Rhode Island Air Toxics

Guideline

REVISED

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I. Introduction

Air Pollution Regulation No. 22, "Air Toxics," was first promulgated in 1988 and listed Acceptable Ambient Levels (AALs) for forty substances. Those substances were selected as the stationary source noncriteria air pollutants that were most likely adversely impact public health, considering toxicity and the quantity of the pollutants emitted in the State.

Stationary sources of the listed pollutants are required to apply, upon notification from the Rhode Island Department of Environmental Management (RI DEM), for Air Toxics Operating Permits (ATOPs). ATOPs are issued only if the stationary source is in compliance with Regulation No. 22, i.e. if the emissions from that source do not cause ground level impacts above the AALs. Since promulgation of the regulation in 1988, the RI DEM Office of Air Resources (OAR) has evaluated most of the most significant sources of the forty listed pollutants in the State and has required those sources to comply with the AALs.

Since the initial promulgation of the regulation, a number of developments in the area of air toxics have occurred. The Federal Clean Air Act Amendments of 1990 included a list of 188 Hazardous Air Pollutants (HAPs), along with requirements that the EPA develop technology based standards to control emissions from sources emitting those pollutants. In addition, the EPA, the State of California, and the Federal Agency for Toxic Substances and Disease Registry, among others, have compiled toxicity information for a number of toxic air pollutants and have derived health benchmarks for many of those pollutants.

In keeping with these developments, in 2004 RI DEM amended Regulation No. 22 to expand the list of air toxics in the regulation to include all of the HAPs, along with other pollutants that may have significant air pollution related health impacts. Further, RI DEM updated the AALs for all of the air toxics, including the original forty, to reflect the current state of knowledge about the toxicity of those pollutants.

This document is a companion document to Air Pollution Regulation No. 22. It provides background information about the selection of pollutants, the derivation of AALs and Minimum Quantities (applicability thresholds), the process that will be used to prioritize sources for requiring the submission of ATOPs, and the process for periodic review of the AALs.

In keeping with the commitments in Section VI of this document, "Procedure for the Periodic Review of Listed Substances, Acceptable Ambient Levels and Minimum Quantities," In 2008, RI DEM modified the AALs and Minimum Quantities in Tables I, II and III of Regulation No. 22 consistent with change in the criteria on which the numbers in those tables are based. Those changes are summarized in Section VII.

II. Pollutant Selection

The 2004 amendments to Regulation No. 22 modified the list of substances in the regulation to include substances that meet one or more of the following criteria:

1. The Environmental Protection Agency (EPA) has classified the substance as a Hazardous Air Pollutants (HAP);

2. An inhalation Reference Concentration (RfC) and/or an inhalation cancer potency factor for the substance is currently listed on EPA's IRIS database;

3. The California Office of Environmental Health Hazard Assessment or California Air Resources Board (CAL) has derived a chronic and/or acute inhalation Reference Exposure Level (REL) for the substance;

4. The EPA has classified the substance as an A, B1, B2, or B2-C carcinogen, the National Toxicology Program (NTP) has classified the substance as a K or R carcinogen, and/or the International Agency for Research on Cancer (IARC) has classified the substance as a 1, 2A or 2B carcinogen **and** CAL and/or EPA has derived an inhalation cancer potency factor for the substance; or

5. The substance is emitted in Rhode Island by one or more stationary sources **and** an inhalation and/or oral health benchmark is available for the substance on EPA's IRIS database (RfC, Reference Dose (RfD) or cancer potency factor), from the Agency for Toxic Substances and Disease Registry (ATSDR), (oral or inhalation Minimal Risk Level (MRL)), and/or from CAL (inhalation REL or cancer potency factor).

The substances listed as air toxics in Regulation No. 22, along with the reasons for inclusion, are shown in Table A. Note that, subsequent to the 2004 amendments of Regulation No. 22, two of the listed substances, ethylene glycol monobutyl ether and methyl ethyl ketone, were delisted by the EPA as Hazardous Air Pollutants[1]. However, since both of these substances meet other criteria to be listed as air toxics in Regulation No.22, they were retained in that regulation.

In the 2008 amendments, RI DEM added n-propyl bromide to the list of regulated substances. Although a final RfC was not available for this substance, EPA had developed an interim RfC for use in rulemaking procedures and California had developed an interim chronic REL. Since use of n-propyl bromide is increasing in Rhode Island, RI DEM believes that it is important to ensure that emissions of this substance do not negatively impact public health.

[1] Delisting of ethylene glycol monobutyl ethere was published in the 11/29/04 Federal Register (69FR 692988). Delisting of methyl ethyl ketone was published in the 12/19/05 Federal Register (70FR 75047).

III. Acceptable Ambient Level (AAL) Derivation Procedures

The Acceptable Ambient Levels (AALs) listed in Regulation No. 22 are ground-level impact limits, i.e. they represent the concentration of a substance that a facility may contribute to the ambient air at or beyond its property line. The AALs take into account only inhalation exposures from individual sources and do not consider additional inhalation exposures from emissions from other sources or intakes via non-inhalation exposure routes. Therefore, they were appropriately developed using conservative assumptions.

In 1988, when the regulation was originally drafted, inhalation ambient air health benchmarks derived by the EPA or other reputable agencies were largely unavailable. Therefore, at that time OAR staff, with the guidance of the EPA Region I toxicologist and an advisory committee, developed AALs for the listed substances. The original AALs for noncancer effects were derived using an approach similar to EPA's method for deriving RfDs (and later RfCs) and the AALs for cancer effects were derived using linear multistage modeling and existing EPA cancer potency factors to determine the concentrations associated with a lifetime cancer risk of 10^{-6} to 10^{-5}.

Since that time, the EPA, ATSDR and CAL have developed inhalation health benchmarks for a large number of toxic substances using procedures similar to those previously used by OAR. Since these benchmarks are well documented and have gained wide acceptance in the regulatory community, the AALs adopted in the 2004 amendments to Regulation No. 22 were based on those benchmarks, where available. In the 2008 revision, OAR updated AALs based on health benchmarks that were revised by the originating agency subsequent to the 2004 amendments. The health benchmarks derived by those agencies for the listed substances, as updated in 2008, are displayed in Table B.

Regulation No. 22 includes AALs for three averaging times: one-hour for acute effects; 24-hours for effects associated with intermediate length exposures; and annual for chronic effects. Depending on the availability of benchmarks and the types of health effects associated with exposure to a particular substance, a substance was assigned AALs for one, two or all three averaging times.

In keeping with recommendations from the RI Department of Health (HEALTH), OAR applied a 24-hour averaging time for some of the RfCs and RfDs listed in EPA's IRIS database. Although RfCs and RfDs are generally understood to be chronic exposure guidelines, the EPA air program has not assigned a specific averaging period to those benchmarks, and it is the belief of HEALTH and OAR that using the RfCs and RfDs as annual average benchmarks would not be appropriately protective in all cases. ATSDR and CAL, however, specify that their chronic health benchmarks are annual average levels, so the OAR is proposing to assign annual averaging times to the AALs derived from those benchmarks.

Specifically, RI DEM determined that RfCs and RfDs for substances meeting any of the following criteria would be used as 24-hour average AALs:

- ATSDR has derived a intermediate exposure time MRL for the substance that is the same as or more stringent than the RfC;
- The RfC for the substance is based on developmental effects;
- ATSDR has derived a chronic MRL and/or CAL has derived a chronic REL for the substance that is lower than the RfC, or
- Neither ATSDR nor CAL has derived a chronic benchmark for the substance.

RfCs For the remaining substances were used to derive annual average AALs for noncancer effects..

The procedure used for developing AALs for the listed substances is delineated below. Note that, in the few instances in which the AALs derived for two different averaging times for a pollutant were contradictory, the AAL that was judged to be of lower quality (e.g. from an oral, not inhalation, benchmark) was excluded. If both AALs are from sources of the same quality, the more stringent was used. Note also that, for a few pollutants, additional factors affected the selection of an AAL. Those cases are discussed further later in this section.

One-hour Average AALs

One-hour average AALs were selected as follows:

1. ATSDR acute inhalation MRLs (28 substances) and CAL acute inhalation RELs (36 substances) were used if available. If both were available for a particular substance, the more stringent was used.

2. If ATSDR and CAL acute inhalation benchmarks were unavailable, ATSDR acute oral MRLs, converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day, were used. (14 substances)

24-Hour Average AALs

RI DEM determined that EPA RfCs are available for 64 of the listed toxic air contaminants. For 9 of the 64, ATSDR has derived a intermediate exposure time MRL that is the same as or more stringent than the RfC. 4 of the other RfCs are based on developmental effects, and thus do not include a subchronic to chronic effects conversion factor. For 7 additional substances, ATSDR and/or CAL have derived chronic benchmarks that are lower than the RfC and for 17 neither ATSDR nor CAL had derived chronic benchmarks. For the 37 total substances in the above cited categories, the RfCs were used as 24-hour AALs. For the remaining 27 substances, the RfCs were used to derive annual average non-cancer AALs.

24-Hour Average AALs were selected in the following order of preference:

1. EPA RfCs (37 substances)

2. ATSDR inhalation MRLs for intermediate exposure times (21 substances)

3. EPA RfDs or ASTDR oral intermediate exposure time MRLs, converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day. If both were available, the more stringent was used. (56 substances)

Annual Average AALs

Both Tables I and Table II of Regulation No. 22 list AALs for the regulated air toxics. Table II AALs apply to processes that have achieved the Lowest Achievable Emissions Rate (LAER), as defined in Regulation No. 22, and Table I AALs apply to all other processes. AALs for one-hour and 24-hour averaging times are the same in both tables, as are annual average AALs that are based on noncancer health effects, since those health effects are generally associated with a toxicity effect threshold. AALs for cancer effects, when derived from cancer potency factors, are ten times more stringent in Table I (10^{-6} risk) than in Table II (10^{-5} risk). Since it is assumed that there is no toxicity threshold for most carcinogens, it is appropriate to have a range of risk acceptable risk levels for those pollutants.

Annual Average AALs were calculated as follows:

Cancer effects

1. For substances classified as Class A, B1,B2 or B2-C carcinogens by the EPA or, if not classified by EPA, as Class 1 or 2A carcinogens by IARC and/or as K or R carcinogens by the NTP (113 substances), annual average AALs were selected according to the following order of preference:

    a) The concentration corresponding to a 10^{-6} risk (for Table I in the regulation) or a 10^{-5} risk (for Table II of the regulation), as derived from the inhalation cancer potency factor listed for that substance in EPA's IRIS database (44 substances)

    b) The concentration corresponding to a 10^{-6} (Table I) or 10^{-5} (Table II) risk, as derived from the CAL inhalation cancer potency factor for that substance (53 substances)

    c) The concentration corresponding to a 10^{-6} (Table I) or 10^{-5} (Table II) risk, as determined by the oral cancer potency factor listed for that substance in EPA's IRIS database (3 substances)

    d) The concentration corresponding to a 10^{-6} (Table I) or 10^{-5} (Table II) risk, as calculated from CAL No Significant Risk Levels (NSRLs) or draft NRSRLs, assuming that all intake is via inhalation and an inhalation fate of 20 cubic meters

of air per day. Note that the NSRLs are set to correspond to a risk of 10^{-5} (10 substances)

e) The EPA inhalation RfC divided by 100 (0 substances)

f) The chronic inhalation ATSDR MRL or CAL REL divided by 100 (if both were available, the more stringent was used) (1 substance)

g) The intermediate inhalation ATSDR MRL divided by 100 (1 substance)

h) The EPA oral RfD/100, converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day (2 substances)

i) The chronic oral ATSDR MRL divided by 100, converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day (0 substances)

2. Substances that are classified as Class C carcinogens by EPA were further evaluated to determine whether annual average AALs based on cancer are appropriate for those substances. Cancer-based annual average AALs were developed for EPA Class C carcinogens that are also classified as Class 2B by IARC, as K or R carcinogens by the NTP, and/or that are listed by CAL as "Known to the State of California to Cause Cancer." (8 of 23 Class C carcinogens). Annual average cancer-based AALs for those eight substances, as well as for five IARC Class 2B carcinogens not classified by EPA and that do not meet the criteria specified in item #1 above were selected according to the following order of preference:

a) The concentration corresponding to a 10^{-6} risk (for Table I in the regulation) or a 10^{-5} risk (for Table II of the regulation). The IRIS inhalation cancer potency factor (2 substances), the CAL inhalation cancer potency factor (2 substances), the IRIS oral cancer potency factor (0 substances) or the CAL NSRL level (0 substances) was used to derive these levels, in that order.

b) The EPA RfC divided by 10 (5 substances)

c) The chronic inhalation ATSDR MRL or CAL REL divided by 10 (if both were available, the more stringent was used) (1 substance)

d) The EPA oral RfD divided by 10 (2 substances)

e) The chronic oral ATSDR MRL divided by 10 (0 substances)

<u>Non-cancer Effects</u>

3. Annual average AALs for non-cancer effects were selected according to the following order of preference:

a) The EPA RfC for the 27 substances for which the RfC was determined to be appropriately associated with an annual average according to the criteria discussed above

b) The CAL chronic inhalation REL or the ATSDR chronic inhalation MRL (where both were available, the more stringent was selected)

c) The ATSDR chronic oral REL, divided by a safety factor of ten to account for possible inter-route differences and converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day

If benchmarks were available to calculate AALs for both cancer and non-cancer effects for carcinogens, the more stringent of the cancer or non-cancer value was used as the annual average AAL.

Persistent Bioaccumulative Toxic Chemicals

EPA has established a list of Persistent Bioaccumulative Toxic chemicals (PBT chemicals) as part of its Toxic Release Inventory program. These substances, if emitted into the air, tend to be deposited in and remain stable in other media and can contaminate the food supply. Therefore, air emissions of those substances would result in potential public exposures via ingestion as well as inhalation.

The Rhode Island Air Toxics list include twelve of the EPA PBT chemicals: aldrin, chlordane, heptachlor, hexachlorobenzene, lead compounds, mercury compounds (elemental and inorganic, mercuric chloride and methyl mercury), methoxychlor, polychlorinated biphenyls (PCBs), doxins and dioxin–like compounds, polycyclic aromatic hydrocarbons (POM on the Rhode Island list), toxaphene and trifluralin. To account for the potential for additional exposure that could result because of the persistent bioaccumulative properties of these substances, the annual average AALs for these substances, derived as described above, were reduced by an additional safety factor of ten. Since methoxychlor does not have a annual average AAL, this safety factor was not used for that substance.

AALs for substances without EPA, ATSDR or CAL Benchmarks

No EPA, ATSDR or CAL health benchmarks were available for 22 of the EPA HAPs, so the above methodology could not be used to derive AALs for those substances. For those substances, OAR compiled the following additional information:

1. Oral and inhalation subchronic, chronic and cancer benchmarks, as listed in EPA's Health Effects Assessment Summary Tables (HEAST), last updated in 1997, converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day. These values,

which were available for 7 of the 22 substances, have limited documentation and are not listed in IRIS.

2. Short-term and Annual Guideline Concentrations from the New York State Department of Environmental Conservation (NYSDEC), as published in "DAR-1, AGC/SGC Tables," 12 July 2000. Annual values were available for all 22 substances, and short-term values for three of the substances. Of the 22 annual values, two were derived by the NYSDEC or NY Department of Health, two are based on analogy to similar substances, two were set at the NYSDEC high toxicity de minimus concentration, three were set at the NYSDEC low-medium toxicity de minimus level, and 13 were derived from occupational standards.

3. Draft and final No Significant Risk Levels (NSRLs) for carcinogens from CAL, as published in the "Proposition 65 Status Report" dated February 2001 and from the toxicity criteria database on CAL's website. NSRLs were available for 7 of the 22 substances. The NSRLs correspond to a dose (in μg/day) that is associated with a 10^{-5} risk. For the purpose of this analysis, this value was converted to units of $\mu g/m^3$ assuming a daily inhalation rate of 20 m^3.

This additional health benchmark information is displayed in Table C.

OAR then assigned AALs for those 24 substances as follows:

1. HEAST oral subchronic benchmarks converted to $\mu g/m^3$ assuming 70 kg body weight and inhalation of 20 cubic meters of air per day were used as 24-hour AALs (3 substances). Note: no inhalation benchmarks were available for any of the 22 substances in HEAST.

