

Appendices to Application Instructions

Appendix A: Hazardous Air Pollutants

Table A-1
Hazardous Air Pollutants - by alpha

CAS Number	Chemical Name	VOC/PM	CAS Number	Chemical Name	VOC/PM
75-07-0	Acetaldehyde	VOC	0	Cyanide Compounds	PM ²
60-35-5	Acetamide	VOC	94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid) (including salts and esters)	VOC ¹
75-05-8	Acetonitrile	VOC	72-55-9	DDE (1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene)	VOC ¹
98-86-2	Acetophenone	VOC	117-81-7	Di(2-ethylhexyl) phthalate (DEHP)	VOC ¹
53-96-3	2-Acetylaminofluorene	VOC ¹	334-88-3	Diazomethane	VOC
107-02-8	Acrolein	VOC	132-64-9	Dibenzofuran	VOC ¹
79-06-1	Acrylamide	VOC	96-12-8	1,2-Dibromo-3-chloropropane	VOC
79-10-7	Acrylic acid	VOC	84-74-2	Dibutyl phthalate	VOC ¹
107-13-1	Acrylonitrile	VOC	106-46-7	1,4-Dichlorobenzene	VOC
107-05-1	Allyl chloride	VOC	91-94-1	3,3'-Dichlorobenzidine	VOC ¹
92-67-1	4-Aminobiphenyl	VOC ¹	111-44-4	Dichloroethyl ether (Bis(2-chloroethyl) ether)	VOC
62-53-3	Aniline	VOC	542-75-6	1,3-Dichloropropene	VOC
90-04-0	o-Anisidine	VOC	62-73-7	Dichlorvos	VOC
0	Antimony Compounds	PM	111-42-2	Diethanolamine	VOC
0	Arsenic Compounds	PM ²	64-67-5	Diethyl sulfate	VOC
1332-21-4	Asbestos (friable)	PM	119-90-4	3,3'-Dimethoxybenzidine	VOC ¹
71-43-2	Benzene	VOC	60-11-7	4-Dimethylaminoazobenzene	VOC ¹
92-87-5	Benzidine	VOC ¹	121-69-7	N,N-Dimethylaniline	VOC
98-07-7	Benzotrichloride	VOC	119-93-7	3,3'-Dimethylbenzidine	VOC ¹
100-44-7	Benzyl chloride	VOC	79-44-7	Dimethylcarbamoyl chloride	VOC
0	Beryllium Compounds	PM	68-12-2	Dimethylformamide	VOC
92-52-4	Biphenyl	VOC	57-14-7	1,1-Dimethylhydrazine	VOC
542-88-1	Bis(chloromethyl) ether	VOC	131-11-3	Dimethyl phthalate	VOC
75-25-2	Bromoform	VOC	77-78-1	Dimethyl sulfate	VOC
106-94-5	1-Bromopropane	VOC	534-52-1	4,6-Dinitro-o-cresol (including salts)	VOC ¹
106-99-0	1,3-Butadiene	VOC	51-28-5	2,4-Dinitrophenol	VOC ¹
0	Cadmium Compounds	PM	121-14-2	2,4-Dinitrotoluene	VOC
156-62-7	Calcium cyanamide	PM	123-91-1	1,4-Dioxane (1,4-Diethylene oxide)	VOC
133-06-2	Captan	VOC ¹	122-66-7	1,2-Diphenylhydrazine	VOC
63-25-2	Carbaryl	VOC ¹	106-89-8	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	VOC
75-15-0	Carbon disulfide	VOC	106-88-7	1,2-Epoxybutane (1,2-Butylene oxide)	VOC
56-23-5	Carbon tetrachloride	VOC	140-88-5	Ethyl acrylate	VOC
463-58-1	Carbonyl sulfide	VOC	100-41-4	Ethylbenzene	VOC
120-80-9	Catechol	VOC	75-00-3	Ethyl chloride (Chloroethane)	VOC
133-90-4	Chloramben	VOC ¹	106-93-4	Ethylene dibromide (Dibromoethane)	VOC
57-74-9	Chlordane	VOC ¹	107-06-2	Ethylene dichloride (1,2-Dichloroethane)	VOC
7782-50-5	Chlorine	VOC	107-21-1	Ethylene glycol	VOC
79-11-8	Chloroacetic acid	VOC	151-56-4	Ethyleneimine (Aziridine)	VOC
532-27-4	2-Chloroacetophenone	VOC	75-21-8	Ethylene oxide	VOC
108-90-7	Chlorobenzene	VOC	96-45-7	Ethylene thiourea	VOC
510-15-6	Chlorobenzilate	VOC ¹	75-34-3	Ethylidene dichloride (1,1-Dichloroethane)	VOC
67-66-3	Chloroform	VOC	0	Fine Mineral Fibers	PM
107-30-2	Chloromethyl methyl ether	VOC	50-00-0	Formaldehyde	VOC
126-99-8	Chloroprene (2-chloro-1,3-butadiene)	VOC	0	Glycol Ethers, except CAS #111-76-2, ethylene glycol mono-butyl ether, also known as EGBE or 2-Butoxyethanol	VOC
0	Chromium Compounds	PM	76-44-8	Heptachlor	VOC
0	Cobalt Compounds	PM			
0	Coke Oven Emissions	VOC/PM ₃			
1319-77-3	Cresol/Cresylic acid (mixed isomers)	VOC			
108-39-4	m-Cresol	VOC			
95-48-7	o-Cresol	VOC			
106-44-5	p-Cresol	VOC			
98-82-8	Cumene	VOC			

