AIR QUALITY OPERATING PERMIT APPLICATION INSTRUCTIONS

Prepared for:
Air Quality Permitted Facilities

By:
Idaho Division of Environmental Quality
Air Quality Permitting Bureau
Operating Permits Section

GENERAL REQUIREMENTS

A. FORMS

The Division of Environmental Quality (DEQ) has developed permit application forms so that the applicant's air pollution sources can be adequately reviewed. Requested information must be provided for all sources which may be affected by any State or Federal regulations because of emission standards (NSPS or NESHAPS) or ambient air standards (NAAQS). If the Permittee is not sure whether a source is or is not applicable, it is best to include it with the application so that DEQ staff may make an applicability determination.

Section 1 of the forms is for general plant information such as contact personnel and location. Sections 2 through 8 apply to specific types of sources. For each of the sources for which the application applies, it is necessary to complete Part A and Part B of the section or sections which are applicable to that source. Part A of each section is for processing parameters which are unique to the process type covered in each section. Part B is for common required parameters for all the process types covered by Sections 2 through 8. Specific instructions for each section will be provided in the section titled **Specific Instructions**.

Below are brief descriptions of each section of the application forms:

Section 1. General Information Form which is to be filled out by all applicants. This information is used to identify and to locate the Permittee and the types of sources to be permitted.

Section 2. Fuel Burning Equipment - boilers, calciners, generators, etc.

Section 3. Processing and Manufacturing Equipment - crushers, screens, calciners, etc.

Section 4. Incinerators - waste disposal, using combustion (i.e., incinerators, wigwam burners, etc.)

Section 5. Storage, Handling, and Use of Liquid Fuels, Solvents, and Other Volatile Organic Compounds - gasoline and oil storage tanks.

Section 6. Loading Racks - for loadout terminals at fuel storage facilities.

Section 7. Solid Material Storage and Handling - for estimating fugitive dust emissions from storage piles, and from the handling of solid materials such as gravel, ore, ash, or other materials which may create emissions of fine particulates.

Section 8. Fugitive Road Dust Sources - vehicle traffic on paved and unpaved surfaces.

B. PROCESS DATA

Process data for emission sources are required to determine emissions rates and to determine applicability to certain regulatory standards such as NESHAPS and NSPS. Since process rates correlate well with emission rates, process information is very important during permit application review.

It is important that the applicant apply for process rates which will accurately reflect the rates at which the source will operate when the permit action takes place. Operating restrictions on processing rates may be included in a permit if they are related to emissions, and if the emissions are likely to exceed a regulatory standard.

Generally, four types of process rates may be required for the application: rated hourly throughput (manufacturer's maximum); maximum hourly throughput (applicant's maximum); normal (average) hourly throughput; and normal annual throughput. This information can be further refined by quarterly percentages of annual throughput, and by daily, weekly, and annual operating hours which are required in the application.

Sometimes the physical and chemical properties (temperature, pressure, and pH) of a process will be factors in the emissions of air pollutants. Information regarding these properties may be required to calculate emissions using published factors (see Appendix C for a partial list of emission factor references) or may be helpful in deriving an emission factor based on material balance data or source testing results. As with process rates, these may affect regulation applicability and may become permit restrictions if they correlate well with emissions.

Therefore, it is important to be as thorough as possible when describing a process and its associated materials. Material Safety Data Sheets (MSDS) should be provided by the applicant for materials containing potential hazardous air pollutants (HAPs). Wood product industries should identify tree species and break out processes by species. If the information is considered confidential, indicate this on the application form, process description, or flowchart. Information requested by the applicant as confidential must meet the requirements of IDAPA 16.01.01.126.

Process rates and other process parameters may also be used as monitoring requirements to interpolate continuous emissions. These requirements could take the place of continuous emission monitoring. Usually, process parameters are more simple and less expensive to use for monitoring than process emissions since they may already be in place as process controls.

C. EMISSION ESTIMATES

The Permittee is required to submit estimated and/or measured emissions rates for the sources included in the application. These emissions data will be used to determine the applicability of air quality rules and regulations to the emission sources. The information in Sections 2 through 8 will be used to check and verify the emission estimates. On the EMISSIONS portion of each section, the Permittee is required to provide emission factors, estimated or measured emissions, and to reference the emission factors' source (i.e., Table 1.1.1, AP-42, source tests, or manufacturer's test results). Additional instructions on this are provided in the Specific Instructions section.

Emission estimates and source test results for all air contaminants shall be expressed as pounds per hour (lb/hr). References must include all calculations and assumptions from all stacks/vents or fugitive sources. If emissions were estimated from a source test, include a copy of the source test documentation and results.

A source may be a point, fugitive, or both point and fugitive source. Point sources vent to a prescribed stack due to a forced draft or induced draft. Some processes, such as combustion, may be ventilated by the expansion of process gases, thus simulating a forced draft ventilation system. Induced draft systems will usually have a fan located near the stack which pulls the gases from the process.

In a forced draft system, fugitive emissions may occur from valves and seals in the system since the pressure inside the system will exceed ambient air pressure.

In an induced draft system, the system's pressure will be less than ambient pressure until the gases pass the fan. As long as a negative gauge pressure is maintained, there should be no leakage from the system. Although, sudden expansions of gases may cause leakage through seals or valves.

With an induced draft system, fugitive emissions are most common in systems involving hoods. The ability of each hood to "capture" the emissions from a process is known as capture efficiency. A ninety percent (90%) capture efficiency means ninety percent (90%) of the emissions are vented to the control equipment and/or stack, and ten percent (10%) of the emissions are fugitive. For point source emissions, this is not the same as control efficiency, which will be covered in more detail in Section D. Capture efficiency will determine the amount of emissions to be handled by the pollution control equipment.

In fugitive emission calculations, capture efficiency may be treated as a control efficiency. Fugitive emissions are considered those which are not captured by the ventilation system. Therefore, the capture efficiency works as a control efficiency for fugitive emissions. The greater the capture efficiency, the greater the control of fugitive emissions will be.

Additional information on using and combining capture and control efficiencies to estimate emissions can be found in Appendix A.

The most common fugitive sources are those which are not enclosed or ventilated. These include material transfer points (i.e., conveyor to conveyor, front end loader dump to storage pile, etc.), storage piles, processing equipment (e.g., crushers, screens, etc.), vehicle traffic on paved and unpaved roads, and open ponds and storage tanks.

D. EMISSION CONTROL EQUIPMENT

Emission estimates are usually calculated as both uncontrolled and controlled emissions. Uncontrolled emissions are those emissions which would occur in the absence of any emission control system. Published emission factors are usually for uncontrolled emissions, and measured emissions are usually controlled emissions. The control efficiency of the emission control system is used to convert uncontrolled emissions to controlled emissions. An emission control system will have different control efficiencies for the different pollutants which are vented through it.

For point sources, an emission control system may include a baghouse, a scrubber, or various other devices to control various pollutants. Several control devices may be used in series to control different pollutants or to increase control efficiency for specific pollutants.

