BOARD MEETING DATE: September 1, 2017 AGENDA NO. 29

PROPOSAL: Determine That Proposed Amendments to Rule 1401 Are Exempt from CEQA and Amend Rule 1401 – New Source Review of Toxic Air Contaminants

SYNOPSIS: In June 2015, Rule 1401 – New Source Review of Toxic Air Contaminants, was amended to incorporate the 2015 Revised OEHHA Health Risk Assessment Guidelines (2015 OEHHA Guidelines). The amendments allowed spray booths and retail gasoline dispensing facilities to use the previous guidelines to allow staff additional time to better understand potential permitting impacts. Based on analysis of SCAQMD permits, implementation of the 2015 OEHHA Guidelines is expected to have minimal impacts to new or modified spray booths or gasoline dispensing facilities. Staff recommends that these two source categories begin using the SCAQMD's Risk Assessment Procedures (Version 8.1) which incorporate the 2015 OEHHA Guidelines for spray booths and gasoline dispensing facilities, revised emission factors and speciation profiles for gasoline dispensing facilities, and updated meteorological data. The proposed changes will also update the list of toxic air contaminants.

COMMITTEE: Stationary Source, July 21, 2017, Reviewed

RECOMMENDED ACTIONS:

1. Adopt the attached Resolution:
   a. Determining that Proposed Amendments to Rule 1401 – New Source Review of Toxic Air Contaminants, are exempt from the requirements of the California Environmental Quality Act; and
   b. Amending Rule 1401 – New Source Review of Toxic Air Contaminants.

2. Receive and file:
   - SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1 and 212 (Version 8.1)

Wayne Nastri
Executive Officer

PF:SN:JW:MM:KC

Background

Rule 1401 – New Source Review of Toxic Air Contaminants, was adopted in June 1990 and establishes cancer and non-cancer health risk thresholds for new, relocated or modified permitted sources. In March 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) revised its methodology to estimate health risks to account for child-specific factors, which resulted in an increased estimated health risk for residential and sensitive receptors by approximately 2.3 times. OEHHA's Risk Assessment Guidelines are incorporated in the SCAQMD Risk Assessment Procedures, which are required for implementing Rules 1401, 1401.1 and 212. On June 5, 2015, the SCAQMD Governing Board adopted amendments to Rule 1401 and incorporated the 2015 OEHHA Guidelines into SCAQMD's Risk Assessment Procedures (Version 8.0).

During the June 2015 amendments to Rule 1401, the SCAQMD staff concluded that additional analysis was needed to better assess potential permitting impacts for spray booths based on an initial screening in 2015 that indicated that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the 2015 OEHHA Guidelines. In addition, time was also needed to better understand the impacts from gasoline dispensing facilities before use of the 2015 OEHHA Guidelines, and updates to emission factors and speciation profiles for gasoline dispensing facilities that the California Air Resources Board (CARB) was recommending. Therefore, provisions were included in the June 2015 amendment to Rule 1401[1] to allow spray booths and retail gasoline transfer and dispensing facilities to use the then-current SCAQMD Risk Assessment Procedures (Version 7.0).

Proposal

Staff has since completed analyzing potential permitting impacts for spray booths and gasoline dispensing facilities. Implementation of the 2015 OEHHA Guidelines is expected to have minimal impacts to new or modified spray booth or gasoline dispensing facilities. Less than one percent of newly permitted spray booths that are

[1] SCAQMD's June 2015 Staff Report for Proposed Amended Rules 212 – Standards for Approving Permits and Issuing Public Notice, 1401 – New Source Review of Toxic Air Contaminants, 1401.1 – Requirements for New and Relocated Facilities Near Schools, and 1402 – Control of Toxic Air Contaminants from Existing Sources," can be found here: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2015/2015-jun1-028.pdf?sfvrsn=9

using chromate based materials may need to upgrade pollution controls to stay under Rule 1401 health risk thresholds. No impacts are expected for modified gasoline dispensing facilities and less than four percent of new gasoline dispensing facilities may need to conduct a more refined health risk assessment, or locate sources farther away from sensitive receptors or reduce their requested throughput to demonstrate compliance with Rule 1401 health risk thresholds. As a result, Proposed Amended Rule 1401 will require spray booths and gasoline dispensing facilities to begin using the SCAQMD's Risk Assessment Procedures (Version 8.1) which incorporate the 2015 OEHHA Guidelines for spray booths and gasoline dispensing facilities and include revised emission factors and speciation profiles for gasoline dispensing facilities, and updated meteorological data.

Proposed Amended Rule 1401 will also update the list of toxic air contaminants (Table 1) subject to the rule to be consistent with OEHHA. Two new toxic air contaminants, namely caprolactum and carbonyl sulfide, will be added to Table 1. The inclusion of these two compounds is not expected to require additional pollution controls as the sources of those emissions already are expected to have pollution controls. Acute health risk values will be added to methylene diphenyl diisocyanate, 1,3-butadiene, and toluene diisocyanates, all of which are already in Table 1 with cancer or chronic risk values. The inclusion of an acute reference exposure level for these three compounds is not expected to have any additional impacts on permitted sources because the cancer risk or chronic risk is more stringent for permitting decisions. Additionally, several compounds will be included on the list for clarity and consistency with CARB's Consolidated Table of OEHHA/CARB Approved Risk Assessment Health Values.

Public Process

Proposed Amended Rule 1401 was developed through a public process. Through the rulemaking process, staff held four stakeholder Working Group Meetings to discuss provisions of the proposed rule: June 1, 2017, July 6, 2017, July 20, 2017, and August 16, 2017. In addition, staff held a Public Workshop on July 12, 2017.

Key Issue

In December 2013, CARB revised emission factors for gasoline dispensing facilities. SCAQMD staff has reviewed the emission factor for refueling, and believes that CARB's 2013 revised emission factors may overestimate the emission reductions from Phase II refueling with On-board Refueling Vapor Recovery (ORVR) system vehicles. Based on recent information, CARB has conducted an initial analysis and agrees that the 2013 emission factor for Phase II refueling with ORVR may overestimate emission reductions and will be revising the refueling emission factor for Phase II and ORVR vehicles. In the interim, staff is recommending to not incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current emission factor of 0.32 pounds per 1,000 gallons for refueling. Staff is recommending the use of CARB's 2013 emission factors for all other categories (loading, breathing, spillage, and hose permeation). SCAQMD staff is committed to continue working with CARB staff to refine the refueling emission estimates for Phase II controls with ORVR vehicles and will return to the Governing Board with future revisions for the refueling emission factor after CARB finalizes revisions.

At the August 16, 2017 Working Group Meeting, CARB staff presented their initial findings and commitment to revisit the emission estimates for Phase II controls with ORVR vehicles. Some stakeholders requested that staff continue to include the provision to exempt new and modified gasoline dispensing facilities from using the proposed Risk Assessment Procedures (Version 8.1) and allow gasoline dispensing facilities to use the current SCAQMD emission factors and SCAQMD Risk Assessment Procedures (Version 7.0) until CARB finalizes the revised refueling emission factor. Based on gasoline dispensing facilities that were permitted over a five-year period, using the 2013 emission factors with the previously proposed refueling emission factor of 0.42 (includes refueling and breathing) lbs per 1,000 gallons, combined with the 2015 OEHHA Guidelines and updated meteorological data (Risk Assessment Procedures (Version 8.1)) would have resulted in no impacts to gasoline dispensing facilities that were modified and less than four percent impact to new gasoline dispensing facilities (less than one new gasoline dispensing facility per year). Therefore, the impacts to gasoline dispensing facilities using the current SCAQMD refueling emission factor of 0.32 lbs per 1,000 gallons would be less than what was analyzed in the Draft Staff Report. Moreover, there is no reason to delay the implementation of 2015 OEHHA Guidelines for gasoline stations.

California Environmental Quality Act

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, has reviewed the proposed amendments to Rule 1401 pursuant to: 1) CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA. To comply with the requirements in Proposed Amended Rule 1401, new and modified spray booths would require more efficient filters to control emissions, and new and modified gasoline dispensing facilities may either comply by requesting a lower throughput, or by increasing the distance to the nearest residential receptor, or by conducting a Tier 3 or Tier 4 analysis. According to staff's analysis, very few facilities would be affected. In any event, there would be no physical change to gasoline dispensing facilities and very minimal physical changes to spray booths due to implementing Proposed Amended Rule 1401. SCAQMD staff has determined that it can be seen with certainty that there is no possibility that the proposed project may have a significant adverse effect on the environment. Therefore, the project is considered to be exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062 - Notice of Exemption, and is included as an attachment to the Board package. If the project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

Socioeconomic Analysis
A socioeconomic analysis was conducted for Proposed Amended Rule 1401. Based on staff's analysis of SCAQMD permits, two spray booths and one gasoline dispensing facility per year could potentially incur costs to comply with Proposed Amended Rule 1401. Spray booths belong to various sectors of the economy such as manufacturing, wholesale, retail, services, and the affected gasoline dispensing facilities belong to the sector of retail services. The potentially affected facilities are likely to be small businesses.