Iowa Title V Operating Permit Application Instructions
Appendix A: Hazardous Air Pollutants

CAS Number	Chemical Name	VOC/PM
118-74-1	Hexachlorobenzene	VOC
87-68-3	Hexachloro-1,3-butadiene	VOC
77-47-4	Hexachlorocyclopentadiene	VOC
67-72-1	Hexachloroethane	VOC
822-06-0	Hexamethylene-1,6-diisocyanate	VOC
680-31-9	Hexamethylphosphoramide	VOC
110-54-3	Hexane	VOC
302-01-2	Hydrazine	
7647-01-0	Hydrochloric acid (HCl)	PM ⁵
7664-39-3	Hydrogen fluoride (HF)	PM ⁵
123-31-9	Hydroquinone	VOC ¹
78-59-1	Isophorone	VOC
0	Lead Compounds	PM
58-89-9	Lindane (1,2,3,4,5,6-Hexachlorocyclohexane)	VOC ¹
108-31-6	Maleic anhydride	VOC ¹
0	Manganese Compounds	PM
0	Mercury Compounds	PM ²
67-56-1	Methanol	VOC
72-43-5	Methoxychlor	VOC ¹
74-83-9	Methyl bromide (Bromomethane)	VOC
74-87-3	Methyl chloride (Chloromethane)	VOC
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	NR ⁴
60-34-4	Methylhydrazine	VOC
74-88-4	Methyl iodide (Iodomethane)	VOC
108-10-1	Methyl isobutyl ketone (MIBK) (Hexone)	VOC
624-83-9	Methyl isocyanate	VOC
80-62-6	Methyl methacrylate	VOC
1634-04-4	Methyl tert-butyl ether (MTBE)	VOC
101-14-4	4,4'-Methylenebis(2-chloroaniline)	VOC ¹
75-09-2	Methylene chloride (Dichloromethane)	NR ⁴
101-77-9	4,4'-Methylenedianiline	VOC ¹
101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	VOC
91-20-3	Naphthalene	VOC
0	Nickel Compounds	PM
98-95-3	Nitrobenzene	VOC
92-93-3	4-Nitrobiphenyl	VOC ¹
100-02-7	4-Nitrophenol	VOC ¹
79-46-9	2-Nitropropane	VOC
62-75-9	N-Nitrosodimethylamine	VOC
684-93-5	N-Nitroso-N-methylurea	VOC
59-89-2	N-Nitrosomorpholine	VOC
56-38-2	Parathion	VOC ¹
82-68-8	Pentachloronitrobenzene (Quintobenzene)	VOC
87-86-5	Pentachlorophenol	VOC ¹
108-95-2	Phenol	VOC
106-50-3	p-Phenylenediamine	VOC ¹

