-4	0.024000	0.100800
Atrazine	1912-24-9	0.417600	1.752000
Azinphos-methyl	86-50-0	0.016560	0.067200
Benomyl	17804-35-2	0.832800	3.480000
Bromacil	314-40-9	0.832800	3.480000
Captafol	2425-06-1	0.008400	0.033600
Captan	133-06-2	0.417600	1.752000
Carbaryl	63-25-2	0.417600	1.752000
Carbofuran	1563-66-2	0.008400	0.033600
Chlordane	57-74-9	0.040800	0.170400
Chlorinated camphene	8001-35-2	0.040800	0.170400
1-Chloro-1-nitropropane	600-25-9	0.832800	3.480000

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Chloropicrin	76-06-2	0.057600	0.240000
Chlorpyrifos	2921-88-2	0.016560	0.067200
Crufomate	299-86-5	0.417600	1.752000
Cyhexatin	13121-70-5	0.417600	1.752000
Demeton	8065-48-3	0.008400	0.033600
Diazinon	333-41-5	0.008400	0.033600
Dibutyl phthalate	84-74-2	0.417600	1.752000
Dichloropropene	542-75-6	0.417600	1.752000
2,2-Dichloropropionic acid	75-99-0	0.499200	2.088000
Dichlorvos	62-73-7	0.084000	0.336000
Dicrotophos	141-66-2	0.020880	0.086400
Dieldrin	60-57-1	0.020880	0.086400
Dinitro-o-cresol	534-52-1	0.016560	0.067200
Dioxathion	78-34-2	0.016560	0.067200
Diquat	85-00-7	0.040800	0.170400
Disulfoton	298-04-4	0.008400	0.033600
Endosulfan	115-29-7	0.008400	0.033600
Endrin	72-20-8	0.008400	0.033600
EPN	2104-64-5	0.040800	0.170400
Ethion	563-12-2	0.033600	0.139200
Fensulfothion	115-90-2	0.008400	0.033600
Fenthion	55-38-9	0.016560	0.067200
Fonofos	944-22-9	0.008400	0.033600
Heptachlor	76-44-8	0.040800	0.170400
Hexachlorobutadiene	87-68-3	0.010520	0.048000
Hexachlorocyclopentadiene	77-47-4	0.008400	0.033600
Methomyl	16752-77-5	0.208800	0.864000
Methyl bromide	74-83-9	1.665600	6.984000
Methyl demeton	8022-00-2	0.040800	0.170400
Methyl parathion	298-00-0	0.016560	0.067200
Mevinphos	7786-34-7	0.008400	0.033600
Monocrotophos	6923-22-4	0.020880	0.086400
Naled	300-76-5	0.249600	1.032000
Paraquat (respirable sizes)	1910-42-5	0.008400	0.033600
Parathion	56-38-2	0.008400	0.033600
Phenothiazine	92-84-2	0.417600	1.752000
Phorate	298-02-2	0.004080	0.017040
Pindone	83-26-1	0.008400	0.033600
Propoxur	114-26-1	0.040800	0.170400
Pyrethrum	8003-34-7	0.417600	1.752000
Quinone	106-51-4	0.033600	0.139200
Rotenone (commercial)	83-79-4	0.417600	1.752000
Sodium fluoroacetate	62-74-8	0.004080	0.017040
Stibine	7803-52-3	0.040800	0.170400
Strychnine	57-24-9	0.012480	0.050400
Sulfotep	3689-24-5	0.016560	0.067200
Sulfuryl fluoride	2699-79-8	1.665600	6.984000
TEPP	107-49-3	0.004080	0.017040
Thiram	137-26-8	0.417600	1.752000

Contaminants	CAS Number	Emission Rate in Pounds/Hour* w/emission points < 25 ft.	≥ 25 ft.
Warfarin	81-81-2	0.008400	0.033600

*The notation (c) indicates those contaminants with ceiling limits which are emission rates averaged over a one-hour period. Those contaminants without such a notation are emission rates per hour averaged over a twenty-four hour period.

Table 3
Hazardous Air Contaminants Without Acceptable Ambient Concentrations Requiring Application of
A. Lowest Achievable Emission Rate for Sources of Group A Hazardous Air Contaminants,
B. Best Available Control Technology for Sources of Group B Hazardous Air Contaminants[1]

Contaminants	CAS Number	lbs/year[2]
GROUP A CONTAMINANTS		
4-Aminobiphenyl	92-67-1	25.0
Arsenic and inorganic compounds, as As	7440-38-2	25.0
Asbestos	1332-21-4	25.0
Benzene	71-43-2	300.0
Benzidine	92-87-5	2.0
Bis(chloromethyl) ether (BCME) and technical grade	542-88-1	0.10
Chloromethyl methyl ether (CMME)	107-30-2	0.10
Chromium (VI), water insoluble compounds, as Cr	7440-47-3	2.0
Coke oven emissions		25.0
2-Naphthylamine	91-59-8	25.0
Nickel subsulfide	12035-72-2	25.0
Vinyl chloride	75-01-4	300.0
Pharmaceuticals (a total of all listed compounds)		25.0
Azathioprine	446-86-6	
N,N-Bis (2-chloroethyl)-2-naphthylamine (Chlornaphazine)	494-03-1	
1,4-Butanediol dimethanesulphonate (Myleran)	55-98-1	
Chlorambucil	305-03-3	
Cyclophosphamide	50-18-0	
Diethylstilbestrol (DES)	56-53-1	
Melphalan	148-82-3	
Mustard gas	505-60-2	