Based on review of spray booths permitted between 2009 and 2014, an average of two spray booths per year are expected to need to install ultra-low particulate air (ULPA) filters instead of high efficiency particulate air (HEPA) filters to obtain new or modified permits pursuant to Proposed Amended Rule 1401. While the filter costs are similar, ULPA filters require the use of a higher horsepower blower that is more expensive and uses more electricity. The resultant incremental costs for a total of two affected spray booths is estimated at $7,450 over a five-year period. An average of one gasoline dispensing facility per year is expected to need to choose from various compliance options to obtain new permits pursuant to Proposed Amended Rule 1401. It is assumed in this analysis that the affected facility would proceed to a Tier 4 Health Risk Assessment and incur a one-time cost of dispersion modeling of $15,000. Other compliance options for permitting a new gasoline dispensing facility include lowering the requested throughput or reorienting equipment or siting the gasoline dispensing sources further from sensitive receptors. Therefore, the overall compliance cost is estimated at $22,450 per year, which would result in a minimal job impact in the regional economy.

AQMP and Legal Mandates
State law requires the District to conduct health risk assessment under AB 2588 "in accordance with guidelines established by" OEHHA. To be consistent, Rule 1401 should be amended to conform gasoline dispensing facilities and spray booths to this requirement. Proposed Amended Rule 1401 is not a control measure in the 2016 AQMP but is needed to reduce exposure and associated health risk impacts from toxic emissions from stationary sources. Proposed Amended Rule 1401 will not be submitted for inclusion into the State Implementation Plan.

Implementation and Resource Impact
Existing SCAQMD resources will be used to implement Proposed Amended Rule 1401.

Attachments
A. Summary of Proposal
B. Key Issues and Responses
C. Rule Development Process
D. Key Contacts List
E. Resolution
F. Proposed Amended Rule 1401
G. Staff Report for Proposed Amended Rule 1401
H. Notice of Exemption from the California Environmental Quality Act
I. SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 (Version 8.1)
J. Board Meeting Presentation

ATTACHMENT A

SUMMARY OF PROPOSAL

Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants

<u>Summary of Proposed Amendments</u>
• Remove provision that excludes spray booths and gasoline dispensing facilities from using the most recent version of the SCAQMD Risk Assessment Procedures
• Reference SCAQMD Risk Assessment Procedures to Version 8.1 which incorporates the 2015 OEHHA Guidelines for spray booths and gasoline dispensing facilities, revised emission factors and speciation profiles for gasoline dispensing facilities, and updated meteorological data
• Update the list of toxic air contaminants in Table 1 of Rule 1401 to be consistent with the current list used by OEHHA
  ▪ New compounds: caprolactam and carbonyl sulfide
  ▪ Compounds with added health risk values: 1,3-butadiene, methylene diphenyl diisocyante, toluene-2,4-diisocyanate, and toluene-2,6-diisocyanate
  ▪ Compounds added for clarifications and consistency, or correction of typographic errors: 1,1-dichloroethylene, fluorides, alpha hexachlorocyclohexane, beta hexachlorocyclohexane, barium chromate, calcium chromate, chromic trioxide, sodium dichromate, strontium chromate, zinc chromate, and vanadium

ATTACHMENT B
KEY ISSUES AND RESPONSES

Proposed Rule 1401 – New Source Review of Toxic Air Contaminants

Emission Factor for Phase II Refueling for Gasoline Dispensing Facilities:

The proposed amendments to Rule 1401 include incorporation of CARB's 2013 recommended emission factors and speciation profiles for gasoline dispensing facilities. CARB's approach to derive the refueling emission factor is to apply a 95 percent control efficiency for Phase II enhanced vapor recovery (EVR), and an additional 95 percent control efficiency for the On-board Refueling Vapor Recovery (ORVR) system to provide an overall control efficiency for refueling of 99.75 percent. Based on SCAQMD staff's review of the Phase II EVR and ORVR technologies, these two pollution control technologies may not work in series to provide a 99.75 percent control efficiency, and that CARB's 2013 revised emission factors may overestimate the emission reductions from Phase II refueling of ORVR vehicles.

- Both CARB and SCAQMD staff agree that additional time is needed to better understand emission reductions from Phase II EVR refueling of ORVR vehicles.
- SCAQMD staff is recommending to not incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current emission factor of 0.32 lbs per 1,000 gallons for refueling.
- Based on new information, CARB is preparing a draft addendum to revise the refueling emission factor which will need to go through CARB's internal review, CAPCOA review, and a public review and comment period.
    - Some stakeholders requested that staff continue to allow gasoline dispensing facilities to use the current SCAQMD emission factors and SCAQMD Risk Assessment Procedures (Version 7.0) until CARB finalizes the revised refueling emission factor.
    - Based on staff analysis of Risk Assessment Procedures (Version 8.1) there would be no impacts to modified gasoline dispensing facilities and one new gasoline dispensing facility could be impacted per year. Therefore, the impacts to gasoline dispensing facilities using the current SCAQMD refueling emission factor of 0.32 lbs per 1,000 gallons would be less than what was analyzed (0.42 lbs per 1,000 gallons for refueling and breathing) in the Draft Staff Report.
- SCAQMD staff is committed to continue working with CARB staff to refine the refueling emission estimates for Phase II controls with ORVR vehicles and will return to the Board with future revisions to the refueling emission factor.

ATTACHMENT C

RULE DEVELOPMENT PROCESS
Proposed Rule 1401 – New Source Review of Toxic Air Contaminants

Initial Rule Development: May 2017

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Working Group Meetings (4)
First Working Group Meeting: June 1, 2017
Second Working Group Meeting: July 6, 2017
Third Working Group Meeting: July 20, 2017
Fourth Working Group Meeting: August 16, 2017

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Stationary Source Committee Briefings (1)
July 21, 2017

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75-Day Public Notice: June 16, 2017

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Public Workshop: July 12, 2017

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Set Hearing: July 7, 2017

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Public Hearing: September 1, 2017

4 months spent in rule development
1 Public Workshop
4 Working Group Meetings

ATTACHMENT D
KEY CONTACTS LIST

American Coatings Association
The Boeing Company
California Air Resources Board
California Council for Environmental and Economic Balance
California Independent Oil Marketers Association
California Small Business Alliance
Capistrano Unified School District
City of Los Angeles
City of Paramount
City of San Bernardino Municipal Water Department
Costco Wholesale Corporation
Los Angeles Department of Water and Power
Los Angeles Internal Services Department
Los Angeles Unified School District
MD Environmental
Metal Finishing Association of Southern California
Metropolitan Water District of Southern California
Nasmyth Group
OmniTrans
Pillsbury Winthrop Shaw Pittman LLP
Ramboll Environ
Sanitation Districts of Los Angeles County
Southern California Alliance of Publicly Owned Treatment Works
Southern California Gas
State Senator Ed Hernandez
Tesoro Corporation
Trinity Consultants
Western States Petroleum Association

ATTACHMENT E

RESOLUTION NO. 17-_____

A Resolution of the Governing Board of the South Coast Air Quality Management District (SCAQMD) determining that the proposed amendments to Rule 1401 – New Source Review of Toxic Air Contaminants, are exempt from the requirements of the California Environmental Quality Act (CEQA).

A Resolution of the SCAQMD Governing Board amending Rule 1401 – New Source Review of Toxic Air Contaminants.

WHEREAS, the SCAQMD Governing Board finds and determines that Proposed Amended Rule 1401 is considered a "project" pursuant to CEQA per CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and

WHEREAS, the SCAQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and has conducted a CEQA review and analysis of the proposed amendments to Rule 1401 pursuant to such program (SCAQMD Rule 110); and

WHEREAS, the SCAQMD Governing Board finds and determines that after conducting a review of the proposed project in accordance with CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA, the proposed amendments to Rule 1401 are determined to be exempt from CEQA; and

WHEREAS, the SCAQMD Governing Board finds and determines that it can be seen with certainty that there is no possibility that the proposed project may have any significant effects on the environment, and is therefore, exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered By General Rule; and

WHEREAS, SCAQMD staff has prepared a Notice of Exemption for the proposed project, that is completed in compliance with CEQA Guidelines Section 15062 – Notice of Exemption; and

WHEREAS, Proposed Amended Rule 1401 and supporting documentation, including but not limited to, the Notice of Exemption, the Socioeconomic Impact Assessment, and the Staff Report, were presented to the

SCAQMD Governing Board and the SCAQMD Governing Board has reviewed and considered the entirety of this information, as well as has taken and considered staff testimony and public comment prior to approving the project; and

WHEREAS, the SCAQMD Governing Board finds and determines, taking into consideration the factors in Section (d)(4)(D) of the Governing Board Procedures (codified as Section 30.5(4) of the Administrative Code), that the modifications which have been made to Proposed Amended Rule 1401 since the notice of public hearing was published do not significantly change the meaning of the proposed amended rule within the meaning of Health and Safety Code Section 40726; and

WHEREAS, Proposed Amended Rule 1401 is not a control measure in the 2016 Air Quality Management Plan (AQMP) and was not ranked by cost-effectiveness relative to other AQMP control measures in the 2016 AQMP, and furthermore, pursuant to Health and Safety Code Section 40910, cost-effectiveness in terms of dollars per ton of pollutant reduced is only applicable to rules regulating ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide and does not apply to toxic air contaminants; and

WHEREAS, Proposed Amended Rule 1401 will not be submitted for inclusion into the State Implementation Plan; and

WHEREAS, the SCAQMD staff conducted a public workshop regarding Proposed Amended Rule 1401 on July 12, 2017; and

WHEREAS, Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1401 is needed to update risk assessment procedures for specific source categories; and