CAS Number	Chemical Name	VOC/PM
75-44-5	Phosgene	VOC
7803-51-2	Phosphine	
7723-14-0	Phosphorus (yellow or white)	PM ²
85-44-9	Phthalic anhydride	VOC ¹
1336-36-3	Polychlorinated biphenyls (PCBs) (Aroclors)	VOC ¹
0	Polycyclic Organic Matter	VOC ¹
1120-71-4	1,3-Propane sultone	VOC
57-57-8	beta-Propiolactone	VOC
123-38-6	Propionaldehyde	VOC
114-26-1	Propoxur (Baygon)	VOC ¹
78-87-5	Propylene dichloride (1,2-Dichloropropane)	VOC
75-56-9	Propylene oxide	VOC
75-55-8	1,2-Propylenimine (2-Methylaziridine)	VOC
91-22-5	Quinoline	VOC
106-51-4	Quinone (p-Benzoquinone)	VOC
0	Radionuclides (including radon)	PM ²
0	Selenium Compounds	PM
100-42-5	Styrene	VOC
96-09-3	Styrene oxide	VOC
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	VOC ¹
79-34-5	1,1,2,2-Tetrachloroethane	VOC
127-18-4	Tetrachloroethylene (Perchloroethylene)	NR ⁴
7550-45-0	Titanium tetrachloride	
108-88-3	Toluene	VOC
95-80-7	2,4-Toluenediamine (2,4-Diaminotoluene)	VOC ¹
584-84-9	2,4-Toluene diisocyanate	VOC
95-53-4	o-Toluidine	VOC
8001-35-2	Toxaphene (chlorinated camphene)	VOC ¹
120-82-1	1,2,4-Trichlorobenzene	VOC
79-00-5	1,1,2-Trichloroethane	VOC
79-01-6	Trichloroethylene	VOC
95-95-4	2,4,5-Trichlorophenol	VOC
88-06-2	2,4,6-Trichlorophenol	VOC
121-44-8	Triethylamine	VOC
1582-09-8	Trifluralin	VOC ¹
540-84-1	2,2,4-Trimethylpentane	VOC
51-79-6	Urethane (Ethyl carbamate)	VOC
108-05-4	Vinyl acetate	VOC
593-60-2	Vinyl bromide (Bromoethene)	VOC
75-01-4	Vinyl chloride (Chloroethene)	VOC
75-35-4	Vinylidene chloride (1,1-dichloroethylene)	VOC
1330-20-7	Xylenes (mixed isomers)	VOC
108-38-3	m-Xylene	VOC
95-47-6	o-Xylene	VOC
106-42-3	p-Xylene	VOC

Notes:

- 1 This compound is defined as a VOC (40 CFR 51.100), but has a low vapor pressure. Emissions may be measured as either VOC or PM, depending on the process generating the emissions, and the test method used to measure the emissions.
- 2 Compounds in this class may be emitted as PM or as inorganic vapors.
- 3 Compounds in this class may be emitted as PM or as VOC.
- 4 Not Reactive-these compounds have been determined to have negligible photochemical reactivity, and are not defined as VOC (40 CFR 51.100)
- 5 DNR determined in May, 2016 that HCl and HF be considered as PM for Title V emissions fee purposes.