Contaminants	*CAS Number*	*lbs/year*[2]
GROUP B CONTAMINANTS		
Acrylonitrile	107-13-1	25.0
Aflatoxins	1402-68-2	25.0
2-Aminoanthraquinone	117-79-3	250.0
o-Anisidine and o-anisidine hydrochloride	29191-52-4	250.0
Benzotrichloride	98-07-7	250.0
Beryllium and beryllium compounds, as Be	7440-41-7	25.0
Cadmium and cadmium compounds, as Cd	7440-43-9	25.0
Carbon tetrachloride	56-23-5	25.0
Chloroform	67-66-3	250.0**
p-Cresidine	120-71-8	250.0
2,4-Diaminoanisole sulfate	39156-41-7	250.0
2,4-Diaminotoluene	95-80-7	250.0
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	250.0
1,2-Dibromoethane (EDB)	106-93-4	250.0
3,3'-Dichlorobenzidine	91-94-1	250.0
1,2-Dichloroethane (EDC)	107-06-2	25.0
Di(2-ethylhexyl) phthalate	117-81-7	250.0
Diethyl sulphate	64-67-5	25.0
3,3-Dimethoxybenzidine (ortho-Dianisidine)	119-90-4	250.0
4-Dimethylaminoazobenzene	60-11-7	250.0
3,3-Dimethylbenzidine	119-93-7	250.0
Dimethylcarbamoyl chloride	79-44-7	250.0
1,1-Dimethylhydrazine	57-14-7	250.0
Dimethyl sulfate	77-78-1	25.0
1,4-Dioxane	123-91-1	250.0
Epichlorohydrin	106-89-8	300.0
Ethylene oxide	75-21-8	25.0
Ethylene thiourea	96-45-7	250.0
Formaldehyde	50-00-0	250.0**
Hexachlorobenzene (HCB)	118-74-1	25.0
Hexamethyl phosphoramide	680-31-9	250.0
Hydrazine and hydrazine sulfate	302-01-2	250.0
Hydrazobenzene	122-66-7	250.0
Lindane and other hexachlorocyclohexane isomers	58-89-9	25.0
4,4'-Methylene bis(2-chloroaniline) (MDCA)	101-14-4	250.0
4,4'-Methylenedianiline (and dihydrochloride)	101-77-9	250.0
Methyl iodide	74-88-4	250.0
Nickel compounds other than nickel subsulfide, as Ni	7440-02-0	250.0
2-Nitropropane	79-46-9	250.0
Polychlorinated biphenyls (PCB)	1336-36-3	0.10
1,3-Propane sultone	1120-71-4	250.0
β-Propiolactone	57-57-8	250.0
Propylenimine	75-55-8	250.0
2,3,7,8-Tetrachlorodibenzo-para-dioxin	1746-01-6	0.0001
Thiourea	62-56-6	250.0
o-Toluidine	95-53-4	25.0
Urethane (Ethyl carbamate)	51-79-6	250.0
Polycyclic Organic Matter (a total of all listed compounds)		250.0

Contaminants	*CAS Number*	*lbs/year*[2]
Benz(a)anthracene	56-55-3	
Benzo(b)fluoranthene	205-99-2	
Benzo(a)pyrene	50-32-8	
Dibenz(a,h)acridine	226-36-8	
Dibenz(a,j)acridine	224-42-0	
Dibenz(a,h)anthracene	53-70-3	
7H-Dibenzo(c,g)carbazole	194-59-2	
Dibenzo(a,h)pyrene	189-64-0	
Dibenzo(a,i)pyrene	189-55-9	
Indeno(1,2,3-cd)pyrene	193-39-5	
Pharmaceuticals (a total of all listed compounds)		250.0
Adriamycin	23214-92-8	
Bischloroethyl nitrosourea	154-93-8	
1-(2-Chloroethyl)-3 cyclohexyl-1-nitrosourea (CCNU)	1301-47-4	
Dacarbazine	4342-03-4	
Iron dextran complex	9004-66-4	
Mestranol	72-33-3	
Nitrogen mustards	51-75-2	
Oestradiol	50-28-2	
Oxymetholone	434-07-1	
Phenazopyridine and phenazopyridine hydrochloride	136-40-3	
Phenytoin and sodium salt of phenytoin	57-41-0	
Procarbazine and procarbazine hydrochloride	366-70-1	
Propylthiouracil	51-52-0	
Reserpine	50-55-5	
Streptozotocin	18883-66-4	
Tris(1-azirindinyl) phosphine sulfide	52-24-4	
Nitrosoamines (a total of all listed compounds)		250.0
N-Nitrosodi-n-butylamine	924-16-3	
N-Nitrosodiethanolamine	1116-54-7	
N-Nitrosodiethylamine	55-18-5	
N-Nitrosodimethylamine	62-75-9	
p-Nitrosodiphenylamine	156-10-5	
N-Nitrosodi-n-propylamine	621-64-7	
N-Nitroso-N-ethylurea	759-73-9	
N-Nitroso-N-methylurea	684-93-5	
N-Nitrosomethylvinylamine	4549-40-0	
N-Nitrosomorpholine	59-89-2	
N'-Nitrosonornicotine	16543-55-8	
N-Nitrosopiperidine	100-75-4	
N-Nitrosopyrrolidine	930-55-2	
N-Nitrososarcosine	13256-22-9	

1. List of Group A and Group B substances taken from Fourth Annual Report on Carcinogens—1985 National Toxicology Program (NTP), U.S. Public Health Service, pursuant to Public Law 95-622.

2. U.S. Environmental Protection Agency Carcinogen Assessment Group (CAG) reported unit risk values as of January 1, 1988 were used in assigning the de minimus emission limit.