For fugitive sources, controls may include the use of enclosures, hoods, dust suppressants, and anything else that results in a reduction of uncontrolled fugitive emissions.

Emission control equipment, such as baghouses and scrubbers, can be monitored to determine whether they are operating effectively. Such monitoring includes gas flowrate through the device, pressure drop across the device, scrubbing fluid flowrate, and other parameters depending on the control type. When stack emissions from control devices are being tested, it is helpful to monitor the operation of the control devices in order to define acceptable set points.

When including control device data in the application, it is important that the control efficiency of the device, for each pollutant, be guaranteed by the manufacturer -- published or measured. If it is published or measured, then the publication or test should be referenced in the EMISSIONS section of each form and included with the application. If this control efficiency is not available in any of these forms, then indicate that the efficiency is an estimate or enter "NA" on the application form.

E. STANDARD CONDITIONS

When calculating or reporting air emissions, flue gas flowrates, or process throughputs of gaseous materials, standard conditions may be involved. Standard conditions refer to the temperature and pressure at which volumes or flowrates are determined. Standard pressure is defined as 1.0 atmosphere, 760 bar (millimeters of mercury), 29.9 inches of mercury, 33.9 feet of water, or 14.7 pounds per square inch (all of these values are equal). Standard temperature may vary depending on the situation. For the purposes of this application, emission estimates and ventilation and flue gas flowrates shall be based on a standard temperature of 68°F (20°C). Processing rates for gases such as natural gas shall be based on a standard temperature of 60°F (15.6°C).

SPECIFIC APPLICATION FORM INSTRUCTIONS

SECTION 1. GENERAL INFORMATION.

COMPANY AND DIVISION NAME. Identify the applicant's company and division name.

STREET ADDRESS OR PO BOX, CITY, STATE, ZIP. Give the applicant's mailing address.

PERSON TO CONTACT, TITLE, PHONE NUMBER. Provide the name, title, and phone number of the person with whom DEQ shall conduct its correspondence.

EXACT PLANT LOCATION. Give the location of the plant where the sources being applied for are located. Use town/city name, street intersections, latitude and longitude, township-range-section, or other information which allows DEQ personnel to locate the plant.

GENERAL NATURE OF BUSINESS/PRODUCT. Provide a brief description of the plant's business and primary products.

NUMBER OF FULL-TIME EMPLOYEES, PROPERTY AREA. Give the number of full-time employees at the plant and the property area of the plant, in acres.

REASON FOR APPLICATION. At the bottom of Section 1 is a list of reasons for applying for an air pollution permit. Enter the code which refers to the applicant's reason for applying.

DISTANCE TO NEAREST STATE BORDER. Give the distance, in miles, to the Idaho border which is closest to the plant.

PRIMARY AND SECONDARY SIC. If available, give the primary and secondary SICs (Standard Industrial Codes) for the primary activity at the facility. Most facilities will have only a primary SIC.

PLANT LOCATION COUNTY. Give the name of the County where the plant is located.

ELEVATION. Give the average elevation of the plant above mean sea level, in feet.

UTM ZONE, UTM X, and UTM Y. Give the UTM (Universal Transverse Mercator) Zone (Zone 11 is west of the 114° longitude, and Zone 12 is east of that longitude). UTM X and Y coordinates, in kilometers, may be obtained from USGS maps or other survey information.

NAME OF OTHER FACILITY, LOCATION OF OTHER FACILITY. Give the name and location of other facilities in Idaho that are under the control of the applicant, or under the common control of the applicant and others, and which have emissions of air pollutants to the air. If there are no others, enter "NONE".

OWNER OR RESPONSIBLE OFFICIAL, TITLE. Give the name and title of the person who assumes responsibility for the accuracy of the information provided in the application. This certification is legally binding.

SIGNATURE, DATE. The person whose name is entered as the owner or responsible official shall sign and date the application.

SECTION 2. FUEL BURNING EQUIPMENT

PART A

This section is to be used for boilers, furnaces, generators, or other fuel burning equipment which combust only standard fuels such as natural gas, propane, gasoline, fuel oil, or coal. For any fuel burning equipment which burns, either alone or in addition to standard fuels, wastes or non-standard fuels such as used oil for energy recovery and/or disposal, the applicant should use Section 4 -- Incinerators.

Information on the handling of ash produced by fuel burning equipment should be entered on the Section 7 forms -- Solid Material Transport, Handling, and Storage.

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each piece of fuel burning equipment and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Manufacturer, Model. Give the name of the manufacturer and the model of the fuel burning equipment as described on the nameplate.

Date Installed or Last Modified. Give the date when the fuel burning equipment was installed or last modified. In general, a modification is a physical change (i.e., enlarging the firebox), or an operational change (i.e., increasing fueling rates) which results in an increase of emissions of pollutants for which a standard applies.

RATED CAPACITY (Choose Appropriate Units). Enter the rated capacity in only one of the four data entry spaces provided (million BTU/hr, thousand lbs/hr steam production, kilowatts, or horsepower). The entry space to be used depends on the appropriate units for the fuel burning equipment being applied for. Typically this would be Million BTUs per Hour (MMBtu/Hr) and Thousand Pounds per Hour Steam (Lbs/Hr) for boilers and furnaces, and Kilowatts (kW) or Horsepower (hP) for generators.

Burner Type. From the list provided on the application form, choose the code which best describes the burner type. If the applicant's burner type is not listed, enter Code 11 and write in the burner type at the end of the list. Additional information and burner type and burner configuration may also be provided in the process description portion of the application.

Percent Used for Process, Percent Used for Heat. Of the total heat generated by the fuel burning equipment, enter the percent of that heat which is used in processing and the percent which is used for space heating.

FUEL DATA. Provide information on the types of fuel used. Space has been provided for two types of fuel (primary and secondary). If more than two types of fuel will be burned, use additional Section 2 - Part A forms, indicate that it is a continued form, and be sure to include the process code or description with the additional fuel data. The specific fuel data required are:

Fuel Code. From the list provided on the application form, choose the code which best describes the fuel. If the applicant's fuel type is not listed, enter Code 15 and write in the fuel type at the end of the list.

Percent Composition Analysis. Provide the weight percentages of each of the listed elements and of moisture (H_2O) in the fuel.

Heat Content. Give the heat content of the fuel in BTU/Unit. Use the last column (UNITS) to indicate the appropriate units (i.e., gallons, cubic feet, pound, etc.).

Combustion Rates. Give the applicant's maximum hourly and normal annual combustion rates in Units/Hour, and Units/Year. The hourly and annual units do not have to be the same, but both must be entered in the UNITS column.

Units. Give the mass or volume (at standard temperature and pressure) units which apply to the heat content, and each of the combustion rate values.

PART B

OPERATING DATA. This information is required to predict impacts during various time intervals of the year. The required data include:

Percent Fuel Consumption Per Quarter. Provide the percentage of fuel consumption for each of the annual quarters listed. The total percentages should add up to 100%.

Operating Schedule. Give the normal annual operating schedule.

