Appendices

APPENDIX A
Air Quality Glossary

ACFM Actual cubic feet per minute. A measurement of exhaust rate from an emission point.
Act refers to the 1990 Clean Air Act Amendments
Actual Emissions are the actual rate of emissions of a pollutant from an emission unit calculated using the emission unit's actual operating hours, production rates, and types of materials processed, stored, or combusted for the calendar year.
Actual Throughput is the quantity of raw material processed, handled, or used in an emission unit, such as fuels, solvents, coatings, or quantity of dust-producing material processed, handled, or transferred.
Air Pollutant is generally any substance in the air not part of the naturally occurring makeup of ambient air or that occurs in un-natural concentrations. In Iowa, this usually refers to hazardous air pollutants and criteria air pollutants.
Allowable Emissions is the emissions rate that represents a limit on the emissions that can occur from an emissions unit. This limit may be based on a federal, state, or local regulatory emission limit determined from state or local regulations and/or 40 Code of Federal Regulations (CFR).
Ambient Standards limit the concentration of a given pollutant in the ambient air. Ambient standards are not emissions limitations on sources, but usually result in such limits being placed on source operation as part of a control strategy to achieve or maintain an ambient standard.
Ammonia is a colorless gas with a very distinct odor. Ammonia emissions are important to air quality analyses because ammonia is involved in the formation of sulfate and nitrate, which are precursors for $PM_{2.5}$. Only primary ammonia needs to be reported. Primary ammonia means it is in the same chemical form as when it was emitted into the atmosphere. Secondary ammonia, such as ammonium sulfate and ammonium nitrate, is formed by chemical reactions in the atmosphere.
Attainment Area is an area considered to have air quality as good as or better than the National Ambient Air Quality Standards (NAAQS) as defined in the Act. An area may be in attainment for one or more pollutants but be a nonattainment area for one or more other pollutants.
Bottleneck: A physical or operational limitation that is part of the design of the facility or emission unit. Bottlenecks prevent operation of the equipment at 100% of capacity, and can only be used in limiting potential to emit if part of a federally enforceable permit.
Capture Efficiency is the percentage of pollutant emitted from an emission unit that is caught or captured by a pickup hood or other collection mechanism. An example is a fume hood.
Carbon Monoxide (CO) is a colorless, odorless gas that depletes the oxygen-carrying capacity of blood. Example sources of CO emissions include industrial boilers, incinerators, and motor vehicles.
CAS Number refers to the Chemical Abstract Services number. CAS numbers are often found on Safety Data Sheets and are sometimes used as a way to identify air pollutants.
CFR is the Code of Federal Regulations. This is a book of rules published by the federal government. Title 40 of the CFR pertains to Protection of the Environment.
Continuous Emissions Monitoring Equipment that measures the concentration or emission rate of a gas or particulate matter using analyzer measurements and a conversion equation, graph, or computer program. Installation and operation of a CEM may be required by EPA or DNR in order to determine compliance with specific standards. Operation of a CEM must meet performance specifications,

certification procedures, and recordkeeping and reporting requirements as specified in applicable regulations.

Construction Permits are permits required before installing or altering equipment or control equipment, with a goal of prevention of significant deterioration or degrading of clean air areas from new industrial development or expansion.

Control Efficiency is the emission reduction efficiency, and is a percentage value representing the amount of an emission unit's emissions that are controlled by a control device.

Criteria Pollutant refers to a pollutant for which a National Ambient Air Quality Standard has been set. Criteria pollutants are carbon monoxide, lead, nitrogen oxides, ozone, particulate matter with aerodynamic diameter less than or equal to 10 micrometers or less than or equal to 2.5 micrometers, and sulfur dioxide.

Dual Fuel refers to fuel burned at a ratio of 95% natural gas and 5% diesel fuel.

Emergency Generator …any generator of which the sole function is to provide emergency backup power during an interruption of electrical power from the electrical utility. An emergency generator does not include: peaking units at electrical utilities, generators at industrial facilities that typically operate at low rates, but are not confined to emergency purposes; or any standby generators that are used during time periods when power is available from the electric utility. An emergency is an unforeseeable condition that is beyond the control of the owner or operator.

Emission means pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, aircraft, or other nonroad engines.

Emission Factors The relationship between the amount of pollution produced and the amount of raw material processed. For example – pounds of CO per ton of coal fired.

Emission Inventory is a listing, by source, of the amount of air pollutants discharged into the atmosphere.

Emission Limits are limits on emissions that may be federally enforceable and exist in a permit. Such limits are usually expressed as a rate, generally in pounds per hour of emissions or as a concentration such as grains per dry standard cubic foot (7,000 grains is one pound).

Emission Point is the point where emissions enter the atmosphere such as stacks, vents and ventilation exhausts.

Emission Unit is a piece of equipment where emissions are generated. Emission units may have one or more processes with the potential to emit air pollutants. Some examples of an emission unit with one or more processes are boilers (the ability to burn both natural gas and fuel oil), generators (the ability to burn both fuel oil and dual fuel), and grain dryers (the ability to dry grain and burn natural gas).

Engineering Estimate is a term commonly applied to the best approximation that can be made when the specific emission estimation techniques such as stack testing, material balance, or emission factors are not possible. This estimation is usually made by an engineer familiar with the specific process, and is based on process information.

Federally Enforceable means all limitations and conditions which are enforceable by the administrator including, but not limited to, the requirements of new source performance standards, national emission standards for hazardous air pollutants, state rules, administrative orders, construction permits, and operating permits.

Fugitive Emissions are emissions that cannot reasonably pass through a stack, chimney, duct, vent or other opening. Fugitive emission sources can include haul roads, exposed storage piles, and wastewater retention ponds, etc.

HAP or Hazardous Air Pollutants are any of the 187 pollutants listed in Section 112 of the 1990 Clean Air Act Amendments. HAPs are known or suspected of being toxic or carcinogenic.

Indirect Heating occurs when the material being heated does not come in direct contact with the combustion gas, such as a hot water boiler.

Iowacleanair.gov is the web site for the DNR's air quality bureau with forms, assistance and guidance data.

MMcf equals 1,000,000 cubic feet. This unit of measure is most typically associated with the amount of natural gas combusted.

Material Balance or Mass Balance A process of estimating emissions using knowledge of the process, process rate, material used, and material properties.