**For existing sources, see s. NR 445.05 (7).

Table 4

Hazardous Air Contaminants with Acceptable Ambient Concentrations
(For existing sources, compliance with the concentrations in this table shall be achieved by April 1, 1993)

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
ACIDS			
Hydrogen bromide	10035-10-6	0.506400(c)	1.944(c)
Oxalic acid	144-62-7	0.084000	0.336000
INDUSTRIAL GASES			
Diborane	19287-45-7	0.008400	0.033600
Hydrogen sulfide	7783-06-4	1.166400	4.896000
CHEMICAL INTERMEDIATES			
Acetic anhydride	108-24-7	1.012800(c)	3.936(c)
Anisidine	29191-52-4	0.040800	0.170400
o-sec-Butylphenol	89-72-5	2.498400	10.488000
p-tert-Butyltoluene	98-51-1	4.996800	20.976000
Calcium cyanamide	156-62-7	0.040800	0.170400
Cyanamide	420-04-2	0.165600	0.672000
Diazomethane	334-88-3	0.033600	0.139200
1,3-Dichloro-5,5-dimethyl hydantoin	118-52-5	0.016560	0.067200
2-Diethylaminoethanol	100-37-8	4.164000	17.472
Dinitrotoluene	121-14-2	0.124800	0.504000
Ethylamine	75-04-7	1.500000	6.288000
Ethylenimine	151-56-4	0.084000	0.336000
Glycidol	556-52-5	6.247200	26.232000
Hydrogen peroxide	7722-84-1	0.124800	0.504000
Hydroquinone	123-31-9	0.165600	0.672000
N-Isopropylaniline	768-52-5	0.832800	3.480000
Ketene	463-51-4	0.074400	0.312000
Maleic anhydride	108-31-6	0.084000	0.336000
4-Methoxyphenol	150-76-5	0.417600	1.752000
Methyl 2-cyanoacrylate	137-05-3	0.667200	2.784000
p-Nitrochlorobenzene	100-00-5	0.249600	1.032000
Nitroethane	79-24-3	25.816800	108.408
Nitromethane	75-52-5	20.820000	87.432
Nitrotoluene	99-08-1	0.916800	3.840000
p-Phenylene diamine	106-50-3	0.008400	0.033600
Phenyl ether vapor	101-84-8	0.583200	2.448000
Phenyl glycidyl ether (PGE)	122-60-1	0.499200	2.088000

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Phenyl mercaptan	108-98-5	0.165600	0.672000
Phosgene	75-44-5	0.033600	0.139200
Phosphorus (yellow)	7723-14-0	0.008400	0.033600
Phosphorus oxychloride	10025-87-3	0.050400	0.211200
Phosphorus pentasulfide	1314-80-3	0.084000	0.336000
Phosphorus trichloride	7719-12-2	0.124800	0.504000
Phthalic anhydride	85-44-9	0.499200	2.088000
Potassium hydroxide	1310-58-3	0.100800(c)	0.384(c)
Propylene oxide	75-56-9	4.164000	17.472000
Resorcinol	108-46-3	3.748800	15.744000
Sulfur tetrafluoride	7783-60-0	0.020160(c)	0.0768(c)
m-Toluidine	108-44-1	0.748800	3.144000
Trimellitic anhydride	552-30-7	0.003360	0.013920
Trimethyl benzene	2551-13-7	10.411200	43.704000
Vinyl acetate	108-05-4	2.498400	10.488000
Vinylidene chloride	75-35-4	1.665600	6.984000
FUMIGANTS			
Methyl formate	107-31-3	20.820000	87.432000
Perchloromethyl mercaptan	594-42-3	0.067200	0.264000
PLASTICIZING COMPOUNDS			
Camphor (synthetic)	76-22-2	0.998400	4.176000
Hydrogenated terphenyls	61788-32-7	0.417600	1.752000
Methylene bis(4-cyclohexylisocyanate)	5124-30-1	0.005520(c)	0.02136(c)
Methyl ethyl ketone peroxide	1338-23-4	0.076800(c)	0.288(c)
Tributyl phosphate	126-73-8	0.208800	0.864000
Triorthocresyl phosphate	78-30-8	0.008400	0.033600
Triphenyl phosphate	115-86-6	0.249600	1.032000
METALS AND COMPOUNDS			
Aluminum pyro powders	7429-90-5	0.417600	1.752000
Aluminum soluble salts	7429-90-5	0.165600	0.672000
Borates, tetra, sodium salts, decahydrate	1303-96-4	0.417600	1.752000
Borates, tetra, sodium salts, pentahydrate	1303-96-4	0.084000	0.336000
Chromium (metal)	7440-47-3	0.040800	0.170400
Chromium (II) compounds,' as Cr	7440-47-3	0.040800	0.170400
Cobalt, as Co, metal, dust	7440-48-4	0.004080	0.017040
Copper dust & mists, as Cu	7440-50-8	0.084000	0.336000
Indium	7440-74-6	0.008400	0.033600
Manganese tetroxide	0000-00-0	0.084000	0.336000
Molybdenum, as Mo, soluble compounds	7439-98-7	0.417600	1.752000
Platinum metal	7440-06-4	0.084000	0.336000