POLLUTION CONTROL EQUIPMENT. Provide information on the types of pollution control equipment used. Space has been provided for two types of controls (primary and secondary). If more than two types of pollution control equipment are being applied for, use additional Section 2 - Part B forms, indicate that it is a continued form, and enter the process code or description as a reference in addition to the control equipment data. It will be assumed that the controls are arranged in series unless the applicant indicates otherwise. Identical controls in series or parallel may have their data combined and entered as a single control (see Appendix A for information on combining control efficiencies). Use the comment field at the end of the form to identify arrangements and combinations of pollution controls which are not explicitly shown on the data entry table.

The control equipment data requested on this form are sufficient only for common types of controls such as venturi scrubbers and baghouses. For these types as well as for the less common types it is important that additional documentation and specifications be provided with the application to ensure the accuracy of the control efficiencies listed in the EMISSIONS section. Specific data required include:

Type. Describe the type of control equipment used (i.e., baghouse, scrubber, etc.).

Type Code (Optional). Choose the appropriate code from the list a pollution control equipment in Appendix A.

Manufacturer, Model Number. Provide the manufacturer's name and model number for the pollution control equipment.

Inlet Temperature. Give the temperature, in degrees Fahrenheit, of the gases entering the pollution control equipment.

Pressure Drop. For all types of controls, provide the pressure drop across the control equipment, in inches of water.

Wet Scrubber Water Flow. For wet scrubbers, give the water flowrate through the control equipment, in gallons per minute.

Baghouse Air/Cloth Ratio. Give the ratio of the gas flowrate (actual cubic feet per minute) to the total fabric surface area in the baghouse (square feet). The result should be in feet per minute.

VENTILATION AND BUILDING/AREA DATA. These data are required to determine the potential for fugitive emissions from hooded sources. It is also helpful if a more detailed description of hooding and/or enclosures is provided in the process description portion of the application. Building dimensions are required to assist the dispersion modeling of point source pollutants; area source dimensions are required for the dispersion modeling of area or fugitive sources. The data requested here include:

Enclosed (Y/N?). Indicate whether the process is enclosed (no potential for fugitive emissions) or not. Partial enclosures are not considered enclosed. If the process is enclosed, the rest of the hood and ventilation data (top row of this section) do not need to be filled out.

Hood Type. Appendix B has pictures of various hood types. Enter the code for the picture which best resembles the applicant's hood type.

Minimum Air Flow. Give the minimum flow through the hood, in actual cubic feet per minute.

Percent Capture Efficiency (Optional). If this has been estimated or measured, give the percentage of process emissions captured by the hood and provide calculations and/or documentation.

Building Height. For point sources, give the height of the building where the source's stack is located or is nearest to.

Building/Area Length, Building/Area Width. For point sources, give the length and width of the building where the source's stack is located or is nearest to. For area sources, give the length and width of the area source.

STACK DATA. The data requested here include:

Ground Elevation. Give the ground elevation of the base of the stack (or building if the stack is on a building) in feet above mean sea level.

UTM X Coordinate, UTM Y Coordinate. Optional if a scaled plot plan with a locational datum has been provided. Give the UTM X and Y coordinates of the stack (for point sources) or the center of an area source, in meters.

Stack Type. From the list below this section, choose the stack type which best describes the source's stack.

Stack Height from Ground Level. Give height of the stack exit above ground level, in feet.

Stack Exit Diameter. Give the stack exit diameter, in feet.

Stack Exit Gas Flowrate. Give the stack exit gas flowrate, in actual cubic feet per minute.

Stack Exit Temperature. Give the stack exit gas temperature, in degrees Fahrenheit.

AIR POLLUTANT EMISSIONS. This portion of the form requests various emissions data for criteria and HAPs. Appendix D lists the HAPs which should be included.

Pollutant. The criteria pollutants are listed on the table, and blanks are provided for the inclusion of HAPs. Note that the data fields for the HAPs values are designed to accept exponential values: 1.2 E -3 = $1.2 * 10^{-3} = 0.0012$.

CAS Number. For HAPs, provide the Chemical Abstract Service Number to help identify the HAPs.

Emission Factor. Provide the emission factor which was used to estimate emissions. If emissions were measured, derive an emission factor based on the process rates measured during the stack test. The factor should be given in pounds per UNITS, where UNITS are identical to those given in the hourly process rate in Part A (see footnote at the bottom of the form). Be sure to include the source of the emission factor as a reference.

Percent Control Efficiency. Give the percent control efficiency of the pollution control equipment for each pollutant.

Estimated or Measured Emissions. Give the applicant's measured or estimated emissions (after emission controls) in maximum pounds per hour. Estimated emissions should be given only if data from an emission test data using a DEQ approved method is not available. Hourly estimated emissions should be based on maximum hourly processing rate multiplied by the emission factor.

Allowable Emissions. The applicant is not required to fill in these data. Allowable emissions shall be obtained from existing permits, operating permit fee based emissions, or from other enforceable standards. If the applicant enters these data, source of the data should be referenced.

Reference. Enter a reference number to identify additional documentation provided by the applicant. These documents should be marked with identification numbers which can be matched to these reference numbers. Documentation should be provided for emissions factors, pollution control efficiencies, estimated emissions, measured emissions, and allowable emissions. One reference number may refer to documents which support several parameters such as control efficiency and estimated emissions.

SECTION 3. PROCESS AND MANUFACTURING OPERATIONS

PART A

This section is for processes which are sources of air pollution and which are not covered by any of the other Sections.

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each process and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Manufacturer, Model. Give the name of the manufacturer and the model of the processing equipment.

Date Installed or Last Modified. Give the date when the process was installed or last modified. In general, a modification is a physical change (i.e., enlarging a reactor), or an operational change (i.e., increasing throughputs) which results in an increase of emissions of pollutants for which a standard applies.

PROCESSING DATA. Provide information on the types and amounts of material processed. The specific material data required are:

Process Stream. Output materials should include solids and liquids -- gases will be assumed to be vented to pollution control equipment or to the atmosphere. Space has been provided for one input, two outputs (product and waste), and one recycle material descriptions. If there are several inputs, these should be combined into one input description (i.e. "calciner feed solids"). The two output types and the one recycle type should be treated similarly.

Material Description. Describe the materials in the input, product output, waste output, and recycle process streams.

Process Rates. Give the applicant's maximum hourly, actual hourly, and actual annual input, product output, waste output, and recycle rates in Units/Hour and Units/Year. The hourly and annual units must be the same.

Units. Give the mass or volume (at standard temperature and pressure) units which apply to the heat content and each of the combustion rate values.

POTENTIAL HAPS IN PROCESS STREAM(S). Provide information on constituents of the process streams which are included in the HAPs List (Appendix D). These data will be required to determine or to check potential HAPs emissions using material balance calculations. The requested data include:

HAPs Description, HAPs CAS Number. Provide the chemical name and CAS number of each HAPs in the process streams. Both parameters are required to ensure that the proper HAPs is identified.

Fraction in Input Stream, Fraction in Product Stream, Fraction in Waste Stream, Fraction in Recycle Stream. Provide the mass fraction of each HAPs in each of the process streams identified above. Enter fractions -- not percentages. Note that the data fields for the HAPs fractions are designed to accept exponential values: 1.2 E -3 = $1.2 * 10^{-3}$.

