Maricopa County Air Quality Department	Number: **TG-2011-001** Title: **Hazardous Air Pollutant (HAP) Permitting Technical Guidance**
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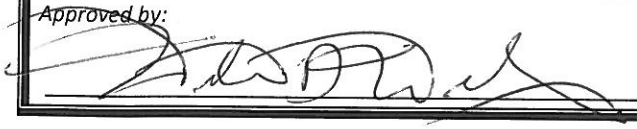
Approved by: 	**William D. Wiley, Director**

I. Purpose

This document provides technical guidance to be used by the department when developing a permit for a source that emits hazardous air pollutants (HAP). This guidance establishes a process to identify predicted air quality from HAP emissions.

II. Definitions

A. ***Ambient Air Concentration*** **(AAC)** means the amount of a substance present in that portion of the atmosphere, external to buildings, to which the general public has access.

B. ***Hazardous Air Pollutants (HAP)*** means any substance listed in Section 112(b)(1) of the federal Clean Air Act; and/or any HAP established under Arizona Revised Statutes (A.R.S.) 49-426.04.

C. ***Good Engineering Practice (GEP) Stack Height*** means a stack height meeting the requirements of Rule 240 §309.

D. ***Acute Ambient Air Concentration*** **(AAAC)** means the amount of a hazardous air pollutant, in the ambient air, above which the general population, including susceptible populations, could experience acute adverse effects to human health (this level is identified in Table 1 of this document).

E. ***Acute Adverse Effects to Human Health*** means those effects described in Arizona Revised Statutes (A.R.S.) §49-401.01(2 "...that result in or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, including adverse effects that are known to be or may reasonably be anticipated to be caused by substances that are acutely toxic, chronically toxic, carcinogenic, mutagenic, teratogenic, neurotoxic, or causative of reproductive dysfunction." Generally, these effects are characterized by rapid onset and short duration.

F. ***Chronic Ambient Air Concentration*** **(CAAC)** means the amount of a hazardous air pollutant, in the ambient air, above which the general population, including susceptible populations, could

experience chronic adverse effects to human health (this level is identified in Table 1 of this document).

G. ***Chronic Adverse Effects to Human Health*** means those effects described in the definition of "adverse effects to human health" contained in A.R.S. §49-401.01(2). Specifically, "...effects that result in or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, including adverse effects that are known to be or may reasonably be anticipated to be caused by substances that are acutely toxic, chronically toxic, carcinogenic, mutagenic, teratogenic, neurotoxic, or causative of reproductive dysfunction." Generally, such effects may be persistent, recurring, or long-term in nature or delayed in their onset.

H. ***Extremely Toxic*** means those HAP which are identified by EPA as the most threatening to public health. This list of 33 HAP can be found at EPA's Technology Transfer Network -- http://www.epa.gov/ttn/atw/urban/list33.html .

III. Procedural Guidance

Where the level of the proposed HAP emissions and the proximity off-site boundaries indicate the possibility that off-site concentrations may approach acute and/or chronic ambient air concentrations, the department intends to conduct an evaluation of the emissions using predictive air quality monitoring methods.

A. Evaluation Criteria

This evaluation will conform to the following:

1. Apply to the development of permits for new sources and permit renewals and revisions for existing sources.

2. Be conducted only for emissions of HAP.

3. Consider air emissions from the entire facility.

4. Evaluate releases occurring during normal business operation (events involving catastrophic or accidental releases are excluded from this evaluation).

5. Background concentrations or emissions from other sources will not be factored into the analysis.

6. Maximum potential exposures will be measured against the established acute and/or chronic ambient air concentration level for a pollutant. If there is no established acute or chronic ambient air concentration level, a value(s) will be determined using Appendix H of Maricopa County Air Quality Department Adopted Rules, "Procedures for Determining Ambient Air Concentrations for Hazardous Air Pollutants".

B. Steps in Permit Evaluation Process

The following five steps comprise the elements of the HAP permit evaluation process:

1. Determine if:

   a) The pollutant is a HAP by confirming the pollutant appears on the list found at: (http://www.epa.gov/ttn/atw/orig189.html);

   b) The pollutant is listed in the Acute and Chronic Ambient Air Concentration at Table 1 of this document.

   c) The proposed emissions of a HAP substance is sufficient in degree to indicate that the off-site concentrations of the HAP could approach levels identified in the Acute and Chronic Ambient Air Concentration list in Table 1 of this document.

   If the answer to each of these questions is yes, proceed to step 3, otherwise go to step 2.

2. If the pollutant is a HAP, but is not listed in Table 1, then use Appendix H (Maricopa County Air Quality Rules and Regulations) to determine the acute and chronic ambient air concentrations for the particular HAP. Once the values are determined proceed to step 3. If no data is available to allow the determination of Acute and Chronic Ambient Air Concentrations, then no further analysis is necessary.

3. Use a screening level (SCREEN3 at the time of this guidance) model to determine the maximum resulting concentration (either the applicant or the department may do the modeling). The model will identify ambient air concentrations of the HAP substance at locations where the general public has access. If the model predicts that the maximum concentration will be less than either the AAAC or CAAC for the pollutant, then the analysis is finished. Proceed to step 5. If the predicted concentrations are above the AAAC or CAAC for the pollutant, continue to step 4.

4. Inform the permit applicant of the results of the screening model and ensure the information is available to the public (include the information in any public factsheet).

5. Ensure the analysis is documented in the permit file. At a minimum, documentation should include placement of the following information in the permit file:

   a. A copy of any modeling used in the analysis,

   b. Sample calculations, if applicable,

   c. A section in the engineering Technical Support Document (TSD) describing any assumptions made or any unusual circumstances examined in reviewing the application, and

   d. A table in the engineering Technical Support Document (TSD) showing the relevant AACs and the predicted offsite concentrations.