Table A-2
Hazardous Air Pollutants - by CAS Number

CAS Number	Chemical Name	VOC/PM	CAS Number	Chemical Name	VOC/PM
0	Antimony Compounds	PM	75-34-3	Ethylidene dichloride (1,1-Dichloroethane)	VOC
0	Arsenic Compounds	PM ²	75-35-4	Vinylidene chloride (1,1-dichloroethylene)	VOC
0	Beryllium Compounds	PM	75-44-5	Phosgene	VOC
0	Cadmium Compounds	PM	75-55-8	1,2-Propylenimine (2-Methylaziridine)	VOC
0	Chromium Compounds	PM	75-56-9	Propylene oxide	VOC
0	Cobalt Compounds	PM	76-44-8	Heptachlor	VOC
0	Coke Oven Emissions	VOC/PM ³	77-47-4	Hexachlorocyclopentadiene	VOC
0	Cyanide Compounds	PM ²	77-78-1	Dimethyl sulfate	VOC
0	Fine Mineral Fibers	PM	78-59-1	Isophorone	VOC
0	Glycol Ethers, except CAS #111-76-2, ethylene glycol mono-butyl ether, also known as EGBE or 2-Butoxyethanol	VOC	78-87-5	Propylene dichloride (1,2-Dichloropropane)	VOC
0	Lead Compounds	PM	79-00-5	1,1,2-Trichloroethane	VOC
0	Manganese Compounds	PM	79-01-6	Trichloroethylene	VOC
0	Mercury Compounds	PM ²	79-06-1	Acrylamide	VOC
0	Nickel Compounds	PM	79-10-7	Acrylic acid	VOC
0	Polycyclic Organic Matter	VOC ¹	79-11-8	Chloroacetic acid	VOC
0	Radionuclides (including radon)	PM ²	79-34-5	1,1,2,2-Tetrachloroethane	VOC
0	Selenium Compounds	PM	79-44-7	Dimethylcarbamoyl chloride	VOC
50-00-0	Formaldehyde	VOC	79-46-9	2-Nitropropane	VOC
51-28-5	2,4-Dinitrophenol	VOC ¹	80-62-6	Methyl methacrylate	VOC
51-79-6	Urethane (Ethyl carbamate)	VOC	82-68-8	Pentachloronitrobenzene (Quintobenzene)	VOC
53-96-3	2-Acetylaminofluorene	VOC ¹	84-74-2	Dibutyl phthalate	VOC ¹
56-23-5	Carbon tetrachloride	VOC	85-44-9	Phthalic anhydride	VOC ¹
56-38-2	Parathion	VOC ¹	87-68-3	Hexachloro-1,3-butadiene	VOC
57-14-7	1,1-Dimethylhydrazine	VOC	87-86-5	Pentachlorophenol	VOC ¹
57-57-8	beta-Propiolactone	VOC	88-06-2	2,4,6-Trichlorophenol	VOC
57-74-9	Chlordane	VOC ¹	90-04-0	o-Anisidine	VOC
58-89-9	Lindane (1,2,3,4,5,6-Hexachlorocyclohexane)	VOC ¹	91-20-3	Naphthalene	VOC
59-89-2	N-Nitrosomorpholine	VOC	91-22-5	Quinoline	VOC
60-11-7	4-Dimethylaminoazobenzene	VOC ¹	91-94-1	3,3'-Dichlorobenzidine	VOC ¹
60-34-4	Methylhydrazine	VOC	92-52-4	Biphenyl	VOC
60-35-5	Acetamide	VOC	92-67-1	4-Aminobiphenyl	VOC ¹
62-53-3	Aniline	VOC	92-87-5	Benzidine	VOC ¹
62-73-7	Dichlorvos	VOC	92-93-3	4-Nitrobiphenyl	VOC ¹
62-75-9	N-Nitrosodimethylamine	VOC	94-75-7	2,4-D (2,4-Dichlorophenoxyacetic Acid) (including salts and esters)	VOC ¹
63-25-2	Carbaryl	VOC ¹	95-47-6	o-Xylene	VOC
64-67-5	Diethyl sulfate	VOC	95-48-7	o-Cresol	VOC
67-56-1	Methanol	VOC	95-53-4	o-Toluidine	VOC
67-66-3	Chloroform	VOC	95-80-7	2,4-Toluenediamine (2,4-Diaminotoluene)	VOC ¹
67-72-1	Hexachloroethane	VOC	95-95-4	2,4,5-Trichlorophenol	VOC
68-12-2	Dimethylformamide	VOC	96-09-3	Styrene oxide	VOC
71-43-2	Benzene	VOC	96-12-8	1,2-Dibromo-3-chloropropane	VOC
71-55-6	Methyl chloroform (1,1,1-Trichloroethane)	NR ⁴	96-45-7	Ethylene thiourea	VOC
72-43-5	Methoxychlor	VOC ¹	98-07-7	Benzotrichloride	VOC
72-55-9	DDE (1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene)	VOC ¹	98-82-8	Cumene	VOC
74-83-9	Methyl bromide (Bromomethane)	VOC	98-86-2	Acetophenone	VOC
74-87-3	Methyl chloride (Chloromethane)	VOC	98-95-3	Nitrobenzene	VOC
74-88-4	Methyl iodide (Iodomethane)	VOC	100-02-7	4-Nitrophenol	VOC ¹
75-00-3	Ethyl chloride (Chloroethane)	VOC	100-41-4	Ethylbenzene	VOC
75-01-4	Vinyl chloride (Chloroethene)	VOC	100-42-5	Styrene	VOC
75-05-8	Acetonitrile	VOC	100-44-7	Benzyl chloride	VOC
75-07-0	Acetaldehyde	VOC	101-14-4	4,4'-Methylenebis(2-chloroaniline)	VOC ¹
75-09-2	Methylene chloride (Dichloromethane)	NR ⁴	101-68-8	4,4'-Methylenediphenyl diisocyanate (MDI)	VOC
75-15-0	Carbon disulfide	VOC	101-77-9	4,4'-Methylenedianiline	VOC ¹
75-21-8	Ethylene oxide	VOC	106-42-3	p-Xylene	VOC
75-25-2	Bromoform	VOC			

Iowa Title V Operating Permit Application Instructions
Appendix A: Hazardous Air Pollutants