PART B

See Part B instructions from Section 2.

SECTION 4. WASTE INCINERATION

PART A

This section is to be used for incinerators, boilers, generators, or other fuel burning equipment which combust wastes or non-standard fuels such as wood, used oil, tires, used solvents, etc. For any fuel burning equipment which burns standard fuels, such as natural gas, fuel oil, coal, etc., the applicant should use Section 2 -- Fuel Burning Equipment.

Information on the handling of ash produced by incinerators should be entered on the Section 7 forms -- Solid Material Transport, Handling, and Storage.

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each piece of fuel burning equipment and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Manufacturer, Model. Give the name of the manufacturer and the model of the fuel burning equipment as described on the nameplate.

Date Installed or Last Modified. Give the date when the fuel burning equipment was installed or last modified. In general, a modification is a physical change (i.e., enlarging the firebox), or an operational change (i.e., increasing fueling rates) which results in an increase of emissions of pollutants for which a standard applies.

Incinerator Type. Refer to the list of incinerator types below this section and enter the code which best describes the type of incinerator. If none of the descriptions fit, enter Code 05 and write in the incinerator type at the end of the list.

Rated Heating Capacity. Enter the rated capacity of the incinerator, in million BTU/hr.

PRIMARY COMBUSTION CHAMBER DATA. This section shall be used to enter primary combustion chamber data for incinerators composed of a combustion chamber for burning solids and liquids (primary chamber) followed by an afterburner (secondary chamber) which burns gases and entrained particles from the primary chamber. This section shall also be used for other incinerator designs for data on the combustion of solids and liquids.

Waste Retention Time. Give the time, in minutes, that the solids are retained in the primary combustion chamber.

Minimum Temperature. Give the minimum temperature set point for the primary chamber, in degrees Fahrenheit.

Combustion Air Feed Rate. Give the air feed rate for the primary chamber, in standard cubic feet per minute (SCFM).

Burner Type. Below this section of the application is a list of codes and burner types. Enter the code next to the burner type which best describes the applicant's burner(s) for the primary chamber. If none of the descriptions fit, enter Code 04 and write in the incinerator type at the end of the list.

Percent Overfire Air. Give the percent of air feed which is introduced to the primary chamber above the combusting waste.

Percent Underfire Air. Give the percent of air feed which is introduced to the primary chamber below the combusting waste.

Gauge Pressure. Give the gauge pressure of the primary chamber, in inches of water.

Gauge Pressure = Absolute Pressure - Atmospheric Pressure

PRIMARY CHAMBER FUEL DATA. Provide information on the types of auxiliary fuel used in the primary chamber. Space has been provided for two types of fuel (primary and secondary fuels). If more than twp types of fuel will be used, use additional Section 4 - Part A forms, indicate that it is a continued form, and as a reference, enter the process code or description in addition to the fuel data. The specified fuel data required are:

Fuel Code. From the list provided on the application form, choose the code which best describes the fuel. If the applicant's fuel type is not listed, enter Code 06 and write in the fuel type at the end of the list.

Percent Composition Analysis. Provide the percentages of each of the listed elements and of moisture (H_2O) in the fuel.

Heat Content. Give the heat content of the fuel in BTU/Unit. Use the last column (UNITS) to indicate the appropriate units (i.e., gallons, cubic feet, pound, etc.).

Combustion Rates. Give the applicant's maximum hourly and normal annual combustion rates in Units/Hour, and Units/Year. The hourly and annual units do not have to be the same, but both must be entered in the UNITS column.

Units. Give the mass or volume (at standard temperature and pressure) units which apply to the heat content and each of the combustion rate values.

SECONDARY COMBUSTION CHAMBER DATA. This section shall be used to enter data for the secondary combustion chamber. It shall also be used for other incinerator designs for entering data on the combustion of vapor, fumes, smoke, and other airborne pollutants.

Combustion Chamber Volume. For multiple chamber incinerators, give the volume of the afterburner, in cubic feet. For others, give the volume of the section of the incinerator where the gases are burned.

Minimum Temperature. Give the minimum temperature set point fort the secondary chamber, in degrees Fahrenheit.

Combustion Air Feed Rate. Give the air feed rate for the secondary chamber, in standard cubic feet per minute (SCFM).

Gauge Pressure. Give the gauge pressure of the secondary chamber, in inches of water.

Gauge Pressure = Absolute Pressure - Atmospheric Pressure

Burner Type. Below this section of the application is a list of codes and burner types. Enter the code next to the burner type which best describes the applicant's burner(s) for the secondary chamber. Additional information and burner type and burner configuration may also be provided in the process description portion of the application. If none of the descriptions fit, enter Code 04 and write in the incinerator type at the end of the list.

SECONDARY CHAMBER FUEL DATA. Same requirements as for Primary Chamber Fuel Data.

PRIMARY CHAMBER MONITORING AND COMBUSTION CONTROLS. Describe the monitoring and process controls which are used to optimize combustion in the primary chamber.

SECONDARY CHAMBER MONITORING AND COMBUSTION CONTROLS. Describe the monitoring and process controls which are used to optimize combustion in the secondary chamber.

WASTE CHARACTERIZATION AND COMBUSTION RATE. This section is to provide information on the amounts and types of solid and liquid wastes being combusted. Solid and liquid wastes should be treated separately. Space has been provided for two types of waste. If more than two types of waste will be used, use additional Section 4 - Part A forms, indicate that it is a continued form, and as a reference, enter the process code or description in addition to the waste data. The specific waste data required are:

Waste Description. Provide a description which can be used to identify the waste (i.e., used oil, pathological waste).

Percent Composition Analysis. Provide the percentages of each of the listed elements and of moisture (H_2O) in the fuel.

Heat Content. Give the heat content of the fuel in BTU/Unit. Use the last column (UNITS) to indicate the appropriate units (i.e., gallons, cubic feet, pound, etc.).

Combustion Rates. Give the applicant's maximum hourly and normal annual combustion rates in Units/Hour, and Units/Year. The hourly and annual units do not have to be the same, but both must be entered in the UNITS column.

Method of Ash Disposal. Provide a description of the method utilized to dispose of ash.

Units. Give the mass or volume (at standard temperature and pressure) units which apply to the heat content and each of the combustion rate values.

POTENTIAL HAPS IN WASTES. Provide information on constituents of the waste and ash which are included in the HAPs List (Appendix D). These data will be required to determine or to check potential HAPs emissions using material balance calculations. The requested data include:

HAPs Description, HAPs CAS Number. Provide the chemical name and CAS number of each HAPs in the waste and ash. Both parameters are required to ensure that the proper HAPs is identified.

Fraction in Waste Feed, Fraction in Bottom Ash, Fraction in Fly Ash. Provide the mass fraction of each HAPs in the waste, bottom ash, and fly ash. Enter fractions -- not percentages. Note that the data fields for the HAPs fractions are designed to accept exponential values: 1.2E-3 = $1.2 * 10^{-3} = 0.0012$.