Manually Operated Equipment means a machine or tool that is hand-held, such as a hand-held circular saw or compressed air chisel; a machine or tool for which the work piece is held or manipulated by hand, such as a bench grinder; a machine or tool for which the tool or bit is manipulated by hand, such as a lathe or drill press; any dust collection system which is part of such machine or tool; but not including any machine or tool for which the extent of manual operation is to control power to the machine or tool and not including any central dust collection system serving more than one machine or tool.

MACT or Maximum Achievable Control Technology are standards set under Title III of the 1990 Clean Air Act Amendments with an emphasis on technology control of hazardous air pollutants.

Maximum Hourly Design Rate is the highest amount of raw material processed or production achieved per hour based on manufacturer's data.

Maximum True Vapor Pressure means the equilibrium partial pressure of the material considering 1) for a material stored at ambient temperature, the maximum monthly average temperature as reported by the National Weather Service, or 2) for a material stored above or below the ambient temperature, the temperature equal to the highest calendar-month average of the material storage temperature.

Minor Source Emissions Inventory is the emissions inventory report that is due every third year for minor source facilities. Minor sources are sources that do not meet the definition of a "major source" in 567-IAC 22.100.

MSDS or Material Safety Data Sheets are known as SDS or Safety Data Sheets as of December 1, 2013. See the definition of SDS or Safety Data Sheets below.

National Ambient Air Quality Standards (NAAQS) are the main ambient standards for the following six criteria pollutants: carbon monoxide, lead, nitrogen oxides, ozone, particulate matter within aerodynamic diameter less than or equal to 10 micrometers or less than or equal to 2.5 micrometers, and sulfur dioxide.

National Emission Standards for Hazardous Air Pollutants (NESHAP) are health-based standards set under the 1970 Clean Air Act for beryllium, mercury, vinyl chloride, benzene, arsenic, asbestos, radon, radionuclides and other HAPs. Under the 1990 Act, roughly 170 source categories are identified for eventual MACT regulations. See MACT definition on page 71. The NESHAPs are published in 40 CFR Parts 61 and 63.

New Source Performance Standards (NSPS) are promulgated for criteria, hazardous, and other pollutant emissions from new, modified, or reconstructed sources that the U.S. EPA determines contribute significantly to air pollution. These are typically emission standards, but may be expressed in other forms such as concentration and opacity. The NSPS are published in 40 CFR Part 60.

Nitrogen Oxides (NOx) are a class of compounds that are respiratory irritants that react with volatile organic compounds (VOC's) in the presence of sunlight to form Ozone. NOx compounds are also precursors to acid rain. Motor vehicles, power plants, and other stationary combustion facilities emit large quantities of NOx.

North American Industrial Classification System (NAICS) A North American system for classifying industries by a six-digit code. This six-digit hierarchical structure allows greater coding flexibility than the four-digit structure of the SIC. NAICS allows for the identification of 1,063 industries compared to the 1,004 found in the SIC system.

Opacity means the degree to which emissions reduce the transmission of light and obscure the view of an object in the background. Opacity can be measured by properly trained observers. The validity of such measurements has been well established in the courts, including the U.S. Supreme Court. DNR field inspectors often take opacity readings during inspections.

Operating Permits are permits required by Title V of the 1990 Act for major sources. Operating permits are for the facility as a whole and differ from construction permits, which are issued for individual emission points.

Overall Control Efficiency is obtained by multiplying the capture efficiency by the control equipment control efficiency to provide the overall control efficiency for reporting emissions.
Ozone (O3) is a colorless gas that damages lungs and can damage materials and vegetation. It is the primary constituent of smog, and is formed primarily when nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in the presence of sunlight.
Particulate Matter of aerodynamic diameter less than or equal to 10 micrometers (PM10) is a measure of small solid matter suspended in the atmosphere. Small particles can penetrate deeply into the lung where they can cause respiratory problems. Emissions of PM-10 are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, fires, and motor vehicles.
Particulate Matter of aerodynamic diameter less than or equal to 2.5 micrometers (PM2.5) is another measure of small solid matter suspended in the atmosphere. Primary PM-2.5 particulate results largely from combustion of fossil fuels or biomass, although selected industrial processes can also be significant in some areas. The sources of PM-2.5 include, but are not limited to, gasoline and diesel exhaust, wood stoves and fireplaces, land clearing, wildland prescribed burning, and wild fires. Sources of primary particulate including fugitive emissions from paved and unpaved roads, dust from ore processing and refining, and to a lesser extent, crustal material from construction activities, agricultural tilling, wind erosion and other crustal sources are less important based on their relatively small contribution to ambient PM-2.5 concentrations. The condensable components are largely made up of semi-volatile organic compounds that condense at ambient temperature to form aerosol.
Potential to Emit (PTE) was devised by Congress as a “measuring-stick” to determine a uniform way to assess all types of facilities. Potential to emit is used to help determine what types of regulations apply to your facility. PTE is calculated assuming each emission unit operates continuously — 24 hours per day, 365 days per year at the maximum physical and operational design. Physical limitations on the equipment, pollution control equipment benefits, and federally enforceable permit limits can reduce PTE. For the purposes of calculating potential to emit for emergency generators, "maximum capacity" means one of the following:

1. 500 hours of operation annually, if the generator has actually been operated less than 500 hours per year for the past five years;
2. 8,760 hours of operation annually, if the generator has actually been operated more than 500 hours in one of the past five years; or
3. The number of hours specified in a state or federally enforceable limit.

Reported Emissions are those emission estimates that are submitted to a regulatory agency. Emission inventories are used for a variety of purposes such as planning pollution control programs, promoting compliance with laws and regulations, and conducting permit reviews. Actual, potential and allowable emissions are typically reported.
SDS or Safety Data Sheets are an information source with details about chemical substances such as chemical composition and other environmental information. SDS can be a useful source of emission information and are available for all chemical substances from the supplier of the material.
Source Classification Codes (SCCs) are codes defined by EPA that classify air emission sources by individual processes and/or operations.
Stack Tests A test that measures the concentration of pollutants in the exhaust stack. Measurements are performed following procedures specified and developed by the US EPA and/or Iowa DNR. Such testing is required by DNR to be conducted by various stationary sources to determine compliance with applicable air emission limits.
SCFM Standard cubic feet per minute. A measurement of exhaust rate from an emission point.
Standard Industrial Classification (SIC) A United States government system for classifying industries by a four-digit code.
State Implementation Plan (SIP) is a state plan approved by EPA for the establishment, regulation, and enforcement of air pollution standards.
Stationary Source is any building, structure, facility or installation which emits or may emit any air pollutant subject to regulation under the Clean Air Act. It includes all pollutant emitting activities which

belong in the same major industrial grouping as identified by the first two digits in the facilities SIC code, are located on one or more contiguous or adjacent properties and are under common ownership or control. Mobile sources such as cars, trains, and forklifts are not regulated by DNR.