2. NYSDEC Short-term Guideline values were used as 1-hour average AALs (3 substances).

3. As mentioned previously, CAL NSRLs correspond to a risk of 10^{-5}. Where available, NSRLs divided by ten and converted to $\mu g/m^3$ assuming a daily inhalation rate of 20 m^3 were used as Table I annual averages AALs for carcinogens. (7 substances). Table II AALs were ten times higher (NSRL values without the ten divisor).

4. The Table I and II annual average AALs for the three 2B or C carcinogens which do not have draft or final NSRLs (catechol, methyl iodide and parathion) were calculated as the NYSDEC Annual Guideline value divided by 10.

5. NYSDEC Annual Guideline values were used as annual average AALs for the other substances in this group (12 substances).

The AALs derived for all listed substances, along with the sources of these limits, are displayed in Table D. Substances which had no adopted CAL, EPA or ATSDR benchmarks and for which the alternative AAL derivation methodology outlined above was used are bolded in that table. Table E shows the old and newly proposed AALs for the 40 substances originally listed in Regulation No. 22. Note that two of the original substances, diphenylamine and 5-nitro(o-

anisidine), are no longer used in Rhode Island and do not meet the pollutant selection criteria in Section II of this document; those substances are not listed in the proposed amended regulation.

Further Explanation of Certain AALs

Further explanation is required for a few of the AAL derivations. These are as follows:

Cadmium The 24-hour AAL for cadmium was derived from the RfD for that substance using a route-route safety factor of 20, rather than the default value of 10, because the RfD assumes poor absorption by ingestion (5% from water and 2.5% from food).

Fluoride Fluoride is known to be highly toxic to certain plant species at concentrations. McCune et al[1] reported that black spruce trees exposed to mean concentrations of 2, 4 and 8 $\mu g\ F/m^3$ for 78 hours exhibited an increasing incidence and severity of foliar injury. The health based AALs derived according to the above procedures, 20 $\mu g/m^3$ as a one-hour average and 6 $\mu g/m^3$ as an annual average, are not stringent enough to prevent exposures at levels that could cause phytotoxic effects. Therefore, a 24-hour average of 3 $\mu g/m^3$ was adopted, consistent with the McCune report. Since this level is more stringent than the annual average health –based level, the annual average AAL was dropped.

Hydrogen sulfide The CAL RELs were used preferentially over EPA's RfC for this substance. Since the RfC, which was derived by applying a safety factor of 1000 to a Lowest Observed Adverse Effect Level (LOAEL) for inflammation of the nasal mucosa, is lower than ambient background hydrogen sulfide concentrations in Rhode Island, OAR believes that the CAL values, which are approximately one order of magnitude higher than the EPA numbers, are more appropriate.

2,4- and 2,6-Toluene diisocyanate The AAL for these substances was based on noncancer effects (the RfC) rather than the cancer potency, because the RfC is lower than the 10^{-6} risk level.

Polycyclic Organic Matter (POM) The POM AAL is expressed in Benzo(a)pyrene (BaP) equivalents. Concentrations of POM constituents are multiplied by the weighting factors listed in Table F and summed to calculate total BaP equivalents. POM weighting factors are based on California cancer potency factors where available and, for five additional substances, on weighting factors listed in the World Health Organization's Guidelines for Air Quality, Geneva, 2000.

Polychlorinated Dibenzo Dioxins (PCDDs), Polychlorinated Dibenzo Furans (PCDFs) and Dioxin-like Polychlorinated Biphenyls (PCBs) Similarly, the PCDD/PCDF AAL is expressed in 2,3,7,8-tetrachlorinated dibenzo dioxins (2,3,7,8-TCDD) equivalents. Concentrations of PCDDs, PCDFs and dioxin-like PCBs are multiplied by the World Health Organization weighting factors listed in Table G and summed to calculate total 2,3,7,8-TCDD equivalents.

[1] McCune, DC, Lauver, TL and Hansen, KS, "Relationship of Concentration of Gaseous Hydrogen Fluoride to Incidence and Severity of Foliar Lesions in Black Spruce and White Spruce," Canadian Journal of Forest Research, 21:756, 1991.

Propylene glycol monomethyl ether (PGME) The California chronic REL was used in place of the EPA RfC to derive the AAL for PGME because the California value was based on a later, more comprehensive study that was not available when the EPA RfC was derived.

IV. Procedure for Calculating Minimum Quantities

Table III in Regulation No. 22 provides Minimum Quantities (MQs) for each of the listed substances. Facilities which emit the listed substances in quantities at or above the MQ levels are subject to the Air Toxics Operating Permit requirements in the regulation unless specifically exempted. The MQs are designed to correspond to a quantity of each of the substances that, if emitted under poor dispersion conditions, would result in an ambient ground level impact no higher than the AALs for that substance.

MQs are in units of pounds per year. However, the MQs were derived using a procedure that considers the one-hour and 24-hour, as well as annual average AALs. To do so, RI DEM had to make assumptions regarding temporal emissions patterns. RI DEM assumed, when calculating MQs based on one-hour AALs, that emissions occur for one hour each day (365 hours per year) and, when calculating MQs based on 24-hour AALs, that emissions occur on one day each week (52 days per year).

MQs were derived as follows:

1. Using a screening model and parameters from actual sources in Rhode Island, it was determined that, under poor dispersion conditions, emissions of 1 lb/hr of a pollutant cause one-hour average maximum ground level impacts up to 1000 $\mu g/m^3$. The maximum 24-hour average impact is estimated as 0.4 times the maximum one-hour impact, or 400 $\mu g/m^3$, and the maximum annual average impact as 0.08 times the maximum one-hour impact, or 80 $\mu g/m^3$. MQs were, therefore, calculated as follows:

Based on One-Hour AAL:

MQ (lb/yr) = One-Hour AAL ($\mu g/m^3$) * 1 lb/hr/1000 $\mu g/m^3$ * 365 hr/yr

= One-Hour AAL ($\mu g/m^3$) * 0.365

Based On 24-Hour AAL:

MQ (lb/yr) = 24-Hour AAL ($\mu g/m^3$) * 1 lb/hr/400 $\mu g/m^3$ * 24 hr/day * 52 hr/yr

= 24-Hour AAL ($\mu g/m^3$) * 3.12

Based on Annual AAL:

MQ (lb/yr) = Annual AAL ($\mu g/m^3$) * 1 lb/hr/80 $\mu g/m^3$ * 8760 hr/year

= Annual AAL ($\mu g/m^3$) * 109.5

2. The lowest of the MQs calculated for each substance using the above procedure was selected as the MQ for that substance. MQs were rounded to one significant digit.

3. If a MQ derived as above was above the general permitting thresholds in Regulation No. 9, 100 lb/day (36,500 lb/yr) for substances that are not HAPs and 20,000 lb/yr for HAPs, the Regulation No. 9 threshold was used for the MQ in place of the MQ calculated as above.

The MQ derivations are shown in Table H.

V. Prioritization of Sources for Requiring Air Toxics Operating Permits

Subsection 22.5.2 of Regulation No. 22 requires a facility to submit an air toxics operating permit (ATOP) application to RI DEM within 60 days of notice that such a submission is required. RI DEM will use the prioritization scheme described below to determine the order in which sources are required to submit ATOP applications. The order is based on an estimate of the potential severity of impacts of emissions from the source on surrounding areas. The prioritization scheme is as follows:

1. A Hazard Factor is calculated for each facility using emissions data from OAR's annual air emissions inventory and the Minimum Quantities in pounds per year listed in Table III of Regulation No. 22 as follows:

$$\text{Hazard Factor} = \sum_{i} \frac{\text{Annual Emissions of Listed Air Toxic}_I \text{ (pounds/year)}}{\text{Minimum Quantity for Listed Air Toxic}_I \text{ (pounds/year)}}$$

2. The Hazard Factors calculated for all applicable sources are entered into the OAR's database system, which then produces a list of the air toxics sources in descending Hazard Factor order. ATOP notifications are issued to sources in that order.

3. The list is updated annually when the emissions inventory calculations for a reporting year have been entered into the database and may be updated more frequently as updates in emissions data occur.

4. Consideration of other factors may shift a source to a higher priority position. Such factors include, but are not limited to:

    - Neighborhood concern about odors and/or health impacts
    - Proximity of the source to other sources emitting air toxics
    - Proximity of the source to residential areas, schools, or other sensitive receptors
    - Uncertainty about emissions calculations
    - Elevated short-term emissions of a substance with a one-hour or 24-hour AAL

VI. Procedure for the Periodic Review of the List of Regulated Substances, Acceptable Ambient Levels (AALs) and Minimum Quantities (MQs)

OAR will reevaluate Regulation No. 22 once every two years. The review will determine whether further amendments to the list of regulated substances, the AALs and/or the MQs should be proposed at that time. Circumstances that may trigger the proposal of further amendments of the regulation include, but are not limited to the following.

1. The addition of a substance to EPA's list of HAPs or the addition of a cancer or noncancer inhalation health benchmark to the CAL or EPA IRIS databases may result in a proposed addition of the substance to the list of air toxics in Regulation No. 22.

2. The submission of a preconstruction permit application for a process that would emit a toxic pollutant that is not currently listed in Regulation No. 22 may result in the proposed addition of that pollutant to the list of regulated substances, provided that appropriate health benchmarks are available for that pollutant.

3. The deletion of a substance from the HAP, IRIS, or CAL lists may result in the proposed deletion of that substance from the Regulation No. 22 list, provided that none of the other criteria for listing identified in this guideline are met.

4. A change in or the addition of an EPA, CAL or ATSDR health benchmark for a substance may result in a proposed change in the Regulation No. 22 AALs and Minimum Quantity for that substance.

5. Changes in OAR air quality modeling procedures that significantly alter the assumptions used to calculate Minimum Quantities delineated in this document may result in the proposed amendment of the Minimum Quantities in Table III of the regulation.

Any future amendments will be subject to a public comment period and public hearing prior to promulgation.

VII. Tables

TABLE A – Proposed Air Toxics List **CHEMICAL NAME**	**CAS #**	**Reason for Listing**
Acetaldehyde	75070	HAP*
Acetamide	60355	HAP
Acetone	67641	RI**
Acetonitrile	75058	HAP
Acetophenone	98862	HAP
2-Acetylaminofluorene	53963	HAP
Acrolein	107028	HAP
Acrylamide	79061	HAP
Acrylic Acid	79107	HAP
Acrylonitrile	107131	HAP
Aldrin	309002	IRIS***
Allyl Chloride	107051	HAP
2-Aminoanthraquinone	117793	CAL****
4-Aminobiphenyl	92671	HAP
Ammonia	7664417	IRIS
Aniline	62533	HAP
o-Anisidine	90040	HAP
Antimony compounds		HAP
Arsenic compounds (inorganic)		HAP
Arsine	7784421	HAP
Asbestos	1332214	HAP
Azobenzene	103333	IRIS
Barium	7440393	RI
Benzene	71432	HAP
Benzidine	92875	HAP
Benzoic acid	65850	RI
Benzotrichloride	98077	HAP
Benzyl Chloride	100447	HAP
Beryllium compounds		HAP
Biphenyl	92524	HAP
Bis (chloromethyl) ether	542881	HAP
Bis(2-ethylhexyl) phthalate (DEHP)	117817	HAP
Boron and borates		RI
Bromates (including Potassium bromate)		CAL
Bromine and cmpds (except Hyrdogen bromide & Bromates)		CAL
Bromodichloromethane	75274	CAL
Bromoform	75252	HAP
1,3-Butadiene	106990	HAP

TABLE A – Proposed Air Toxics List CHEMICAL NAME	CAS #	Reason for Listing
Butyl benzyl phthalate	85687	RI
Cadmium compounds		HAP
Calcium cyanamide	156627	HAP
Captan	133062	HAP
Carbaryl	63252	HAP
Carbon disulfide	75150	HAP
Carbon tetrachloride	56235	HAP
Carbonyl sulfide	463581	HAP
Catechol	120809	HAP
Chloramben	133904	HAP
Chlordane	57749	HAP
Chlorinated paraffins	108171262	CAL
Chlorine	7782505	HAP
Chlorine Dioxide	10049044	IRIS
Chloroacetic acid	79118	HAP
2-Chloroacetophenone	532274	HAP
4-Chloroaniline	106478	RI
Chlorobenzene	108907	HAP
Chlorobenzilate	510156	HAP
1-Chloro-1,1-difluoroethane (CFC 142B)	75683	IRIS
Chlorodifluoromethane (HCFC-22)	75456	IRIS
Chloroform	67663	HAP
Chloromethyl methyl ether	107302	HAP
2-Chlorophenol	95578	CAL
4-Chloro-o-phenylenediamine	95830	CAL
Chloropicrin	76062	CAL
Chloroprene	126998	HAP
p-Chloro-o-toluidine	95692	CAL
Chromium III (insoluble salts)		HAP
Chromium VI-mists and aerosols		HAP
Chromium VI- particulate		HAP
Cobalt compounds		HAP
Coke oven Emissions	8007452	HAP
Copper and compounds (except Copper cyanide)		CAL
p-Cresidine	120718	CAL
Cresols/Cresylic acid (methylphenols)	1319773	HAP
Cumene	98828	HAP
Cupferron	135206	CAL
Cyanide and Compounds (inorganic), except HCN		HAP

TABLE A – Proposed Air Toxics List **CHEMICAL NAME**	**CAS #**	**Reason for Listing**
Cyclohexane	110827	IRIS
2,4-Diaminoanisole	615054	CAL
2,4-Diaminotoluene	95807	CAL
Diazomethane	334883	HAP
Dibromochloromethane	124481	CAL
1,2-Dibromo-3-chloropropane	96128	HAP
Dibutylphthalate	84742	HAP
1,2-Dichlorobenzene	*95501*	RI
1,4-Dichlorobenzene (p)	106467	HAP
3,3-Dichlorobenzidene	91941	HAP
Dichloro diphenyl dichloroethylene (DDE)	3547044	HAP
1,2-Dichloroethene (cis)	156592	RI
1,2-Dichloroethene (trans)	156605	RI
Dichloroethyl ether (Bis (chloroethyl) ether)	111444	HAP
2,4-Dichlorophenoxyacetic acid	94757	HAP
1,3-Dichloropropene	542756	HAP
Dichlorvos	62737	HAP
Dieldrin	60571	IRIS
Diethanolamine	111422	HAP
Diethyl sulfate	64675	HAP
1,1-Difluoroethane (HCFC 152a)	75376	IRIS
3,3-Dimethoxybenzidine	119904	HAP
Dimethyl aminoazobenzene (p)	60177	HAP
N,N-Dimethyl aniline	121697	RI
3,3-Dimethyl benzidine	119937	HAP
Dimethyl carbamoyl chloride	79447	HAP
Dimethyl formamide	68122	HAP
1,1-Dimethyl hydrazine	57147	HAP
1,2-Dimethyl hydrazine	*540738*	CAL
2,4-Dimethylphenol	105679	RI
Dimethyl phthalate	131113	HAP
Dimethyl sulfate	77781	HAP
4,6-Dinitro-o-cresol	534521	HAP
2,4-Dinitrophenol	51285	HAP
2,4-Dinitrotoluene	121142	HAP
1,4-Dioxane (1,4-Diethyleneoxide)	123911	HAP
1,2-Diphenylhydrazine (hydrazobenzene)	122667	HAP
Epichlorohydrin	106898	HAP
1,2-Epoxybutane	106887	HAP