PART B

See Part B instructions from Section 2.

SECTION 5. STORAGE AND HANDLING OF LIQUID SOLVENTS AND OTHER VOLATILE COMPOUNDS

PART A

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each piece of fuel burning equipment and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Date Installed or Last Modified. Give the date when the fuel burning equipment was installed or last modified. In general, a modification is a physical change (i.e., enlarging the firebox), or an operational change (i.e., increasing fueling rates) which results in an increase of emissions of pollutants for which a standard applies.

GENERAL TANK AND MATERIAL HANDLING DATA. This section is for general information on processes which involve the storage of volatile materials in tanks. These data include:

Material Description. Describe the material which is being stored and/or handled (i.e., #2 fuel oil, perchloroethylene). Additional forms should be used if several materials are being stored and/or handled.

Tank Capacity. Give the maximum storage capacity of the tank, in gallons.

Tank Type. Enter the code for list (1) below this section of the application form which best describes the tank. If none of the codes describe the applicant's tank, enter Code 06 and enter the tank description at the end of the list.

Annual Throughput. Give the actual annual throughput, in gallons.

Source. Enter the code for list (2) below this section of the application form which best describes the source (ex. pipeline, railcar) of the material which is stored in the tank. If none of the codes describe the material's source, enter Code 05 and enter the tank description at the end of the list.

ADDITIONAL VAPOR PHASE DEGREASING DATA. These data are required for processes involving vapor phase degreasing operations.

Manufacturer of Degreasing Agent. Provide the name of the degreasing agent's manufacturer.

Tank Surface Area. Give the surface area of the liquid solvent in the vapor degreaser, in square feet.

Temperature of Degreasing Agent in Tank. Give the temperature of the liquid solvent in the vapor degreaser, in degrees Fahrenheit.

Method of Vapor Recovery. Enter the code from list (3) below this section of the application form which best describes the method of vapor recovery. If none of the codes describe the applicant's tank, enter Code 07 and enter the recovery method description at the end of the list.

ADDITIONAL MATERIAL HANDLING DATA. These data are required for processes involving material handling (i.e., using piping, pumps, and valves).

Physical State. Enter V (vapor), L (light liquid), or H (heavy liquid). Light liquids have a vapor pressure greater than 0.1 psia at 100°F.

Number of Seals, Valves, Etc. Give the number of each of these components in the material transfer system.

MATERIAL DATA. Provide information on constituents of the material being stored/handled which are included in the HAPs List (Appendix D). These data will be required to determine or to check potential HAPs emissions using material balance calculations. MSDS sheets should also be provided as a reference if these are available. The requested data include:

HAPs Description, HAPs CAS Number. Provide the chemical name and CAS number of each HAPs in the process streams. Both parameters are required to ensure that the proper HAPs is identified.

HAPs Fraction in Material by Weight. Provide the mass fraction of each HAPs in material identified above. Enter fractions -- not percentages. Note that the data fields for the HAPs fractions are designed to accept exponential values: 1.2E-3 = $1.2 * 10^{-3}$ = 0.0012.

PART B

See Part B instructions from Section 2.

SECTION 6. LOADING RACKS

PART A

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

LOADING RACK DATA. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each loading rack and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Date Installed or Last Modified. Give the date when the loading rack was installed or last modified. In general, a modification is a physical change or operational change (i.e., increasing throughputs) which results in an increase of emissions of pollutants for which a standard applies.

Type of Loading. Tank Type. Enter the code for list (1) below this section of the application form which best describes the type of loading.

Loading Arm Vapor Closure. Enter the code for list (2) below this section of the application form which best describes the loading arms vapor closure for controlling emissions. If none of the codes describe the material's source, enter Code 06 and enter the closure description at the end of the list.

Material Loaded. Describe the material which is being handled via the loading rack (i.e., #2 fuel oil). Additional forms should be used if several materials are being loaded.

Annual Throughput. Give the actual annual throughput, in gallons.

Reid Vapor Pressure. Give the Reid vapor pressure for the material being loaded, in pounds per square inch.

Maximum Material Temperature, Average Material Temperature. Give the maximum and average temperatures of the material being loaded, in degrees Fahrenheit.

PART B

See Part B instructions from Section 2.

SECTION 7. SOLID MATERIAL TRANSPORT, HANDLING, AND STORAGE

PART A

Fill one transfer process per form. A transfer process may include several conveyors, vehicles, and transfers as long as the material which is transferred has consistent physical properties (i.e. silt and moisture content, and as long as the transfers have the same emission control system and stack.

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. The required information are the following:

Process Code or Description, Stack Description, Building Description. Provide, for each process and its stack and building, unique codes or descriptions which will allow these to be identified on a plot plan and a flowchart.

Date Installed or Last Modified. Give the date when the process was installed or last modified. In general, a modification is a physical change (i.e., additional conveyors), or an operational change (i.e., increasing throughputs) which results in an increase of emissions of pollutants for which a standard applies.

Material Description. Describe the material which is being stored and/or handled (i.e., ore, fly ash). Additional forms should be used if several materials with different properties (i.e. moisture content, silt content) are being processed.

MATERIAL TRANSFER RATES. Provide data on the amounts of solid materials transferred during transport, handling, and/or storage.

Maximum and Normal Hourly Transfer Rates, and Normal Annual Transfer Rates. Give the amounts transported, handled, and/or stored for each time period. Maximums may be rated capacities, and normal may be average. The hourly and annual UNITS must be the same.

Unit of Measure. Give the mass or volume (at standard temperature and pressure) units which apply to the heat content and each of the combustion rate values.

BELT CONVEYOR/VEHICLE TRANSFER. These data are required for solid material handling which involves belt, screw, or similar conveyors and/or vehicles, such as trucks or loaders.

Number of Transfers. Give the number of transfer points in each transfer. In other words, list how many times the material drops from one conveyor or transfer device to another during the material handling process.

Material Moisture Content. Give the weight percent of moisture (H_2O) in the material being handled.

Maximum and Average Hourly Wind Speed. Give the maximum and average wind speeds measured over hourly averaging periods.

Conveyors, and Transfers, Enclosed?, In Building? Indicate whether the conveyor belt(s) and the transfer point(s) are contained inside an enclosure or are inside a building.

PNEUMATIC CONVEYOR TRANSFERS. These data are required for pneumatic conveyor systems.

Material Moisture Content. Give the weight percent of moisture (H_2O) in the material being handled.

Primary and Secondary Separator Type. Describe the types of material separators if used in the pneumatic system. If more than two types of separators are used, then break the handling process into two or more processes and use additional Section 7 - Part A forms.

Primary and Secondary Separator Percent Efficiency. Give the weight percent of the product produced by each separator.

MATERIAL STORAGE DATA. These data are required to obtain information on how the material is stored. Include information on the storage which occurs at the end of the material handling process.

Pile?, Silo?, or Other Storage Type Description. Indicate how the material is stored. Piles are assumed not to be enclosed. For example, if it is an enclosed pile, use Other Storage Description.

Storage Capacity. Give the storage capacity in the units of the applicant's choice.