WHEREAS, the SCAQMD Governing Board obtains its authority to adopt, amend or repeal rules and regulations from Sections 39002, 39650 et Seq., 40000, 40001, 40440, 40441, 40702, 40725 through 40728, 41508, 41700, and 42300 et. seq. of the Health and Safety Code; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1401, as proposed to be amended, is written and displayed so that the meaning can be easily understood by persons directly affected by it; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1401, as proposed to be amended, is in harmony with, and not in conflict with, or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1401, as proposed to be amended, does not impose the same requirements as any existing state or federal regulations, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD; and

WHEREAS, the SCAQMD Governing Board, in adopting this regulation, references the following statutes which the SCAQMD hereby implements, interprets or makes specific: the provisions of the Health and Safety Code Section 42301 (purposes of permit system), Section 41700 (nuisance) and Federal Clean Air Act Section 112 (Hazardous Air Pollutants) and Section 116 (Retention of State Authority); and

WHEREAS, Health and Safety Code Section 40727.2 requires the SCAQMD to prepare a written analysis of existing federal air pollution control requirements applicable to the same source type being regulated whenever it adopts, or amends a rule, and that the SCAQMD's comparative analysis of Proposed Amended Rule 1401 is included in the staff report; and

WHEREAS, the SCAQMD Governing Board has determined that the Socioeconomic Impact Assessment, as contained in the Final Staff Report, of Proposed Amended Rule 1401 is consistent with the March 17, 1989 Governing Board Socioeconomic Resolution for rule adoption; and

WHEREAS, the SCAQMD Governing Board has determined that the Socioeconomic Impact Assessment, as contained in the Final Staff Report, is consistent with the provisions of the Health and Safety Code Sections 40440.8, 40728.5, 40920.6; and

WHEREAS, the SCAQMD Board has actively considered the Socioeconomic Impact Assessment, as contained in the Final Staff Report, and has made a good faith effort to minimize such impacts; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 1401 will result in increased costs, yet such costs are considered to be reasonable, with a total annualized cost as specified in the Socioeconomic Impact Assessment, as contained in the Final Staff Report; and

WHEREAS, the SCAQMD Governing Board specifies the Assistant Deputy Executive Officer overseeing the rule development for Proposed Amended Rule 1401 as the custodian of the documents or other materials which constitute the record of proceedings upon which the adoption of this proposed project is based, which are located at the SCAQMD, 21865 Copley Drive, Diamond Bar, California; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of Health and Safety Code Section 40725; and

WHEREAS, the SCAQMD Governing Board has held a public hearing in accordance with all provisions of law; and

WHEREAS, the SCAQMD staff and the California Air Resources Board (CARB) staff have been in communication regarding the refueling emission factor to account for emission reductions from Enhanced Vapor Recovery and the On-board Refueling Vapor Recovery (ORVR) system, and CARB will be reevaluating its 2013 emission factor recommended for this category; and

NOW, THEREFORE BE IT RESOLVED, that the SCAQMD Governing Board does hereby determine, pursuant to the authority granted by law, that the proposed amendments to Rule 1401 are exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered By General Rule. This information was presented to the SCAQMD Governing Board, whose members reviewed, considered, and approved the information therein prior to acting on the proposed amendments to Rule 1401; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board directs staff to continue working with CARB to refine the emission estimates for Phase II refueling with ORVR vehicles and to return to the Governing Board when a refueling emission factor has been agreed upon; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board directs staff to report to the Stationary Source Committee within 30 days after CARB finalizes revisions for the refueling emission factor for Enhanced Vapor Recovery and ORVR systems and to return to the Governing Board as quickly as practicable with revisions to update the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 to reflect emission factor revisions from CARB; and

BE IT FURTHER RESOLVED, that the SCAQMD Governing Board does hereby adopt, pursuant to the authority granted by law, Proposed Amended Rule 1401 as set forth in the attached, and incorporated herein by reference.

DATE: ___________________ ___________________________

CLERK OF THE BOARDS

ATTACHMENT F

(Adopted June 1, 1990)(Amended December 7, 1990)(Amended July 10, 1998)
(Amended January 8, 1999)(Amended March 12, 1999)(Amended August 13, 1999)
(Amended March 17, 2000)(Amended August 18, 2000)(Amended June 15, 2001)
(Amended May 3, 2002)(Amended February 7, 2003)(Amended May 2, 2003)
(Amended March 4, 2005)(Amended March 7, 2008)(Amended June 5, 2009)
(Amended September 10, 2010)(Amended June 5, 2015)(Amended October 7, 2016)
(Proposed Amended Rule September 2017)

PROPOSED AMENDED RULE 1401. NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

(a) Purpose

This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) from new permit units, relocations, or modifications to existing permit units which emit toxic air contaminants listed in Table I. The rule establishes allowable risks for permit units requiring new permits pursuant to Rules 201 or 203.

(b) Applicability

(1) Applications for new, relocated, and modified permit units which were received by the District on or after June 1, 1990 shall be subject to Rule 1401. Applications shall be subject to the version of Rule 1401 that is in effect at the time the application is deemed complete. Permit units installed without a required permit to construct shall be subject to this rule, if the application for a permit to operate such equipment was submitted after June 1, 1990.

(2) This rule shall apply to new, relocated, and modified equipment identified in Rule 219 as not requiring a written permit if the risk from the equipment will be greater than identified in subparagraph (d)(1)(A), or paragraphs (d)(2) or (d)(3) in Rule 1401.

(c) Definitions

(1) ACCEPTABLE STACK HEIGHT for a permit unit is defined as a stack height that does not exceed two and one half times the height of the permit unit or two and one half times the height of the building housing the permit unit, and shall not be greater than 65 meters (213 feet), unless the applicant demonstrates to the satisfaction of the Executive Officer that a greater height is necessary.

(2) BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS (T-BACT) means the most stringent emissions limitation or control technique which:

(A) has been achieved in practice for such permit unit category or class of source; or

(B) is any other emissions limitation or control technique, including process and equipment changes of basic and control equipment, found by the Executive Officer to be technologically feasible for such class or category of sources, or for a specific source.

(3) CANCER BURDEN means the estimated increase in the occurrence of cancer cases in a population subject to a MICR of greater than or equal to one in one million (1.0×10^{-6}) resulting from exposure to toxic air contaminants.

(4) CONTEMPORANEOUS RISK REDUCTION means any reduction in risk resulting from a decrease in emissions of toxic air contaminants at the facility that is permanent, real, quantifiable and enforceable through District permit conditions. Permit applications associated with the increase and decrease in risk must be submitted together and the reduction of risk must occur before the start of operation of the permit unit that will have an increased risk. A contemporaneous risk reduction shall be calculated based on the actual average annual emissions, as determined by facility records, and annual emissions declarations pursuant to Rule 301 as appropriate, or other data approved by the Executive Officer, whichever is less, which have occurred during the two-year period immediately preceding the date of application.

(5) FACILITY means any permit unit or grouping of permit units or other air contaminant-emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control), or an outer continental shelf (OCS) source as determined in 40 CFR Section 55.2. Such above-described groupings, if noncontiguous, but connected only by land carrying a pipeline, shall not be considered one facility. Notwithstanding the above, sources or installations involved in crude oil and gas production in Southern California Coastal or OCS Waters and transport of such crude oil and gas in Southern California Coastal or

OCS Waters shall be included in the same facility which is under the same ownership or use entitlement as the crude oil and gas production facility on-shore.

(6) INDIVIDUAL SUBSTANCE ACUTE HAZARD INDEX (HI) is the ratio of the estimated maximum one-hour concentration of a toxic air contaminant for a potential maximally exposed individual to its acute reference exposure level.

(7) INDIVIDUAL SUBSTANCE CHRONIC HAZARD INDEX (HI) is the ratio of the estimated long-term level of exposure to a toxic air contaminant for a potential maximally exposed individual to its chronic reference exposure level. The chronic hazard index calculations shall include multipathway consideration, if applicable.

(8) MAXIMUM INDIVIDUAL CANCER RISK (MICR) is the estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants for residential receptor locations calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e). The MICR for worker receptor locations shall be calculated pursuant to the Risk Assessment Procedures referenced in subdivision (e). The MICR calculations shall include multipathway consideration, if applicable.

(9) MODIFICATION means any physical change in, change in method of operation, or addition to an existing permit unit that requires an application for a permit to construct and/or operate. Routine maintenance and/or repair shall not be considered a physical change. A change in the method of operation of equipment, unless previously limited by an enforceable permit condition, shall not include:

(A) an increase in the production rate, unless such increase will cause the maximum design capacity of the equipment to be exceeded; or

(B) an increase in the hours of operation; or

(C) a change in ownership of a source; or

(D) a change in formulation of the materials processed which will not result in a net increase of the MICR, cancer burden, or chronic or acute HI from the associated permit unit.

For facilities that have been issued a facility permit pursuant to Regulation XX or a Title V permit pursuant to Regulation XXX, modification means any physical change in, change in method of operation of, or addition to an existing individual article, machine, equipment or other contrivance which would have required an application for a permit to construct and/or operate, were the unit not covered under a facility permit or Title V permit.

(10) PERMIT UNIT means any article, machine, equipment, or other contrivance, or combination thereof, which may cause or control the issuance of air contaminants, and which requires a written permit pursuant to Rules 201 and/or 203. For facilities that have been issued a facility permit or Title V permit, a permit unit for the purpose of this rule means any individual article, machine, equipment or other contrivance which may cause or control the issuance of air contaminants and which would require a written permit pursuant to Rules 201 and/or 203 if it was not covered under a facility permit or Title V permit. For publicly-owned sewage treatment operations, each process within multi-process permit units at the facility shall be considered a separate permit unit for purposes of this rule.