TABLE A – Proposed Air Toxics List CHEMICAL NAME	CAS #	Reason for Listing
Ethyl acrylate	140885	HAP
Ethyl benzene	100414	HAP
Ethyl carbamate (urethane)	51796	HAP
Ethyl chloride (Chloroethane)	75003	HAP
Ethylene dibromide (Dibromoethane)	106934	HAP
Ethylene dichloride (1,2-Dichloroethane)	107062	HAP
Ethylene glycol	107211	HAP
Ethylene glycol monobutyl ether	111762	IRIS
Ethylene glycol monoethyl ether	110805	HAP
Ethylene glycol monoethyl ether acetate	111159	HAP
Ethylene glycol monomethyl ether	109864	HAP
Ethylene glycol monomethyl ether acetate	110496	HAP
Ethylene imine (Aziridine)	151564	HAP
Ethylene oxide	75218	HAP
Ethylene thiourea	96457	HAP
Ethylidene dichloride (1,1-Dichloroethane)	75343	HAP
Fluorides and compounds (including Hydrogen fluoride)		HAP
Formaldehyde	50000	HAP
Glutaraldehyde	111308	CAL
Heptachlor	76448	HAP
Hexachlorobenzene	118741	HAP
Hexachlorobutadiene	87683	HAP
Hexachlorocyclohexanes, including Lindane	608731	HAP
Hexachlorocyclopentadiene	77474	HAP
Hexachloroethane	67721	HAP
Hexamethylene-1,6-diisocyanate	822060	HAP
Hexamethylphosphoramide	680319	HAP
Hexane	110543	HAP
Hydrazine	302012	HAP
Hydrochloric acid (hydrogen chloride)	7647010	HAP
Hydrogen bromide	10035106	CAL
Hydrogen cyanide	74908	HAP
Hydrogen sulfide	7783064	CAL
Hydroquinone	123319	HAP
Isophorone	78591	HAP
Isopropanol	67630	CAL
Lead Compounds - inorganic		HAP
Tetraethyl lead	78002	HAP
Lindane - see hexachlorocyclohexanes	58899	HAP

TABLE A – Proposed Air Toxics List CHEMICAL NAME	CAS #	Reason for Listing
Maleic anhydride	108316	HAP
Manganese Compounds		HAP
Mercury Compounds - Elemental & inorganic		HAP
Methylmercury	22967926	HAP
Methanol	67561	HAP
Methoxychlor	72435	HAP
Methyl bromide (Bromomethane)	74839	HAP
Methyl chloride (Chloromethane)	74873	HAP
Methyl chloroform (1,1,1-trichloroethane)	71556	HAP
4,4-Methylene bis (2-chloroaniline)	101144	HAP
Methylene chloride (dichloromethane)	75092	HAP
4,4-Methylenedianiline	101779	HAP
Methylene diphenyl diisocyanate	101688	HAP
Methyl ethyl ketone (2-Butanone)	78933	IRIS
Methyl hydrazine	60344	HAP
Methyl iodide (Iodomethane)	74884	HAP
Methyl isobutyl ketone (Hexanone)	108101	HAP
Methyl isocyanate	624839	HAP
Methyl methacrylate	80626	HAP
Methyl tert butyl ether	1634044	HAP
Michler's ketone (4,4'-Bis(dimethylamino)benzophenone)	90948	CAL
Fine mineral fibers		CAL
Molybdenum	7439-98-7	RI
Naphthalene	91203	HAP
Nickel and Compounds, except Nickel subsulfide		HAP
Nickel subsulfide	12035722	HAP
Nitric acid	7697372	CAL
Nitrobenzene	98953	HAP
4-Nitrobiphenyl	92933	HAP
4-Nitrophenol	100027	HAP
2-Nitropropane	79469	HAP
N-Nitrosodi-n-butylamine	924163	IRIS
N-Nitrosodiethylamine	55185	IRIS
N-Nitrosodimethylamine	62759	HAP
N-Nitrosodiphenylamine	86306	CAL
N-Nitrosdi-n-propylamine	621647	CAL
N-Nitroso-n-methylethylamine	10595956	CAL
N-Nitroso-n-methylurea	684935	HAP
N-Nitrosomorpholine	59892	HAP

TABLE A – Proposed Air Toxics List **CHEMICAL NAME**	**CAS #**	**Reason for Listing**
N-Nitrosopiperidine	100754	CAL
N-Nitrosopyrrolidine	930552	IRIS
Parathion	56382	HAP
Pentachloronitrobenzene (Quintozene)	82688	HAP
Pentachlorophenol	87865	HAP
Phenol	108952	HAP
p-Phenylenediamine	106503	HAP
Phosgene	75445	HAP
Phosphine	7803512	HAP
Phosphoric acid	7664382	IRIS
Phosphorus	7723140	HAP
Phthalic anhydride	85449	HAP
Polychlorinated biphenyls	1336363	HAP
PCDDs, PCDFs, and dioxin-like PCBs		HAP
Polycyclic Organic Matter		HAP
1,3-Propane sultone	1120714	HAP
beta-Propiolactone	57578	HAP
Propionaldehyde	123386	HAP
Propoxur (Baygon)	114261	HAP
n-Propyl Bromide	106945	RI
Propylene	115071	CAL
Propylene dichloride (1,2-Dichloropropane)	78875	HAP
Propylene glycol monomethyl ether (PGME)	107982	IRIS
Propylene oxide	75569	HAP
1,2-Propylenimine (2-Methyl aziridine)	75558	HAP
Quinoline	91225	HAP
Quinone	106514	HAP
Radionuclides (including Radon)		HAP
Selenium Compounds		HAP
Hydrogen selenide	7783075	HAP
Selenium sulfide	7446346	HAP
Sodium hydroxide	1310932	CAL
Styrene	100425	HAP
Styrene oxide	96093	HAP
Sulfates		CAL
Sulfuric acid and oleum	7664939	CAL
1,1,1,2-Tetrachloroethane	*630206*	IRIS
1,1,2,2-Tetrachloroethane	79345	HAP
Tetrachloroethylene (perchloroethylene)	127184	HAP

TABLE A – Proposed Air Toxics List **CHEMICAL NAME**	**CAS #**	**Reason for Listing**
Tetrachlorophenols	25167833	CAL
1,1,1,2-Tetrafluoroethane	811972	IRIS
Thioacetamide	62555	CAL
Titanium tetrachloride	7550450	HAP
Toluene	108883	HAP
2,4-Toluene diamine (2,4-diaminotoluene)	95807	HAP
2,4-and 2,6-Toluene diisocyanate	26471625	HAP
o-Toluidine	95534	HAP
Toxaphene (chlorinated camphene)	8001352	HAP
1,2,4-Trichlorobenzene	120821	HAP
1,1,2-Trichloroethane	79005	HAP
Trichloroethylene	79016	HAP
Trichlorofluoromethane	75694	RI
2,4,5-Trichlorophenol	95954	HAP
2,4,6-Trichlorophenol	88062	HAP
Triethylamine	121448	HAP
Trifluralin	1582098	HAP
2,2,4-Trimethylpentane	540841	HAP
Vanadium and compounds		CAL
Vinyl acetate	108054	HAP
Vinyl bromide	593602	HAP
Vinyl chloride	75014	HAP
Vinylidene chloride (1,1-Dichloroethylene)	75354	HAP
Xylenes (isomers and mixtures)	1330207	HAP
Zinc and compounds		CAL

* HAP = EPA Hazardous Air Pollutant

** RI = Substance emitted in RI for which EPA, CAL, or ATSDR has developed an oral or inhalation health benchmark

*** IRIS = Substance for which an inhalation RfC or inhalation cancer potency factor is listed in EPA's IRIS database.

**** CAL = Substance for which California ARB or OEHHA has developed an inhalation REL or and inhalation cancer potency factor

Note: Many substances are included in more than one category, however, for simplicity, only one category is listed for each substance.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Acetaldehyde	75070	R	2B	B2	9	0.5			0.37		9
Acetamide	60355		2B	-					0.05		
Acetone	67641			Inadeq.	3000*		Acu	62000			
							Int	31000			
							Chr	31000			
Acetonitrile	75058			D	60						
Acetophenone	98862			D	350*						
2-Acetylaminofluorene	53963	R							0.00077		
Acrolein	107028		3	Inadeq.	0.02		Acu	0.7[2]		0.19	0.06
							Int	0.09			
Acrylamide	79061	R	2A	B2	0.7*	0.0008			0.00077		0.7
Acrylic Acid	79107		3		1					6000	
Acrylonitrile	107131	R	2B	B1	2	0.01	Acu	221	0.0034		5
Aldrin	309002		3	B2	0.1*	0.0002	Acu	7*			
							Chr	0.1*			
Allyl Chloride	107051		3	C	1				0.17		
2-Aminoanthraquinone	117793	R	3						0.11		
4-Aminobiphenyl	92671	K	1						0.00017		
Ammonia	7664417				100		Acu	1190		3200	200
							Chr	70[3]			
Aniline	62533		3	B2	1	0.6*			0.63		
o-Anisidine	90040	R (HCl)	2B						0.025		
Antimony compounds:					1.4*						
Antimony trioxide	1309644		2B		0.2						

[2] ATSDR MRLs for acrolein updated 8/07.
[3] ATSDR chronic MRL for ammonia updated 10/04.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Antimony trisulfide			3								
Aramite	140578		2B	B2		0.1					
Arsenic compounds (inorganic)		K	1	A	1.1*	0.0002	Acu	17.5*	0.00030	0.19	0.03
							Chr	1.1*			
Arsine	7784421				0.05					160	
Asbestos	1332214	K	1	A		4**			0.5**		
Azobenzene	103333		3	B2		0.03					
Barium				D	700*[4]		Int/ch	700*[5]			
Benzene	71432	K	1	A	30	0.13-0.45	Acu	29[6]	0.034	1300	60
							Int	19			
							Chr	9.6			
Benzidine	92875	K	1	A	10.5*	0.00002			0.0000071		10
Benzoic acid				D	14,000*						
Benzotrichloride	98077	R	2A	B2		0.0003*			-		
Benzyl Chloride	100447		2A	B2		0.02*			0.020	240	12
Beryllium compounds		R	1	B1	0.02	0.0004	Chr	7*	0.00040		0.007
Biphenyl	92524			D	180*				-		
Bis (chloromethyl) ether	542881	K	1	A		0.000016	Int	1.4	0.000077		
Bis(2-ethylhexyl) phthalate (DEHP)	117817	R	3	B2	70*	0.3*	Int	350*	0.42		70
							Chr	220			
Boron and borates					700*[7,8]		Acu	10			

[4] EPA RfD for barium updated 7/05.
[5] ATSDR MRLs for barium final on 8/07.
[6] ATSDR MRLs for benzene updated 8/07.
[7] EPA RfD for boron updated 8/04.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Bromine & Cmpds	7726956										1.7
Bromate	15541454			B2 (oral)	14*	0.005*					
Hydrogen bromide	10035106										24
Potassium bromate	7758012		2B						0.0071		1.7
Bromodichloromethane	75274	R	2B	B2	70*	0.06*	Acu	140*	**0.027**		
							Chr	70*			
Bromoform	75252		3	B2	70*	0.9	Acu	2450*[9]			
							Int	700*			
							Chr	70*			
1,3-Butadiene	106990	K	1	carcin to humans by inhal	2	0.03			0.0059		20
Butyl benzyl phthalate	85687			C	700*						
Cadmium compounds		K	1	B1	1.8*	0.0006	Chr	0.7*	0.00024		0.02
Calcium cyanamide	156627										
Captan	133062		3		460*				1.52		
Carbaryl	63252		3		350*						
Carbon disulfide	75150				700		Chr	933		6200	800
Carbon tetrachloride	56235	R	2B	B2	2.5*	0.07	Int	189[10]	0.024	1900	40
							Chr	189			
Carbonyl sulfide	463581										
Catechol	120809		2B								
Chloramben	133904				53*						
Chlordane	57749		2B	B2	0.7	0.01	Int	0.2	0.0029		

[8] ATSDR MRL for boron amended (draft) 9/07.
[9] ATSDR MRls for bromoform updated 9/05.
[10] ATSDR MRLs for carbon tetrachloride updated 9/05.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
							Chr	0.02			
Chlorinated paraffins , avg length C12- C13, 60% chlorine)	1.08E+08	R	2B						0.040		
Chlorine	7782505				350*		Acu	203[11]		210	0.2
							Int	5.8			
							Chr	0.1			
Chlorine Dioxide	10049044			D	0.2		Int	2.8[12]			0.6
Chloroacetic acid	79118				7*						
2-Chloroacetophenone	532274				0.03						
4-Chloroaniline	106478		2B		14*						
Chlorobenzene	108907			D	70*		Int	1400*			1000
Chlorobenzilate	510156		3		70*						
1-Chloro-1,1-difluoroethane	75683				50000						
Chlorodifluoromethane (HCFC-22)	75456		3		50000						
Chloroform	67663	R	2B	B2	35*	0.04	Acu	496	0.19	150	300
							Int	248			
							Chr	98			
Chloromethyl methyl ether	107302	K	1	A		≥1.6E-05***			0.0014		
2-Chlorophenol	95578				18*						18
4-chloro-o-phenylenediamine	95830	R	2B						0.22		
Chloropicrin	76062									29	0.4
Chloroprene	126998	R	2B								1

[11] ATSDR MRL for chlorine adopted (draft) 9/07

[12] ATSDR MRL for chlorine dioxide adopted 10/04.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
p-chloro-o-toluidine	95692	R	2A						0.013		
Chromium compounds:											
Chromium (III) (insoluble salts)			3	D	5300*						
Chromium (VI)		K	1	A	0.1 (partic) 0.008 (mists)	0.00008	Int Int	0.005 mists 1 partic	0.0000067		0.2 (sol, exc triox)
Chromium (VI) Trioxide											0.002
Cobalt and compounds		R (sulfate)	2B				Chr	0.1			
Coke oven Emissions		K	1	A		0.002			0.0016		
Copper & compounds				D			Acu Int	35*[13] 35*		100	2.4
p-cresidine	120718	R	2B						0.023		
Cresols/Cresylic acid	1319773			C			Int	35*[14]			600
'o-Cresol (Methylphenol)	95487			C	180*						600
m-Cresol (3-Methylphenol)	108394			C	180*						600
'p-Cresol (4-Methylphenol)	106445			C							600
Cumene	98828			D	400						
Cupferron	135206	R							0.016		
Cyanide Compounds				D	70*						9
Barium Cyanide	542621										
Calcium Cyanide	592018				140*						

[13] ATSDR MRLs for copper updated 10/04.
[14] ATSDR MRL for cresols updated 9/06 (draft).

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Chlorine Cyanide	506774				180*						
Copper Cyanide	544923				18*						
Hydrogen Cyanide	74908				3					340	9
Potassium Cyanide	151508				180*						
Potassium silver Cyanide	506616				700*						
Silver Cyanide	506649				350*						
Sodium Cyanide	143339				140*		Int	175*[15]			
Zinc Cyanide	557211				180*						
Cyclohexane	110827			D	6,000						
2,4-Diaminoanisole	615054	R (sulfate)	2B						0.15		
2,4-Diaminotoluene	95807	R	2B						0.00091		
Diazomethane	334883		3								
Dibromochloromethane	124481		3	C	70*	.04*	Acu	350*[16]	0.037		
							Chr	315*			
1,2-Dibromo-3-chloropropane	96128	R	2B		0.2		Int	1.9	0.00050		0.2
Dibutylphthalate	84742			D	350*		Acu	1750*			
1,2-Dichlorobenzene	*95501*		3	D	300*		Acu	2450*[17]			
							Int	2100*			
							Chr	1050*			
1,4-Dichlorobenzene	106467	R	2B	C	800		Acu	12.020[18]	0.091		800
							Int	1200*			

[15] ATSDR MRL for sodium cyanide adopted 7/06 (draft).
[16] ATSDR MRLs for dibromochloromethane (chlorodibromomethane) adopted 9/05.
[17] ATSDR MRls for 1,2-dichlorobenzene adopted 7/06.
[18] ATSDR MRLs for 1,4-dichlorobenzene revised 7/06.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
							Chr	60			
3,3-Dichlorobenzidene	91941	R	2B	B2		0.008*			0.0029		
Dichloro diphenyl dichloroethylene (DDE)	3547044			B2		.01*			0.010		
1,2-Dichloroethene (cis)	156592			D			Acu	3500*			
							Int	1050*			
1,2-Dichloroethene (trans)	156605				70*		Acu	790			
							Int	790			
Dichloroethyl ether (Bis (chloroethyl) ether)	111444		3	B2		0.003	Int	120	0.0014		
2,4-Dichloro-phenoxyacetic acid	94757				35*						
1,3-Dichloropropene	542756	R	2B	B2	20	0.2	Int	36[19]	0.063		
							Chr	32			
Dichlorvos	62737		2B	B2	0.5	0.01*	Acu	18.4	0.012		
							Int	2.8			
							Chr	0.54			
Dieldrin	60571		3	B2	0.175*	0.0002	Int	0.3*			
							Chr	0.2*			
Diethanolamine	111422		3	-							3
Diethyl sulfate	64675	R	2A								
1,1-Difluoroethane (HCFC 152a)	75376				40000						
3,3-Dimethoxybenzidine	119904	R	2B								
Dimethyl aminoazobenzene (p)	60177	R	2B						0.00077		

[19] ATSDR MRLs for 1,3-dichlorophropene revised 9/06 (draft).