C. Options Based on Results of the Analysis

There is no regulatory requirement to modify the permit based on the results of the analysis. A permit applicant may, upon review of the predictions contained in the analysis:

1. Submit results from another model, such as AERMOD, to provide a more accurate analysis; and/or

2. Request and propose conditions for inclusion within the proposed permit that will have the effect of reducing the facility's predicted off-site HAP concentrations to levels below the AAAC or CAAC.

Concentration reductions can be accomplished through conditions relating to material substitution, additional controls, usage or operational limitations, increasing stack height up to what would be allowed based on Good Engineering Practice, or any other method that is enforceable.

Table 1. Acute and Chronic Ambient Air Concentrations

Pollutant	Acute Ambient Air Concentrations (mg/m^3)	Chronic Ambient Air Concentrations (mg/m^3)
1,1,1-Trichloroethane (Methyl Chloroform)	2,075	2.30E+00
1,1,2,2-Tetrachloroethane	18	3.27E-05
1,3-Butadiene	7,514	6.32E-05
1,4-Dichlorobenzene	300	3.06E-04
2,2,4-Trimethylpentane	900	NA
2,4-Dinitrotoluene	5.0	2.13E-05
2-Chloroacetophenone	NA	3.13E-05
Acetaldehyde	306	8.62E-04
Acetophenone	25	3.65E-01
Acrolein	0.23	2.09E-05
Acrylonitrile	38	2.79E-05
Antimony Compounds (Selected Compound: Antimony)	13	1.46E-03
Arsenic Compounds (Selected Compound: Arsenic)	2.5	4.41E-07
Benzene	1,276	2.43E-04
Benzyl Chloride	26	3.96E-05
Beryllium Compounds (Selected Compound: Beryllium)	0.013	7.90E-07
Biphenyl	38	1.83E-01
bis (2-Ethylhexy) Phthalate	13	4.80E-04
Bromoform	7.5	1.72E-03
Cadmium Compounds (Selected Compound: Cadmium)	0.25	1.05E-06
Carbon Disulfide	311	7.30E-01
Carbon Tetrachloride	201	1.26E-04

Pollutant	Acute Ambient Air Concentrations (mg/m^3)	Chronic Ambient Air Concentrations (mg/m^3)
Carbonyl Sulfide	30	NA
Chlorobenzene	1,000	1.04E+00
Chloroform	195	3.58E-04
Chromium Compounds (Selected Compound: Hexavalent Chromium)	0.10	1.58E-07
Cobalt Compounds (Selected Compound: Cobalt)	10	6.86E-07
Cumene	935	4.17E-01
Cyanide Compounds (Selected Compound: Hydrogen Cyanide)	3.9	3.13E-03
Dibenzofurans	25	7.30E-03
Dichloromethane (Methylene Chloride)	347	4.03E-03
Dimethyl Formamide	164	3.13E-02
Dimethyl Sulfate	0.31	NA
Ethyl Benzene	250	1.04E+00
Ethyl Chloride (Chloroethane)	1,250	1.04E+01
Etylene Dibromide (Dibromoethane)	100	3.16E-06
Ethylene Dichloride (1,2-Dichloroethane)	405	7.29E-05
Ethylene Glycol	50	4.17E-01
Ethylidene Dichloride (1,1-Dichloroethane)	6,250	5.21E-01
Formaldehyde	17	1.46E-04
Glycol Ethers (Selected Compound: Diethylene Glycol, Monoethyl Ether)	250	3.14E-03
Hexachlorobenzene	0.50	4.12E-06
Hexane	11,649	2.21E+00
Hydrochloric Acid	16	2.09E-02
Hydrogen Fluoride (Hydrofluoric Acid)	9.8	1.46E-02
Isophorone	13	2.09E+00
Manganese Compounds (Selected Compound: Manganese)	2.5	5.21E-05
Mercury Compounds (Selected Compound: Elemental Mercury)	1.0	3.13E-04
Methanol	943	4.17E+00
Methyl Bromide	261	5.21E-03
Methyl Chloride	1,180	9.39E-02
Methyl Hydrazine	0.43	3.96E-07
Methyl Isobutyl Ketone (Hexone)	500	3.13E+00
Methyl Methacrylate	311	7.30E-01
Methyl Tert-Butyl Ether	1,444	7.40E-03
N, N-Dimethylaniline	25	7.30E-03
Naphthalene	75	5.58E-05
Nickel Compounds (Selected Compound: Nickel Refinery Dust)	5.0	7.90E-06
Phenol	58	2.09E-01
Polychlorinated Biphenyls (Selected Compound: Aroclor 1254)	2.5	1.90E-05
Polycyclic Organic Matter (Selected Compound: Benzo(a)pyrene)	5.0	2.02E-06

Pollutant	Acute Ambient Air Concentrations (mg/m^3)	Chronic Ambient Air Concentrations (mg/m^3)
Propionaldehyde	403	8.62E-04
Propylene Dichloride	250	4.17E-03
Selenium Compounds (Selected Compound: Selenium)	0.50	1.83E-02
Styrene	554	1.04E+00
Tetrachloroethylene (Perchloroethylene)	814	3.20E-04
Toluene	1,923	5.21E+00
Trichlorethylene	1,450	1.68E-05
Vinyl Acetate	387	2.09E-01
Vinyl Chloride	2,099	2.15E-04
Vinylidene Chloride (1,2-Dichloroethylene)	38	2.09E-01
Xylene (Mixed Isomers)	1,736	1.04E-01

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements. The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the department to give the rules in these policies that weight or deference. This document establishes the framework within which the department will exercise its administrative discretion in the future. The department reserves the discretion to deviate from this policy statement if circumstances warrant.