Sulfur Oxides (SOx) are a class of colorless, pungent gases that are respiratory irritants and precursors to acid rain. Sulfur oxides are emitted from various combustion or incineration sources, particularly from coal combustion.

Tertiary-Butyl Acetate (TBAC) is a pollutant common to surface coating operations that is neither a VOC nor a HAP. However, EPA still requires that TBAC emissions be reported on the emissions inventory as an "additional pollutant".

Threshold is a level of emissions that once reached, triggers requirements to obtain a permit.

Transfer Efficiency is the percentage of sprayed material such as paint or solvent that is actually adhered to the intended surface.

Twelve-Month Rolling Period is a period of 12 consecutive months determined on a rolling basis.

Volatile Organic Compounds (VOCs) are organic compounds that contribute to ground-level ozone or smog formation. Ground level ozone is a strong lung oxidant. Large amounts of VOCs are emitted from fuel distribution, chemical manufacturing, motor vehicles, and a wide variety of industrial, commercial, and consumer solvent uses.

1000gal equals 1,000 gallons. This unit of measure is most typically associated with the amount of fuel oil or LPG combusted.

APPENDIX B

List of Criteria Pollutants, Chemicals Not Considered VOCs, and Hazardous Air Pollutants

Criteria Pollutants

$PM_{2.5}$	Particulate Matter less than or equal to 2.5 micrometers in diameter
PM_{10}	Particulate Matter less than or equal to 10 micrometers in diameter
SO_2	Sulfur Dioxide
NO_x	Nitrogen Oxides
VOC	Volatile Organic Compound
CO	Carbon Monoxide
Pb	Lead

***Note: Tertiary-Butyl Acetate (TBAC)**, CAS #540-88-5 is no longer considered to be a VOC or HAP, but must still be reported on INV-3, INV-4, and INV-6 as an additional regulated air pollutant per 40 CFR 51.100(s)—"The following compound(s) are VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements which apply to VOC and shall be uniquely identified in emission reports, but are not VOC for purposes of VOC emissions limitations or VOC content requirements: t-butyl acetate."*

Chemicals Not Considered Volatile Organic Compounds (VOCs) – from paragraphs 40 CFR 51.100 (s)(1) and 40 CFR 51.100 (s)(5):

(1) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC–113); trichlorofluoromethane (CFC–11); dichlorodifluoromethane (CFC–12); chlorodifluoromethane (HCFC–22); trifluoromethane (HFC–23); 1,2-dichloro 1,1,2,2-tetrafluoroethane (CFC–114); chloropentafluoroethane (CFC–115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC–123); 1,1,1,2-tetrafluoroethane (HFC–134a); 1,1-dichloro 1-fluoroethane (HCFC–141b); 1-chloro 1,1-difluoroethane (HCFC–142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC–124); pentafluoroethane (HFC–125); 1,1,2,2-tetrafluoroethane (HFC–134); 1,1,1-trifluoroethane (HFC–143a); 1,1-difluoroethane (HFC–152a); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; perchloroethylene (tetrachloroethylene); 3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC–225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC–225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC 43–10mee); difluoromethane (HFC–32); ethylfluoride (HFC–161); 1,1,1,3,3,3-hexafluoropropane (HFC–236fa); 1,1,2,2,3-pentafluoropropane (HFC–245ca); 1,1,2,3,3-pentafluoropropane (HFC–245ea); 1,1,1,2,3-pentafluoropropane (HFC–245eb); 1,1,1,3,3-pentafluoropropane (HFC–245fa); 1,1,1,2,3,3-hexafluoropropane (HFC–236ea); 1,1,1,3,3-pentafluorobutane (HFC–365mfc); chlorofluoromethane (HCFC–31); 1 chloro-1-fluoroethane (HCFC–151a); 1,2-dichloro-1,1,2-trifluoroethane (HCFC–123a); 1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane ($C_4F_9OCH_3$or HFE–7100); 2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OCH_3$); 1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane ($C_4F_9OC_2H_5$or HFE–7200); 2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane ($(CF_3)_2CFCF_2OC_2H_5$); methyl acetate, 1,1,1,2,2,3,3-heptafluoro-3-methoxy-propane (n-$C_3F_7OCH_3$, HFE–7000); 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl) hexane (HFE–7500); 1,1,1,2,3,3,3-heptafluoropropane (HFC 227ea); methyl formate ($HCOOCH_3$); (1) 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-trifluoromethyl-pentane (HFE–7300); trans-1,3,3,3-tetrafluoropropene (HFO-1234ze); propylene carbonate; dimethyl carbonate; HCF2OCF2H (HFE-134); HCF2OCF2OCF2H (HFE-

236cal2); HCF2OCF2CF2OCF2H (HFE-338pcc13); HCF2OCF2OCF2CF2OCF2H (H-Galden 1040X or H-Galden ZT 130 [or 150 or 180]); 2,3,3,3-tetrafluoropropene (HFO-1234yf); trans 1-chloro-3,3,3-trifluoroprop-1-ene (Solstice™ 1233zd(E)); and perfluorocarbon compounds which fall into these classes:

(i) Cyclic, branched, or linear, completely fluorinated alkanes;

(ii) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(iii) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(iv) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(5) The following compound(s) are VOC for purposes of all recordkeeping, emissions reporting, photochemical dispersion modeling and inventory requirements which apply to VOC and shall be uniquely identified in emission reports, but are not VOC for purposes of VOC emissions limitations or VOC content requirements: t-butyl acetate (540-88-5).