(11) RECEPTOR LOCATION means

(A) for the purpose of calculating acute HI, any location outside the boundaries of the facility at which a person could experience acute exposure; and

(B) for the purpose of calculating chronic HI and MICR, any location outside the boundaries of the facility at which a person could experience chronic exposure.

The Executive Officer shall consider the potential for exposure in determining whether the location will be considered a receptor location.

(12) RELOCATION means the removal of an existing permit unit from one parcel of land in the District and installation at another parcel of land where two parcels are not in actual physical contact and are not separated solely by a public roadway or other public right-of-way. The removal of a permit unit from one location within a facility and installation at another location within the facility is a relocation only if an increase in maximum individual cancer risk in excess of one in one million (1.0×10^{-6}) or a Hazard Index of 1.0 occurs at any receptor location.

(13) TOTAL ACUTE HAZARD INDEX (HI) is the sum of the individual substance acute HIs for all toxic air contaminants affecting the same target organ system.

(14) TOTAL CHRONIC HAZARD INDEX (HI) is the sum of the individual substance chronic HIs for all toxic air contaminants affecting the same target organ system.

(15) TOXIC AIR CONTAMINANT is an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. For the purpose of this rule, toxic air contaminants are those listed in Table I.

(d) Requirements

The Executive Officer shall deny the permit to construct a new, relocated or modified permit unit if emissions of any toxic air contaminant listed in Table I may occur, unless the applicant has substantiated to the satisfaction of the Executive Officer all of the following:

(1) MICR and Cancer Burden

The cumulative increase in MICR which is the sum of the calculated MICR values for all toxic air contaminants emitted from the new, relocated or modified permit unit will not result in any of the following:

(A) an increased MICR greater than one in one million (1.0×10^{-6}) at any receptor location, if the permit unit is constructed without T-BACT;

(B) an increased MICR greater than ten in one million (10×10^{-6}) at any receptor location, if the permit unit is constructed with T-BACT;

(C) a cancer burden greater than 0.5.

(2) Chronic Hazard Index

The cumulative increase in total chronic HI for any target organ system due to total emissions from the new, relocated or modified permit unit owned or operated by the applicant for which applications were deemed complete on or after the date when the risk value for the compound is finalized by the state Office of Environmental Health Hazard Assessment (OEHHA) will not exceed 1.0 at any receptor location.

(3) Acute Hazard Index

The cumulative increase in total acute HI for any target organ system due to total emissions from the new, relocated or modified permit unit owned or operated by the applicant for which applications were deemed complete on or after the date when the risk value for the compound is finalized by OEHHA will not exceed 1.0 at any receptor location.

(4) If a permit contains operating conditions imposed pursuant to Rule 1401, which prohibit or limit the use or emission of toxic air contaminants, those conditions shall apply only to those toxic air contaminants listed in the version of Rule 1401 applicable at the time the permit conditions were imposed.

(5) Federal New Source Review for Toxics

Pursuant to Section 112(g) of the federal Clean Air Act (CAA), no person shall begin construction or reconstruction of a major stationary source emitting hazardous air pollutants listed in Section 112 (b) of the CAA, unless the source is constructed with Best Available Control Technology for Toxics (T-BACT) and complies with all other applicable requirements, including definitions and public noticing, referenced in 40 CFR 63.40 through 63.44. The requirements of this paragraph shall not apply to:

(A) any source that is subject to an existing National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to sections 112(d), 112(h), or 112(j) of the federal CAA;

(B) any source that is exempted from regulations under a NESHAP issued pursuant to sections 112(d), 112(h), or 112(j) of the federal CAA;

(C) any source that has received all necessary air quality permits for such construction or reconstruction before June 29, 1998;

(D) electric utility steam generating units, unless and until such time as these units are added to the source category list pursuant to the requirements of section 112(c)(5) of the federal CAA;

(E) any sources that are within a source category that has been deleted from the source category list pursuant to section 112(c)(9) of the federal CAA; or

(F) research and development activities.

Compliance with this paragraph does not relieve any owner or operator of a major stationary source from complying with all other applicable District rules and regulations, including this rule, any applicable state airborne toxic control measure, or other applicable state and federal laws. Exemptions under subdivision (g) of this rule do not apply to this paragraph. This paragraph shall take effect retroactively from June 29, 1998.

(e) Risk Assessment Procedures

(1) The Executive Officer shall periodically publish procedures for determining health risks under this rule~~, except as provided in paragraph (e)(3)~~. To the extent possible, the procedures will be consistent with the most recently adopted policies and procedures of the state OEHHA.

(2) To calculate the cumulative increase in MICR pursuant to paragraph (d)(1), the increase from each permit unit shall be based on the emissions of toxic air contaminants, the risk values, and risk assessment procedures applicable at the time when each complete application was deemed complete by the District.

~~(3) The following equipment or industry source categories shall be allowed to use SCAQMD Risk Assessment Procedures for Rules 1401 and 212 (Version 7.0, July 1, 2005) in order to calculate the cumulative increase in MICR pursuant to paragraph (d)(1):~~

~~(A) spray booths, until the Executive Officer, as quickly as practicable, can make a recommendation regarding a regulation and/or procedures, and the Board approves regulations and/or procedures specific to this source category; and~~

~~(B) retail gasoline transfer and dispensing facilities as defined in District Rule 461, until the Executive Officer, as quickly as practicable, can provide an analysis of emissions data from gasoline dispensing activities to the Governing Board, and the Board approves regulations and/or procedures, if needed, specific to this industry.~~

(f) Emissions Calculations

(1) For the purpose of determining MICR and cancer burden due to a new or relocated permit unit pursuant to this rule, the total Toxic Air Contaminant emissions from the new or relocated permit unit shall be calculated on an annual basis from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(A) the maximum rated capacity;

(B) the maximum possible annual hours of operation;

(C) the maximum annual emissions; and

(D) the physical characteristics of the materials processed.

(2) For the purpose of determining chronic HI due to a new or relocated permit unit pursuant to this rule, the total emissions from a permit unit shall be

calculated on an annual average basis from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(A) the maximum rated capacity;

(B) the annual average hours of operation;

(C) the annual average emissions; and

(D) the physical characteristics of the materials processed.

(3) For the purpose of determining MICR, cancer burden and chronic HI due to a modified permit unit pursuant to this rule, the increase in emissions from the modified permit unit shall be calculated based on the difference between the total permitted emissions after the modification, calculated pursuant to the criteria established in subparagraphs (f)(1)(A), (B), (C), and (D), and:

(A) the total permitted emissions prior to the modification as stated in the permit conditions; or

(B) if there are no existing permit conditions that limit emissions, the average annual emissions which have occurred during the two-year period immediately preceding the date of the complete permit application for modification or other appropriate period determined by the Executive Officer to be representative of a permit unit's operation; or

(C) for modification of any source installed prior to October 8, 1976, resulting from the addition of air pollution controls installed solely to reduce the issuance of air contaminants, emission shall be calculated from permit conditions which directly limit the emissions or, when no such conditions are imposed, from:

(i) the maximum rated capacity; and

(ii) the maximum proposed daily hours of operation; and

(iii) the physical characteristics of the materials processed.

(4) For the purpose of determining acute HI due to a new, relocated or modified permit unit pursuant to this rule, the total emissions from a permit unit shall be calculated on a maximum hourly basis from permit conditions which directly limit the emissions or, when no such conditions exist, from:

(A) the maximum rated capacity;

(B) the maximum hourly emissions; and

(C) the physical characteristics of the materials processed.

(5) De Minimus Values

Any permit unit with values at or below the screening levels as specified in the procedures for determining health risks under this rule, published pursuant to paragraph (e)(1), shall be deemed in compliance with the requirements of subdivision (d).

(g) Exemptions

(1) The requirements of subdivision (d) shall not apply to:

(A) Permit Renewal or Change of Ownership

Any permit unit which is in continuous operation, without modification or change in operating conditions, for which a new permit to operate is required solely because of permit renewal or change of ownership.

(B) Modification with No Increase in Risk

A modification of a permit unit that causes a reduction or no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.

(C) Functionally Identical Replacement

A permit unit replacing a functionally identical permit unit, provided there is no increase in maximum rating or increase in emissions of any toxic air contaminants. For replacement of dry cleaning permit units only, provided there is no increase in any toxic air contaminants.

(D) Equipment Previously Exempt Under Rule 219

Equipment which previously did not require a written permit pursuant to Rule 219 that is no longer exempt, provided that the equipment was installed prior to the Rule 219 amendment eliminating the exemption and a complete application for the permit is received within one (1) year after the Rule 219 amendment removing the exemption.

(E) Modifications to Terminate Research Projects

Modifications restoring the previous permit conditions of a permit unit, provided that: the applicant demonstrates that the previous permit conditions were modified solely for the purpose of installing innovative control equipment as part of a demonstration or investigation designed to advance the state of the art with regard to controlling emissions of toxic air contaminants; the emission reductions achieved by the demonstration project are not used for permitting any equipment with emission increases under the contemporaneous emission reduction exemption as specified in paragraph (g)(2); the demonstration project is completed within two (2) years; and a complete application is submitted no later than two (2) years after the date of issuance of the permit which modified the conditions of the previous permit for the purpose of the demonstration or investigation.