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
N,N-Dimethyl aniline	121697		2B (2,6)		7*						
3,3-Dimethyl benzidine	119937	R	2B								
Dimethyl carbamoyl chloride	79447	R	2A						0.00027		
Dimethyl formamide	68122		3		30						80 (n,n)
1,1-Dimethyl hydrazine	57147	R	2B	B2			Int	0.49	**0.001 (drNRSL)**		
1,2-Dimethyl hydrazine	*540738*		2A				Int	2.8*	0.0000063		
2,4-Dimethylphenol	105679				70*						
Dimethyl phthalate	131113			D							
Dimethyl sulfate	77781	R	2A	B2							
4,6-Dinitro-o-cresol	534521						Acu	14*			
							Int	14*			
2,4-Dinitrophenol	51285				7*		Acu	35*			
2,4-Dinitrotoluene	121142		2B (2,4&2,6)	B2	7*	0.005* (2,4 & 2,6)	Acu	175*	0.011		
							Chr	7*			
1,4-Dioxane (1,4-Diethyleneoxide)	123911	R	2B	B2		0.3*	Acu	7200[20]	0.13	3000	3000
							Int	3600			
							Chr	3600			
1,2-Diphenylhydrazine (hydrazobenzene)	122667			B2		0.005			0.0040		
Epichlorohydrin	106898	R	2A	B2	1	0.8			0.043	1300	3
1,2-Epoxybutane	106887		2B		20						20
Ethyl acrylate	140885		2B								48
Ethyl benzene	100414		2B	D	1000		Acu	43,400[21]			2000

[20] ATSDR MRLs for 1.4-dioxane adopted 9/07 (draft).

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
							Int	3040			
							Chr	1300			
Ethyl carbamate (urethane)	51796	R	2A	B2					0.0034		
Ethyl chloride (Chloroethane)	75003		3		10000		Acu	40200			30000
Ethylene dibromide (Dibromoethane)	106934	R	2A	B2	9[22]	0.002			0.014		0.8
Ethylene dichloride (1,2-Dichloroethane)	107062	R	2B	B2		0.04	Chr	2466	0.048		400
Ethylene glycol	107211				7,000*		Acu	2000[23]			400
Ethylene glycol	111762			C	13000		Acu	29000		14000	20
monobutyl ether							Int	14000			
							Chr	970			
Ethylene glycol monoethyl ether	110805				200					370	70
Ethylene glycol monoethyl ether acetate	111159									140	300
Ethylene glycol monomethyl ether	109864				20					93	60
Ethylene glycol mono-methyl ether acetate	110496										90
Ethylene imine (Aziridine)	151564		2B						0.000053		
Ethylene oxide	75218	K	1				Int	165	0.011		30
Ethylene thiourea	96457	R	3		0.28*				0.077		
Ethylidene dichloride (1,1-Dichloroethane)	75343			C					0.63		

[21] ATSDR MRls for ethyl benzene revised 9/07 (draft).
[22] EPA RfC and cancer risk for ethylene dibromide (dibromoethane) revised in IRIS 7/04.
[23] ATSDR MRL for ethylene glycol revised 9/07 (draft).

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Fluorides & compds			3		210*		Acu	15 (fluorine)[24]		240	13
Hydrogen fluoride (hydrofluoric acid)	7664393						Acu	15.5		240	13
Sodium fluoride							Chr	175*			
Formaldehyde	50000	R	1	B1	700*	0.08	Acu	49.2	0.17	94	3
							Int	36.9			
							Chr	9.8			
Glutaraldehyde	111308										0.08
Heptachlor	76448		2B	B2	1.8*	0.0008	Acu	2.1*[25]	0.00085		
							Int	0.4*			
Hexachlorobenzene	118741	R	2B	B2	2.8*	0.002	Acu	28*	0.0020		2.8
							Int	0.35*			
							Chr	0.175*			
Hexachlorobutadiene	87683		3	C		0.05	Int	0.7*			
Hexachlorocyclohexanes	608731	R	2B	B2		0.002			0.00090		1
alpha	319846	R	2B	B2		0.0006	Chr	30*	0.0010		1
beta	319857	R	2B	C		0.002	Acu	175*[26]	0.0020		1
							Int	2*			1
gamma (lindane)	58899	R	2B		1.1*		Acu	10.5*	0.0032		1
							Int	0.04*			
Hexachlorocyclopentadiene	77474			E	0.2		Int	112			0.24
							Chr	2.2			
Hexachloroethane	67721	R	2B	C	3.5*	0.3	Acu	58080	0.091		
							Int	58080			

[24] ATSDR MRls for fluorine, hydrogen fluoride and sodium fluoride updated 9/03.
[25] ATSDR MRL for heptachlor updated 8/07.
[26] ATSDR MRLs for hexachlorocyclohexanes updated 9/05.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Hexamethylene-1,6-diisocyanate	822060				0.01		Int	0.21			
							Chr	0.069			
Hexamethylphosphoramide	680319	R	2B								
Hexane	110543			Inad.	700[27]		Chr	2100			7000
Hydrazine	302012	R	2B	B2		0.0002	Int	5.2	0.00020		0.2
Hydrochloric acid	7647010		3		20					2100	9
Hydrogen bromide	10035106										24
Hydrogen cyanide	74908				3					340	9
Hydrogen fluoride	7664393	see	fluorides	-							
Hydrogen sulfide	7783064			Inad.	2		Acu	98		42	10
							Int	28[28]			
Hydroquinone	123319		3								
Isophorone	78591			C	700*	4*	Int	10500*			2000
							Chr	700*			
Isopropanol	67630		3							3200	7000
Lead Compounds - inorganic:		R	2A	B2					0.083		
Tetraethyl lead	78002				0.00035*						
Maleic anhydride	108316				350*						0.7
Manganese Compounds				D	0.05		Chr	0.04			0.2
Mercury Compounds - Elemental			3	D	0.3		Chr	0.2		1.8 (inorg)	0.09 (inorga)
Methylmercury	22967926		2B	C	0.35*		Chr	1.1*			

[27] EPA RfC for n-hexane updated on IRIS 12/05.
[28] ATSDR MRL for hydrogen sulfide updated 7/06.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Mercuric Chloride	7487947		3	C	1.05*		Acu	24.5*			
							Int	7*			
Methanol	67561				1800*					28000	4000
Methoxychlor	72435		3	D	18*		Int	17.5*			
Methyl bromide (Bromomethane)	74839		3	D	5		Acu	197.5		3900	5
							Int	197.5			
							Chr	19.8			
Methyl chloride	74873		3	D	90		Acu	1050			
(Chloromethane)							Int	420			
							Chr	105			
Methyl chloroform	71556		3	D	1hr - 9000[29]		Acu	11100		68000	1000
(1,1,1-Trichloroethane)					24-hr –6000 Subch-5000 Chr – 5000		Int	3885			
4,4-Methylene bis (2-chloroaniline)	101144	R	2A				Chr	10.5*	0.0023		
Methylene chloride	75092	R	2B	B2	210*	2	Acu	2100	1.00	14000	400
(Dichloromethane)							Int	1059			
							Chr	1100			
4,4-Methylenedianiline	101779	R	2B				Acu	700*	0.0022		20
							Int	280*			
Methylene diphenyl diisocyanate	101688		3	D	0.6						0.7
Methyl ethyl ketone (2-Butanone)	78933			Inad.	5000					13000	1000
Methyl hydrazine	60344										

[29] EPA RfC for methyl chloroform (1,1,1-trichloroethane) updated on IRIS 9/07. In addition to the chronic RfC, the update includes RfCs for 1, 4, 8 and 24-hour acute exposures and subchronic exposures.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Methyl iodide (Iodomethane)	74884		3								
Methyl isobutyl ketone (Hexanone)	108101			Inad.	3000						
Methyl isocyanate	624839										1
Methyl methacrylate	80626		3	E	700						980
Methyl tert butyl ether	1634044		3		3000		Acu	7200	4		8000
							Int	2500			
							Chr	2500			
Michler's ketone (4,4'-Bis(dimethylamino)benzophenone)	90948	R							0.0040		
Mineral fibers (fine)											
Molybdenum	7439987				17.5*						
Naphthalene	91203	R	2B	C	3		Chr	3.7[30]	0.029[31]		9
Nickel Compounds:		K	1				Int	0.2[32]	0.0038	6	.05 (exc oxide)
							Chr	0.09			
Nickel Oxide	1331991								0.0040	6	0.1
Nickel Carbonyl	13463393	K		B2							
Nickel Refinery Dust				A		0.004					
Nickel subsulfide	12035722	K		A		0.002					
Nickel, soluble salts					70*						
Nitric acid	7697372									86	
Nitrobenzene	98953		2B	D	2*						1.7

[30] ATSDR MRL for naphthalene updated 9/05.
[31] Cancer potency value for naphthalene adopted by CAL Hot Spots program 8/04.
[32] ATSDR MRLs for nickel updated 9/05.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
4-Nitrobiphenyl	92933		3								
4-Nitrophenol	100027		3								
2-Nitropropane	79469	R	2B		20				0.1 (NRSL)		20
N-Nitroso-n-methylurea	684935	R	2A						0.000029		
N-Nitrosodi-n-butylamine	924163	R	2B	B2		0.0006			0.0003		
N-Nitrosodiethylamine	55185	R	2A	B2		0.00002			0.0001		
N-Nitrosodimethylamine	62759	R	2A	B2		0.00007			0.00022		
N-Nitroso-n-methylethylamine	10595956		2B	B2		0.0002*			0.00016		
N-Nitrosodiphenylamine	86306		3	B2		0.7*			0.38		
N-Nitrosopiperidine	100754	R	2B						0.00037		
N-Nitrosdi-n-propylamine	621647	R	2B	B2		0.0005*	Acu	300*	0.00050		
N-Nitrosomorpholine	59892	R	2B						0.00053		
N-Nitrosopyrrolidine	930552	R	2B	B2		0.002					
Parathion	56382		3	C							
Pentachloronitro-benzene (quintozene)	82688		3		11*						
Pentachlorophenol	87865			B2	110*	0.03*	Acu Int Chr	17.5* 3.5* 3.5*	0.20		0.2
Phenol	108952		3	D	1050*		Acu	77[33]		5800	200
p-Phenylenediamine	106503		3								
Phosgene	75445			Inad.	0.3[34]					4	

[33] ATSDR MRL for phenol added 9/06 (draft).
[34] EPA RfC for phosgene listed in IRIS 1/06.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Phosphine	7803512			D	0.3						0.3
Phosphoric acid	7664382				10						7
Phosphorus, white	7723140			D	0.07*		Acu	20			
Phthalic anhydride	85449				7,000*						20
Polychlorinated biphenyls	1336363	R	2A	B2		0.01			0.002 -0.05		1.2
Aroclor 1254	11097691				0.07		Int	0.11*			
							Chr	0.07*			
Aroclor 1016	12674112				0.25*						
PCDDs, PCDFs, and	1746016	R					Acu	0.0007*	0.00000003		4E-05
dioxin-like PCBs							Int	0.00007*	(2378 TCDD		
							Chr	0.0000035*	equiv.)		
Polycyclic Organic Matter		R	1								
1,3-Propane sultone	1120714	R	2B						0.0014		
beta-Propiolactone	57578	R	2B						0.00025		
Propionaldehyde	123386				8[35]						
Propoxur (Baygon)	114261				14*						
Propylene	115071		3								3000
Propylene dichloride	78875		3		4		Acu	230	0.1		
(1,2-Dichloropropane)							Int	32			
Propylene glycol mono methyl ether (PGME)	107982				2000						7000
Propylene oxide	75569	R	2B	B2	30	0.3			0.27	3100	30
1,2-Propylenimine (2-Methyl aziridine)	75558	R	2B								
Quinoline	91225			B2		0.001*					

[35] EPA RfC for propionaldehyde proposed 3/08.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
Quinone	106514		3								
Radionuclides (including radon):		K	1								
Radon 222	14859677										
Selenium Compounds:		R (sulfide)	3	D	18*		Chr	17.5*			20
Hydrogen selenide	7783075									5	
Selenium sulfide	7446346			B2			Chr	17.5*			20
Sodium hydroxide	1310932									8	4.8
Styrene	100425		2B		1000		Acu	8520[36]		21000	900
							Chr	850			
Styrene oxide	96093	R (7,8)	2A (7,8)						0.022		
Sulfates										120	25
Sulfuric acid/oleum	7664939									120	1
1,1,1,2-Tetrachloroethane	630206		3	C	105*	0.1					
1,1,2,2-Tetrachloroethane	79345		3	C		0.02	Int	1750*[37]	0.017		
Tetrachloroethylene	127184	R	2A		35*		Acu	1378	0.17	20000	35
(Perchloroethylene)							Chr	270			
Tetrachlorophenols	25167833										88
1,1,1,2-Tetrafluoroethane	811972				80000						
Thioacetamide	62555	R	2B						0.00059		
Titanium tetrachloride	7550450						Int	10			
							Chr	0.1			
Toluene	108883		3	D	5000[38]		Acu	3800		37000	300
							Chr	300			

[36] ATSDR MRLs for styrene revised 9/07 (draft).
[37] ATSDR MRL for 1,1,2,2-tetrachloroethane revised 9/06 (draft).
[38] EPA RfC for toluene revised on IRIS 9/05.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
2,4-Toluene diamine (2,4-diaminotoluene)	95807		2B						0.00091		
2,4-and 2,6-Toulene diisocyanate	26471625	R	2B (ALL)		0.07				0.091		0.07
o-Toluidine	95534	R	2A	B2					0.020		
Toxaphene	8001352	R	2B	B2		0.003	Acu	17.5*	0.0029		
(chlorinatd camphene)							Int	3.5*			
1,2,4-Trichlorobenzene	120821			D	35*						
1,1,2-Trichloroethane	79005		3	C	14*	0.06	Acu	1050*	0.063		
							Int	140*			
Trichloroethylene	79016	R	2A	B2-C			Acu	10920	0.50		600
							Int	546			
Trichlorofluoromethane	75694				1100*						
2,4,5-Trichlorophenol	95954			D	350*						
2,4,6-Trichlorophenol	88062	R		B2		0.3			0.050		
Triethylamine	121448				7					2800	200
Trifluralin	1582098		3	C	26*	0.5*					
2,2,4-Trimethylpentane	540841										
Vanadium							Acu	0.2		30	
Vanadium pentoxide	1314621		2B		30*					30	
Vinyl acetate	108054		2B		200		Int	35.2			200
Vinyl bromide	593602	R	2A		3						
Vinyl chloride	75014	K	1	A	100	0.23	Acu	1300	0.013	180000	26
							Int	77			
Vinylidene chloride (1,1-Dichloroethylene)	75354		3	C	200	0.02	Int	79			70
Xylenes	1330207		3	D	100		Acu	8820[39]		22000	700

[39] ATSDR MRLs for mixed xylenes revised 8/07.

Table B – Health Benchmarks		NTP	IARC	EPA			ATSDR MRL		California		
CHEMICAL NAME	CAS #	Cancer Class	Cancer Class	Cancer Class	RfC or RfD (ug/m3)	10-6 Risk (ug/m3)	Duration	Level (ug/m3)	10-6 Risk (ug/m3)	Ac REL (ug/m3)	Chr REL (ug/m3)
(isomers and mixtures)							Int	2646			
							Chr	220			
Zinc				D	1050*		Int/ch	1050*			35

* Values refer to oral RfD or MRL converted from mg/kg/day assuming 70 kg body weight and 20 m3 daily inhalation rate

** Asbestos level in units of fibers per meter cubed

*** IRIS states that no quantitative estimate is available for the carcinogenicity of chloromethyl methyl ether however, “risk is likely to be no more than that of BCME, a contaminant of chloromethyl methyl ether.” Using the IRIS oral potency of BCME of 1.6E-4/ ug/l, a 10^{-6} risk concentration of 1.6E-5 ug/m3 was derived.