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
Platinum soluble salts, as Pt	7440-06-4	0.000166	0.000672
Rhodium metal	7440-16-6	0.084000	0.336000
Rhodium soluble compounds, as Rh	7440-16-6	0.000840	0.003360
Tellurium and compounds, as Te	13494-80-9	0.008400	0.033600
Thallium soluble compounds, as Tl	7440-28-0	0.008400	0.033600
Tin (metal)	7440-31-5	0.165600	0.672000
Tin oxide & inorganic compounds, except SnH_4, as Sn	7440-31-5	0.165600	0.672000
Tungsten—as W, insoluble compounds	7440-33-7	0.417600	1.752000
Tungsten—as W, soluble compounds	7440-33-7	0.084000	0.336000
Uranium (natural) soluble & insoluble, as U	7440-61-1	0.016560	0.067200
Zirconium compounds, as Zr	7440-67-2	0.417600	1.752000
MONOMERS			
Caprolactam vapor	105-60-2	1.665600	6.984000
Carbon tetrabromide	558-13-4	0.117600	0.480000
Carbonyl fluoride	353-50-4	0.417600	1.752000
β-Chloroprene	126-99-8	3.748800	15.744000
Cyclopentadiene	542-92-7	16.656000	69.936000
2-N-Dibutylaminoethanol	102-81-8	1.166400	4.896000
Divinyl benzene	108-57-6	4.164000	17.472000
2-Hydroxypropyl acrylate	999-61-1	0.249600	1.032000
Isopropylamine	75-31-0	0.998400	4.176000
Methacrylic acid	79-41-4	5.829600	24.480000
o-Methylcyclohexanone	583-60-8	19.154400	80.448000
α-Methyl styrene	98-83-9	19.987200	83.928000
Sulfur monochloride	10025-67-9	0.304800(c)	1.176(c)
Xylidine	1300-73-8	0.832800	3.480000
SOLVENTS			
2-Butoxyethanol	111-76-2	9.993600	41.952000
n-Butyl lactate	138-22-7	2.083200	8.736000
o-Chlorotoluene	95-49-8	20.820000	87.432000
Cumene	98-82-8	20.404800	85.680000
Cyclohexanol	108-93-0	16.656000	69.936000
Diacetone alcohol	123-42-2	19.987200	83.928000
Diisobutyl ketone	108-83-8	12.492000	52.464000
Dimethyl acetamide	127-19-5	2.916000	12.240000
Dimethylformamide	68-12-2	2.498400	10.488000

Contaminants	CAS Number	Emission Rate in Pounds/Hour* w/emission points < 25 ft.	≥ 25 ft.
2-Ethoxyethyl acetate	111-15-9	2.248800	9.432000
Ethyl amyl ketone	541-85-5	10.826400	45.456000
Ethyl butyl ketone	106-35-4	19.154400	80.448000
Furfuryl alcohol	98-00-0	3.331200	13.968000
sec-Hexyl acetate	108-84-9	24.984000	104.928
Hexylene glycol	107-41-5	6.331200(c)	24.552(c)
Isooctyl alcohol	26952-21-6	22.485600	94.416000
Isopropoxyethanol	109-59-1	8.745600	36.720000
Isopropyl glycidyl ether	4016-14-2	19.987200	83.928000
Mesityl oxide	141-79-7	4.996800	20.976000
2-Methoxyethyl acetate	110-49-6	1.999200	8.376000
Methyl n-amyl ketone	110-43-0	19.572000	82.200000
Methylcyclohexanol	25639-42-3	19.572000	82.200000
Methyl isoamyl ketone	110-12-3	19.987200	83.928000
Methyl isobutyl carbinol	108-11-2	8.328000	34.968000
Propylene dichloride	78-87-5	29.148000	122.4
Stoddard solvent (Mineral spirits)	8052-41-3	43.723200	183.624
1,2,3-Trichloropropane	96-18-4	24.984000	104.928
Vinyl toluene	25013-15-4	19.987200	83.928000
m-Xylene-α,α'-diamine	1477-55-0	0.005040(c)	0.01944(c)
CHEMICAL WARFARE AGENTS			
Cyanogen chloride	506-77-4	0.031200(c)	0.12(c)
FLAVORS AND FRAGRANCES			
1,1-Dichloro-1-nitroethane	594-72-9	0.832800	3.480000
n-Valeraldehyde	110-62-3	14.575200	61.200000
CATALYSTS AND REAGENTS			
Benzoyl peroxide	94-36-0	0.417600	1.752000
Boron tribromide	10294-33-4	0.506400(c)	1.944(c)
Boron trifluoride	7637-07-2	0.151200(c)	0.576(c)
Bromine pentafluoride	7789-30-2	0.057600	0.240000
Catechol (Pyrocatechol)	120-80-9	1.665600	6.984000
Cesium hydroxide	21351-79-1	0.165600	0.672000
Diisopropylamine	108-18-9	1.665600	6.984000
N-Ethylmorpholine	100-74-3	1.915200	8.040000
Phosphorus pentachloride	10026-13-8	0.084000	0.336000
Thionyl chloride	7719-09-7	0.254400(c)	0.984(c)
GENERAL USE CHEMICALS			
tert-Butyl chromate, as CrO_3	1189-85-1	0.005040(c)	0.019440(c)
n-Butyl glycidyl ether (BGE)	2426-08-6	11.244000	47.208000
Calcium hydroxide	1305-62-0	0.417600	1.752000
Carbon black	1333-86-4	0.290400	1.200000
Chlorinated diphenyl oxide	55720-99-5	0.040800	0.170400
Chlorine trifluoride	7790-91-2	0.020160(c)	0.0768(c)