(F) Emergency Internal Combustion Engines

Emergency internal combustion engines that are exempted under Rule 1304.

(G) Wood Product Stripping

Wood product stripping permit units, provided that the risk increases due to emissions from the permit unit owned or operated by the applicant for which complete applications were submitted on or after July 10, 1998 will not exceed a MICR of 100 in one million (100×10^{-6}) or a total acute or chronic hazard index of five (5) at any receptor location. This exemption shall not apply to permit applications received after January 10, 2000, or sooner if the Executive Officer makes a determination that T-BACT is available to enable compliance with the requirements of paragraphs (d)(1), (d)(2) and (d)(3).

(H) Gasoline Transfer and Dispensing Facilities

For gasoline transfer and dispensing facilities, as defined in Rule 461 – Gasoline Transfer and Dispensing, the Executive Officer shall not, for the purposes of paragraphs (d)(1) through (d)(4), consider the risk contribution of methyl tert-butyl ether for any gasoline transfer and dispensing permit applications deemed complete on or before December 31, 2003. If the state of California extends the phase-out requirement for methyl tert-butyl ether as an oxygenate in gasoline, the limited time exemption shall be extended to that expiration date or December 31, 2004, whichever is sooner.

(2) Contemporaneous Risk Reduction

(A) Paragraph (d)(1) shall not apply if the applicant demonstrates that a contemporaneous risk reduction resulting in a decrease in emissions will occur such that both of the following conditions are met:

(i) no receptor location will experience a total increase in MICR of greater than one in one million (1.0 x 10^{-6}) due to the cumulative impact of both the permit unit and the contemporaneous risk reduction; and

(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.

T-BACT shall be used on permit units exempted under this subparagraph if the MICR from the permit unit exceeds one in one million (1.0 x 10^{-6}).

(B) The requirements of paragraphs (d)(2) and (d)(3) shall not apply if the applicant substantiates to the satisfaction of the Executive Officer that a contemporaneous risk reduction will occur such that any increase in individual substance acute or chronic HI from the permit unit exceeding 1.0 is mitigated with an equal or greater decrease in the same individual substance acute or chronic HI, respectively, from the contemporaneous risk reduction such that both of the following conditions are met:

(i) no receptor location will experience an increase in total acute or chronic HI of more than 1.0 due to the cumulative impact of both the permit unit and the contemporaneous risk reduction; and

(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.

(3) Alternate Hazard Index Levels

The requirements of paragraphs (d)(2) and (d)(3) shall not apply if the applicant substantiates to the satisfaction of the Executive Officer that at all receptor locations and for every target organ system, the total chronic and acute HI level resulting from emissions from the new, modified or relocated permit unit owned or operated by the applicant for which applications were submitted on or after July 10, 1998 shall not exceed alternate HI levels which are determined by the Executive Officer in consultation with the Office of Environmental Health Hazard Assessment to be protective against adverse health effects. No alternate HI level shall exceed 10.

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
75-07-0	acetaldehyde	December 7, 1990	September 8, 1998	September 10, 2010
60-35-5	acetamide	January 8, 1999		
107-02-8	acrolein		June 15, 2001	August 13, 1999
79-06-1	acrylamide (or propenamide)	December 7, 1990	**	
79-10-7	acrylic acid		*	August 13, 1999
107-13-1	acrylonitrile (or vinyl cyanide)	December 7, 1990	May 3, 2002	
107-05-1	allyl chloride	January 8, 1999		
117-79-3	aminoanthraquinone, 2-	January 8, 1999		
7664-41-7	ammonia		August 18, 2000	August 13, 1999
62-53-3	aniline	January 8, 1999		
7440-38-2	**arsenic and arsenic compounds (inorganic)** including, but not limited to:	December 7, 1990	June 15, 2001	August 13, 1999
	arsenic compounds (inorganic)			
7784-42-1	arsine		September 10, 2010	August 13, 1999
1332-21-4	asbestos	June 1, 1990		
71-43-2	benzene (including benzene from gasoline)	June 1, 1990	August 18, 2000	August 13, 1999
92-87-5	benzidine (and its salts)	December 7, 1990	**	
100-44-7	benzyl chloride	September 8, 1998	**	August 13, 1999
7440-41-7	beryllium and beryllium compounds	December 7, 1990	May 3, 2002	
111-44-4	bis(2-chloroethyl)ether (DCEE)	December 7, 1990		
117-81-7	bis(2-ethylhexyl)phthalate (DEHP)	September 8, 1998	**	

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
542-88-1	bis(chloromethyl)ether	December 7, 1990		
7789-30-2	bromine pentafluoride		*	
106-99-0	butadiene, 1,3-	December 7, 1990	June 15, 2001	{Date of Adoption}
7440-43-9	cadmium and cadmium compounds	June 1, 1990	June 15, 2001	
105-60-2	caprolactum		{Date of Adoption}	{Date of Adoption}
75-15-0	carbon disulfide		May 3, 2002	August 13, 1999
56-23-5	carbon tetrachloride (or tetrachloromethane)	June 1, 1990	June 15, 2001	August 13, 1999
463-58-1	carbonyl sulfide		{Date of Adoption}	{Date of Adoption}
7782-50-5	chlorine		August 18, 2000	August 13, 1999
10049-04-4	chlorine dioxide		June 15, 2001	
95-83-0	chloro-o-phenylenediamine, 4-	January 8, 1999		
95-69-2	chloro-o-toluidine, p-	January 8, 1999		
108-90-7	chlorobenzene		June 15, 2001	
	chlorofluorocarbons			
75-43-4	dichlorodifluoromethane (CFC-12)		*	
75-69-4	trichlorofluoromethane (CFC-11)		*	
76-13-1	trichlorotrifluoroethane (CFC-113)		*	
67-66-3	chloroform (trichloromethane)	December 7, 1990	August 18, 2000	August 13, 1999

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
	Chlorophenols			
95-57-8	chlorophenol, 2-		*	
88-06-2	trichlorophenol, 2,4,6-	December 7, 1990		
	tetrachlorophenols (TECPH)		*	
87-86-5	pentachlorophenol	September 8, 1998	**	
76-06-2	chloropicrin		May 3, 2002	August 13, 1999
126-99-8	chloroprene		**	
18540-29-9	**chromium (hexavalent) and chromium compounds**	June 1, 1990	June 15, 2001	
	including, but not limited to:			
10294-40-3	barium chromate	June 1, 1990	June 15, 2001	
13765-19-0	calcium chromate	June 1, 1990	June 15, 2001	
7758-97-6	lead chromate	September 8, 1998	June 15, 2001	
10588-01-9	sodium dichromate	June 1, 1990	June 15, 2001	
7789-06-2	strontium chromate	June 1, 1990	June 15, 2001	
13530-65-9	zinc chromate	June 1, 1990	June 15, 2001**	
1333-82-0	chromic trioxide	June 1, 1990	June 15, 2001	
7440-50-8	copper and copper compounds		*	August 13, 1999
120-71-8	cresidine, p-	January 8, 1999		
1319-77-3	**cresols/cresylic acid (all isomers and mixture)**		June 15, 2001	

TABLE I TOXIC AIR CONTAMINANTS				
CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
108-39-4	cresol, m-		June 15, 2001	
95-48-7	cresol, o-		June 15, 2001	
106-44-5	cresol, p-		June 15, 2001	
135-20-6	cupferron	January 8, 1999		
	dialkylnitrosamines			
924-16-3	nitrosodi-n-butylamine, n-	December 7, 1990		
621-64-7	nitrosodi-n-propylamine, n-	September 8, 1998		
55-18-5	nitrosodiethylamine, n-	December 7, 1990		
62-75-9	nitrosodimethylamine, n-	December 7, 1990		
10595-95-6	nitrosomethylethylamine, n-	September 8, 1998		
615-05-4	diaminoanisole, 2,4- (sulfate)	January 8, 1999		
95-80-7	diaminotoluene, 2,4-	January 8, 1999		
	dibenzo-p-dioxins (chlorinated)			
1746-01-6	tetrachlorodibenzo-p-dioxin, 2,3,7,8-	June 1, 1990	August 18, 2000	
40321-76-4	pentachlorodibenzo-p-dioxin, 1,2,3,7,8-	June 1, 1990	August 18, 2000	
39227-28-6	hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-	June 1, 1990	August 18, 2000	
57653-85-7	hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-	June 1, 1990	August 18, 2000	
19408-74-3	hexachlorodibenzo-p-dioxin, 1,2,3,7,8,9-	June 1, 1990	August 18, 2000	
35822-46-9	heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-	June 1, 1990	August 18, 2000	
3268-87-9	octachlorodibenzo-p-dioxin, 1,2,3,4, ~~5,~~6,7,8,9-	June 1, 1990	August 18, 2000	