Table C Additional Data Compiled for Substances with No IRIS, CAL or ATSDR Benchmarks									
	HEAST (from oral benchmarks)			NYSDEC				CAL	Cancer Class
	Subchronic	Chronic	Cancer 10^{-6}	Short-term		Annual		NSRL	
	$\mu g/m^3$			$\mu g/m^3$	Basis	$\mu g/m^3$	Basis	$\mu g/m^3$	
Calcium cyanamide						1.2	TLV		
Carbonyl sulfide				250	DEC	28	DEC		
Catechol				5800	Anal.	55	TLV		2B
Chloroacetic acid	70*	7*		30	DEC	7	DEC		
Diazomethane						0.81	TLV		
Diethyl sulfate						1.2	Anal.	0.035-dr	2A,R
3,3'-Dimethoxybenzidine			0.25*					0.0075	2B,R
3,3'-Dimethyl benzidine			0.004*			0.6		0.0022	2B,R
Dimethyl phthalate						12	TLV		
Dimethyl sulfate						1.2	TLV	0.0025-dr	B2
Hexamethylphosphoramide								0.0005-dr	2B,R
Hydroquinone	1000*	100*				4.8	TLV		3
Methyl hydrazine						0.045	TLV	0.0045	B2
Methyl iodide (Iodomethane)						29	TLV		C,3
4-Nitrobiphenyl						2E-5	HT De M		
4-Nitrophenol									3
Parathion	20*	20*				0.12	TLV		C,3
p-Phenylenediamine		700*				0.24	TLV		3
1,2-Propylenimine (2-Methyl aziridine)						11	TLV	0.0014	B2
Quinone						1	TLV		
2,2,4-Trimethylpentane						3300	TLV		

Key to Table C:

- Provisional RfDs are listed in EPA's Health Effects Notebook but are not currently on IRIS.
- Draft NSRLs are the No Significant Risk Levels listed as draft in CAL's "Proposition 65 Status Report, dated February 2001.
- DEC and DOH means values derived by NYSDEC and NYSDOH, respectively.
- STELs and TLVs are occupational standards derived by OSHA for peak and 8-hour exposures, respectively.
- Anal. denotes derivations by analogy to the toxicity of a similar substance.
- HT and MLT DeM denotes de minimus values assigned to high and medium-low toxicity substances, respectively.
- Cancer classifications B2 and C are EPA classifications, Classes 2B and 3 are IARC classifications, and R is a NTP classification

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Acetaldehyde	75070							0.5	IRIS	cancer B2	5
Acetamide	60355							0.05	CAL	cancer 2B	0.5
Acetone	67641	60,000	ATSDR	Neurology	30,000	ATSDR	Neurology				
Acetonitrile	75058				60	RfC	mortality				
Acetophenone	98862				300	RfD	general tox				
2-Acetylamino fluorene	53963							0.0008	CAL	cancer R	0.008
Acrolein	107028	0.2	CAL	Eye irrit				0.02	RfC	nasal epith	0.02
Acrylamide	79061							0.0008	IRIS	cancer B2	0.008
Acrylic Acid	79107	6,000	CAL	Resp irrit	1	RfC					
Acrylonitrile	107131	200	ATSDR	Neurology				0.01	IRIS	cancer B1	0.1
Aldrin	309002	7	ATSDRo	Devlpmnt	0. 1	RfD	Liver	0.00002	IRIS/10	Cancer B2, PBT	0.0002
Allyl Chloride	107051				1	RfC	Neurology				
2-Amino anthraquinone	117793							0.1	CAL	cancer R	1
4-Aminobiphenyl	92671							0.0002	CAL	cancer 1,K	0.002
Ammonia	7664417	1,000	ATSDR	Respiratory	100	RfC	Respiratory	70	ATSDR	Respiratory	70
Aniline	62533				1	RfC	Spleen	0.6	CAL	cancer B2	
o-Anisidine	90040							0.02	CAL	Cancer 2B,R	0.2
Antimony & cmpds exc. Antimony trioxide					0.2	RfC	Pulmonary				
Antimony trioxide	1309644				0.2	RfC	Pulmonary	0.02	RfC/10	Cancer 2B	0.02
Aramite	140578							0.1	IRIS	Cancer B2	1
Arsenic compounds (inorganic)		0.2	CAL	Repro/ Develpmt				0.0002	IRIS	Cancer A	0.002
Arsine	7784421	200	CAL	Hematolgy	0.05	RfC	hematology spleen				
Asbestos	1332214							4*	IRIS	Cancer A	40*
Azobenzene	103333							0.03	IRIS	Cancer B2	0.3
Barium	7440393				700	RfD					

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
							Neuropathy				
Benzene	71432	30	ATSDR	immunolgy	20	ATSDR	immunology	0.1	IRIS	cancer A	1
Benzidine	92875							0.00002	IRIS	cancer A	0.0002
Benzoic acid	65850				10,000	RfD	general tox				
Benzotrichloride	98077							0.0003	IRIS oral	cancer B2	0.003
Benzyl Chloride	100447	200	CAL	Eye, resp. irritation				0.02	CAL	cancer B2	0.2
Beryllium compounds					0.02	RfC	Sensitizatn	0.0004	IRIS	Cancer B1	0.004
Biphenyl	92524				200	RfD	Kidney				
Bis (chloromethyl) ether	542881				1	ATSDR	Respiratory	0.00002	IRIS	cancer A	0.0002
Bis(2-ethylhexyl) phthalate (DEHP)	117817				70	RfD	Liver wt	0.4	CAL	cancer B2	4
Boron and borates		10	ATSDR	Respiratory							
Bromates (incl. Potassium bromate)					10	RfD	Renal hyperplasia	0.007	CAL	cancer B2	0.07
Bromine and cmpds (exc HBr&bromates)								2	CAL	respiratory	2
Bromodichlorometh ane	75274	100	ATSDRo	Liver	70	RfD	Renal cytomegaly	0.03	CAL	cancer B2	0.3
Bromoform	75252	2000	ATSDRo	Neurology	70	RfD	Hepatic lesions	0.9	IRIS	cancer B2	9
1,3-Butadiene	106990							0.03	IRIS	cancer K,1	0.3
Butyl benzyl phthalate	85687				700	RfD	Liver wt				
Cadmium compounds					0.1	RfD/20	Kidney	0.0006	IRIS	Cancer B1	0.006
Calcium cyanamide	**156627**							**1**	**NY**	**TLV**	**1**
Captan	133062				500	RfD	Body wt	1	CAL	cancer B2	10
Carbaryl	63252				300	RfD	Kidney,liver				
Carbon disulfide	75150	6,000	CAL	Repro/				700	RfC	Periph Nervo	700

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
				develpmt						sys .	
Carbon tetrachloride	56235	2,000	CAL	Repro/ develpmt	200	ATSDR	liver	0.07	IRIS	cancer B2	0.7
Carbonyl sulfide	**463581**	**200**	**NY**					**30**	**NY**	**DEC**	30
Catechol	**120809**	**6000**	**NY**					**5**	**NY/10**	**TLV,cancr 2B**	**5**
Chloramben	133904				50	RfD	liver				
Chlordane	57749				0.7	RfC	liver	0.001	IRIS/10	Cancer B2, PBT	0.01
Chlorinated paraffins (avg length C12- C13, 60% Cl)	108171262							0.04	CAL	Cancer R	0.4
Chlorine	7782505	200	CAL/ATSDR	Respiratory	6	ATSDR	Respiratory	0.1	ATSDR	Respiratory	0.1
Chlorine dioxide	10049044				3	ATSDR	Respiratory	0.2	RfC	Respiratory	0.2
Chloroacetic acid	**79118**				**30**	**NYSDEC**		**7**	**NYDEC**		**7**
2-Chloro acetophenone	532274				0.03	RfC	Nasal Resp Epith				
4-Chloroaniline	106478				10	RfD	Splenic capsule	1	RfD/10	Cancer 2B	1
Chlorobenzene	108907							1,000	CAL	Alimentary, Kidney,Repro.	1,000
Chlorobenzilate	510156				70	RfD	Body wt				
1-Chloro-1,1-difluoroethane (CFC 142B)	75683				50,000	RfC	NOAEL				
Chlorodifluoro Methane (HCFC-22)	75456				50,000	RfC	Kidney, endocrine				
Chloroform	67663	100 (7 hr)	CAL	Reprod/ develpmt				0.2	CAL	cancer B2	2
Chloromethyl methyl ether	107302							0.001	CAL	cancer A	0.01
2-Chlorophenol	95578				20	RfD	Reprodctve				
4-Chloro-o-	95830							0.2	CAL	cancer 2B,R	2

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
phenylenediamine											
Chloropicrin	76062	30	CAL	Eye, resp. irritation				0.4	CAL	respiratory	0.4
Chloroprene	126998							1	CAL	cent, periph nerv sys	1
p-chloro-o-toluidine	95692							0.01	CAL	cancer 2A,R	0.1
Chromium III (insoluble salts)					5000	RfD	NOAEL				
Chromium VI-mists and aerosols					0.008	RfC	Nasal septum	0.00008	IRIS	Cancer A	0.0008
Chromium VI-particulate					1	ATSDR	Respiratory	0.00008	IRIS	Cancer A	0.0008
Cobalt compounds								0.01	ATSDR/ 10	Respiratory, Cancer 2B	0.01
Coke oven Emissions	8007452							0.002	IRIS	Cancer A	0.02
Copper and compounds (except Copper cyanide)		100	CAL	Resp irrit				2	CAL	Respiratory	2
p-cresidine	120718							0.02	CAL	cancer 2B,R	0.2
Cresols/Cresylic acid (methylphenols)	1319773							600	CAL	nervous sys	600
Cumene	98828				400	RfC	Kidney, adrenal wt				
Cupferron	135206							0.02	CAL	Cancer R	0.2
Cyanide and Cmpnds (inorganic), except HCN		300	CAL	Neurology				9	CAL	cardiovasclr, endocrine, nerv system	9
Cyclohexane	110827				6,000	RfC	develpmntl				
2,4-Diaminoanisole	615054							0.2	CAL	cancer 2B	2
2,4-Diaminotoluene	95807							0.0009	CAL	cancer 2B	0.009
Diazomethane	**334883**							**0.8**	**NY**		**0.8**

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Dibromochloro methane	124481	300	ATSDRo	liver	70	RfD	liver lesions				
1,2-Dibromo-3-chloropropane	96128				0.2	RfC	Testicular	0.0005	CAL	cancer 2B,R	0.005
Dibutylphthalate	84742	2000	ATSDRo	Devlpmnt	300	RfD	Mortality				
1,2-Dichloro benzene	*95501*	2000	ATSDRo	liver				300	RfD	liver lesions	300
1,4- Dichloro benzene (p)	106467	12,000	ATSDR	ocular	800	RfC	liver/reprod	0.09	CAL	Cancer 2B,R	0.9
3,3'-Dichloro benzidene	91941							0.003	CAL	cancer B2	0.03
Dichloro diphenyl dichloroethylene (DDE)	3547044							0.01	CAL	cancer B2	0.1
1,2-Dichloroethene (cis)	156592	3000	ATSDRo	hematology	1000	ATSDRo	hematology				
1,2-Dichloroethene (trans)	156605	800	ATSDR	Liver				70	RfD	hematology	70
Dichloroethyl ether (Bis (chloroethyl) ether)	111444				100	ATSDR	Body wt	0.003	IRIS	cancer B2	0.03
2,4-Dichloro phenoxyacetic acid	94757				30	RfD	hematlgy, hep, ren				
1,3-Dichloropropene	542756				20	RfC	Nasal Epith	0.2	IRIS	cancer B2	2
Dichlorvos	62737	20	ATSDR	Neurology	3	ATSDR	neurology	0.01	CAL	cancer B2	0.1
Dieldrin	60571				0. 2	RfD	Liver	0.0002	IRIS	Cancer B2	0.002
Diethanolamine	111422							3	CAL	Cardvas, nerv	3
Diethyl sulfate	**64675**							**0.003**	**dr NSRL/10**	**cancer 2A,R**	**0.03**
1,1-Difluoroethane (HCFC 152a)	75376				40,000	RfC	NOAEL				
3,3'-Dimethoxy benzidine	**119904**							**0.0008**	**NSRL/10**	**cancer 2B,R**	**0.008**

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Dimethyl aminoazo Benzene (p)	60177							0.0008	CAL	cancer B2	0.008
n,n-Dimethyl aniline	121697				7	RfD	Spleen				
3,3'-Dimethyl benzidine	**119937**							**0.0002**	**NSRL/10**	**cancer R**	**0.002**
Dimethyl carbamoyl chloride	79447							0.0003	CAL	Cancer B2	0.003
Dimethyl formamide	68122							30	RfC	liver	30
1,1-Dimethyl hydrazine	57147				0.5	ATSDR	liver	0.001	dr NRSL/10	Cancer B2	0.01
1,2-Dimethyl hydrazine	*540738*				3	ATSDRo	liver	0.000006	CAL	Cancer 2A	0.00006
2,4-Dimethylphenol	105679				70	RfD	hematolgy, clin. signs				
Dimethyl phthalate	**131113**							**10**	**NY**	**TLV**	**10**
Dimethyl sulfate	**77781**							**0.0002**	**dr NSRL/10**	**Cancer B2**	**0.002**
4,6-Dinitro-o-cresol	534521	10	ATSDRo	Neurology							
2,4-Dinitrophenol	51285	30	ATSDRo	Body wt.	7	RfD	Cataracts				
2,4-Dinitrotoluene	121142	200	ATSDR	Neurology	7	RfD	Neurology	0.01	CAL	cancer B2	0.1
1,4-Dioxane (1,4-Diethyleneoxide)	123911	3,000	CAL	Eye, resp. irritation				0.1	CAL	cancer B2	1
1,2-Diphenyl hydrazine (hydrazobenzene)	122667							0.005	IRIS	cancer B2	0.05
Epichlorohydrin	106898	1,000	CAL	Eye, resp. irritation				0.8	IRIS/RfC	Nasal, cancer B2	1
1,2-Epoxybutane	106887							2	RfC/10	Nasal, Cancer 2B	2
Ethyl acrylate	140885							0.5	CAL/100	cancer B2	0.5
Ethyl benzene	100414	40,000	ATSDR	Neurology	3,000	ATSDR	Neurology	1,000	RfC/ ATSDR	Devlpmnt/ kidney	1,000
Ethyl carbamate	51796							0.003	CAL	cancer B2	0.03

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
(urethane)											
Ethyl chloride (Chloroethane)	75003	40,000	ATSDR	Devlpmnt	10,000	RfC	Devlpmnt				
Ethylene dibromide (Dibromoethane)	106934				9	RfC	Nasal inflamation	0.002	IRIS	cancer B2	0.02
Ethylene dichloride (1,2-Dichloroethane)	107062							0.04	IRIS	cancer B2	0.4
Ethylene glycol	107211	2,000	ATSDR	Respiratory				400	CAL	kidney, resp.	400
Ethylene glycol monobutyl ether	111762	10,000	CAL	Eye, resp. irritation				1,000	ATSDR	Hematology,	1,000
Ethylene glycol monoethyl ether	110805	400	CAL	Repro/ Develpmt	200	RfC	Testicular	70	CAL	reproductive, hematopoietic	70
Ethylene glycol monoethyl ether acetate	111159	100	CAL	Repro/ Develpmt							
Ethylene glycol monomethyl ether	109864	90	CAL	Repro/ Develpmt				20	RfC	Testicular	20
Ethylene glycol monomethyl ether acetate	110496							90	CAL	reproductive	90
Ethylene imine (Aziridine)	151564							0.00005	CAL	cancer B2	0.0005
Ethylene oxide	75218				200	ATSDR	Kidney	0.01	CAL	cancer B1	0.1
Ethylene thiourea	96457							0.08	CAL	cancer B2/ RfD -thyroid	0.3
Ethylidene dichloride (1,1-Dichloroethane)	75343							0.6	CAL	Cancer C	6
Fluorides & cmpds (incl HF)		20	ATSDR	Respiratory	3		Phytotox.				
Formaldehyde	50000	50	ATSDR	Resp irrit	40	ATSDR	Respiratory	0.08	IRIS	cancer B1	0.8
Glutaraldehyde	111308							0.08	CAL	respiratory	0.08