The following chemicals have been added to the definition of chemicals not considered VOC:

- HFE-7300----January 18, 2007
- Propylene carbonate (108-32-7)----January 21, 2009
- Dimethyl carbonate (616-38-6)----January 21, 2009
- HFO-1234ze----July 23, 2012
- HCF2OCF2H (HFE-134)----March 14, 2013
- HCF2OCF2OCF2H (HFE-236cal2)----March 14, 2013
- HCF2OCF2CF2OCF2H (HFE-338pcc13)----March 14, 2013
- HCF2OCF2OCF2CF2OCF2H (H-Galden 1040X or H-Galden ZT 130 (or 150 or 180))----March 14, 2013
- Trans 1-chloro-3,3,3-trifluoroprop-1-ene (Solstice™ 1233zd(E))----September 27, 2013
- 2,3,3,3-tetrafluoropropene (HFO-1234yf)----November 21, 2013
- 2-amino-2-methyl-1-propanol (AMP)----March 27, 2014

Hazardous Air Pollutants – alphabetical listing

Note: Methyl ethyl ketone (MEK) is no longer considered to be a HAP as of 12/19/05.

CAS Number	Chemical Name
A	
75-07-0	Acetaldehyde
60-35-5	Acetamide
75-05-8	Acetonitrile
98-86-2	Acetophenone
53-96-3	2-Acetylaminofluorene
107-02-8	Acrolein
79-06-1	Acrylamide
79-10-7	Acrylic acid
107-13-1	Acrylonitrile
107-05-1	Allyl chloride
92-67-1	4-Aminobiphenyl
62-53-3	Aniline
90-04-0	o-Anisidine
0	Antimony Compounds
0	Arsenic Compounds
1332-21-4	Asbestos (friable)
B	
71-43-2	Benzene
92-87-5	Benzidine
98-07-7	Benzoic trichloride
100-44-7	Benzyl chloride
0	Beryllium Compounds
92-52-4	Biphenyl
111-44-4	Bis(2-chloroethyl) ether
542-88-1	Bis(chloromethyl) ether
75-25-2	Bromoform
74-83-9	Bromomethane (Methyl Bromide)
106-99-0	1,3-Butadiene
106-88-7	1,2-Butylene oxide (1,2-Epoxybutane)
C	
0	Cadmium Compounds
156-62-7	Calcium cyanamide
133-06-2	Captan
63-25-2	Carbaryl
75-15-0	Carbon disulfide
56-23-5	Carbon tetrachloride
463-58-1	Carbonyl sulfide
120-80-9	Catechol
133-90-4	Chloramben
57-74-9	Chlordane
7782-50-5	Chlorine
79-11-8	Chloroacetic acid
532-27-4	2-Chloroacetophenone
108-90-7	Chlorobenzene
510-15-6	Chlorobenzilate
75-00-3	Chloroethane (Ethyl chloride)
67-66-3	Chloroform
74-87-3	Chloromethane (Methyl chloride)
107-30-2	Chloromethyl methyl ether
126-99-8	Chloroprene
0	Chromium Compounds
0	Cobalt Compounds
0	Coke Oven Emissions
1319-77-3	Cresol/Cresylic acid (isomers/mixtures)
108-39-4	m-Cresol
95-48-7	o-Cresol
106-44-5	p-Cresol
98-82-8	Cumene
0	Cyanide Compounds
D	
94-75-7	2,4-D, salts and esters
3547-04-4	DDE
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)
334-88-3	Diazomethane
132-64-9	Dibenzofuran
96-12-8	1,2-Dibromo-3-chloropropane
106-93-4	1,2-Dibromoethane (Ethylene dibromide)
84-74-2	Dibutyl phthalate
106-46-7	1,4-Dichlorobenzene(p)
91-94-1	3,3'-Dichlorobenzidine
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)
107-06-2	1,2-Dichloroethane (Ethylene dichloride)
75-09-2	Dichloromethane (Methylene chloride)
78-87-5	1,2-Dichloropropane (Propylene dichloride)
542-75-6	1,3-Dichloropropylene
62-73-7	Dichlorvos
111-42-2	Diethanolamine
121-69-7	N,N-Dimethylaniline
64-67-5	Diethyl sulfate
119-90-4	3,3'-Dimethoxybenzidine
60-11-7	4-Dimethylaminoazobenzene
119-93-7	3,3'-Dimethylbenzidine
68-12-2	Dimethyl formamide
57-14-7	1,1-Dimethyl hydrazine
131-11-3	Dimethyl phthalate
77-78-1	Dimethyl sulfate
79-44-7	Dimethylcarbamyl chloride
534-52-1	4,6-Dinitro-o-cresol
51-28-5	2,4-Dinitrophenol
121-14-2	2,4-Dinitrotoluene
123-91-1	1,4-Dioxane
122-66-7	1,2-Diphenylhydrazine
E	
106-89-8	Epichlorohydrin
140-88-5	Ethyl acrylate
100-41-4	Ethylbenzene
107-21-1	Ethylene glycol
75-21-8	Ethylene oxide
96-45-7	Ethylene thiourea
151-56-4	Ethyleneimine
F	
0	Fine Mineral Fibers
50-00-0	Formaldehyde
G	
0	Glycol Ethers (See page 79)

CAS Number	Chemical Name
H	
76-44-8	Heptachlor
87-68-3	Hexachloro-1,3-butadiene
118-74-1	Hexachlorobenzene
77-47-4	Hexachlorocyclopentadiene
67-72-1	Hexachloroethane
822-06-0	Hexamethylene-1,6-diisocyanate
680-31-9	Hexamethylphosphoramide
110-54-3	Hexane
302-01-2	Hydrazine
7647-01-0	Hydrochloric acid
7664-39-3	Hydrogen fluoride
123-31-9	Hydroquinone
I	
78-59-1	Isophorone
L	
0	Lead Compounds
58-89-9	Lindane
M	
108-31-6	Maleic anhydride
0	Manganese Compounds
0	Mercury Compounds
67-56-1	Methanol
72-43-5	Methoxychlor
60-34-4	Methyl hydrazine
74-88-4	Methyl iodide
108-10-1	Methyl isobutyl ketone
624-83-9	Methyl isocyanate
80-62-6	Methyl methacrylate
1634-04-4	Methyl tert-butyl ether
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylenebis(phenylisocyanate)
101-77-9	4,4'-Methylenedianiline
N	
91-20-3	Naphthalene
0	Nickel Compounds
98-95-3	Nitrobenzene
92-93-3	4-Nitrobiphenyl
100-02-7	4-Nitrophenol
79-46-9	2-Nitropropane
62-75-9	N-Nitrosodimethylamine
59-89-2	N-Nitrosomorpholine
684-93-5	N-Nitroso-N-methylurea
P	
56-38-2	Parathion
87-86-5	Pentachlorophenol
108-95-2	Phenol
106-50-3	p-Phenylenediamine
75-44-5	Phosgene
7803-51-2	Phosphine
7723-14-0	Phosphorus (yellow or white)
85-44-9	Phthalic anhydride