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
41903-57-5	total tetrachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
36088-22-9	total pentachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
34465-46-8	total hexachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
37871-00-4	total heptachlorodibenzo-p-dioxin	June 1, 1990	August 18, 2000	
	total dioxins, with individual isomers reported	June 1, 1990	August 18, 2000	
	total dioxins, without individual isomers reported	June 1, 1990	August 18, 2000	
	dibenzofurans (chlorinated)			
~~51207-31-9~~5120-73-19	tetrachlorodibenzofuran, 2,3,7,8-	June 1, 1990	August 18, 2000	
57117-41-6	pentachlorodibenzofuran, 1,2,3,7,8-	June 1, 1990	August 18, 2000	
57117-31-4	pentachlorodibenzofuran, 2,3,4,7,8-	June 1, 1990	August 18, 2000	
70648-26-9	hexachlorodibenzofuran, 1,2,3,4,7,8-	June 1, 1990	August 18, 2000	
57117-44-9	hexachlorodibenzofuran, 1,2,3,6,7,8-	June 1, 1990	August 18, 2000	
72918-21-9	hexachlorodibenzofuran, 1,2,3,7,8,9-	June 1, 1990	August 18, 2000	
60851-34-5	hexachlorodibenzofuran, 2,3,4,6,7,8-	June 1, 1990	August 18, 2000	
67562-39-4	heptachlorodibenzofuran, 1,2,3,4,6,7,8-	June 1, 1990	August 18, 2000	
55673-89-7	heptachlorodibenzofuran, 1,2,3,4,7,8,9-	June 1, 1990	August 18, 2000	
39001-02-0	octachlorodibenzofuran, 1,2,3,4,5,6,7,8	June 1, 1990	August 18, 2000	
55722-27-5	total tetrachlorodibenzofuran	June 1, 1990	August 18, 2000	

TABLE I **TOXIC AIR CONTAMINANTS**				
CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
30402-15-4 55684-94-1 38998-75-3	total pentachlorodibenzofuran total hexachlorodibenzofuran total heptachlorodibenzofuran	June 1, 1990 June 1, 1990 June 1, 1990	August 18, 2000 August 18, 2000 August 18, 2000	
96-12-8	dibromo-3-chloropropane, 1,2- (DBCP)	September 8, 1998	**	
106-46-7	dichlorobenzene, 1,4- (or p-dichlorobenzene)	September 8, 1998	June 15, 2001	
91-94-1	dichlorobenzidine, 3,3	December 7, 1990		
75-34-3	dichloroethane, 1,1-	January 8, 1999		
75-35-4	dichloroethylene, 1,1- (see vinylidene chloride)		~~June 15, 2001~~	
9901 (emittant ID)	diesel PM – diesel particulate matter from diesel-fueled internal combustion engine exhaust	March 7, 2008	March 7, 2008	
111-42-2	diethanolamine		May 3, 2002	
60-11-7	dimethylaminoazobenzene, p-	January 8, 1999		
68-12-2	dimethylformamide (N,N-)		June 15, 2001	
121-14-2	dinitrotoluene, 2,4-	December 7, 1990		
123-91-1	dioxane, 1,4- (or 1,4-diethylene dioxide)	December 7, 1990	August 18, 2000	August 13, 1999
106-89-8	epichlorohydrin (or 1-chloro-2,3-epoxypropane)	December 7, 1990	June 15, 2001	August 13, 1999
106-88-7	epoxybutane,1,2-		June 15, 2001	
140-88-5	ethyl acrylate		*	
100-41-4	ethyl benzene	June 5, 2009	August 18, 2000	

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
75-00-3	ethyl chloride (or chloroethane)		August 18, 2000	
106-93-4	ethylene dibromide (or 1,2-dibromoethane)	June 1, 1990	May 3, 2002	
107-06-2	ethylene dichloride (or 1,2-dichloroethane)	June 1, 1990	June 15, 2001	
75-21-8	ethylene oxide (or 1,2-epoxyethane)	June 1, 1990	June 15, 2001	
96-45-7	ethylene thiourea	January 8, 1999		
1101	Fluorides (except hydrogen fluoride, listed separately below)		September 10, 2010	<u>August 13, 1999</u>
50-00-0	formaldehyde	December 7, 1990	August 18, 2000	August 13, 1999
	gasoline vapors		*	
111-30-8	glutaraldehyde		June 15, 2001	
	glycol ethers (and their acetates)			
107-21-1	ethylene glycol		August 18, 2000	
111-76-2	ethylene glycol butyl ether		*	August 13, 1999
110-80-5	ethylene glycol ethyl ether		August 18, 2000	February 10, 1999
111-15-9	ethylene glycol ethyl ether acetate		August 18, 2000	August 13, 1999
109-86-4	ethylene glycol methyl ether		August 18, 2000	August 13, 1999
110-49-6	ethylene glycol methyl ether acetate		August 18, 2000	
118-74-1	hexachlorobenzene	December 7, 1990	**	

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
608-73-1	**hexachlorocyclohexanes (mixed or technical grade)**	December 7, 1990	**	
319-85-6	hexachlorocyclohexane, alpha	September 8, 1998		
319-85-7	hexachlorocyclohexane, beta	September 8, 1998		
58-89-9	hexachlorocyclohexane, gamma- (lindane)	September 8, 1998	**	
77-47-4	hexachlorocyclopentadiene		*	
110-54-3	hexane		August 18, 2000	
302-01-2	hydrazine	September 8, 1998	June 15, 2001	
122-66-7	hydrazobenzene (or 1,2-diphenylhydrazine)	December 7, 1990		
7647-01-0	hydrochloric acid (or hydrogen chloride)		August 18, 2000	August 13, 1999
7664-39-3	hydrofluoric acid (or hydrogen fluoride)		September 10, 2010	August 13, 1999
10035-10-6	hydrogen bromide (HBR)		*	
74-90-8	hydrogen cyanide		August 18, 2000	August 13, 1999
7783-06-4	hydrogen sulfide		August 18, 2000	February 10, 1999
7783-07-5	hydrogen selenide			August 13, 1999
	isocyanates			
624-83-9	methyl isocyanate		May 3, 2002	
78-59-1	isophrone		May 3, 2002	
67-63-0	isopropyl alcohol		August 18, 2000	August 13, 1999

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
7439-92-1	**lead and lead compounds (inorganic, including elemental lead)** including, but not limited to:	September 8, 1998	**	
	lead compounds (inorganic)	September 8, 1998	**	
301-04-2	lead acetate	September 8, 1998	**	
7758-97-6	lead chromate	September 8, 1998	**	
7446-27-7	lead phosphate	September 8, 1998	**	
1335-32-6	lead subacetate	September 8, 1998	**	
	lead compounds (other than inorganic)	September 8, 1998	**	
108-31-6	maleic anhydride		May 3, 2002	
7439-96-5	manganese and manganese compounds		August 18, 2000	
7439-97-6	**mercury and mercury compounds (inorganic)**		August 18, 2000	August 13, 1999
	including, but not limited to:			
7487-94-7	mercuric chloride		August 18, 2000	
593-74-8	methyl mercury		August 18, 2000	
67-56-1	methanol (methyl alcohol)		August 18, 2000	August 13, 1999
74-83-9	methyl bromide (or bromomethane)		August 18, 2000	August 13, 1999
71-55-6	methyl chloroform (or 1,1,1-trichloroethane)		August 18, 2000	August 13, 1999
78-93-3	methyl ethyl ketone		*	August 13, 1999
80-62-6	methyl methacrylate		*	

TABLE I TOXIC AIR CONTAMINANTS				
CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
1634-04-4	methyl tert-butyl ether	May 2, 2003	August 18, 2000	
101-14-4	methylene bis(2-chloroaniline), 4,4- (MOCA)	January 8, 1999		
75-09-2	methylene chloride (or dichloromethane)	June 1, 1990	August 18, 2000	August 13, 1999
101-77-9	methylene dianiline, 4,4'- (and its dichloride)	September 8, 1998	May 3, 2002	
101-68-8	methylene diphenyl diisocyanate		June 15, 2001	{Date of Adoption}
1135	mineral fibers (other than man-made)		*	
90-94-8	michler's ketone	January 8, 1999		
7440-02-0	**nickel and nickel compounds:**	March 12, 1999	August 18, 2000	August 13, 1999
	including, but not limited to:			
373-02-4	nickel acetate	March 12, 1999	August 18, 2000	August 13, 1999
3333-67-3	nickel carbonate	March 12, 1999	August 18, 2000	August 13, 1999
13463-39-3	nickel carbonyl	March 12, 1999	August 18, 2000	August 13, 1999
12054-48-7	nickel hydroxide	March 12, 1999	August 18, 2000	August 13, 1999
1313-99-1	nickel oxide	March 12, 1999	August 18, 2000	August 13, 1999
12035-72-2	nickel subsulfide	December 7, 1990	August 18, 2000	August 13, 1999
1271-28-9	nickelocene	March 12, 1999	August 18, 2000	August 13, 1999
	refinery dust from the pyrometallurgical process	December 7, 1990	August 18, 2000	August 13, 1999
7697-37-2	nitric acid		*	August 13, 1999
98-95-3	nitrobenzene		*	
79-46-9	nitropropane, 2-		*	