Contaminants	*CAS Number*	Emission Rate in Pounds/Hour* w/emission points *< 25 ft.*	*≥ 25 ft.*
o-Chlorostyrene	2039-87-4	23.736000	99.672000
Chromyl chloride	14977-61-8	0.012480	0.050400
Diethylene triamine	111-40-0	0.333600	1.392000
Ethanolamine	141-43-5	0.667200	2.784000
Ethylidene norbornene	16219-75-3	1.267200(c)	4.896(c)
Ethyl silicate	78-10-4	7.080000	29.736000
Germanium tetrahydride	7782-65-2	0.050400	0.211200
Hexachloronaphthalene	1335-87-1	0.016560	0.067200
Iodine	7553-56-2	0.050400(c)	0.1944(c)
Iron salts, soluble, as Fe		0.084000	0.336000
Morpholine	110-91-8	5.829600	24.480000
Octachloronaphthalene	2234-13-1	0.008400	0.033600
Pentachloronaphthalene	1321-64-8	0.040800	0.170400
Silicon tetrahydride (Silane)	7803-62-5	0.583200	2.448000
Sodium bisulfite	7631-90-5	0.417600	1.752000
Sodium hydroxide	1310-73-2	0.100800(c)	0.384(c)
Terphenyls	26140-60-3	0.254400(c)	0.984(c)
Tetrachloronaphthalene	1335-88-2	0.165600	0.672000
Trichloronaphthalene	1321-65-9	0.417600	1.752000
SUPPLEMENTAL LIST OF CHEMICALS			
Calcium oxide	1305-78-8	0.165600	0.672
Cyanogen	460-19-5	1.665600	6.984000
Dicyclopentadiene	77-73-6	2.498400	10.488000

*The notation (c) indicates those contaminants with ceiling limits which are emission rates averaged over a one-hour period. Those contaminants without such a notation are emission rates per hour averaged over a 24 hour period.

History: Cr. Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.05 Emission limits for existing sources. (1) TABLE 1 SUBSTANCES. Except as provided in par. (c), no owner or operator of a stationary source on which construction or modification last commenced on or before October 1, 1988 may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 1 of s. NR 445.04 in such quantity or duration as to cause ambient air concentrations off the source's property which exceed the limits in par. (a) or (b).

(a) *24-hour.* 1. Two and four tenths percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any consecutive 24-hour averaging period; or

2. Ten percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists, in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any 24-hour averaging period if the hazardous air contaminant is emitted no more than 5 days in any consecutive 30-day period and if the department

determines after complying with s. NR 445.06 (1) that such limits will not pose a threat to public health or welfare.

(b) *One-hour.* Ten percent of the threshold limit value—ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any one-hour averaging period.

(c) *Exemptions.* The following emissions are exempt from the emission limits of Table 1 substances:

1. Emissions from the combustion of group 1 virgin fossil fuels.

2. Emissions from the combustion of group 2 virgin fossil fuels vented from a stack which has downwash minimization stack height or a height approved by the department.

3. Emissions from a laboratory.

4. Indoor fugitive emissions.

(2) TABLE 2 SUBSTANCES. Except as provided in par. (c), no owner or operator of a stationary source on which construction or modification last commenced on or before October 1, 1988 and which manufactures or processes pesticides, rodenticides, insecticides, herbicides or fungicides may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 2 of s. NR 445.04 in such quantity or duration as to cause ambient air concentrations which exceed the limits in par. (a) or (b).

(a) *24-hour.* Two and four-tenths percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any 24-hour averaging period.

(b) *One-hour.* Ten percent of the threshold limit value—ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any one-hour averaging period.

(c) *Exemptions.* The following emissions are exempt from emission limits for Table 2 substances:

1. Emissions from a laboratory.

2. Indoor fugitive emissions.

(3) TABLE 3 SUBSTANCES. (a) *Group A.* Except as provided in par. (c), the owner or operator of any facility on which construction or modification last commenced on or before October 1, 1988 and which emits any hazardous air contaminant listed in group A of Table 3 of s. NR 445.04 in amounts greater than those listed in group A of Table 3 of s. NR 445.04 shall control emissions of those hazardous air contaminants to a level which is the lowest achievable emission rate. The lowest achievable emission rate shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the lowest achievable emission rate to this emissions unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group A of Table 3 of s. NR 445.04 for the

hazardous air contaminant, then the lowest achievable emission rate shall be met by other emissions units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group A of Table 3 of s. NR 445.04 or until all emissions units at the facility which emit at least 10% of the rate listed in group A of Table 3 of s. NR 445.04 for the hazardous air contaminant have met the lowest achievable emissions rate. If application of lowest achievable emissions rate to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of lowest achievable emission rate on a reasonable array of smaller emissions units which emit the hazardous air contaminant.

(b) *Group B.* Except as provided in par. (c), the owner or operator of any facility on which construction or modification last commenced on or before October 1, 1988 and which emits any hazardous air contaminant listed in group B of Table 3 of s. NR 445.04 in amounts greater than those listed in group B of Table 3 of s. NR 445.04 shall control emissions of those hazardous air contaminants to a level which is the best available control technology. The best available control technology shall be met by the emissions unit at the facility which emits the greatest amount of the hazardous air contaminant. If application of the best available control technology to this emissions unit does not reduce facility emissions of the hazardous air contaminant to a level less than the rate listed in group B of Table 3 of s. NR 445.04 for the hazardous air contaminant, then best available control technology shall be met by other emissions units at the facility which emit decreasingly smaller amounts of the hazardous air contaminant until emissions from the facility are below the emission rate listed in group B of Table 3 of s. NR 445.04 or until all emissions units at the facility which emit at least 10% of the rate listed in group B of Table 3 of s. NR 445.04 for the hazardous air contaminant have met best available control technology. If application of best available control technology to these emissions units does not result in the control of at least 50% of the potential emissions of the hazardous air contaminant from the facility, then the department may require application of best available control technology on a reasonable array of smaller emissions units which emit the hazardous air contaminant.

(c) *Exemptions.* The following emissions are exempt from the emission limits for Table 3 of s. NR 445.04 substances:

1. Emissions from the combustion of group 1 virgin fossil fuels.

2. Emissions from the combustion of group 2 virgin fossil fuels vented from a stack which has downwash minimization stack height or a height approved by the department.