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Heptachlor	76448	2	ATSDRo	Reproduc.	0.4	ATSDRo	Immuno.	0.00008	IRIS/10	Cancer B2, PBT	0.0008
Hexachlorobenzene	118741	30	ATSDRo	Devlpmnt	0.4	ATSDRo	Reprodctve	0.0002	IRIS/10	cancer B2, PBT	0.002
Hexachloro Butadiene	87683				0. 7	ATSDRo	Kidney				
Hexachlorocyclo Hexanes, technical & mixed isomers	608731							0.002	IRIS	cancer B2	0.02
Alpha Hexchloro Cyclohexane	319846							0.0006	IRIS	cancer B2	0.006
Beta Hexchloro Cyclohexane	319857	200	ATSDRo	Neurology	2	ATSDRo	liver	0.002	IRIS	Cancer C,2B,R	0.02
Gamma Hexachloro Cyclohexane (lindane)	58899	10	ATSDRo	Devlpmnt	0.04	ATSDRo	Immuno.	0.003	CAL	Cancer 2B, R	0.03
Hexachlorocyclo Pentadiene	77474				100	ATSDR	Respiratory	0.2	RfC	Nose	0.2
Hexachloroethane	67721	60,000	ATSDR	Neurology				0.3	IRIS	Cancer C,2B,R	3
Hexamethylene-1,6-diisocyanate	822060				n 0.2	ATSDR	Respiratory	0.03	RfC X 3	Olfactory epithelium	0.03
Hexamethyl Phosphoramide	**680319**							**0.00005**	**NSRL/10**	**Cancer 2B,R**	**0.0005**
Hexane	110543							700	RfC	Peripheral neurophathy	700
Hydrazine	302012				5	ATSDR	Liver	0.0002	IRIS	Cancer B2	0.002
Hydrochloric acid (hydrogen chloride)	7647010	2,000	CAL	Eye, resp. irritation				9	CAL	respiratory	9
Hydrogen bromide	10035106							20	CAL	respiratory	20
Hydrogen cyanide	74908	300	CAL	Neurology				3	RfC	Neurolgy, endocrine	3
Hydrogen sulfide	7783064	40	CAL	Resp irrit	30	ATSDR	respiratory	10	CAL	respiratory	10

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Hydroquinone	**123319**				**1000**	**sc oral HEAST**	**hematol.**	**5**	**NY**	**occupational**	**5**
Isophorone	78591				700	RfD	Kidney				
Isopropanol	67630	3,000	CAL	Eye, resp. irritation							
Lead Compounds – inorganic:	1							0.008	CAL/10	Cancer B2,PBT	0.08
Tetraethyl lead	78002				3E-04	RfD	Livr,thymus				
Lindane – see hexachloro-Cyclohexanes	58899										
Maleic anhydride	108316	10	CAL	Resp irrit				0.7	CAL	respiratory	0.7
Manganese Compounds					0.05	RfC	Neurobehavior	0.04	ATSDR	Neurology	0.04
Mercury Cmpnds-Elem. & inorg		2	CAL	Repro/Develpmtl	0.3	RfC	Neurology	0.009	CAL/10	Neurology, PBT	0.009
Methylmercury	22967926				0. 3	RfD	Devlpmnt	0.003	RfD/100	Cancer C,2B, PBT	0.003
Methanol	67561	30,000	CAL	Neurology				4,000	CAL	Devlpmnt	4,000
Methoxychlor	72435				20	RfD	Reproductv				
Methyl bromide (Bromomethane)	74839	200	ATSDR	Neurology				5	RfC	Olfactory epithelium	5
Methyl chloride (Chloromethane)	74873	1,000	ATSDR	Neurology	400	ATSDR	Hepatic	90	RfC	Brain	90
Methyl chloroform (1,1,1-trichloroethane)	71556	9,000	Acute RfC	Neurobe-havioral	6,000	24-hr RfC	Neurobe-havioral	5,000	Chr RfC	Liver	5,000
4,4-Methylene bis (2-chloroaniline)	101144							0.002	CAL	Cancer 2A,R	0.02

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Methylene chloride (Dichloromethane)	75092	2,000	ATSDR	Neurology	1,000	ATSDR	liver	2	IRIS	Cancer B2	20
4,4-Methylenedianiline	101779	700	ATSDRo	liver	300	ATSDRo	liver	0.002	CAL	Cancer 2B,R	0.02
Methylene diphenyl diisocyanate	101688							0.6	RfC	Olfactory epithelium	0.6
Methyl ethyl ketone (2-Butanone)	78933	10,000	CAL	Eye, resp. irritation	5,000	RfC	Devlpmnt				
Methyl hydrazine	**60344**							**0.0004**	**NSRL/10**	**Cancer B2**	**0.004**
Methyl iodide (Iodomethane)	**74884**							**30**	**NY**	**TLV**	**30**
Methyl isobutyl ketone (Hexanone)	108101				3,000	RfC	Developmt				
Methyl isocyanate	624839							1	CAL	Respir, repro	1
Methyl methacrylate	80626				700	RfC					
Methyl tert butyl ether	1634044	7,000	ATSDR	Neurology	3,000	RfC	Liver, kidney				
Michler's ketone (4,4'-Bis(dimethyl Aminobenzo phenone)	90948							0.004	CAL	Cancer R	0.04
Fine mineral fibers								20	CAL	Respiratory	20
Molybdenum	7439-98-7				20	RfD	Serum uric acid				
Naphthalene	91203				3	RfC	nasal epithelium	0.03	CAL	Cancer C,2B,R	0.3
Nickel & Cmpds, Exc Ni subsulfide		6	CAL	Immune, resp. irrit	0.2	ATSDR	Respiratory	0.004	IRIS	cancer A-B2	0.04
Nickel subsulfide	12035722	6	CAL	Immune, resp. irrit	0.2	ATSDR	Respiratory	0.002	IRIS	cancer A	0.02
Nitric acid	7697372	90	CAL	Resp irrit							
Nitrobenzene	98953							2	CAL	Alimentary, hematological	2

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
4-Nitrobiphenyl	**92933**							**0.00002**	**NY**	**High Tox de minimus**	**0.00002**
4-Nitrophenol	**100027**							**0.1**	**NY**	**Min/Low Tox de minimus**	**0.1**
2-Nitropropane	79469				20	RfC	Liver	0.1	NRSL/10	Cancer B2	1
N-Nitrosodi-n-butylamine	924163							0.0006	IRIS	Cancer B2	0.006
N-Nitroso Diethylamine	55185							0.00002	IRIS	Cancer B2	0.0002
N-Nitroso Dimethylamine	62759							0.00007	IRIS	Cancer B2	0.0007
N-Nitroso Diphenylamine	86306							0.4	CAL	Cancer B2	4
N-Nitrosdi-n-propylamine	621647	300	ATSDRo	liver				0.0005	CAL	Cancer B2	0.005
N-Nitroso-n-methylethylamine	10595956							0.0002	CAL	Cancer 2A,R	0.002
N-Nitroso-n-methylurea	684935							0.00003	CAL	Cancer B2	0.0003
N-Nitroso Morpholine	59892							0.0005	CAL	Cancer 2B,R	0.005
N-Nitrosopiperidine	100754							0.0004	CAL	Cancer 2B,R	0.004
N-Nitrosopyrrolidine	930552							0.002	IRIS	Cancer B2	0.02
Parathion	**56382**				**20**	**sc oral HEAST**	**neurological**	**0.1**	**NY**	**occupational**	**0.1**
Pentachloronitrobenzene (quintozene)	82688				10	RfD	Liver				
Pentachlorophenol	87865	20	ATSDRo	Develpmt.	4	ATSDRo	Reprodctve	0.2	CAL	Cancer B2	2
Phenol	108952	80	ATSDR	Respiratory							
p-Phenylene diamine	**106503**							**0.2**	**NY**		**0.2**

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Phosgene	75445	4	CAL	Resp irrit	0.3	RfC	Fibrosis				
Phosphine	7803512							0.3	RfC	Body wt	0.3
Phosphoric acid	7664382							7	CAL	Respiratory	7
Phosphorus, white	7723140	20	ATSDR	Resp irrit	0.07	RfD/	Reproductv				
Phthalic anhydride	85449				7000	RfD	Lung,kid	20	CAL	respiratory	20
Polychlorinated biphenyls, except Aroclor 1254 and dioxin-like PCBs	1336363				0. 2	RfD	Reproduc tive	0.001	IRIS/10	Cancer B2, PBT	0.01
Aroclor 1254	11097691				0.07	RfD	Clin/immun				
PCDDs, PCDFs, and dioxin-like PCBs								3 E-9**	CAL/10	Cancer R, PBT	3 E-8**
Polycyclic Organic Matter								0.00009***	CAL/10	Cancer B2, PBT	0.0009***
1,3-Propane sultone	1120714							0.001	CAL	cancer 2B,R	0.01
Beta-Propiolactone	57578							0.0002	CAL	cancer 2B,R	0.002
Propionaldehyde	123386				8	RfC (prop)	nasal lesions				
Propoxur (Baygon)	114261				10	RfD	Neurotrans	0. 1	RfD/100	Cancer B2	0. 1
Propylene	115071							3,000	CAL	Respiratory	3,000
Propylene dichloride (1,2-Dichloro Propane)	78875	200	ATSDR	Resp irrit	4	RfC	Nasal mucosa	0.1	CAL	cancer B2	1
Propylene glycol monomethyl ether (PGME)	107982							7,000	CAL	Liver	7,000
Propylene oxide	75569	3,000	CAL	Eye, resp. irritation				0.3	IRIS	Cancer B2	3
1,2-Propylenimine (2-Methyl aziridine)	**75558**							**0.0001**	**NSRL/10**	**Cancer B2**	**0.001**
Quinoline	91225							0.001	IRISo	Cancer B2	0.01
Quinone	**106514**							**1**	**NY**		**1**
Selenium and								20	CAL	Alim.,cardio,	20

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Compounds										nervous sys	
Hydrogen selenide	7783075	5	CAL	Eye, resp. irritation							
Selenium sulfide	7446346				20	RfD	Clinical, biochem.	0.2	CAL/100	Respiratory, Cancer B2	0.2
Sodium hydroxide	1310932	8	CAL	Skin,eye, resp irrit				5	CAL	Skin,eye,resp	5
Styrene	100425	9,000	ATSDR	Neurology	1,000	RfC	Neurology	100	RfC/10	Cancer 2B	100
Styrene oxide	96093							0.02	CAL	Cancer 2A,R	0.2
Sulfates		100	CAL	Resp irrit				20	CAL	Respiratory	20
Sulfuric acid and oleum	7664939	100	CAL	Resp irrit				1	CAL	Respiratory	1
1,1,1,2-Tetrachloro ethane	*630206*				100	RfD	Kidney,liver				
1,1,2,2-Tetrachloro ethane	79345				2,000	ATSDRo	Liver				
Tetrachloroethylene (perchloroethylene)	127184	1,000	ATSDR	Neurology				0.2	CAL	Cancer B2-C, 2A	2
Tetrachlorophenols	25167833							90	CAL	Alimentary,Devlpmnt,Reprd	90
1,1,1,2-Tetrafluoroethane	811972				80,000	RfC	Testicular				
Thioacetamide	62555							0.0006	CAL	Cancer 2B,R	0.006
Titanium tetrachloride	7550450				10	ATSDR	Respiratory	0.1	ATSDR	Respiratory	0.1
Toluene	108883	4,000	ATSDR	Neurology				300	ATSDR, CAL	Neurology,eye ,resp.irrit	300
2,4-Toluene diamine (2,4-diamino toluene)	95807							0.0009	CAL	Cancer 2B	0.009
2,4-and 2,6-Toluene diisocyanate	26471625							0.07	RfC	Lung function	0.07
o-Toluidine	95534							0.02	CAL	Cancer B2	0.2
Toxaphene (chlor.	8001352	20	ATSDRo	liver	4	ATSDRo	liver	0.0003	IRIS/10	Cancer B2,	0.003

Table D Proposed Acceptable Ambient Levels (AALs) in μg/m^3 – Origins and Critical Organs											
CHEMICAL NAME	**CAS #**	one-hour AAL			24-hour AAL			Annual AAL			
		Level	source	organ/ effect	Level	source	organ/ effect	Table I Level	Source	organ/ effect	Table II Level
Camphene)										PBT	
1,2,4-Trichloro benzene	120821				30	RfD	Adrnl cortx, reprod				
1,1,2-Trichloro ethane	79005				10	RfD	Hematol.				
Trichloroethylene	79016	10,000	ATSDR	Neurology	500	ATSDR	Neurology	0.5	CAL	Cancer B2-C,2A	5
Trichlorofluoro Methane	75694				1000	RfD	Survival/ histopath				
2,4,5-Trichloro phenol	95954				300	RfD	Liver,kidn				
2,4,6-Trichloro phenol	88062							0.3	IRIS	Cancer B2	3
Triethylamine	121448	3,000	CAL	CNS,eye irrit				7	RfC	Nasal inflammatn	7
Trifluralin	1582098				30	RfD	Liver,blood	3	RfD/10	liver, blood, PBT	3
2,2,4-Trimethyl pentane	**540841**							**3000**	**NY**	**occupational**	**3000**
Vanadium and compounds		0.2	ATSDR	Respiratory							
Vinyl acetate	108054				200	RfC	Nasal epith.	20	RfC/10	Cancer C	20
Vinyl bromide	593602				3	RfC	Liver	0.005	NRSL/10	Cancer B2	0.05
Vinyl chloride	75014	1,000	ATSDR	Devlpmnt	100	RfC	Liver	0.2	IRIS	Cancer A	2
Vinylidene chloride (1,1-Dichloro ethylene)	75354				200	RfC	liver	70	CAL	Alimentary	70
Xylenes (isomers and mixtures)	1330207	9,000	ATSDR	Neurology	3,000	ATSDR	Neurology	100	RfC	Motor coordination	100
Zinc and compounds					1000	RfD	Hematolgy	30	CAL	Cardiovascular,hematology	30

ATSDRo = Oral REL from ATSDR

*Asbestos units are fibers/cubic meter.
**PCDD AALs are in terms of 2,3,7,8-tetrachlorodibenzodioxin equivalents, calculated using weighting factors specified in Table G.
**Polycyclic Organic Matter AALs are in benzo(a)pyrene equivalents, calculated using weighting factors specified in Table F.

