Supplemental Guidelines for Submission of Rule 1200 Health Risk Assessments (HRAs)

San Diego Air Pollution Control District
May 2019

Typically, the District conducts a Health Risk Assessments (HRA) for Rule 1200 purposes as part of the engineering evaluation for a permit application. An applicant may voluntary submit an HRA for District review. The submitted HRA should include all the information requested on the Rule 1200 Submittal Application (http://www.sdapcd.org/permits/APPS/AppsWord/ToxEval.doc). The District's review will verify that the HRA complies with the Guidelines adopted by the State Office of Environmental Health Hazard Assessment (OEHHA) and these supplemental guidelines.

This document provides supplemental guidance for modelling and user default options for the risk evaluation incorporated into the Hot Spots Analysis and Reporting Program (HARP) developed by the California Air Resources Board (ARB), OEHHA, and the Districts, which is the recommended program to use for Rule 1200 HRAs. The modelling portion of the evaluation may also be performed using a vendor front-end software program (i.e., BEE-Line BEEST and Lakes Environmental) then imported into HARP.

1. **Guidelines** HRAs submitted to the District will be reviewed according to the most recent guidelines that are approved at the time of the review. The most recent OEHHA Guidelines are at: http://oehha.ca.gov/air/hot_spots/hotspots2015.html . This includes the Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments (February, 2015). These District supplemental guidelines may be changed or amended as necessary.

2. **Elements of a HRA** HRAs shall include the following elements: the estimated maximum residential 30-year exposures cancer risk, the maximum occupational 25-year exposure cancer risk, the estimated maximum non-cancer chronic health hazard index (HHI), the estimated 8-hour chronic HHI, and the estimated maximum non-cancer acute HHI. These risk estimates shall each be made for the offsite point of maximum health impact (PMI), the maximally exposed individual resident (MEIR), and the maximally exposed individual worker (MEIW). The location of each of these receptors shall also be specified. Cancer and non-cancer chronic risk estimates shall include estimates of both inhalation and multipathway noninhalation risks. HRAs resulting in a maximum incremental cancer risk of greater than 10 in one million shall also include estimates of population cancer burden as specified in Section (d)(1)(iii). using the lifetime 70-year exposure duration. Refer to the OEHHA Guidance Manual, Section 4.7.1, Receptor Points.

3. **Recommended Software** The ARB HARP computer program the recommended program to use for Rule 1200 HRAs. The most recent HARP software is available at: http://www.arb.ca.gov/toxics/harp/harp.htm. The District will review the results of the HRA and the methodology used along with independently verifying the results. All modelling and the data needed to calculate the risk using HARP shall be provided to the District. Use of the HARP program will assist and facilitate the HRA review. Specifics about HARP files and output to be supplied with the HRA report are included in these guidelines. The HARP program is available from the ARB web site: http://www.arb.ca.gov/toxics/harp/harp.htm.

HRAs performed using commercial front-end software for HARP may also be acceptable. Please contact the District's Toxics Section below for guidance.

4. **Screening HRAs** Facilities may elect to perform a screening-level HRA in lieu of a refined HRA. Screening HRAs differ from refined HRAs in that they are typically conducted using a screening-level dispersion program (AERSCREEN) and simplified procedures. A screening-level HRA can also be done using the HARP software and screening meteorological data. A screening-level HRA is less data intensive but will likely result in more conservative (i.e., higher) health risk estimates. They are not suitable for all situations. Facility characteristics, such as multiple emission sources, unusual source-receptor configurations, complex sources and multiple nearby buildings, etc., may make screening HRAs inappropriate. The District should be consulted prior to conducting a screening-level HRA. If the screening HRA results in estimated risks greater than the levels specified in Rule 1200, a refined HRA should be performed.

5. **Emissions** Potential to Emit (PTE) shall be those calculated as specified in Section (e)(5).

6. **Release Parameters** Health risk estimates depend on accurate representation of pollutant release parameters. This refers to the stack parameters (stack height, diameter, temperature, and velocity/flow) for vertical point sources or volume/area source parameters (volume release height, lateral and vertical dimensions, area dimensions) for extended fugitive sources. Sources with rain-caps or horizontal point sources should be evaluated using the default AERSCREEN or AERMOD release type options. Fugitive sources should be represented as the smallest volume that accurately characterizes the release of pollutant into ambient air. Care should be taken not to use an un-representative large volume source if emissions are spread out over a large area over time but the actual release at any given time is localized. In this case, it is preferred to represent the emitting device as a small volume occurring at the most common location.

7. **Health Data** The most recent health data for toxic air contaminants (TACs) must be used to estimate risk. The most recent health data is contained in the Consolidated Table of OEHHA/ARB Approved HRA Health Values. This table can be obtained at the ARB web site: www.arb.ca.gov/toxics/healthval/healthval.htm. The latest version of the HARP program which incorporates the most recent health table should be used. Please note: though OEHHA provides health data for carbon monoxide (CO), nitrogen dioxide (NO2) and sulfur dioxide (SO2), they are not considered TACs. They are criteria pollutants and should be excluded from risk calculations.