Storage Capacity Units. Give the units for the storage capacity number.

Pile Length, Width, and Height. For non-enclosed storage piles, give the length, width, and height of the pile, in feet.

MATERIAL DATA. Provide identification and HAPs composition data for the material being processed which are included in the HAPs List (Appendix D). These data will be required to determine or to check potential HAPs emissions using material balance calculations. The requested data include:

HAPs Description, HAPs CAS Number. Provide the chemical name and CAS number of each HAPs in the material. Both parameters are required to ensure that the proper HAPs is identified.

HAPs Fraction in Material by Weight. Provide the mass fraction of each HAPs in material identified above. Enter fractions -- not percentages. Note that the data fields for the HAPs fractions are designed to accept exponential values: 1.2 E -3 = $1.2 * 10^{-3}$ = 0.0012.

PART B

See Part B instructions from Section 2.

SECTION 8. FUGITIVE ROAD DUST SOURCES

PART A

Do not fill in any information in the boxed section at the top of the form. This is for DEQ use only.

GENERAL INFORMATION. These data are to be used to identify and to locate specific roads.

Road Description. Provide, for each road (or road segment) being applied for, a unique code or description which will allow it to be identified on a plot plan and a flowchart. Each road section should run in one general direction. Roads which are circular or angular should be broken up into segments which head in one general direction.

Paved? Indicate if road segment is paved or unpaved.

Length. Give the length of road segment, in feet.

Width. Give the road segment width, in feet.

Beginning and End Coordinates. Provide the UTM coordinates for the beginning and end points of the road or road segment.

DATA FOR ALL ROADS -- PAVED AND UNPAVED. This section is for the general data required for both paved and unpaved roads.

Vehicle Description. Describe each type of vehicle which uses the road or road segment. Vehicle types may be grouped as long as they have the same weight, capacity, speed, and wheel number.

Number of Roundtrips Per Day or Vehicle Miles Traveled Per Day. Give either the number of trips or the total distance the vehicle travels on the road per day.

Number of Days Per Year Used. Give the actual number of days the road will be used each year.

Average Vehicle Speed. Give the average vehicle speed on the road, in miles per hour (mph).

Surface Silt Content. Give the silt content of the road surface material, in weight percent. Silt is defined as the amount of material which passes through a 200 mesh (75 μm) screen.

Vehicle Empty Weight. Give the unloaded vehicle weight, in tons.

Vehicle Full Weight. Give the loaded vehicle weight, in tons.

DATA FOR UNPAVED ROADS. These data are required only for unpaved road segments.

Number of Wheels Per Vehicle. Give the total number of wheels per vehicle.

Number of Days > 0.01 Inches of Precipitation. Give the number of days with at least 0.01 inch of precipitation per year (this number can be found in EPA AP-42, Section 11.2.1).

DATA FOR PAVED ROADS. These data are required only for paved roads.

Number of Lanes. Give the number of traffic lanes on the paved road.

Industrial Augmentation Factor. Give the industrial augmentation factor (dimensionless). This factor has a value of 7.0 for paved roads, which have traffic entering from unpaved areas; 3.5 for paved roads with unpaved shoulders and with twenty percent (20%) of the traffic traveling on the shoulders; and 1.0 when the traffic travels only on paved surfaces.

Dust Loading. Give the surface dust loading, in pounds of dust per mile of road. Dust can be generally defined as material which can be collected from the road surface using a portable vacuum cleaner (coarse aggregate should be initially removed from the road surface using broom sweeping).

ROAD DUST CHEMICAL DATA. Provide identification and HAPs composition data for the road dust which are included in the HAPs List (Appendix D). These data will be required to determine or to check for potential HAPs emissions using material balance calculations. The requested data include:

HAPs Description, HAPs CAS Number. Provide the chemical name and CAS number of each HAPs in the road dust. Both parameters are required to ensure that the proper HAPs is identified.

HAPs Fraction in Road Dust by Weight. Provide the mass fraction of each HAPs in road dust. Enter fractions -- not percentages. Note that the data fields for the HAPs fractions are designed to accept exponential values: 1.2 E -3 = $1.2 * 10^{-3} = 0.0012$.

PART B

See Part B instructions from Section 2.

APPENDIX A

APPENDIX A

EMISSION CONTROL DEVICE CODES			
000	no equipment		
001	wet scrubber, high eff	**051**	tray-type gas absorb column
002	wet scrubber, med eff	**052**	spray tower
003	wet scrubber, low eff	**053**	venturi scrubber
004	gravity coll, high eff	**054**	process enclosed
005	gravity coll, med eff	**055**	impingement plate scrub
006	gravity coll, low eff	**056**	dynamic separator (dry)
007	centrif coll, high eff	**057**	dynamic separator (wet)
008	centrif coll, med eff	**058**	mat or panel filter
009	centrif coll, low eff	**059**	metal fabric filter scrn
010	electro prec, high eff	**060**	process gas recovery
011	electro prec, med eff	**061**	dust suppress, H_2O spray
012	electro prec, low eff	**062**	DS-chem stab/wet agents
013	gas scrubber, general	**063**	gravel bed filter
014	mist elim, high veloc	**064**	annular ring filter
015	mist elim, low veloc	**065**	catalytic reduction
016	fabric filter, > 250°F	**066**	molecular sieve
017	fabric filter, 180°-250°F	**067**	wet lime slurry scrub
018	fabric filter, < 180°F	**068**	alkaline fly ash scrb
019	catalytic afterburner	**069**	sodium carbonate scrub
020	cat afterburn, heat exch	**070**	sodium alkali scrubbing
021	direct flame afterburn	**071**	fluid bed dry scrubber
022	DF afterburn, heat exch	**072**	tube & shell condenser
023	flaring	**073**	refrigerated condenser
024	mod furn/burner design	**074**	barometric condenser
025	staged combustion	**075**	single cyclone
026	flue gas recirculation	**076**	multiple cyclone w/o fly ash reinjection
027	reduc combust - air preheat	**077**	multiple cyclone with fly ash reinjection
028	steam or water injection	**078**	baffle
029	low excess - air firing	**079**	dry electrostatic granu filter
030	fuel - low nitrogen content	**080**	chemical oxidation
031	air injection	**081**	chemical reduction
032	ammonia injection	**082**	ozonation
033	cntrl of % O_2 in comb air	**083**	chemical neutralization
034	well.-lord/sodium sulf scrb	**084**	activated clay adsorption
035	magnesium oxide scrubbing	**085**	wet xcyclonic separator
036	dual alkali scrubbing	**086**	water curtain
037	citrate process scrubbing	**087**	nitrogen blanket
038	ammonia scrubbing	**088**	conservation vent
039	catal. oxid-flue gas desulf	**089**	bottom filling
040	alkalized alumina	**090**	conversion to variable vapor space tank
041	dry limestone injection	**091**	conversion to floating roof tank
042	wet limestone injection	**092**	conversion to pressurized tank
043	sulf acid plant - contact proc	**093**	submerged filling
044	sulf acid plant - dbl cnt proc	**094**	underground tank
045	sulfur plant	**095**	white paint
046	process change	**096**	vapor lock balance recovery system
047	vapor recovery system	**097**	install of sec. seal for ext floating roof tank
048	activated carbon adsorption	**098**	moving bed dry scrubber
049	liquid filtration system	**099**	miscellanous control devices
050	packed-gas absorption column	**100**	high efficiency particulate air filter (HEPA)

APPENDIX A

CALCULATIONS FOR SOURCES WITH MULTIPLE CONTROLS

The PM10 emission inventory spreadsheets are set up to accept one control device and one control efficiency for each process, combustion unit, transfer, and road. Sometimes, though, there are several control devices or control devices combined with ventilation equipment, and these efficiencies must be combined to give the single efficiency which will be used in the spreadsheet calculations.