CAS Number	Chemical Name
85-44-9	Phthalic anhydride
1336-36-3	Polychlorinated biphenyls
0	Polycyclic Organic Matter
1120-71-4	Propane sultone
123-38-6	Propionaldehyde
57-57-8	beta-Propiolactone
114-26-1	Propoxur
75-56-9	Propylene oxide
75-55-8	Propyleneimine
Q	
91-22-5	Quinoline
106-51-4	Quinone
82-68-8	Quintozene
R	
0	Radionuclides (including Radon)
S	
0	Selenium Compounds
100-42-5	Styrene
96-09-3	Styrene oxide
T	
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
79-34-5	1,1,2,2-Tetrachloroethane
127-18-4	Tetrachloroethylene
7550-45-0	Titanium tetrachloride
108-88-3	Toluene
95-80-7	2,4-Toluene diamine (2,4-Diaminotoluene)
584-84-9	2,4-Toluene diisocyanate
95-53-4	o-Toluidine
800-135-2	Toxaphene
120-82-1	1,2,4-Trichlorobenzene
71-55-6	1,1,1-Trichloroethane
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
95-95-4	2,4,5-Trichlorophenol
88-06-2	2,4,6-Trichlorophenol
121-44-8	Triethylamine
1582-09-8	Trifluralin
540-84-1	2,2,4-Trimethylpentane
U	
51-79-6	Urethane
V	
108-05-4	Vinyl acetate
593-60-2	Vinyl bromide
75-01-4	Vinyl chloride
75-35-4	Vinylidene chloride
X	
1330-20-7	Xylene (mixed isomers)
108-38-3	m-Xylene
95-47-6	o-Xylene
106-42-3	p-Xylene

Hazardous Air Pollutants - by CAS Number

Note: Methyl ethyl ketone (MEK) is no longer considered to be a HAP as of 12/19/05.

CAS Number	Chemical Name
0	Antimony Compounds
0	Arsenic Compounds
0	Beryllium Compounds
0	Cadmium Compounds
0	Chromium Compounds
0	Cobalt Compounds
0	Coke Oven Emissions
0	Cyanide Compounds
0	Fine Mineral Fibers
0	Glycol Ethers (See page 79)
0	Lead Compounds
0	Manganese Compounds
0	Mercury Compounds
0	Nickel Compounds
0	Polycyclic Organic Matter
0	Radionuclides (including Radon)
0	Selenium Compounds
50-00-0	Formaldehyde
51-28-5	2,4-Dinitrophenol
51-79-6	Urethane
53-96-3	2-Acetylaminofluorene
56-23-5	Carbon tetrachloride
56-38-2	Parathion
57-14-7	1,1-Dimethyl hydrazine
57-57-8	beta-Propiolactone
57-74-9	Chlordane
58-89-9	Lindane
59-89-2	N-Nitrosomorpholine
60-11-7	4-Dimethylaminoazobenzene
60-34-4	Methyl hydrazine
60-35-5	Acetamide
62-53-3	Aniline
62-73-7	Dichlorvos
62-75-9	N-Nitrosodimethylamine
63-25-2	Carbaryl
64-67-5	Diethyl sulfate
67-56-1	Methanol
67-66-3	Chloroform
67-72-1	Hexachloroethane
68-12-2	Dimethyl formamide
71-43-2	Benzene
71-55-6	1,1,1-Trichloroethane
72-43-5	Methoxychlor
74-83-9	Bromomethane (Methyl Bromide)
74-87-3	Chloromethane (Methyl chloride)
74-88-4	Methyl iodide
75-00-3	Chloroethane (Ethyl chloride)
75-01-4	Vinyl chloride
75-05-8	Acetonitrile
75-07-0	Acetaldehyde
75-09-2	Dichloromethane (Methylene chloride)
75-15-0	Carbon disulfide
75-21-8	Ethylene oxide
75-25-2	Bromoform
75-34-3	1,1-Dichloroethane (Ethylidene dichloride)
75-35-4	Vinylidene chloride
75-44-5	Phosgene
75-55-8	Propyleneimine
75-56-9	Propylene oxide
76-44-8	Heptachlor
77-47-4	Hexachlorocyclopentadiene
77-78-1	Dimethyl sulfate
78-59-1	Isophorone
78-87-5	1,2-Dichloropropane (Propylene dichloride)
79-00-5	1,1,2-Trichloroethane
79-01-6	Trichloroethylene
79-06-1	Acrylamide
79-10-7	Acrylic acid
79-11-8	Chloroacetic acid
79-34-5	1,1,2,2-Tetrachloroethane
79-44-7	Dimethylcarbamyl chloride
79-46-9	2-Nitropropane
80-62-6	Methyl methacrylate
82-68-8	Quintozene
84-74-2	Dibutyl phthalate
85-44-9	Phthalic anhydride
87-68-3	Hexachloro-1,3-butadiene
87-86-5	Pentachlorophenol
88-06-2	2,4,6-Trichlorophenol
90-04-0	o-Anisidine
91-20-3	Naphthalene
91-22-5	Quinoline
91-94-1	3,3'-Dichlorobenzidine
92-52-4	Biphenyl
92-67-1	4-Aminobiphenyl
92-87-5	Benzidine
92-93-3	4-Nitrobiphenyl
94-75-7	2,4-D, salts and esters
95-47-6	o-Xylene
95-48-7	o-Cresol
95-53-4	o-Toluidine
95-80-7	2,4-Toluene diamine (2,4-Diaminotoluene)
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-45-7	Ethylene thiourea
98-07-7	Benzoic trichloride
98-82-8	Cumene
98-86-2	Acetophenone
98-95-3	Nitrobenzene
100-02-7	4-Nitrophenol
100-41-4	Ethylbenzene
100-42-5	Styrene
100-44-7	Benzyl chloride
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylenebis(phenylisocyanate)
101-77-9	4,4'-Methylenedianiline
106-42-3	p-Xylene
106-44-5	p-Cresol
106-46-7	1,4-Dichlorobenzene(p)
106-50-3	p-Phenylenediamine
106-51-4	Quinone
106-88-7	1,2-Butylene oxide (1,2-Epoxybutane)
106-89-8	Epichlorohydrin
106-93-4	1,2-Dibromoethane (Ethylene dibromide)
106-99-0	1,3-Butadiene
107-02-8	Acrolein
107-05-1	Allyl chloride
107-06-2	1,2-Dichloroethane (Ethylene dichloride)
107-13-1	Acrylonitrile
107-21-1	Ethylene glycol
107-30-2	Chloromethyl methyl ether
108-05-4	Vinyl acetate
108-10-1	Methyl isobutyl ketone
108-31-6	Maleic anhydride
108-38-3	m-Xylene