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
759-73-9	nitroso-n-ethylurea, n-	December 7, 1990		
684-93-5	nitroso-n-methylurea, n-	December 7, 1990		
86-30-6	nitrosodiphenylamine, n-	December 7, 1990		
156-10-5	nitrosodiphenylamine, p-	September 8, 1998		
59-89-2	nitrosomorpholine, n-	January 8, 1999		
100-75-4	nitrosopiperidine, n-	January 8, 1999		
930-55-2	nitrosopyrrolidine, n-	December 7, 1990		
108171-26-2	paraffins, chlorinated (average chain length, c12; approx. 60% cl by weight)	January 8, 1999		
127-18-4	perchloroethylene (or tetrachloroethylene)	September 8, 1998	September 8, 1998	August 13, 1999
108-95-2	phenol		August 18, 2000	August 13, 1999
75-44-5	phosgene		*	August 13, 1999
7723-14-0 7803-51-2	**phosphorus and phosphorus compounds** phosphine		* February 7, 2003	
7664-38-2	phosphoric acid		August 18, 2000	
85-44-9	phthalic anhydride		June 15, 2001	
1336-36-3 <u>32598-13-3</u> <u>70362-50-4</u> <u>32598-14-4</u> <u>74472-37-0</u>	**polychlorinated biphenyls (PCBs)** 3,3’,4,4’ Tetrachlorobiphenyl 3,4,4’,5 Tetrachlorobiphenyl 2,3,3’,4,4’ Pentachlorobiphenyl 2,3,4,4’,5 Pentachlorobiphenyl	December 7, 1990 March 4, 2005*** March 4, 2005*** March 4, 2005*** March 4, 2005***	** March 4, 2005*** March 4, 2005*** March 4, 2005*** March 4, 2005***	

TABLE I TOXIC AIR CONTAMINANTS				
CAS #	**SUBSTANCE**	**EFFECTIVE DATE CANCER**	**EFFECTIVE DATE CHRONIC**	**EFFECTIVE DATE ACUTE**
31508-00-6	2,3',4,4',5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
65510-44-3	2',3,4,4',5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
57465-28-8	3,3',4,4',5 Pentachlorobiphenyl	March 4, 2005***	March 4, 2005***	
38380-08-4	2,3,3',4,4',5 Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
69782-90-7	2,3,3',4,4',5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
52663-72-6	2,3',4,4',5.5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
32774-16-6	3,3',4,4',5,5' Hexachlorobiphenyl	March 4, 2005***	March 4, 2005***	
39635-31-9	2,3,3'4,4',5,5' Heptachlorobiphenyl	March 4, 2005***	March 4, 2005***	
	polycyclic aromatic hydrocarbons (PAHs)			
56-55-3	benz[a]anthracene	December 7, 1990		
50-32-8	benzo[a]pyrene	December 7, 1990		
205-99-2	benzo[b]fluoranthene	December 7, 1990		
205-82-3	benzo[j]fluoranthene	January 8, 1999		
207-08-9	benzo[k]fluoranthene	December 7, 1990		
218-01-9	chrysene	December 7, 1990		
226-36-8	dibenz[a,h]acridine	January 8, 1999		
224-42-0	dibenz[a,j]acridine	January 8, 1999		
53-70-3	dibenz[a,h]anthracene	December 7, 1990		
192-65-4	dibenzo[a,e]pyrene	January 8, 1999		
189-64-0	dibenzo[a,h]pyrene	January 8, 1999		
189-55-9	dibenzo[a,i]pyrene	January 8, 1999		

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
191-30-0	dibenzo[a,l]pyrene	January 8, 1999		
194-59-2	dibenzo[c,g]carbazole, 7h-	January 8, 1999		
57-97-6	dimethylbenz[a]anthracene, 7,12-	January 8, 1999		
42397-64-8	dinitropyrene, 1,6-	January 8, 1999		
42397-65-9	dinitropyrene, 1,8-	January 8, 1999		
193-39-5	indeno[1,2,3-cd]pyrene	December 7, 1990		
56-49-5	methylcholanthrene, 3-	January 8, 1999		
3697-24-3	methylchrysene, 5-	January 8, 1999		
91-20-3	naphthalene	March 4, 2005***	August 18, 2000	
602-87-9	nitroacenaphthene, 5-	January 8, 1999		
7496-02-8	nitrochrysene, 6-	January 8, 1999		
607-57-8	nitrofluorene, 2-	January 8, 1999		
5522-43-0	nitropyrene, 1-	January 8, 1999		
57835-92-4	nitropyrene, 4-	January 8, 1999		
1150/1151	polycyclic aromatic hydrocarbons (PAHs), total	September 8, 1998		
7758-01-2	potassium bromate	January 8, 1999		
1120-71-4	propane sultone, 1,3-	January 8, 1999		
115-07-1	propylene		August 18, 2000	
107-98-2	propylene glycol methyl ether		August 18, 2000	
75-56-9	propylene oxide (or 1,2-epoxy propane)	September 8, 1998	February 23, 2000	August 13, 1999

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
7782-49-2	**selenium and selenium compounds** other than hydrogen selenide		May 3, 2002	
1310-73-2	sodium hydroxide		*	August 13, 1999
100-42-5	styrene (or vinyl benzene)		August 18, 2000	August 13, 1999
7664-93-9	sulfuric acid (and oleum)		May 3, 2002	August 13, 1999
79-34-5	tetrachloroethane, 1,1,2,2-	January 8, 1999		
62-55-5	thioacetamide	January 8, 1999		
108-88-3	toluene (or methyl benzene)		August 18, 2000	August 13, 1999
	toluene diisocyanates			
584-84-9	toluene-2,4-diisocyanate	September 8, 1998	June 15, 2001	{Date of Adoption}
91-08-7	toluene-2,6-diisocyanate	September 8, 1998	June 15, 2001	{Date of Adoption}
79-00-5	trichloroethane, 1,1,2-	January 8, 1999		
79-01-6	trichloroethylene	December 7, 1990	August 18, 2000	
121-44-8	triethylamine		February 7, 2003	August 13, 1999
51-79-6	urethane (or ethyl carbamate)	September 8, 1998		
7440-62-2	vanadium (fume or dust)			August 13, 1999
1314-62-1	vanadium pentoxide			August 13, 1999
108-05-4	vinyl acetate		May 3, 2002	
75-01-4	vinyl chloride (or chloroethylene)	December 7, 1990	**	August 13, 1999
75-35-4	vinylidene chloride (dichloroethylene, 1,1-)		June 15, 2001*	
1330-20-7	**xylenes (isomers and mixture)**		August 18, 2000	August 13, 1999

TABLE I
TOXIC AIR CONTAMINANTS

CAS #	SUBSTANCE	EFFECTIVE DATE CANCER	EFFECTIVE DATE CHRONIC	EFFECTIVE DATE ACUTE
108-38-3	xylene, m-		August 18, 2000	August 13, 1999
95-47-6	xylene, o-		August 18, 2000	August 13, 1999
106-42-3	xylene, p-		August 18, 2000	August 13, 1999
7440-66-6	**zinc and zinc compounds**		*	
	including, but not limited to:			
1314-13-2	zinc oxide		*	

* Compounds not classified as carcinogenic, but have chronic risk values proposed by OEHHA that have not yet been finalized. The effective date is the date the Scientific Review Panel approves the chronic risk value.
** Compounds are classified as carcinogenic, but have chronic risk values proposed by OEHHA that have not yet been finalized. The effective date for use of chronic risk values is the date the Scientific Review Panel approves the chronic risk value.
*** Effective date for these risk values will be March 4, 2005 or the date of implementation of the applicable most recent version of Risk Assessment Procedures for Rules 1401, 1401.1 and 212, whichever is later.

TABLE II

TOXIC AIR CONTAMINANTS WITH PROPOSED RISK VALUES

CAS #	SUBSTANCE
79-10-7	acrylic acid
107-05-1	allyl chloride
7783-20-2	ammonium sulfate
62-53-3	Aniline
1309-64-4	antimony trioxide
	arsenic compounds (other than inorganic)
532-27-4	chloroacetophenone, 2-
75-45-6	chlorodifluoromethane (HCFC-22)
7440-48-4	cobalt and cobalt compounds
74-85-1	Ethylene
96-45-7	ethylene thiourea
	fluorides and fluoride compounds
87-68-3	hexachlorobutadiene
67-72-1	hexachloroethane
822-06-0	hexamethylene-1,6-diisocyanate
78-93-3	methyl ethyl ketone (or 2-butanone)
7697-37-2	nitric acid
156-10-5	nitrosodiphenylamine, p-
7440-22-4	silver and silver compounds
96-09-3	styrene oxide
79-00-5	trichloroethane, 1,1,2-
593-60-2	vinyl bromide

ATTACHMENT G

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report

Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants

September 2017

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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BACKGROUND

Rule 1401 – New Source Review of Toxic Air Contaminants (Rule 1401) was adopted in June 1990 and establishes health risk thresholds for new or modified permitted equipment or processes. Under Rule 1401, the health risk assessment conducted for new or modified permit units must not exceed a maximum individual cancer risk of one in one million, a cancer burden of 0.5, a chronic hazard index of one, and an acute hazard index of one. The methodology used to estimate health risks for SCAQMD's toxic regulatory program, including Rule 1401, is based on guidance from the Office of Environmental ~~Human~~ Health Hazard Assessment (OEHHA). OEHHA's Risk Assessment Guidelines are incorporated in the South Coast Air Quality Management District's (SCAQMD) Risk Assessment Procedures, which are required for implementing Rules 1401, 1401.1 and 212. The current version of the SCAQMD Risk Assessment Procedures is Version 8.0.

In March 2015, OEHHA revised its Risk Assessment Guidelines[1] (2015 OEHHA Guidelines) to incorporate requirements from the Children's Health Protection Act of 1999 (SB 25) which included the addition of child specific factors that increased the estimated cancer risk for long-term exposures for residential and sensitive receptors. The result is an increase in the estimated cancer risk of about 2.3 times, and higher for certain toxic air contaminants that have multiple exposure pathways such as inhalation, ingestion, and dermal. The 2015 OEHHA Guidelines do not change the toxic emission reductions already achieved by facilities in the South Coast Air Basin (Basin). The 2015 OEHHA Guidelines represent a change in the methodologies and calculations used to estimate health risk based on the most recent scientific data on exposure, childhood sensitivity, and breathing rates.

