



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

**STAFF REPORT**

**JUNE 2005**

## **Appendix D**

**Proposed BAAQMD**

**Air Toxics NSR Program**

**Health Risk Screening Analysis**

**(HRSA) Guidelines**



**BAY AREA AIR QUALITY MANAGEMENT DISTRICT**  
**939 ELLIS STREET**  
**SAN FRANCISCO, CA 94109**

**Proposed BAAQMD Air Toxics NSR Program**  
**Health Risk Screening Analysis (HRSA) Guidelines**

**D1. INTRODUCTION**

This document describes the Bay Area Air Quality Management District's guidelines for conducting health risk screening analyses. Any health risk screening analysis (HRSA) that is required pursuant to Regulation 2 Permits, Rule 1 General Requirements or Rule 5 New Source Review of Toxic Air Contaminants shall be conducted in accordance with these guidelines.

In accordance with Regulation 2-5-402, these guidelines generally conform to the Health Risk Assessment Guidelines adopted by Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with State risk assessment and risk management policies and guidelines in effect as of January 1, 2005. Through the District's rule development process, these guidelines will periodically be updated to clarify procedures, amend health effects data, or incorporate other revisions to regulatory guidelines.

**D2. PROCEDURES**

The procedures described below constitute the Regulation 2-5-603 Health Risk Screening Analysis Procedures. Any HRSA shall be completed by following the procedures described in the OEHHA Health Risk Assessment Guidelines for the Air Toxics Hot Spots Program that were adopted by OEHHA on October 3, 2003 and any State risk assessment and risk management policies and guidelines in effect as of January 1, 2005.

The OEHHA Health Risk Assessment Guidelines contain several sections which identify (a) the overall methodology, (b) the exposure assessment assumptions and procedures, and (c) the health effects data (cancer potency factors, chronic reference exposure levels, and acute reference exposure levels).

A summary of OEHHA's Health Risk Assessment Guidelines and an index of the relevant documents are located at:

[http://www.oehha.ca.gov/air/hot\\_spots/index.html](http://www.oehha.ca.gov/air/hot_spots/index.html)

OEHHA's risk assessment methodology is located at:

[http://www.oehha.ca.gov/air/risk\\_assess/index.html](http://www.oehha.ca.gov/air/risk_assess/index.html)

The exposure assessment and stochastic technical support document (Part IV of OEHHA's Risk Assessment Guidelines) is located at:

[http://www.oehha.ca.gov/air/exposure\\_assess/index.html](http://www.oehha.ca.gov/air/exposure_assess/index.html)

The cancer potency factors for carcinogenic compounds (Part II of OEHHA's Risk Assessment Guidelines) are located at:

[http://www.oehha.ca.gov/air/cancer\\_guide/hasca2.html](http://www.oehha.ca.gov/air/cancer_guide/hasca2.html)

The chronic reference exposure levels (RELs), which are Part III of OEHHA's Risk Assessment Guideline, are located at:

[http://www.oehha.ca.gov/air/chronic\\_rels/index.html](http://www.oehha.ca.gov/air/chronic_rels/index.html)

The acute reference exposure levels (RELs), which are Part I of OEHHA's Risk Assessment Guideline, are located at:

[http://www.oehha.ca.gov/air/acute\\_rels/index.html](http://www.oehha.ca.gov/air/acute_rels/index.html)

Sections D2.1 through D2.3 below clarify and highlight some of the exposure assessment procedures including exposure assumptions (e.g., breathing rate and exposure duration) and health effect values to be used for conducting HRSAs.

## **D2.1 Clarifications of Exposure Assessment Procedures**

This section clarifies and highlights some of the exposure assessment procedures that should be followed when conducting an HRSA.

### **D2.1.1 Breathing Rate**

On October 9, 2003, a statewide interim Risk Management Policy for inhalation-based residential cancer risk was adopted by the California Air Resources Board (ARB) and Cal/EPA's OEHHA (<http://www.arb.ca.gov/toxics/rmpolicy.pdf>). For the HRSA methodology used in the Air Toxics NSR Program, the District has conformed with these State guidelines and adopted the interim exposure assessment recommendations made by ARB and OEHHA. The interim policy recommends where a single cancer risk value for a residential receptor is needed or prudent for risk management decision-making, the potential cancer risk estimate for the inhalation exposure pathway be based on the breathing rate representing the 80<sup>th</sup> percentile value of the breathing rate range of values (302 L/kg-day).

To assess potential inhalation exposure to offsite workers, OEHHA recommends assuming a breathing rate of 149 L/kg-day. This value corresponds to a 70 kg

worker breathing 1.3 m<sup>3</sup>/hour (breathing rate recommended by USEPA as an hourly average for outdoor workers) for an eight-hour day. For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95% percentile of daily breathing rates for children.

#### D2.1.2 Exposure Time and Frequency

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors assuming exposure occurs 24 hours per day for 350 days per year. For a worker receptor, exposure is assumed to occur 8 hours per day for 245 days per year. However, for some professions (e.g., teachers) a different schedule may be more appropriate. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year.

#### D2.1.3 Exposure Duration

Based on OEHHA recommendations, the District will estimate cancer risk to residential receptors based on a 70-year lifetime exposure. Although 9-year and 30-year exposure scenarios may be presented for information purposes, risk management decisions will be made based on 70-year exposure duration for residential receptors. For worker receptors, risk management decisions will be made based on OEHHA's recommended exposure duration of 40 years. Cancer risk estimates for children at school sites will be calculated based on a 9 year exposure duration.

### D2.2 Health Effects Values

Chemical-specific health effects values have been consolidated and are presented in Table 2-5-1 for use in conducting HRSAs. Toxicity criteria summarized in Table 2-5-1 represent health effects values that were adopted by OEHHA/ARB as of January 1, 2005. Prior to use in Regulation 2, Rule 5, any new or revised health effects values adopted by OEHHA/ARB after January 1, 2005 will be reviewed by the District through a rule development process. The District will evaluate the new criteria for implementation, enforcement, and feasibility of compliance with the project risk limits.

### D2.3 Stochastic Risk Assessment

For a stochastic, multipathway risk assessment, the potential cancer risk should be reported for the full distribution of exposure from all exposure pathways included in the risk assessment. For risk management decisions, the potential cancer risk from a stochastic, multipathway risk assessment should be based on the 95<sup>th</sup> percentile cancer risk.

### D3. Assessment of Acrolein Emissions

Currently, CARB does not have certified emission factors or an analytical test method for acrolein. Therefore, since the appropriate tools needed to implement and enforce acrolein emission limits are not available, the District will not conduct a HRSA for emissions of acrolein. In addition, due to the significant uncertainty in the derivation, OEHHA is currently re-evaluating the acute REL for acrolein. When the necessary tools are developed, the District will re-evaluate this specific evaluation procedure and the HRSA guidelines will be revised.

#### *References*

- 1 *“Air Toxics “Hot Spots” Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, ”, OEHHA, August 2003*
- 2 *“Air Toxics “Hot Spots” Program Risk Assessment Guidelines, Part IV. Technical Support Document for Exposure Assessment and Stochastic Analysis”, OEHHA, September 2000*
- 3 *“Air Toxics “Hot Spots” Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors”, OEHHA, updated December, 2002.*
- 4 *“Air Toxics “Hot Spots” Program Risk Assessment Guidelines, Part III, Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels”, OEHHA, April 2000.*
- 5 *“Air Toxics “Hot Spots” Program Risk Assessment Guidelines, Part I, Technical Support Document for the Determination of Acute Reference Exposure Levels for Airborne Toxicants”, OEHHA, March 1999.*