CAS Number	Chemical Name
108-39-4	m-Cresol
108-88-3	Toluene
108-90-7	Chlorobenzene
108-95-2	Phenol
110-54-3	Hexane
111-42-2	Diethanolamine
111-44-4	Bis(2-chloroethyl) ether
114-26-1	Propoxur
117-81-7	Di(2-ethylhexyl) phthalate (DEHP)
118-74-1	Hexachlorobenzene
119-90-4	3,3'-Dimethoxybenzidine
119-93-7	3,3'-Dimethylbenzidine
120-80-9	Catechol
120-82-1	1,2,4-Trichlorobenzene
121-14-2	2,4-Dinitrotoluene
121-44-8	Triethylamine
121-69-7	N,N-Dimethylaniline
122-66-7	1,2-Diphenylhydrazine
123-31-9	Hydroquinone
123-38-6	Propionaldehyde
123-91-1	1,4-Dioxane
126-99-8	Chloroprene
127-18-4	Tetrachloroethylene
131-11-3	Dimethyl phthalate
132-64-9	Dibenzofuran
133-06-2	Captan
133-90-4	Chloramben
140-88-5	Ethyl acrylate
151-56-4	Ethyleneimine
156-62-7	Calcium cyanamide
302-01-2	Hydrazine
334-88-3	Diazomethane
463-58-1	Carbonyl sulfide
510-15-6	Chlorobenzilate
532-27-4	2-Chloroacetophenone
534-52-1	4,6-Dinitro-o-cresol
540-84-1	2,2,4-Trimethylpentane
542-75-6	1,3-Dichloropropylene
542-88-1	Bis(chloromethyl) ether
584-84-9	2,4-Toluene diisocyanate
593-60-2	Vinyl bromide
624-83-9	Methyl isocyanate
680-31-9	Hexamethylphosphoramide
684-93-5	N-Nitroso-N-methylurea
822-06-0	Hexamethylene-1,6-diisocyanate
1120-71-4	Propane sultone
1319-77-3	Cresol/Cresylic acid (isomers and mixture)
1330-20-7	Xylene (mixed isomers)
1332-21-4	Asbestos (friable)
1336-36-3	Polychlorinated biphenyls
1582-09-8	Trifluralin
1634-04-4	Methyl tert-butyl ether
1746-01-6	2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)
3547-04-4	DDE
7550-45-0	Titanium tetrachloride
7647-01-0	Hydrochloric acid
7664-39-3	Hydrogen fluoride
7723-14-0	Phosphorus (yellow or white)
7782-50-5	Chlorine
7803-51-2	Phosphine
8001-35-2	Toxaphene

Glycol Ethers*

Chemical Name	CAS Number
Diethylene glycol dimethyl ether	111-96-6
Diethylene glycol monobutyl ether acetate	124-17-4
Diethylene glycol monobutyl ether	112-34-5
Diethylene glycol monoethyl ether acetate	112-15-2
Diethylene glycol monoethyl ether	111-90-0
Diethylene glycol monohexyl ether	112-59-4
Diethylene glycol monomethyl ether acetate	629-38-9
Diethylene glycol monomethyl ether	111-77-3
Ethylene glycol dibutyl ether	112-48-1
Ethylene glycol diethyl ether	629-14-1
Ethylene glycol dimethyl ether	110-71-4
Ethylene glycol monoacetate	542-59-6
Ethylene glycol monobutyl ether acetate	112-07-2
Ethylene glycol monoethyl ether acetate	111-15-9
Ethylene glycol monoethyl ether	110-80-5
Ethylene glycol monohexyl ether	112-25-4
Ethylene glycol monomethyl ether acetate	110-49-6
Ethylene glycol monomethyl ether	109-86-4
Ethylene glycol monooctyl ether	10020-43-6
Ethylene glycol monophenyl ether	122-99-6
Ethylene glycol monopropyl ether	2807-30-9
Triethylene glycol	112-27-6
Triethylene glycol dimethyl ether	112-49-2
Triethylene glycol monoethyl ether	112-50-5
Triethylene glycol monomethyl ether	112-35-6

*This is a partial list of common glycol ethers. A complete listing can be found on line at **http://www.epa.gov/ttn/atw/glycol2000.pdf**

APPENDIX C
Iowa DNR Control Efficiency Guidance

Details
The level of air emissions from a facility depends on many factors. For many industrial processes, technical information is available to assist in determining the quantity and types of air pollutants that a process would create and thus be emitted without any control. This information on the quantity of air pollutants generated during a particular process is referred to as an emission factor. Facilities can control the amount of pollutants emitted to the atmosphere from these processes by installing air pollution control equipment. The level of control depends on various factors. These include: the type of equipment used; the design of the equipment; the process involved; temperature; air flow rates; raw materials; combustion products, etc.; as well as the pollutant(s) targeted for control. Control efficiency is contaminant specific.

DNR staff has prepared a general guidance document identifying typical control efficiencies achieved by different generic types of control equipment. The control efficiency values identified in the table represent single pieces of control equipment. Multiple pieces of control equipment in series should be evaluated on a case-by-case basis.

This control efficiency guidance document is used in reviewing emission inventories by comparing the facility's claimed control efficiency with the guidance document's value. If the facility claims higher control efficiency for a particular piece of equipment, DNR staff will request supporting information to substantiate the facility's claim. This supporting information would consist of test results either from a previous stack test, continuous emission monitoring, or any other verifiable source of information.