8. **Meteorological Data** Screening meteorological data is provided with the HARP program. The District's Meteorology Section should consulted to provide the appropriate AERMET surface and profile preprocessed files to be used for the refined HRA. There are approximately ten sets of AERMET meteorological data that are available county-wide. For further assistance, please contact Monitoring and Technical Services.

9. **Rural/Urban Dispersion Coefficients** Considering the close proximity to the coastline, rural dispersion coefficients are the modelling default and should be used for San Diego County HRAs. However, on a case by case basis, there may be some sources where the use of the urban dispersion is justified. In AERMOD, the population should be limited to a three

kilometer radius from the project area. For further assistance, please contact Monitoring and Technical Services.

10. **Emission Rate Factors** When appropriate, emission rate factors such as hour of day (HROFDY) scalars can be entered as inputs into the modelling program. This is to enable facilities that do not operate 24 hours per day to avoid including meteorological data for hours when the facility is not operating in calculations of the annual average or maximum hourly ground level concentrations. When emission rate factors are used, it is mandatory to include in the HRA report operating-hour data for the facility that justifies the use of emission rate factors. If there are any questions, please contact the District's Toxics Section guidance.

11. **Worker Exposure Correction** Potential health impacts to an offsite worker will vary depending on the worker's schedule and the operating hours of the facility. Most offsite workers are assumed to work a regular 8 hour per day, 5 day per week, 49 week per year, 25 year schedule. If a facility operates 24 hours per day and 7 days per week, inhalation cancer risk calculations for the worker should use the same ground level concentration values calculated by the dispersion model for the residential receptor. If the facility operates for fewer than 24 hours per day and/or fewer than 7 days per week, the air concentration that the offsite worker breathes will be increased, and a correction factor must be applied to calculate occupational cancer risk and the 8-hour chronic HHI. For example, assuming the emitting source and worker's schedules are the same, the adjustment factor is 4.2 = (24 hours per day/8 hours per shift)x(7 days in a week/5 days in a work week). Refer to the OEHHA Guidance Manual, Section 4.12.2, Modeling and Adjustments for Inhalation Cancer Risk at a Worksite.

12. **Noninhalation Deposition Rate** For uncontrolled particulate matter greater than $PM_{2.5}$ microns in diameter, use the OEHHA default deposition rate of 0.05 m/s. For controlled sources (i.e., filtered), use the OEHHA default deposition rate of 0.02 m/s. Refer to the OEHHA Guidance, Section 5.3, Estimation of Concentrations in Air, Soil, and Water.

13. **Noninhalation Garden Fraction** If there are households that garden or households that farm then the Homegrown Produce ingestion pathway needs to be included. The OEHHA defaults are 13.7 percent for households that garden and 23.5 percent for households that farm. Refer to the OEHHA Guidance, Table 5.17, Fraction of Food Intake that is Home-Produced

14. **Fraction of Time at Home** From the 3rd Trimester < 16 years of age, prior to applying a fraction of time at home (FAH) adjustment, it is recommended to initially calculate risk where the FAH = 1 (no exposure adjustment) to ensure there is no school within the potential 1 in one million or greater isopleth. Refer to the OEHHA Guidance Manual, Section 8.2.2, Fraction of Time Spent at Home for Cancer Risk Assessment.

15. **Geographic Coordinates** All geographic coordinates used in the HRA shall be expressed in UTM (Universal Transverse Mercator) coordinates. All UTM data, including terrain elevation data, shall be referenced to the same coordinate datum (NAD27 or NAD83) and the datum used shall be clearly identified in the HRA report.

16. **Receptor Grids** Receptors shall be sufficiently dense to show where the points of maximum health impacts occur.

17. **Report Format** To assist with the review of the HRA, it is recommended that the outline shown in Section 4.16 of the OEHHA Guidance Manual for Preparation of HRAs (February, 2015) be consolidated to include Information on the Facility, Source and Emissions, Receptor Locations, Meteorological Data, Air Dispersion, and Risk Methodology and Results.

18. **Summary Tables** Summary tables are an integral part of the HRA Report. At a minimum, tables describing emitting sources and their release parameters and locations, emissions of TACs from each emitting source, and cancer and non-cancer risk estimates at PMI, MEIR, and MEIW should be included in the report.

19. **Maps and Diagrams** The following information should be presented and clearly labeled: facility location and boundary; emission points within the facility boundary; locations of maximum impacts (PMI, MEIW, MEIR) for cancer, chronic, 8-hour chronic, acute total hazard indices (THI), and receptor grid arrangement (i.e., receptor point grid locations). More than one map may be needed to clearly show all this information. For further assistance, please contact the Toxics Section.