3. Emissions from a laboratory.

4. Emissions from any gasoline dispensing facility which meets the requirements of s. NR 420.04 (3) (b) to (i) and which in 1986 dispensed less than 2 million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it did not exceed an emission limitation for a hazardous air contaminant contained in Table 3 of s. NR 445.04.

5. Emissions from any gasoline dispensing facility which does not meet the requirements of s. NR 420.04 (3) (b) to (i) and which in 1986

dispensed less than 1.25 million gallons of gasoline a year or can otherwise demonstrate to the satisfaction of the department that it did not exceed an emission limitation for a hazardous air contaminant in Table 3 of s. NR 445.04.

6. Emissions from the combustion of wood by combustion units which operate with good combustion technology. Good combustion technology means that technology which provides for a minimization of emissions of hazardous air contaminants listed on Table 3 of s. NR 445.04. Good combustion technology will be determined on an individual case-by-case basis by the department, taking into account the fuel to be burned, the economic and environmental impacts of the combustion, and other costs related to the source. Good combustion technology may include, but is not limited to, consideration of such factors as temperature, residence time, carbon monoxide emissions, excess oxygen, and turbulence.

7. Indoor emissions which are exhausted to the ambient air through general building ventilation and which have a threshold limit value established by the American conference of governmental industrial hygienists and for which the source demonstrates to the department that it is in compliance with applicable occupational safety and health administration requirements.

(4) TABLE 4 SUBSTANCES. Except as provided in par. (c), as of October 1, 1991, no owner or operator of a stationary source on which construction or modification last commenced on or before October 1, 1988 may cause, allow or permit emissions from the source of a hazardous air contaminant listed in Table 4 of s. NR 445.04 in such quantity or duration as to cause ambient air concentrations which exceed the limits in par. (a) or (b).

(a) *24-hour.* 1. Two and four-tenths percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any consecutive 24-hour averaging period; or

2. Ten percent of the threshold limit value—time weighted average established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any 24-hour averaging period if the hazardous air contaminant is emitted no more than 5 days in any consecutive 30-day period and if the department determines under s. NR 445.06 (1) that such limits will not pose a threat to public health or welfare.

(b) *One-hour.* Ten percent of the threshold limit value—ceiling established by the American conference of governmental industrial hygienists in the threshold limit values and biological exposure indices for 1987-1988, incorporated by reference in ch. NR 484, for any one-hour averaging period.

(c) *Exemptions.* The following emissions are exempt from the emission limits for the hazardous air contaminants listed in Table 4 of s. NR 445.04:

1. Emissions from the combustion of group 1 virgin fossil fuels.

2. Emissions from the combustion of group 2 virgin fossil fuels vented from a stack which has downwash minimization stack height or a height approved by the department.

3. Emissions from a laboratory.

4. Indoor fugitive emissions.

(5) INCINERATORS. Any owner or operator of a stationary source on which construction or modification last commenced on or before October 1, 1988 and which combusts municipal solid waste as defined in s. NR 500.03 (86) or infectious waste shall comply with sub. (1) and shall control emissions of hazardous air contaminants listed in Table 3 of s. NR 445.04 to a level which is the lowest achievable emission rate. A source which combusts refuse derived fuel in a boiler and obtains less than 50% of its heat input from the refuse derived fuel is not subject to this subsection.

(6) COMPLIANCE REQUIREMENTS. Any source whose allowable emissions of any hazardous air contaminant in Table 1, 2, 3 or 4 of s. NR 445.04 is equal to or greater than the emission rate listed in the table for the hazardous air contaminant for the respective stack height and any incinerator subject to sub. (5) shall achieve compliance with the emission limits of this section according to the compliance schedules in this subsection.

(a) *Compliance schedule for Tables 1, 2 and 3.* 1. The owner or operator of any facility whose actual emissions of volatile organic compounds or particulate matter for calendar year 1986 exceeded 100 tons shall:

a. Notify the department's bureau of air management in writing by January 1, 1989 which of the hazardous air contaminants in Tables 1 to 3 of s. NR 445.04 the source is capable of emitting and the allowable emissions of each hazardous air contaminant in the tables by the source;

b. Submit to the department by April 1, 1989 a compliance plan for achieving compliance with subs. (1) to (3); and

c. Achieve final compliance with subs. (1) to (3) by April 1, 1990 if compliance consists of measures other than installation of control equipment (e.g., material substitution), or by April 1, 1991 if compliance requires installation of control equipment.

2. The owner or operator of any facility whose actual emissions for calendar year 1986 of volatile organic compounds and of particulate matter were less than 100 tons for each of the 2 air contaminants, but whose annual allowable emissions of any air contaminant for which an ambient air quality standard has been promulgated under section 109 of the federal clean air act exceeds 100 tons shall:

a. Notify the department's bureau of air management in writing by June 1, 1989 which of the hazardous air contaminants in Tables 1 to 3 of s. NR 445.04 the source is capable of emitting and the allowable emissions of each substance in the tables by the source:

b. Submit to the department by October 1, 1989 a compliance plan for achieving compliance with subs. (1) to (3); and

c. Achieve final compliance with subs. (1) to (3) by of October 1, 1990 if compliance consists of measures other than installation of control

equipment (e.g., material substitution), or by October 1, 1991 if compliance requires installation of control equipment.