The $PM_{2.5}$ control efficiency is currently assumed to be equal to the PM_{10} control efficiency due to a lack of documentation. If a facility has any questions regarding $PM_{2.5}$ control efficiency, please call the emissions inventory staff.

Control Efficiency Table

Control Device or Practice	Control Efficiency (%)						
	TSP	PM_{10}	SOx	NOx	VOC	CO	Pb
Wet Scrubber - high efficiency	note 1		note 2				
Wet Scrubber - med efficiency	note 1		note 2				
Wet Scrubber - low efficiency	note 1		note 2				
Gravity Collector	3[a]	--	--	--	--	--	2[a]
Centrifugal Collector (cyclone)-high efficiency*	95[c]	80[a]	--	--	--	--	65[a]
Centrifugal Collector (cyclone)-med efficiency*	75[c]	50[a]	--	--	--	--	40[a]
Centrifugal Collector (cyclone)-low efficiency*	35[c]	10[a]	--	--	--	--	8[a]
Electrostatic Precipitator-high efficiency**	95[a]	95[a]	--	--	--	--	75[a]
Electrostatic Precipitator-medium efficiency**	80[a]	80[a]	--	--	--	--	65[a]
Electrostatic Precipitator-low efficiency**	70[a]	70[a]	--	--	--	--	55[a]
Fabric Filter	99[a]	95[c]	--	--	--	--	80[a]
Catalytic Afterburner	--	--	--	--	95[c]	--	--
Direct Flame Afterburner	--	--	--	--	95[c]	--	--
Flaring	--	--	--	--	90[a]	--	--
Low NOx Burners	--	--	--	note 3	--	--	--
Staged Combustion	--	--	--	40[a]	--	--	--
Flue Gas Recirculation	--	--	--	50[a]	--	--	--
Reduced Combustion Air Preheat	--	--	--	note 4	--	--	--
Steam or Water Injection	--	--	--	65[a]	--	--	--
Low Excess Air Firing	--	--	--	30[a]	--	--	--
Fuel with low Nitrogen Content	--	--	--	50[a]	--	--	--
Sulfuric Acid Plant-Single Contact Process	--	--	50[a]	--	--	--	--
Sulfuric Acid Plant-Double Contact Process	--	--	95[a]	--	--	--	--
Vapor Recovery System (Condensers)	--	--	--	--	note 5	--	--
Activated Carbon Adsorption	--	--	note 6				--
Gas Absorption Column-packed	90[a]	90[a]	note 2				--
Gas Absorption Column-tray type	25[a]	25[a]	note 2				--
Spray Tower	20[a]	20[a]	note 2				--
Venturi Scrubber	90[a]	90[a]	note 2				--

Control Efficiency Table (continued)

Control Device or Practice	Control Efficiency (%)						
	TSP	PM_{10}	SOx	NOx	VOC	CO	Pb
Impingement Plate Scrubber	note 7		--	--	--	--	--
Mat or Panel Filter	90 [c]	90 [c]	--	--	--	--	--
Dust Suppression by Water Spray	40 [a]	40 [a,d]	--	--	--	--	--
Dust Suppression by Chemical or Wetting Agents	40 [a]	40 [a,d]	--	--	--	--	--
Catalytic Reduction	--	--	--	note 8	--	--	--
Wet Lime Slurry Scrubbing	--	--	85 [c]	--	--	--	--
Multiple Cyclone w/o Fly Ash Reinjection	80 [a]	80 [a]	--	--	--	--	65 [a]
Multiple Cyclone with Fly Ash Reinjection	50 [a]	50 [a]	--	--	--	--	40 [a]
Water Curtain	50 [c]	10 [a]	--	--	--	--	--

[a] – Control efficiency was taken from a literature review and developmental work by the Minnesota Pollution Control Agency
[b] – Control efficiency was taken from AP-42
[c] – Control efficiency was developed from the combination of a literature review and developmental work by the Minnesota Pollution Control Agency, AP-42, and staff judgment
[d] – Unless a higher efficiency is required as an operating condition of a DNR construction permit

***** Low, medium, and high efficiency cyclones will be defined based on pressure drop. The ranges of pressure drops are as follows:

Low-efficiency cyclones	2-4 inches water
Medium-efficiency cyclones	4-7 inches water
High-efficiency cyclones	7-10 inches water

****** Low, medium, and high efficiency electrostatic precipitators (ESP) will be defined based on the specific collection area (SCA). The SCA is the total collector plate area divided by the gas volume flow rate. It is usually expressed in terms of square feet per 1000 acfm of gas flow. For example, the SCA of an ESP with a gas flow rate of 250,000 acfm and collection plate area of 100,000 square feet is:

$$100{,}000\ ft^2\ /\ 250{,}000\ acfm \times 0.001\ =\ 400\ ft^2/thousand\ acfm$$

The ranges of SCA for low, medium, and high efficiency ESPs are as follows:

Low-efficiency ESP	< 400
Medium-efficiency ESP	400 - 700
High-efficiency ESP	> 700

Typical control efficiencies were not assigned to all control devices because some efficiencies strongly depend on source specific parameters. In these instances the table will refer to one of the notes listed below for additional information.

Note 1. Particulate control equipment represented by these classifications should be included in the other, more specific categories (i.e., venturi scrubbers or packed bed absorption columns).

Note 2. The achievable gaseous pollutant control efficiencies for these types of control equipment will depend on the pollutant solubility, the solvent used, the vapor-liquid contact time, and the contact area. These devices are normally designed to achieve a promulgated control efficiency rather than the maximum achievable reduction. Control efficiencies for these devices should be evaluated on a case-by-case basis.

Note 3. Low NOx burners (LNB) have been developed by many boiler and burner manufacturers for both new and retrofit applications. Low NOx burners limit NOx formation by controlling both the stoichiometric and temperature profiles of the combustion process. This control is achieved with design features that regulate the aerodynamic distribution and mixing of the fuel and air, yielding one or more of the following conditions:

1. Reduced O_2 in the primary combustion zone, which limits fuel NOx formation;
2. Reduced flame temperature, which limits thermal NOx formation; and
3. Reduced residence time at peak temperature, which limits thermal NOx formation.