One way to determine the combined efficiency of several control devices in series is to run a stack test. Another way is to calculate the combined efficiency if the individual efficiencies of the control devices are known. When emissions from a process, combustion unit, etc., are controlled by several control devices in series, the following calculation can be used to calculate a combined efficiency:

$C_c=1-[(1-C_1)*(1-C_2)]$ or

$C_c=C_1+C_2-(C_1*C_2)$ (1)
(For 2 Control Devices)

$C_c=1-[(1-C_1)*(1-C_2)*(1-C_3)]$ (2)
(For 3 Control Devices)

Where: C_c= Combined control efficiency
C_1, C_2, and C_3= Individual control efficiencies

Ventilation equipment is considered control equipment for fugitive emissions from processes or material transfers. The capture efficiency of the ventilation equipment is the control efficiency for these fugitive emissions. Thus fugitive emissions are calculated this way:

$E_f=(1-K) * E_u$ (3)

Where: E_f= Fugitive emissions
E_u= Uncontrolled emissions
K= Capture efficiency

Now, when emissions are controlled by ventilation equipment in series with a control device (or several controls, but let's keep it simple), the capture efficiency determines the fraction of uncontrolled emissions vented to the control device. The emissions vented to the control device are:

$E_k=K * E_u$ (4)

Where: E_k= Captured emissions

Control Device Calculations

And the emissions passing through the control device (controlled emissions) would be:

$E_c=(1-C) * E_k$ or

$E_c=(1-C) * K * E_u$ (5)

Where: E_c= Controlled (point) emissions
C= Control efficiency

So, the combined efficiency of the ventilation equipment and the control device would be:

$C_c= 1-[(1-C)*K]$ or

$C_c= 1-[K-(K*C)]$ (6)

If K=0 then C_c=1 (all emissions are fugitive).

If K=1 then C_c=C (no fugitive emissions).

If several control devices are used on the vented emissions, then C in equations 5 and 6 can be replaced with C_c in equations 1 or 2.

When entering data onto the spreadsheets, the following control efficiencies should be used.

CASE	SPREADSHEET ENTRY
100% capture eff., 1 control device	Control device eff.
100% capture, several control devices	Combined eff. (eq. 1 or 2)
<100% capture, fugitive emissions	Capture efficiency
<100% capture, 1 control, point emissions	Combined eff. (eq. 6)
<100% capture, several controls, point emissions	Combined eff. (eq. 6 and eq. 1 or 2)

APPENDIX B

APPENDIX B

HOOD TYPES		
DEQ CODE	**HOOD TYPE**	**DESCRIPTION**
01		SLOT
02		FLANGED SLOT
03		PLAIN OPENING
04		FLANGED OPENING
05		BOOTH
06		CANOPY
07		PLAIN MULTIPLE SLOT OPENING 2 OR MORE SLOTS
08		FLANGED MULTIPLE SLOT OPENING 2 O MORE SLOTS

APPENDIX C

APPENDIX C

DUST SUPPRESSION CHEMICALS (water plus as listed)			
00	No Control	**013**	1% CaO in 1:8 Coherex
01	Dustrol “A” 1:5000	**014**	1% CaO in 2% Dowell Chemical Binder
02	T-Det 1:4	**015**	1% CaO in 3 % Dowell Chemical Binder
03	CaO 1%	**016**	Dried Whole Bood 5%
04	$CaCl_2$ 2%	**017**	Dried Pork Plasma 5%
05	Cements 5%	**018**	Dried Pork Plasma 3%
06	Coherex 1:15	**019**	1% $CaCl_2$, in 3% Pork Plasma
07	Coherex 1:8	**020**	Dri-Pro 5%
08	Coherex 1:4	**021**	1% CaO, 1:3000 T-Det in 2% Dowell Chemical Binder
09	Dowell Chemical Binder 1%	**022**	1% CaO, 1% $CaCl_2$, 1:4000 Dustrol “A” + 2% Dowell Chemical Binder
10	Dowell Chemical Binder 2%	**023**	Water
11	Dowell Chemical Binder 3%	**024**	Other (Specify)
12	1% $CaCl_2$, in 1:5000 Dustrol “A”		

APPENDIX D

APPENDIX D

ALPHABETICAL LISTING OF HAZARDOUS AIR POLLUTANTS (HAPS)