3. The owner or operator of any facility whose annual allowable emissions of each air contaminant for which an ambient air quality standard has been promulgated under section 109 of the federal clean air act is 100 tons or less shall:

a. Notify the department's bureau of air management in writing by December 1, 1989 which of the hazardous air contaminants in Tables 1 to 3 of s. NR 445.04 the source is capable of emitting and the allowable emissions of each substance in the tables by the source;

b. Submit to the department by April 1, 1990 a compliance plan for achieving compliance with subs. (1) to (3); and

c. Achieve final compliance with subs. (1) to (3) by April 1, 1991 if compliance consists of measures other than installation of control equipment (e.g., material substitution), or by April 1, 1992 if compliance requires installation of control equipment.

(b) *Compliance schedule for Table 4.* The owner or operator of any source subject to sub. (4) shall:

1. Notify the department's bureau of air management in writing by April 1, 1990 which of the hazardous air contaminants in Table 4 of s. NR 445.04 the source is capable of emitting and the allowable emissions of each hazardous air contaminant in the table by the source;

2. Submit to the department by April 1, 1992 a compliance plan for achieving compliance with sub. (4); and

3. Achieve final compliance with sub. (4) by April 1, 1993 if compliance consists of measures other than installation of control equipment (e.g., material substitution), or by April 1, 1994 if compliance requires installation of control equipment.

(c) *Department review.* The department shall review any compliance plan submitted under par. (a) to determine whether the control technology is adequate. Department approval, conditional approval, or disapproval of any compliance plan shall be completed within 6 months after the applicable deadline date provided in par. (a) 1.b., 2.b. or 3.b. If the department does not complete its review and approve, disapprove or conditionally approve a source's compliance plan within 6 months after the applicable deadline date provided in par. (a) 1.b, 2.b. or 3.b., the source's compliance requirements under par. (a) 1.c., 2.c. or 3.c. shall be extended by 6 additional months.

(d) *Demonstration of compliance.* For the purpose of demonstrating compliance with this section:

1. The owner or operator of a source may rely on information on an approved material safety data sheet if the approved material safety data sheet lists a hazardous air contaminant listed in Tables 1 to 4 of s. NR 445.04 and the hazardous air contaminant listed in Table 1, 2 or 4 of s. NR 445.04 constitutes 10,000 parts per million or more of the material or the hazardous air contaminant listed in Table 3 of s. NR 445.04 constitutes 1,000 parts per million or more of the material. If an approved material safety data sheet for a material is not classified as proprietary and does not list a hazardous air contaminant in Tables 1 to 4 of s. NR 445.04 at or above the amounts listed in this paragraph, that

material will be presumed not to result in emissions of a hazardous air contaminant unless a hazardous air contaminant is formed in processing of the material.

2. The owner or operator of a source may rely upon mass balance or other use, consumption and analytical methodologies for calculating potential emissions. However, the department may require that a stack test be conducted to affirm the acccuracy of emission estimations.

3. The owner or operator of a source is not required to consider indoor fugitive emissions in calculating emissions of any hazardous air contaminant in Table 1, 2 or 4 of s. NR 445.04.

4. The department shall allow credit for the emission reduction capability of in-place emission control devices.

5. The owner or operator of a source may demonstrate compliance with the emission limitations of sub. (1), (2) or (4) by demonstrating that the concentration of the hazardous air contaminant in Table 1, 2 or 4 of s. NR 445.04 in the stack is less than the ambient concentration allowed under sub. (1), (2) or (4).

6. The owner or operator of a source is not required to consider emissions resulting directly from naturally occurring constituents in windblown soil.

(e) *Subsequent requirements.* The owner or operator of a source which has achieved compliance with this section by installing emission control equipment may not be required to install additional control equipment to achieve compliance with this section for a period of 10 years after the installation of the control equipment or the useful life of the control equipment as determined by the department, whichever is less. For the purpose of this paragraph, increasing stack height, other dilution measures, or material reformulations may not be construed as installation of control equipment. Material reformulation which requires substantial capital expenditures for process equipment which was made with prior department approval and which results in a reduction of emissions of hazardous air contaminants which is sufficient to comply with the limitations of this section, may be construed as installation of control equipment under this paragraph.

(f) *Compliance extensions.* 1. The department may, at the request of the owner or operator of a source, grant an extension of any compliance deadline in par. (a) for a period of not to exceed 6 months.

2. The owner or operator of a source which has achieved compliance with the emission limits for the hazardous air contaminants in Tables 1 to 3 of s. NR 445.04 under subs. (1) to (3) by installing emission control equipment, may apply for, and the department may grant, an extension of the schedule for submitting a compliance plan and deadline for achieving compliance with an emission limitation in par. (b) for the earlier of April 1, 1997 or the useful life of the control equipment installed to meet the provisions of subs. (1) to (3), as determined by the department. For the purposes of this paragraph, increasing stack height, other dilution measures, or material reformulation may not be construed as installation of control equipment. Material reformulation which requires substantial capital expenditures for process equipment which was made with prior department approval and which results in a reduction of emissions of hazardous air contaminants which is sufficient to comply with the limitations of this section, may be construed as

installation of control equipment under this subdivision. An extension may be granted under this subdivision if the applicant demonstrates to the satisfaction of the department that compliance with par. (b) would be economically infeasible and the department finds that the residual emissions would not pose a threat to public health and would not cause significant public harm.

3. Notwithstanding the compliance deadlines in par. (a) 1.c., 2.c. and 3.c., if the department is required to review a source's compliance plan under par. (c), the source shall achieve final compliance with subs. (1) to (3):

a. Within 12 months after the department completes its review of the source's compliance plan under par. (c), if compliance consists of measures other than installation of control equipment; or

b. Within 24 months after the department completes its review of the source's compliance plan under par. (c), if compliance requires installation of control equipment.