The amount of NOx reduction achievable is dependent upon the combustion system and burner design, actual operating practices, and fuel characteristics. The amount of reduction should be based on the manufacturer's demonstration.

Note 4. The amount of NOx reduction achievable from reducing preheating of combustion air will vary according to the temperatures before and after the modification. Therefore, efficiencies for this process should be evaluated on a case-by-case basis.

Note 5. Control efficiencies for a particular condenser will vary for different VOC compounds and depends on both the partial pressure of the pollutant and the operating parameters of the condenser. Efficiencies should be evaluated on a case-by-case basis.

Note 6. Since the overall control efficiency will depend on source specific parameters such as the physical characteristics of the absorbent bed and gaseous stream, the temperature, and the choice of regeneration technique, efficiencies should be evaluated on a case-by-case basis.

Note 7. Depending on the application control efficiencies may range from 25-99%. Efficiencies should be evaluated on a case-by-case basis.

Note 8. Generic classification; recommend specific technologies be addressed on an individual basis. Two widely used NOx control technologies include Selective Catalytic Reduction (SCR) and Selective Noncatalytic Reduction (SNCR). SCR can obtain reductions of 60-90%. Urea based SNCR can achieve reductions of 30-80% and ammonia based 55-85%.

APPENDIX D

Abbreviations, Conversion Factors, and Spray Painting Transfer Efficiencies

Abbreviations

ACFM	Actual cubic feet per minute
CAA	Clean Air Act
CAS	Chemical Abstract Service Registry number
CFR	Code of Federal Regulation
CHIEF	Clearinghouse for Inventories and Emission Factors
CO	Carbon Monoxide
DNR	Iowa Department of Natural Resources
gr./dscf	grains per dry standard cubic foot
HAP	Hazardous Air Pollutant
IAC	Iowa Administrative Code
lbs/hr	pounds per hour
lbs/MMBtu	pounds per million British thermal units
lbs/MMcf	pounds per million cubic feet
MACT	Maximum Achievable Control Technology
MSEI	Minor Source Emission Inventory
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industrial Classification System
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxides
NSPS	New Source Performance Standards
NSR	New Source Review
˚F	degrees Fahrenheit
PM_{10}	Particulate Matter less than or equal to 10 micrometers in diameter
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 micrometers in diameter
ppmv	parts per million by volume
PTE	Potential to Emit
SCC	Source Classification Code
SCFM	Standard cubic feet per minute
SDS (formerly MSDS)	Safety Data Sheet (formerly Material Safety Data Sheet)
SIC	Standard Industrial Classification
SO_2	Sulfur Dioxide
SPARS	State Permitting and Air Reporting System
TPY	Tons per year
TSP	Total Suspended Particulates
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

Conversion Factors*

**Additional conversion factors are located in AP-42, Appendix A.*

- 1,050 Btu per ft^3 (Natural Gas)
- 0.0905 MMBtu per gallon (Propane)
- 0.140 MMBtu per gallon (No.2 Fuel Oil)
- 0.140 MMBtu per gallon (Diesel Fuel)
- 1 pound is equal to 7,000 grains
- 1 ton is equal to 2,000 pounds
- 1 gallon is equal to 3.785 liters
- 1 gallon of water is equal to 8.345 pounds
- To convert ounces into pounds multiply by 0.0625
- 56 pounds per bushel (corn)
- 60 pounds per bushel (soybeans)
- To convert g/L to lbs/gal:
  lbs/gal = (g/L) x .008345
- To convert scfm to acfm at standard pressure:
  $$Acfm = \frac{(\text{actual temp. } (^{\circ}F) + 460)}{(\text{standard temp. } (^{\circ}F) + 460)} \times scfm$$
- standard temperature = 70 ˚F

Spray Painting Transfer Efficiencies

Transfer Efficiency as a function of Spraying Method and Sprayed

Method of Spraying	Flat Surface (%)	Table Leg Surface (%)	Bird Cage Surface (%)
Air atomized	50	15	10
Airless	75-80	10	10
Electrostatic:			
Disk	95	90-65	90-95
Airless	80	70	70
Air atomized	75	65	65

Source: Air Pollution Engineering Manual (1992), Table 2, pg. 362

APPENDIX E

Minor Source Emissions Inventory Completeness Checklist

MSEI Completeness Checklist

Have you included . . .

Form INV-1 Facility Identification

- ☐ Your facility contact person's address and phone number
- ☐ Your facility latitude and longitude
- ☐ Your responsible official signature
- ☐ Your six digit NAICS
- ☐ Your state-wide company employee count

Form INV-2 Emission Point Description

- ☐ Emission Point Forms for all emission units

Form INV-3 Emission Unit Description – Potential Emissions

- ☐ SCC numbers for all emission units, if available
- ☐ Dates of construction and installation
- ☐ Federally enforceable limits in calculations where applicable
- ☐ Your emission units' maximum design rates
- ☐ Multiple forms if more than one process is possible
- ☐ **PM-2.5 and Ammonia estimates where applicable**

Form INV-4 Emission Unit Description – Actual Emissions

- ☐ The actual throughput for each emission unit
- ☐ The actual operating schedule
- ☐ Multiple forms if more than one process
- ☐ **PM-2.5 and Ammonia emissions where applicable**

Form INV-5 Calculations

- ☐ All safety data sheets, if applicable
- ☐ For paint booths, a list containing the amount of each paint and solvent used
- ☐ All calculations shown in full, including engineering estimates

Form INV-6 Facility-Wide Potential & Actual Emissions

- ☐ Facility-wide emission limits (and accounted for facility-wide operating limits) when calculating potential emissions
- ☐ Multiple forms if needed for additional pollutants
- ☐ Total potential emissions for each pollutant being emitted at the facility
- ☐ Total actual emissions for each pollutant being emitted at the facility
- ☐ All pollutants listed on either Form INV-3 or Form INV-4
- ☐ Does the facility-wide potential emissions for each pollutant on INV-6 match the total for each pollutant on all INV-3 forms
- ☐ Does the facility-wide actual emissions for each pollutant on INV-6 match the total for each pollutant on all INV-4 forms

Other Reminders

- ☐ Are your control efficiencies acceptable according to the control efficiency guidance document?
- ☐ Did you use the most recent emission factors available?