Table E Comparison of 2004 and 2008 AALs	1- Hour Average		24-Hour Average		Table I Annual		Table II Annual	
	2004	2008	2004	2008	2004	2008	2004	2008
Acrolein	0.1	0.2	0.02			0.02		0.02
Ammonia	1000	1000		100	100	70	100	70
Barium			200	700				
Benzene	200	30	30	20	0.1	0.1	1	1
Boron and borates		10	30					
Carbon tetrachloride	1,000	2,000	300	200	0.07	0.07	0.7	0.7
Chlorine	200	200		6	0.2	0.1	0.2	0.1
Chlorine dioxide				3	0.2	0.2	0.2	0.2
Chloroacetic acid			70	30	0.00002	7	0.00002	7
Chlorobenzilate			70	70	0.7		0.7	
Dibromochlorormethane	100	300	70	70				
1,2-Dichlorobenzene		2000	300			300		300
1,4-Dichlorobenzene (p)	5,000	12,000	800	800	0.09	0.09	0.9	0.9
3,3'-Dimethoxybenzidine					0.0005	0.0008	0.005	0.008
Ethyl benzene		40000	1,000	3,000		1000		1000
Ethylene dibromide (Dibromoethane)				9	0.005	0.002	0.05	0.02
Ethylene glycol	1,000	2,000			400	400	400	400
Ethylene thiourea					0.08	0.08	0.8	0.3
Heptachlor		2	2	0.4	0.00008	0.00008	0.0008	0.0008
β-Hexchlorocyclohexane	700	200	2	2	0.002	0.002	0.02	0.02
γ-Hexachlorocyclohexane (lindane)	40	10	0.04	0.04	0.003	0.003	0.03	0.03
Hexane					200	700	200	700
Hydrogen sulfide	40	40		30	10	10	10	10
Methyl chloroform (1,1,1-trichloroethane)	10,000	9,000	4,000	6,000	1,000	5,000	1,000	5,000
Methyl iodide (Iodomethane)	4,000				30	30	30	30
Naphthalene				3	0.3	0.03	0.3	0.3
Nickel & Cmpds exc. nickel subsulfide	6	6		0.2	0.004	0.004	0.04	0.04
Nickel subsulfide	6	6		0.2	0.002	0.002	0.02	0.02
Parathion			20	20	0.2	0.1	0.2	0.1
Phenol	6,000	80			200		200	
Phosgene	4	4		0.3				
Propionaldehyde				8	100		100	
Styrene	20,000	9,000	1,000	1,000	100	100	100	100
1,1,2,2-Tetrachloroethane			3,000	2,000				
Toluene	4,000	4,000	400		300	300	300	300
2,2,4-Trimethylpentane					200	3000	200	3000
Xylenes (isomers and mixtures)	4,000	9,000	3,000	3,000	100	100	100	100

Table F Polycyclic Organic Matter Weighting Factors	
Polycyclic Organic Matter Constituent	**Weighting factor**
Anthracene	*0.3*
benz(a)anthracene	0.1
benzo(b)fluoranthene	0.1
benzo(j)fluoranthene	0.1
benzo(k)fluoranthene	0.1
benzo(a)pyrene	1
Chrysene	0.01
Cyclopenta(*cd*)pyrene	*0.1*
dibenz(a,h)acridine	0.1
dibenz(a,c)anthracene	*0.1*
dibenz(a,h)anthracene	1.1
dibenz(a,j)acridine	0.1
dibenzo(a,e)fluoranthene	*1*
dibenzo(a,e)pyrene	1
dibenzo(a,h)pyrene	10
dibenzo(a,i)pyrene	10
dibenzo(a,l)pyrene	10
7H-dibenzo(c,g)carbazole	1
7,12-dimethylbenz(a)anthracene	64
1,6-dinitropyrene	10
1,8-dinitropyrene	1
fluoranthene	*0.1*
ideno(1,2,3-c,d)pyrene	0.1
3-methylcholanthrene	5.7
5-methylchrysene	1
5-nitroacenaphthene	0.03
6-nitrochrysene	10
2-nitrofluorene	0.01
1-nitropyrene	0.1
4-nitropyrene	0.1

All weighting factors are based on California cancer potency factors except for those in italics. Italicized weighting factors are from the World Health Organization's Guidelines for Air Quality, Geneva, 2000.

Table G WHO Weighting Factors for PCDDs, PCDFs and Dioxin-like PCBs			
Cogener	**Weighting Factor**	**Cogener**	**Weighting Factor**
Dibenzo-p-dioxins		***Non-ortho PCBs***	
2,3,7,8-TCDD	1	PCB 77	0.0001
1,2,3,7,8-PnCDD	1	PCB 81	0.0001
1,2,3,4,7,8-HxCDD	0.1	PCB 126	0.1
1,2,3,6,7,8-HxCDD	0.1	PCB 169	0.01
1,2,3,7,8,9-HxCDD	0.1	***Mono-ortho PCBs***	
1,2,3,4,6,7,8-HpCDD	0.01	PCB 105	0.0001
OCDD	0.0001	PCB 114	0.0005
Dibenzofurans		PCB 118	0.0001
2,3,7,8-TCDF	0.1	PCB 123	0.0001
1,2,3,7,8-PnCDF	0.05	PCB 156	0.0005
2,3,4,7,8-PnCDF	0.5	PCB 157	0.0005
1,2,3,4,7,8-HxCDF	0.1	PCB 167	0.00001
1,2,3,6,7,8-HxCDF	0.1	PCB 189	0.0001
1,2,3,7,8,9-HxCDF	0.1		
2,3,4,6,7,8-HxCDF	0.1		
1,2,3,4,6,7,8-HpCDF	0.01		
1,2,3,4,7,8,9-HpCDF	0.01		
OCDF	0.0001		

Weighting factors are based on the conclusions of the World Health Organization meeting in Stockholm, Sweden, 15-18 June 1997, as reported in the WHO's Assessment of the Health Risk of Dioxins: Re-evaluation of the Tolerable Daily Intake, 1998.

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis
	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL				
Acetaldehyde			0.5			54.75	54.75	50	50	annual AAL
Acetamide			0.05			5.475	5.475	5	5	annual AAL
Acetone	60,000	30,000		21900	93600		21900	20000	20000	1-hr AAL
Acetonitrile		60			187.2		187.2	200	200	24-hr AAL
Acetophenone		300			936		936	900	900	24-hr AAL
2-Acetylaminofluorene			0.0008			0.0876	0.0876	0.09	0.09	annual AAL
Acrolein	0.2		0.02	0.073		2.19	0.073	0.07	0.07	1-hr AAL
Acrylamide			0.0008			0.0876	0.0876	0.09	0.09	annual AAL
Acrylic Acid	6,000	1		2190	3.12		3.12	3	3	24-hr AAL
Acrylonitrile	200		0.01	73		1.095	1.095	1	1	annual AAL
Aldrin	7	0.1	0.00002	2.555	0.312	0.00219	0.00219	0.002	0.002	annual AAL
Allyl Chloride		1			3.12		3.12	3	3	24-hr AAL
2- Aminoanthraquinone			0.1			10.95	10.95	10	10	annual AAL
4-Aminobiphenyl			0.0002			0.0219	0.0219	0.02	0.02	annual AAL
Ammonia	1000	100	70	365	312	7665	312	300	300	24-hr AAL
Aniline		1	0.6		3.12	65.7	3.12	3	3	24-hr AAL
o-Anisidine			0.02			2.19	2.19	2	2	annual AAL
Antimony & cmpds exc. trioxide*		0.2			0.624		0.624	0.6	0.6	24-hr AAL
Antimony trioxide*		0.2	0.02		0.624	2.19	0.624	0.6	0.6	24-hr AAL
Aramite			0.1			10.95	10.95	10	10	annual AAL
Arsenic & cmpds (inorganic)	0.2		0.0002	0.073		0.0219	0.0219	0.02	0.02	annual AAL
Arsine	200	0.05		73	0.156		0.156	0.2	0.2	24-hr AAL
Asbestos**			4			438	438	400	400	annual AAL
Azobenzene			0.03			3.285	3.285	3	3	annual AAL
Barium		700			2184		2184	2000	2000	24-hr AAL
Benzene	30	20	0.1	10.95	62.4	10.95	10.95	10	10	annual AAL
Benzidine			0.00002			0.00219	0.00219	0.002	0.002	annual AAL
Benzoic acid		10,000			31200		31200	30000	30000	24-hr AAL
Benzotrichloride			0.0003			0.03285	0.03285	0.03	0.03	annual AAL

Table H Derivation of Minimum Quantities (MQs)										
	AALs			MQs based on			Lowest MQ	1	Considering	Basis
CHEMICAL NAME	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL		significant digit	Reg. 9	
Benzyl Chloride	200		0.02	73		2.19	2.19	2	2	annual AAL
Beryllium & compounds		0.02	0.0004		0.0624	0.0438	0.0438	0.04	0.04	annual AAL
Biphenyl		200			624		624	600	600	24-hr AAL
Bis (chloromethyl) ether		1	0.00002		3.12	0.00219	0.00219	0.002	0.002	annual AAL
Bis(2-ethylhexyl) phthalate (DEHP)		70	0.4		218.4	43.8	43.8	40	40	annual AAL
Boron and borates	10			3.65			3.65	4	4	1-hr AAL
Bromates (incl. Potassium bromate)		10	0.007		31.2	0.7665	0.7665	0.8	0.8	annual AAL
Bromine & cmpds exc HBr & bromates			2			219	219	200	200	annual AAL
Bromodichloromethane	100	70	0.03	36.5	218.4	3.285	3.285	3	3	annual AAL
Bromoform	2000	70	0.9	730	218.4	98.55	98.55	100	100	annual AAL
1,3-Butadiene			0.03			3.285	3.285	3.0	3.0	annual AAL
Butyl benzyl phthalate		700			2184		2184	2000	2000	24-hr AAL
Cadmium & compounds		0.1	0.0006		0.312	0.0657	0.0657	0.07	0.07	annual AAL
Calcium cyanamide			1			109.5	109.5	100	100	annual AAL
Captan		500	1		1560	109.5	109.5	100	100	annual AAL
Carbaryl		300			936		936	900	900	24-hr AAL
Carbon disulfide	6,000		700	2190		76650	2184	2000	2000	1-hr AAL
Carbon tetrachloride	1,000	300	0.07	365	936	7.665	7.665	8	8	annual AAL
Carbonyl sulfide	200		30	73		3285	73	70	70	1-hr AAL
Catechol	6000		5	2190		547.5	547.5	500	500	annual AAL
Chloramben		50			156		156	200	200	24-hr AAL
Chlordane		0.7	0.001		2.184	0.1095	0.1095	0.1	0.1	annual AAL
Chlorinated paraffins (avg lngth C12-C13, 60% Cl)			0.04			4.38	4.38	4	4	annual AAL
Chlorine	200	6	0.1	73	18.72	10.95	10.95	10	10	annual AAL
Chlorine dioxide		3	0.2		9.36	21.9	9.36	9	9	24-hr AAL
Chloroacetic acid		30	7		93.6	766.5	93.6	90	90	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)										
	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis
CHEMICAL NAME	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL				
2-Chloroacetophenone		0.03			0.0936		0.0936	0.09	0.09	24-hr AAL
4-Chloroaniline		10	1		31.2	109.5	31.2	30	30	24-hr AAL
Chlorobenzene			1,000			109500	109500	100000	20,000	Reg. 9
Chlorobenzilate		70			218.4		218.4	200	200	24-hr AAL
1-Chloro-1,1-difluoroethane (CFC 142B)		50,000			156000		156000	200000	36500	Reg. 9
Chlorodifluoromethane (HCFC-22)		50,000			156000		156000	200000	36500	Reg. 9
Chloroform	140		0.2	51.1		21.9	21.9	20	20	annual AAL
Chloromethyl methyl ether			0.001			0.1095	0.1095	0.1	0.1	annual AAL
2-Chlorophenol		20			62.4		62.4	60	60	24-hr AAL
4-Chloro-o-phenylenediamine			0.2			21.9	21.9	20	20	annual AAL
Chloropicrin	30		0.4	10.95		43.8	10.95	10	10	1-hr AAL
Chloroprene			1			109.5	109.5	100	100	annual AAL
p-chloro-o-toluidine			0.01			1.095	1.095	1	1	annual AAL
Chromium III & compounds (insoluble salts)		5000			15600		15600	20000	20000	24-hr AAL
Chromium VI & compounds-mists and aerosols		0.008	0.00008		0.02496	0.00876	0.00876	0.009	0.009	annual AAL
Chromium VI & compounds- particulate		1	0.00008		3.12	0.00876	0.00876	0.009	0.009	annual AAL
Cobalt & compounds			0.01			1.095	1.095	1	1	annual AAL
Coke oven Emissions			0.002			0.219	0.219	0.2	0.2	annual AAL
Copper and compounds (exc copper cyanide)	100		2	36.5		219	36.5	40	40	annual AAL
p-Cresidine			0.02			2.19	2.19	2	2	annual AAL
Cresols/Cresylic acid (methylphenols)			600			65700	65700	70000	20000	Reg 9
Cumene		400			1248		1248	1000	1000	24-hr AAL
Cupferron			0.02			2.19	2.19	2	2	annual AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
Cyanide & Componds (inorganic), except HCN	300		9	109.5		985.5	109.5	100	100	1-hr AAL
2,4-Diaminoanisole			0.2			21.9	21.9	20	20	annual AAL
2,4-Diaminotoluene			0.0009			0.09855	0.09855	0.1	0.1	annual AAL
Diazomethane			0.8			87.6	87.6	90	90	annual AAL
Dibromochlorormethane	300	70		109.5	218.4		109.5	100	100	1-hr AAL
1,2-Dibromo-3-chloropropane		0.2	0.0005		0.624	0.05475	0.05475	0.05	0.05	annual AAL
Dibutylphthalate	2000	300		730	936		730	700	700	1-hr AAL
1,2-Dichlorobenzene	2000		300	730		32850	730	700	700	1-hr AAL
1,4-Dichlorobenzene (p)	12,000	800	0.09	4380	2496	9.855	9.855	10	10	annual AAL
3,3'-Dichlorobenzidene			0.003			0.3285	0.3285	0.3	0.3	annual AAL
Dichloro diphenyl dichloroethylene (DDE)			0.01			1.095	1.095	1	1	annual AAL
1,2-Dichloroethene (cis)	3000	1000		1095	3120		1095	1000	1000	1-hr AAL
1,2-Dichloroethene (trans)	800		70	292		7665	292	300	300	1-hr AAL
Dichloroethyl ether (Bis (chloroethyl) ether)		100	0.003		312	0.3285	0.3285	0.3	0.3	annual AAL
2,4-Dichlorophenoxyacetic acid		30			93.6		93.6	90	90	24-hr AAL
1,3-Dichloropropene		20	0.2		62.4	21.9	21.9	20	20	annual AAL
Dichlorvos	20	3	0.01	7.3	9.36	1.095	1.095	1	1	annual AAL
Dieldrin		0.2	0.0002		0.624	0.0219	0.0219	0.02	0.02	annual AAL
Diethanolamine			3			328.5	328.5	300	300	annual AAL
Diethyl sulfate			0.003			0.3285	0.3285	0.3	0.3	annual AAL
1,1-Difluoroethane (HCFC 152a)		40,000			124800		124800	100000	36500	Reg. 9
3,3'-Dimethoxybenzidine			0.0008			0.0876	0.087	0.09	0.09	annual AAL