(g) *Compliance schedule for wastewater treatment facilities.* The owner or operator of any wastewater treatment facility shall:

1. Notify the department's bureau of air management in writing by December 1, 1989 which of the hazardous air contaminants in Tables 1, 3 and 4 of s. NR 445.04 the source is capable of emitting and the allowable emissions of each hazardous air contaminant in the table by the source;

2. Submit to the Department by April 1, 1992 a compliance plan for achieving compliance with subs. (1), (3), and (4); and

3. Achieve final compliance with subs. (1), (3), and (4) by April 1, 1993 if compliance consists of measures other than installation of control equipment (e.g., material substitution), or by April 1, 1994 if compliance requires installation of control equipment.

(7) CHLOROFORM AND FORMALDEHYDE STUDY AND COMPLIANCE REQUIREMENTS. (a) The department staff shall, after consultation with the department of health and social services by October 1, 1990, undertake and complete a study of the emissions of chloroform and formaldehyde. The study shall include an inventory of sources and amount of emissions of chloroform and formaldehyde in Wisconsin, and the control technologies available to control emissions of chloroform and formaldehyde. The department staff shall submit a report of its study to the natural resources board by January 1, 1991.

(b) The owner or operator of any source subject to sub. (3) which emits chloroform or formaldehyde in amounts greater than those listed in Group B of Table 3 of s. NR 445.04 for chloroform or formaldehyde shall:

1. Notify the departments' bureau of air management in writing by December 1, 1989 that the source is capable of emitting chloroform or formaldehyde and the allowable emission of chloroform or formaldehyde by the source;

2. Submit to the department by April 1, 1992 a compliance plan for achieving compliance with the emission limits under sub. (3) for chloroform and formaldehyde; and

3. Achieve final compliance with the emission limits under sub. (3) for chloroform and formaldehyde by April 1, 1993 if compliance consists of

measures other than installation of control equipment (e.g., material substitution), or by April 1, 1994 if compliance requires installation of control equipment.

(8) VARIANCE. The owner or operator of a source may apply for and the department may grant a variance from an emission limitation of sub. (3) (a) or (5) if the applicant demonstrates to the satisfaction of the department that compliance with sub. (3) (a) or (5) would be economically infeasible, and that residual emissions of the hazardous air contaminant in question would not cause significant harm to the environment or public health, and the source's emissions are controlled to a level which is the best available control technology. The department shall publish a notice of and hold a public hearing on any preliminary determination to approve a variance request under this subsection. The department shall grant or deny a variance request within 90 business days after the close of the public hearing on the request. The department shall review any variance granted under this subsection on a 5 year basis. Following its review and after notice and an opportunity for a public hearing and public comment, the department may modify, extend or rescind the variance.

History: Cr. Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.06 Hazardous air contaminant review. (1) The department staff shall consult with the department of health and social services prior to incorporating an emission limit under s. NR 445.04 (1) (a) 2. or 445.05 (1) (a) 2. in an order or a permit.

(2) The department shall, after consultation with the department of health and social services, submit a report to the natural resources board which contains recommended acceptable ambient concentrations for the hazardous air contaminants listed in Table 4 of s. NR 445.04 by October 1, 1990. Unless a specific acceptable ambient concentration is recommended for a hazardous air contaminant, the acceptable ambient concentration for each hazardous air contaminant shall be the limits specified in s. NR 445.05 (4) (a) and (b).

(3) The department shall monitor changes in the classifications of hazardous air contaminants in Tables 1 to 4 of s. NR 445.04 as reported by the American conference of governmental industrial hygienists, the United States environmental protection agency, the international agency for research on cancer, and the national toxicology program and shall prepare rule modificatons to the tables to incorporate these changes. The department shall presume that any hazardous air contaminant which is included on a list of known or suspected carcinogens by both the international agency for research on cancer and the national toxicology program is a hazardous air contaminant which should be listed in Table 3 of s. NR 445.04. This presumption may be overcome for adding or removing contaminants to or from Table 3 of s. NR 445.04 if the greater weight of the evidence demonstrates the presumption in incorrect.

(4) The department staff shall consult with the department of health and social services prior to establishing an emission limit for any hazardous air contaminant in a permit or order for any hazardous air contaminant which is not listed in Table 1, 2, 3 or 4 of s. NR 445.04 or in threshold limit values and biological exposure indices for 1987-1988 adopted by the American conference of governmental industrial hygienists, incorporated by reference in ch. NR 484.

(5) The department staff shall, with the cooperation of affected industrial and municipal wastewater treatment facilities, by October 1, 1990, undertake and complete a study of the types and quantities of hazardous air contaminants emitted from wastewater treatment facilities and emission control techniques applicable to hazardous air contaminants emitted from wastewater treatment facilities. The department staff shall submit a report of its study to the natural resources board by January 1, 1991.

History: Cr. Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.07 Hazardous air contaminant limitations. The department may establish emission limitations for hazardous air contaminants for sources in permits or general or special orders issued by the department.

History: Renum. from NR 154.19 (2), Register, September, 1986, No. 369, eff. 10-1-86; renum. from NR 445.04 and am. Register, September, 1988, No. 393, eff. 10-1-88.

NR 445.08 Notice of hazardous substance air spills. Persons possessing or controlling a hazardous substance shall immediately notify the department of any hazardous emission not in conformity with a permit or allowed by the department under chs. NR 400 to 499. Notice shall be given as required by s. 144.76, Stats and ch. NR 158.

History: Renum. from NR 154.06 and am., Register, September, 1986, No. 369, eff. 10-1-86; renum. from NR 445.05, Register, September, 1988, No. 393, eff. 10-1-88; correction made under s. 13.93 (2m) (b) 7. Stats., Register, September, 1988, No. 393.