CAS Number	Chemical Name	VOC/PM
106-44-5	p-Cresol	VOC
106-46-7	1,4-Dichlorobenzene	VOC
106-50-3	p-Phenylenediamine	VOC ¹
106-51-4	Quinone (p-Benzoquinone)	VOC
106-88-7	1,2-Epoxybutane (1,2-Butylene oxide)	VOC
106-89-8	Epichlorohydrin (l-Chloro-2,3-epoxypropane)	VOC
106-93-4	Ethylene dibromide (Dibromoethane)	VOC
106-94-5	1-Bromopropane	VOC
106-99-0	1,3-Butadiene	VOC
107-02-8	Acrolein	VOC
107-05-1	Allyl chloride	VOC
107-06-2	Ethylene dichloride (1,2-Dichloroethane)	VOC
107-13-1	Acrylonitrile	VOC
107-21-1	Ethylene glycol	VOC
107-30-2	Chloromethyl methyl ether	VOC
108-05-4	Vinyl acetate	VOC
108-10-1	Methyl isobutyl ketone (MIBK) (Hexone)	VOC
108-31-6	Maleic anhydride	VOC ¹
108-38-3	m-Xylene	VOC
108-39-4	m-Cresol	VOC
108-88-3	Toluene	VOC
108-90-7	Chlorobenzene	VOC
108-95-2	Phenol	VOC
110-54-3	Hexane	VOC
111-42-2	Diethanolamine	VOC
111-44-4	Dichloroethyl ether (Bis(2-chloroethyl) ether)	VOC
114-26-1	Propoxur (Baygon)	VOC ¹
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)	VOC ¹
118-74-1	Hexachlorobenzene	VOC
119-90-4	3,3'-Dimethoxybenzidine	VOC ¹
119-93-7	3,3'-Dimethylbenzidine	VOC ¹
120-80-9	Catechol	VOC
120-82-1	1,2,4-Trichlorobenzene	VOC
121-14-2	2,4-Dinitrotoluene	VOC
121-44-8	Triethylamine	VOC
121-69-7	N,N-Dimethylaniline	VOC
122-66-7	1,2-Diphenylhydrazine	VOC
123-31-9	Hydroquinone	VOC ¹
123-38-6	Propionaldehyde	VOC

CAS Number	Chemical Name	VOC/PM
123-91-1	1,4-Dioxane (1,4-Diethylene oxide)	VOC
126-99-8	Chloroprene (2-chloro-1,3-butadiene)	VOC
127-18-4	Tetrachloroethylene (Perchloroethylene)	NR ⁴
131-11-3	Dimethyl phthalate	VOC
132-64-9	Dibenzofuran	VOC ¹
133-06-2	Captan	VOC ¹
133-90-4	Chloramben	VOC ¹
140-88-5	Ethyl acrylate	VOC
151-56-4	Ethyleneimine (Aziridine)	VOC
156-62-7	Calcium cyanamide	PM
302-01-2	Hydrazine	
334-88-3	Diazomethane	VOC
463-58-1	Carbonyl sulfide	VOC
510-15-6	Chlorobenzilate	VOC ¹
532-27-4	2-Chloroacetophenone	VOC
534-52-1	4,6-Dinitro-o-cresol (including salts)	VOC ¹
540-84-1	2,2,4-Trimethylpentane	VOC
542-75-6	1,3-Dichloropropene	VOC
542-88-1	Bis(chloromethyl) ether	VOC
584-84-9	2,4-Toluene diisocyanate	VOC
593-60-2	Vinyl bromide (Bromoethene)	VOC
624-83-9	Methyl isocyanate	VOC
680-31-9	Hexamethylphosphoramide	VOC
684-93-5	N-Nitroso-N-methylurea	VOC
822-06-0	Hexamethylene-1,6-diisocyanate	VOC
1120-71-4	1,3-Propane sultone	VOC
1319-77-3	Cresol/Cresylic acid (mixed isomers)	VOC
1330-20-7	Xylenes (mixed isomers)	VOC
1332-21-4	Asbestos (friable)	PM
1336-36-3	Polychlorinated biphenyls (PCBs) (Aroclors)	VOC ¹
1582-09-8	Trifluralin	VOC ¹
1634-04-4	Methyl tert-butyl ether (MTBE)	VOC
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	VOC ¹
7550-45-0	Titanium tetrachloride	
7647-01-0	Hydrochloric acid (HCl)	PM ⁵
7664-39-3	Hydrogen fluoride (HF)	PM ⁵
7723-14-0	Phosphorus (yellow or white)	PM ²
7782-50-5	Chlorine	
7803-51-2	Phosphine	
8001-35-2	Toxaphene (chlorinated camphene)	VOC ¹

Notes:

- 1 This compound is defined as a VOC (40 CFR 51.100), but has a low vapor pressure. Emissions may be measured as either VOC or PM, depending on the process generating the emissions, and the test method used to measure the emissions.
- 2 Compounds in this class may be emitted as PM or as inorganic vapors.
- 3 Compounds in this class may be emitted as PM or as VOC.
- 4 Not Reactive-these compounds have been determined to have negligible photochemical reactivity, and are not defined as VOC (40 CFR 51.100)
- 5 DNR determined in May 2016 that HCl and HF be considered as PM for Title V emissions fee purpose