Table H Derivation of Minimum Quantities (MQs)										
CHEMICAL NAME	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis
	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL				
							6			
Dimethyl aminoazobenzene (p)			0.0008			0.0876	0.0876	0.09	0.09	annual AAL
n,n-Dimethyl aniline		7			21.84		21.84	20	.0	24-hr AAL
3,3'-Dimethyl benzidine			0.0002			0.0214	0.0214	0.02	0.02	annual AAL
Dimethyl carbamoyl chloride			0.0003			0.03285	0.03285	0.03	0.03	annual AAL
Dimethyl formamide			30			3285	3285	3000	3000	annual AAL
1,1-Dimethyl hydrazine		0.5	0.001		1.56	0.1095	0.1095	0.1	0.1	annual AAL
1,2-Dimethyl hydrazine		3	0.000006		9.36	0.000657	0.000657	0.0007	0.0007	annual AAL
2,4-Dimethylphenol		70			218.4		218.4	200	200	24-hr AAL
Dimethyl phthalate			10			1095	1095	1000	1000	annual AAL
Dimethyl sulfate			0.0002			0.0219	0.0219	0.02	0.02	annual AAL
4,6-Dinitro-o-cresol	10			3.65			3.65	4	4	1-hr AAL
2,4-Dinitrophenol	30	7		10.95	21.84		10.95	10	10	1-hr AAL
2,4-Dinitrotoluene	200	.7	0.01	73	21.84	1.095	1.095	1	1	annual AAL
1,4-Dioxane (1,4-Diethyleneoxide)	3,000		0.1	1095		10.95	10.95	10	10	annual AAL
1,2-Diphenylhydrazine (hydrazobenzene)			0.005			0.5475	0.5475	0.5	0.5	annual AAL
Epichlorohydrin	1,000		0.8	365		87.6	87.6	90	90	annual AAL
1,2-Epoxybutane			2			219	219	200	200	annual AAL
Ethyl acrylate			0.5			54.75	54.75	50	50	annual AAL
Ethyl benzene	40,000	3,000	1,000	14600	9360	109500	9360	9000	9000	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
Ethyl carbamate (urethane)			0.003			0.3285	0.3285	0.3	0.3	annual AAL
Ethyl chloride (chloroethane)	40,000	10,000		14600	31200		14600	10000	10000	1-hr AAL
Ethylene dibromide (dibromoethane)		9	0.002		28.08	0.219	0.219	0.2	0.2	annual AAL
Ethylene dichloride (1,2-Dichloroethane)			0.04			4.38	4.38	4	4	annual AAL
Ethylene glycol	2,000		400	730		43800	730	700	700	1-hr AAL
Ethylene glycol monobutyl ether	10,000		1,000	3650		109500	3650	4000	4000	1-hr AAL
Ethylene glycol monoethyl ether	400	200	70	146	624	7665	146	100	100	1-hr AAL
Ethylene glycol monoethyl ether acetate	100			36.5			36.5	40	40	1-hr AAL
Ethylene glycol monomethyl ether	90		20	32.85		2190	32.85	30	30	1-hr AAL
Ethylene glycol monomethyl ether acetate			90			9855	9855	10000	10000	annual AAL
Ethylene imine (aziridine)			0.00005			0.005475	0.005475	0.005	0.005	annual AAL
Ethylene oxide		200	0.01		624	1.095	1.095	1	1	annual AAL
Ethylene thiourea			0.08			8.76	8.76	9	9	annual AAL
Ethylidene dichloride (1,1-dichloroethane)			0.6			65.7	65.7	70	70	annual AAL
Fluorides & cmpds (incl HF)	20	3		7.3	9.36		7.3	7	7	1-hr AAL
Formaldehyde	50	40	0.08	18.25	124.8	8.76	8.76	9	9	annual AAL
Glutaraldehyde			0.08			8.76	8.76	9	9	annual AAL
Heptachlor	2	0.4	0.00008	0.73	1.248	0.00876	0.00876	0.009	0.009	annual AAL
Hexachlorobenzene	30	0.4	0.0002	10.95	1.248	0.0219	0.0219	0.02	0.02	annual AAL
Hexachlorobutadiene		0. 7			2.184			2	2	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)										
CHEMICAL NAME	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis
	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL				
							2.184			
Hexachlorocyclohexanes, technical & mixed isomers			0.002			0.219	0.219	0.2	0.2	annual AAL
alpha-Hexchlorocyclohexane			0.0006			0.0657	0.0657	0.07	0.07	annual AAL
beta-Hexchlorocyclohexane	200	2	0.002	73	6.24	0.219	0.219	0.2	0.2	annual AAL
gamma-Hexachlorocyclohexane (lindane)	10	0.04	0.003	3.65	0.1248	0.3285	0.1248	0.1	0.1	24-hr AAL
Hexachlorocyclopentadiene		100	0.2		312	21.9	21.9	20	20	annual AAL
Hexachloroethane	60,000		0.3	21900		32.85	32.85	30	30	annual AAL
Hexamethylene-1,6-diisocyanate		0.2	0.03		0.624	3.285	0.624	0.6	0.6	24-hr AAL
Hexamethylphosphoramide			0.00005			0.005475	0.005475	0.005	0.005	annual AAL
Hexane			700			76650	76650	80000	20,000	Reg. 9
Hydrazine		5	0.0002		15.6	0.0219	0.0219	0.02	0.02	annual AAL
Hydrochloric acid (hydrogen chloride)	2,000		9	730		985.5	730	700	700	1-hr AAL
Hydrogen bromide			20			2190	2190	2000	2000	annual AAL
Hydrogen cyanide	300		3	109.5		328.5	109.5	100	100	1-hr AAL
Hydrogen sulfide	40	30	10	14.6	93.6	1095	14.6	10	10	1-hr AAL
Hydroquinone		1000	5		3120	547.5	547.5	500	500	annual AAL
Isophorone		700			2184		2184	2000	2000	24-hr AAL
Isopropanol	3,000			1095			1095	1000	1000	1-hr AAL
Lead & compounds – inorganic			0.008			0.876	0.876	0.9	0.9	annual AAL
Tetraethyl lead		3.00E- 04			9.36E- 04		0.	9.E- 04	9.E- 04	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)										
	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis
CHEMICAL NAME	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL				
							000936			
Maleic anhydride	10		0.7	3.65		76.65	3.65	4	4	1-hr AAL
Manganese & compounds		0.05	0.04		0.156	4.38	0.156	0.2	0.2	24-hr AAL
Mercury & Cmpds-elemental & inorganic ***	2	0.3	0.009	0.73	0.936	0.9855	0.73	0.7	0.7	1-hr AAL
Methylmercury		0. 3	0. 003		0. 936	0. 3285	0. 3285	0. 3	0. 3	annual AAL
Methanol	30,000		4,000	10950		438000	10950	10000	10000	1-hr AAL
Methoxychlor		20			62.4		62.4	60	60	24-hr AAL
Methyl bromide (bromomethane)	200		5	73		547.5	73	70	70	1-hr AAL
Methyl chloride (chloromethane)	1,000	400	90	365	1248	9855	365	400	400	1-hr AAL
Methyl chloroform (1,1,1-trichloroethane)	9,000	6,000	5,000	3285	18720	547500	3285	3000	3000	1-hr AAL
4,4-Methylene bis (2-chloroaniline)			0.002			0.219	0.219	0.2	0.2	annual AAL
Methylene chloride (dichloromethane)	2,000	1,000	2	730	3120	219	219	200	200	annual AAL
4,4-Methylenedianiline	700	300	0.002	255.5	936	0.219	0.219	0.2	0.2	annual AAL
Methylene diphenyl diisocyanate			0.6			65.7	65.7	70	70	annual AAL
Methyl ethyl ketone (2-butanone)	10,000	5,000		3,650	15,600		3,650	4,000	4,000	24-hr AAL
Methyl hydrazine			0.0004			0.0438	0.0438	0.04	0.04	annual AAL
Methyl iodide (Iodomethane)			30			3285	3285	3000	3000	24-hr AAL
Methyl isobutyl ketone (hexanone)		3000			9360		9360	9000	9000	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
Methyl isocyanate			1			109.5	109.5	100	100	annual AAL
Methyl methacrylate		700			2184		2184	2000	2000	24-hr AAL
Methyl tert butyl ether	7,000	3,000		2555	9360		2555	3000	3000	1-hr AAL
Michler's ketone (4,4'-bis(dimethylaminobenzophenone)			0.004			0.438	0.438	0.4	0.4	annual AAL
Fine mineral fibers (avg. diameter ≤ 1 μm)			20			2190	2190	2190	2000	annual AAL
Molybdenum		20			62.4		62.4	60	60	24-hr AAL
Naphthalene		3	0.03		9.36	3.285	3.285	3	3	annual AAL
Nickel & cmpds exc. nickel subsulfide	6	0.2	0.004	2.19	0.624	0.438	0.438	0.4	0.4	annual AAL
Nickel subsulfide	6	0.2	0.002	2.19	0.624	0.219	0.219	0.2	0.2	annual AAL
Nitric acid	90			32.85			32.85	30	30	1-hr AAL
Nitrobenzene			2			219	219	200	200	annual AAL
4-Nitrobiphenyl			0.00002			0.00219	0.00219	0.002	0.002	annual AAL
4-Nitrophenol			0.1			10.95	10.95	10	10	annual AAL
2-Nitropropane		20	0.1		62.4	10.95	10.95	10	10	annual AAL
N-Nitrosodi-n-butylamine			0.0006			0.0657	0.0657	0.07	0.07	annual AAL
N-Nitrosodiethylamine			0.00002			0.00219	0.00219	0.002	0.002	annual AAL
N-Nitrosodimethylamine			0.00007			0.007665	0.007665	0.008	0.008	annual AAL
N-Nitrososdiphenylamine			0.4			43.8	43.8	40	40	annual AAL
N-Nitrosdi-n-propylamine	300		0.0005	109.5		0.05475	0.05475	0.05	0.05	annual AAL
N-Nitroso-n-methylethylamine			0.0002			0.0219	0.0219	0.02	0.02	annual AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
N-Nitroso-n-methylurea			0.00003			0.003285	0.003285	0.003	0.003	annual AAL
N-Nitrosomorpholine			0.0005			0.05475	0.05475	0.05	0.05	annual AAL
N-Nitrosopiperidine			0.0004			0.0438	0.0438	0.04	0.04	annual AAL
N-Nitrosopyrrolidine			0.002			0.219	0.219	0.2	0.2	annual AAL
Parathion		20	0.1		62.4	10.95	10.95	10	10	annual AAL
Pentachloronitrobenzene (quintozene)		10			31.2		31.2	30	30	24-hr AAL
Pentachlorophenol	20	4	0.2	7.3	12.48	21.9	7.3	7	7	1-hr AAL
Phenol	80			29.2			29.2	30	30	1-hr AAL
p-Phenylenediamine			0.2			21.9	21.9	20	20	annual AAL
Phosgene	4	0.3		1.46	0.936		0.936	0.9	0.9	24-hr AAL
Phosphine			0.3			32.85	32.85	30	30	annual AAL
Phosphoric acid			7			766.5	766.5	800	800	anuual AAL
Phosphorus, white	20	0.07		7.3	0.2184		0.2184	0.2	0.2	24-hr AAL
Phthalic anhydride		7000	20		21840	2190	2190	2000	2000	annual AAL
PCBs, exc Aroclor 1254 & dioxin-like PCBs		0. 2	0.001		0.624	0.1095	0.1095	0.1	0.1	annual AAL
PCBs -Aroclor 1254		0.07			0.2184		0.2184	0.2	0.2	24-hr AAL
PCDDs, PCDFs, and dioxin-like PCBs****			3.00E-09			3.285E-07	3.285E-07	3.E-07	3.E-07	annual AAL
Polycyclic Organic Matter*****			0.00009			0.009855	0.009855	0.01	0.01	annual AAL

Table H Derivation of Minimum Quantities (MQs)											
	AALs			MQs based on			Lowest MQ	1 significant digit	Considering Reg. 9	Basis	
CHEMICAL NAME	1-hr	24-hr	Annual	1-hr AAL	24-hr AAL	Annual AAL					
1,3-Propane sultone			0.001			0.1095	0.1095	0.1		0.1	annual AAL
beta-Propiolactone			0.0002			0.0219	0.0219	0.02		0.02	annual AAL
Propionaldehyde		8			24.96		24.96	20		20	24-hr AAL
Propoxur (Baygon)		10	0.1		31.2	10.95	10.95	10		10	annual AAL
Propylene			3,000			328500	328500	300000		36500	annual AAL
Propylene dichloride (1,2-dichloropropane)	200	4	0.1	73	12.48	10.95	10.95	10		10	annual AAL
Propylene glycol monomethyl ether (PGME)			7,000			766,500	766,500	800,000		36500	annual AAL
Propylene oxide	3,000		0.3	1095		32.85	32.85	30		30	annual AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
1,2-Propylenimine (2-methyl aziridine)			0.0001			0.01095	0.01095	0.01	0.01	annual AAL
Quinoline			0.001			0.1095	0.1095	0.1	0.1	annual AAL
Quinone			1			109.5	109.5	100	100	annual AAL
Selenium and compounds			20			2190	2190	2000	2000	annual AAL
Hydrogen selenide	5			1.825			1.825	2	2	1-hr AAL
Selenium sulfide		20	0.2		62.4	21.9	21.9	20	20	annual AAL
Sodium hydroxide	8		5	2.92		547.5	2.92	3	3	1-hr AAL
Styrene	9,000	1,000	100	3285	3120	10950	3120	3000	3000	24-hr AAL
Styrene oxide			0.02			2.19	2.19	2	2	annual AAL
Sulfates	100		20	36.5		2190	36.5	40	40	1-hr AAL
Sulfuric acid and oleum	100		1	36.5		109.5	36.5	40	40	1-hr AAL
1,1,1,2-Tetrachloroethane		100			312		312	300	300	24-hr AAL
1,1,2,2-Tetrachloroethane		2,000			6240		6240	6000	6000	24-hr AAL
Tetrachloroethylene (perchloroethylene)	1,000		0.2	365		21.9	21.9	20	20	annual AAL
Tetrachlorophenols			90			9855	9855	10000	10000	annual AAL
1,1,1,2-Tetrafluoroethane		80,000			249600		249600	200000	36500	Reg. 9
Thioacetamide			0.0006			0.0657	0.0657	0.07	0.07	annual AAL
Titanium tetrachloride		10	0.1		31.2	10.95	10.95	10	10	annual AAL
Toluene	4,000		300	1460		32850	1460	1000	1000	1-hr AAL
2,4-Toluene diamine (2,4-diamino toluene)			0.0009			0.09855	0.09855	0.1	0.1	annual AAL
2,4-and 2,6-Toluene diisocyanate			0.07			7.665	7.665	8	8	annual AAL
o-Toluidine			0.02			2.19	2.19	2	2	annual AAL
Toxaphene (chlor. camphene)	20	4	0.0003	7.3	12.48	0.03285	0.03285	0.03	0.03	annual AAL
1,2,4-Trichlorobenzene		30			93.6		93.6	90	90	24-hr AAL

Table H Derivation of Minimum Quantities (MQs)

CHEMICAL NAME	AALs 1-hr	AALs 24-hr	AALs Annual	MQs based on 1-hr AAL	MQs based on 24-hr AAL	MQs based on Annual AAL	Lowest MQ	1 significant digit	Considering Reg. 9	Basis
1,1,2-Trichloroethane		10			31.2		31.2	30	30	24-hr AAL
Trichloroethylene	10,000	500	0.5	3650	1560	54.75	54.75	50	50	annual AAL
Trichlorofluoromethane		1000			3120		3120	3000	3000	24-hr AAL
2,4,5-Trichlorophenol		300			936		936	900	900	24-hr AAL
2,4,6-Trichlorophenol			0.3			32.85	32.85	30	30	annual AAL
Triethylamine	3,000		7	1095		766.5	766.5	800	800	annual AAL
Trifluralin		30	3		93.6	328.5	93.6	90	90	24-hr AAL
2,2,4-Trimethylpentane			3000			328500	328500	300000	20000	Reg. 9
Vanadium and compounds	0.2			0.073			0.073	0.07	0.07	1-hr AAL
Vinyl acetate		200	20		624	2190	624	600	600	24-hr AAL
Vinyl bromide		3	0.005		9.36	0.5475	0.5475	0.5	0.5	annual AAL
Vinyl chloride	1,000	100	0.2	365	312	21.9	21.9	20	20	annual AAL
Vinylidene chloride (1,1-Dichloroethylene)		200	70		624	7665	624	600	600	24-hr AAL
Xylenes (isomers and mixtures)	9,000	3,000	100	3285	9360	10950	3285	3000	3000	1-hr AAL
Zinc and compounds		1000	30		3120	3285	3120	3000	30000.1095	24-hr AAL

*Asbestos units are fibers/year
**Antimony and antimony trioxide MQs are not separated in Regulation No. 22 because they are equal.
***Mercury and mercuric chloride MQs are not separated in Regulation No. 22 because they are equal.
****PCDD AALs are in terms of 2,3,7,8-tetrachlorodibenzodioxin equivalents, calculated using weighting factors specified in Table G.
*****Polycyclic Organic Matter AALs are in benzo(a)pyrene equivalents, calculated using weighting factors specified in Table F.

Table I Comparison of 2004 and 2008 Minimum Quantities for Air Toxics with Revised AALs		
CHEMICAL	**2004 MQ**	**2008 MQ**
Acrolein	0.04	0.07
Ammonia	400	300
Barium	600	2000
Benzene	10	10
Boron and borates	90	4
Carbon tetrachloride	8	8
Chlorine	20	10
Chlorine dioxide	20	9
Chloroacetic acid	0.002	90
Chlorobenzilate	80	200
Dibromochlorormethane	40	100
1,2-Dichlorobenzene	900	700
1,4-Dichlorobenzene (p)	10	10
3,3'-Dimethoxybenzidine	0.05	0.09
Ethyl benzene	3000	9000
Ethylene dibromide (Dibromoethane)	0.5	0.2
Ethylene glycol	400	700
Ethylene thiourea	9	9
Heptachlor	0.009	0.009
beta-Hexchlorocyclohexane	0.2	0.2
gamma-Hexachlorocyclohexane (lindane)	0.1	0.1
Hexane	20000	20000
Hydrogen sulfide	10	10
Methyl chloroform (1,1,1-trichloroethane)	4000	3000
Methyl iodide (Iodomethane)	1000	3000
Naphthalene	30	3
Nickel & Cmpds exc. nickel subsulfide	0.4	0.4
Nickel subsulfide	0.2	0.2
Parathion	20	10
Phenol	2000	30
Phosgene	1	0.9
Propionaldehyde	10000	20
Styrene	3000	3000
1,1,2,2-Tetrachloroethane	9000	6000
Toluene	1000	1000
2,2,4-Trimethylpentane	20000	20000
Xylenes (isomers and mixtures)	100	3000