75070	Acetaldehyde	**96128**	1,2-Dibromo-3-chloropropane
60355	Acetamide	**84742**	Dibutylphthalate
75058	Acetonitrile	**106467**	1,4-Dichlorobenzene(p)
98862	Acetophenone	**91941**	3,3-Dichlorobenzidene
53963	2-Acetylaminofluorene	**111444**	Dichloroethyl Ether (Bis(2-chloroethyl)ether)
107028	Acrolein	**542756**	1,3-Dichloropropane
79061	Acrylamide	**62737**	Dichlorvos
79107	Acrylic Acid	**111422**	Diethanolamine
107131	Acrylonitrile	**64675**	Diethyl Sulfate
107051	Allyl Chloride	**119904**	3,3-Dimethoxybenzidine
92671	4-Aminobiphenyl	**60117**	Dimethyl Aminoazobenzene
62533	Aniline	**119937**	3,3'-Dimethyl Benzidine
0	Antimony Compounds	**79447**	Dimethyl Carbomoyl Chloride
0	Aresenic Compounds (Inorganic including Arsine)	**68122**	Dimethyl Formamide
1332214	Asbestos	**57147**	1,1-Dimethyl Hydrazine
71432	Benzene (including Benzene from Gasoline)	**131113**	Dimethyl Phthalate
92875	Benzidine	**77781**	Dimethyl Sulfate
98077	Benzotrichloride	**51285**	2,4-Dinitrophenol
100447	Benzyl Chloride	**121142**	2,4-Dinitrotoluene
0	Beryllium Compounds	**534521**	4,6-Dinitro-o-cresol, and Salts
57578	beta-Propiolactone	**123911**	1,4-Dioxane (1,4-Diethyleneoxide)
92524	Biphenyl	**122667**	1,2-Diphenylhydrazine
117817	Bis(2-ethylhexyl)phthalate (DEHP)	**106898**	Epichlorohydrin (1,Chloro-2,3-epoxypropane)
542881	Bis(chloromethyl)ether	**106887**	1,2-Epoxybutane
75252	Bromoform	**140885**	Ethyl Acrylate
106990	1,3-Butadiene	**100414**	Ethyl Benzene
0	Cadmium Compounds	**51796**	Ethyl Carbamate (Urethane)
156627	Calcium Cyanamide	**75003**	Ethyl Chloride (Chloroethane)
105602	Caprolactam	**106934**	Ethylene Dibromide (Dibromoethane)
133062	Captan	**107062**	Ethylene Dichloride (1,2-Dichloroethane)
63252	Carbaryl	**107211**	Ethylene Glycol
75150	Carbon Disulfide	**151564**	Ethylene Imine (Aziridine)
56235	Carbon Tetrachloride	**75218**	Ethylene Oxide
463581	Carbonyl Sulfide	**96457**	Ethylene Thiourea
120809	Catechol	**75343**	Ethylidene Dichloride (1,1-Dichloroethane)
133904	Chloramben	**0**	Fine Mineral Fibers *3
57749	Chlordane	**50000**	Formaldehyde
7782505	Chlorine	**0**	Glycol Ethers *2
79118	Chloroacetic Acid	**76448**	Heptachlor
532274	2-Chloroacetophenone	**118741**	Hexachlorobenzene
108907	Chlorobenzene	**87683**	Hexachlorobutadiene
510156	Chlorobenzilate	**77474**	Hexachlorocyclopentadiene
67663	Chloroform	**67721**	Hexachloroethane
107302	Chloromethyl Methyl Ether	**822060**	Hexamethylene-1,6-diisocyanate
126998	Chloroprene	**680319**	Hexamethylphosphoramide
0	Chromium Compounds	**110543**	Hexane
0	Cobalt Compounds	**302012**	Hydrazine
0	Coke Oven Emissions	**7647010**	Hydrochloric Acid
1319773	Cresol/Cresylic Acid (Isomers and Mixture)	**7664393**	Hydrogen Fluoride (Hydrofluoric Acid)
98828	Cumene	**7783064**	Hydrogen Sulfide
0	Cyanide Compounds *1	**123319**	Hydroquinone
3547044	DDE	**78591**	Isophorone
334883	Diazomethane	**0**	Lead Compounds
132649	Dibenzofurans	**58899**	Lindane (all Isomers)

ALPHABETICAL LISTING OF HAZARDOUS AIR POLLUTANTS (HAPS)

108384	m-Cresol	**108952**	Phenol
108383	m-Xylenes	**75445**	Phosgene
108316	Maleic Anhydride	**7803512**	Phosphine
0	Managese Compounds	**7723140**	Phosphorus
0	Mercury Compounds	**85449**	Phthalic Anhydride
67561	Methanol	**1336363**	Polychlorinated Biphenyls (Aroclors)
72435	Methoxychlor	**0**	Polycyclic Organic Matter *4
74839	Methyl Bromide (Bromomethane)	**1120714**	1,3-Propane Sultone
74873	Methyl Chloride (Chloromethane)	**123386**	Propionaldehyde
71556	Methyl Chloroform (1,1,1-Trichloroethane)	**114261**	Propoxur (Baygon)
78933	Methyl Ethyl Ketone (2-Butanone)	**78875**	Propylene Dicholoride (1,2-Dichloropropane)
0344	Methyl Hydrazine	**75558**	1,2-Propylenimine(2-Methyl Aziridine)
674884	Methyl Iodide (Iodomethane)	**75569**	Propylene Oxide
108101	Methyl Isobutyl Ketone (Hexone)	**91225**	Quinoline
624839	Methyl Isocyanate	**106514**	Quinone
80626	Methyl Methacrylate	**0**	Radionuclides (including Radon) *5
1634044	Methyl Tert Butyl Ether	**94757**	2,4-D, Salts and Esters
101144	4,4-Methylene Bis (2-chloroaniline)	**0**	Selenium Compounds
75092	Methylene Chloride (Dichloromethane)	**100425**	Styrene
101779	4,4'-Methylenedianiline	**96093**	Styrene Oxide
101688	Methylene Diphenyl Diisocyanate (MDI)	**1746016**	2,3,7,8-Tetrachlorodibenzo-p-dioxin
684935	N-Nitroso-N-methtlurea	**79345**	1,1,2,2-Tetrachloroethane
62759	N-Nitrosodimethylamine	**127184**	Tetrachloroethylene (Perchloroethylene)
59892	N-Nitrosomorpholine	**7550450**	Titanium Tetrachloride
91203	Naphthalene	**108883**	Toluene
0	Nickel Compounds	**95807**	2,4-Toluene Diamine
98953	Nitrobenzene	**584849**	2,4-Toluene Diisocyanate
92933	4-Nitrobiphenyl	**8001352**	Toxaphene (Chlorinated Camphene)
100027	4-Nitrophenol	**120821**	1,2,4-Trichlorobenzene
79469	2-Nitropropane	**79005**	1,1,2-Trichloroethane
121697	N,N-Diethyl Aniline (N,N-Dimethylanaline)	**79016**	Trichloroethylene
90040	o-Anisidine	**95954**	2,4,5-Trichlorophenol
95487	o-Cresol	**88062**	2,4,6-Trichlorophenol
95534	o-Toluidine	**121448**	Triethylamine
95476	o-Xylenes	**1582098**	Trifluralin
106445	p-Cresol	**540841**	2,2,4-Trimethylpentane
106503	p-Phenylenediamine	**108054**	Vinyl Acetate
106423	p-Xylenes	**593602**	Vinyl Bromide
56382	Parathion	**75014**	Vinyl Chloride
82688	Pentachloronitrobenzene (Quintobenzene)	**75354**	Vinylidene Chloride (1,1-Dichloroethylene)
87865	Pentachlorophenol	**1330207**	Xylenes (Isomers and Mixture)

NOTE: For all listings above which contain the work "compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substances that contains the named chemical (i.e., antimony, arsenic, etc.) as part of that chemical's infrastructure.

*1 X'CN where C = H' or any other group where a formal dissociation may occur. For example, KCN or Ca(CN2)

*2 Indicates mono- and di- ethers of ethylene glycol, diethylene glycol, and triethlyene glycol R-(OCH2CH2)n-OR' where
n = 1, 2, pr 3
R = alkyl or arly groups
R' = R, H, or groups which, when removed, yield glycol ethers with the structure: R-(OCH2CH2)n-OH. Polymers are excluded from the glycol category.

*3 Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.

*4 Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100°C.

*5 A type of atom which spontaneously undergoes radioactive decay.

APPENDIX E

APPENDIX E

LIST OF EMISSION FACTORS REFERENCES

(1) Compilation of Air Pollutant Emission Factors, Fourth Edition, September 1985. Volume I: Stationary Point and Area Sources, EPA AP-42.

(2) Toxic Air Pollutant Emission Factors- A Compilation For Selected Air Toxic Compounds And Sources, Second Edition. EPA-450/2-90-011-October 1990.

(3) Estimating Releases and Waste Treatment Efficiencies for the Toxic Chemical Release Inventory Form. EPA 560/4-88-002, December 1987.

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