At the June 5, 2015 meeting, the SCAQMD Governing Board adopted amendments to Rule 1401 and incorporated the 2015 OEHHA Guidelines into SCAQMD's Risk Assessment Procedures (Version 8.0)[2]. SCAQMD staff evaluated permits received between October 1, 2009 and October 1, 2014 and found that most sources would not be required to install new or additional pollution controls as a result of the 2015 OEHHA Guidelines. The SCAQMD staff had concluded that based on an initial screening in June 2015, that some spray booths may have difficulties meeting the Rule 1401 risk thresholds using the 2015 OEHHA Guidelines so additional analysis was needed to better understand potential permitting impacts for spray booths. In addition, time was also needed to better assess and understand the impacts from gasoline dispensing facilities before use of the 2015 OEHHA Guidelines, and updates to emission factors and speciation profiles for gasoline dispensing facilities that the California Air Resources Board (CARB) was recommending. Therefore, provisions were included in the June 2015 amendment to Rule 1401[3] to allow spray

[1] Available on the internet at https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0

[2] SCAQMD's Risk Assessment Procedures for Rules 1401 and 212 (Version 8.0) can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/riskassprocjune15.pdf and Attachment M can be found here: http://www.aqmd.gov/docs/default-source/permitting/attachment-m.pdf.

[3] SCAQMD's June 2015 Staff Report for Proposed Amended Rules 212 – Standards for Approving Permits and Issuing Public Notice, 1401 – New Source Review of Toxic Air Contaminants, 1401.1 – Requirements for New and Relocated Facilities Near Schools, and 1402 – Control of Toxic Air Contaminants from Existing Sources," can be found here: http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2015/2015-jun1-028.pdf?sfvrsn=9

booths and retail gasoline transfer and dispensing facilities to continue to use the then current SCAQMD Risk Assessment Procedures (Version 7.0)[4] to calculate the cancer risk until SCAQMD staff returns to the Board with specific regulations and/or procedures for these industries.

Staff has since completed the review of analyzing potential permitting impacts for spray booths and gasoline dispensing facilities. The results of the analysis is presented below under the section Proposed Amendments to Rule 1401. As discussed later in this staff report, implementation of the 2015 OEHHA Guidelines are expected to have minimal impacts to new or modified spray booth or gasoline dispensing facilities. As a result, Proposed Amended Rule 1401 will require these two source categories to begin using the SCAQMD's Risk Assessment Procedures (Version 8.1) which incorporate~~s~~ the 2015 OEHHA Guidelines for spray booths and gasoline dispensing facilities, revised emission factors and speciation profiles for gasoline dispensing facilities, and updated meteorological data. Currently, the SCAQMD's Risk Assessment Procedures (Version 8.0) requires all other permitted sources to use the 2015 OEHHA Guidelines and no changes except for updated screening tables using updated meteorological data are proposed for those sources.

PUBLIC PROCESS AND OUTREACH EFFORTS

Development of Proposed Amend Rule 1401 (PAR 1401) is being conducted through a public process. SCAQMD staff held ~~three~~ four working group meetings at SCAQMD Headquarters in Diamond Bar on June 1, 2017, July 6, 2017, ~~and~~ July 20, 2017, and August 16, 2017. Based on Board Member comments at the Stationary Source Committee on July 21, 2017, staff held the fourth Working Group Meeting on August 16th to allow CARB to present their current view on the refueling emission factor for gasoline dispensing facilities, as this was a key issue for some stakeholders. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purpose of the working group meetings are to discuss proposed concepts and to work through the details of staff's proposal. A Public Workshop was held on July 12, 2017.

PROPOSED AMENDMENTS TO RULE 1401

Currently, Rule 1401 allows the use of the previous SCAQMD Risk Assessment Procedures (Version 7.0) when determining risk for new and modified spray booths (e)(3)(A) and gasoline dispensing facilities (e)(3)(B). PAR 1401 will remove those provisions and instead require the use of the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for all new and modified permitted equipment and processes. Version 8.1 of SCAQMD's Risk Assessment Procedures will replace Version 8.0 to reflect updates to emission factors for gasoline dispensing facilities, gasoline speciation profiles and meteorological data. Additionally, PAR 1401 will update the list of toxic air contaminants subject to the rule.

SPRAY BOOTHS

While previously issued permits are not subject to the proposed amendments to Rule 1401, they were used to predict potential impacts. To determine if the 2015 OEHHA Guidelines would impact future spray booth permits, the maximum individual cancer risk calculated in the previous permit

[4] SCAQMD's Risk Assessment Procedures for Rules 1401, 1401.1 and 212 (Version 7.0) can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/risk-assessment-procedures-v-7.pdf and Attachment L can be found here: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/attachment-l.pdf.

evaluation was multiplied by 2.3 if the materials driving cancer risk had no multipathway factor (including most volatile organic compounds) or multiplied by six if the material driving cancer risk had a multipathway factor (including most toxic metals). The increase in the estimated cancer risk for a residential receptor is 2.3 times higher with the 2015 OEHHA Guidelines. If the receptor is a worker there is generally no change in the estimated health risk. As a conservative approach, it is assumed that these permits had a residential receptor.

If the risk remained below the Rule 1401 risk thresholds of either 1 in-one-million without Best Available Control Technology for Toxics (T-BACT), or 10 in one million with T-BACT, then there would be no additional pollution controls required, and no permitting impact. If the calculated risk was higher than Rule 1401 thresholds, then it was deemed that a similar future spray booth permit could potentially be impacted. The objectives of the analysis were to answer the questions if spray booths were permitted with estimated health risks reflecting the 2015 OEHHA Guidelines: (1) would future spray booths that were not required to install pollution controls, potentially need to install pollution controls; or (2) would future spray booths that were required to install pollution controls, potentially need to upgrade pollution controls.

Analysis of Spray Booths

Staff evaluated spray booth permits issued from October 1, 2009 through October 1, 2014. Over the five-year permitting period, SCAQMD staff processed approximately 1,400 new or modified permits for spray booths. Out of the 1,400 spray booth permits, staff conducted a detailed review of a subset of 327 permits, which were randomly chosen. This sample size was selected to provide a 95 percent confidence level and a 5 percent margin of error in the analysis. Staff reviewed permit applications to better understand:

- Industry type and applicable coating rule(s);
- Compound(s) driving the carcinogenic risk; and
- Maximum individual cancer risk

Out of the 327 permits reviewed, automotive finishing accounted for almost one third of the applications. Wood coatings and other coatings each contributed to 23 percent of the applications, followed by metal coatings and aerospace coatings. Overall, the distribution of the industry type was very similar between the subset of reviewed permits and all the spray booth permits issued over the five-year period, indicating that the universe of spray booth application was well represented by the subset sample as indicated by Figure 1 below.

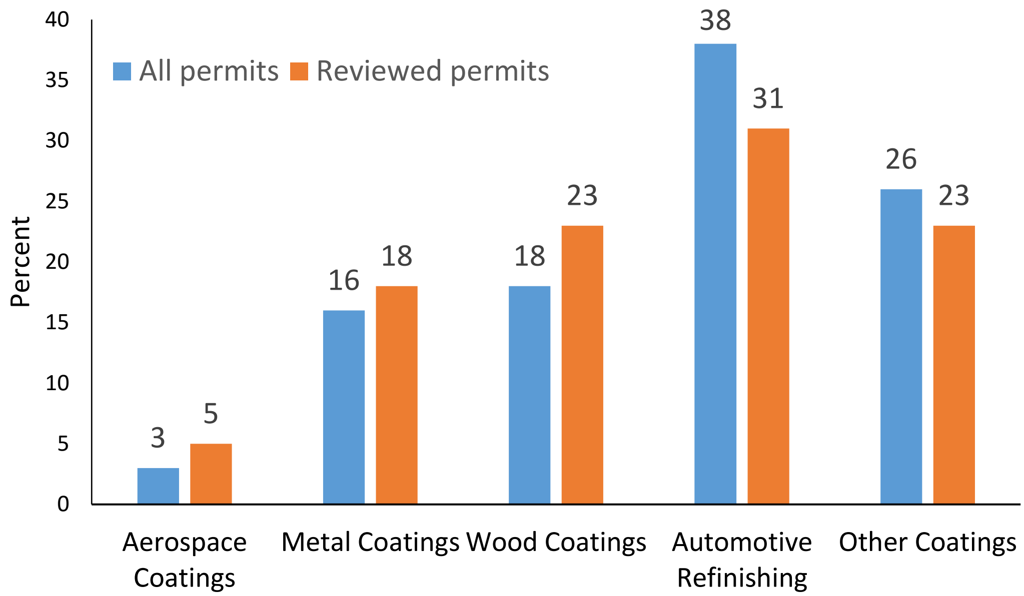

Figure 1: Industry Type Breakdown of Spray Booth Permit Applications

The spray booths can be categorized into two groups: with or without T-BACT. Figure 2 provides an overview of the potential impacts of the 2015 OEHHA Guidelines on spray booths. Majority of the spray booths (277 of 327) are not equipped with T-BACT, while 50 of the 327 spray booths are equipped with T-BACT. More details about the potential impacts on the two types of spray booths are discussed below.

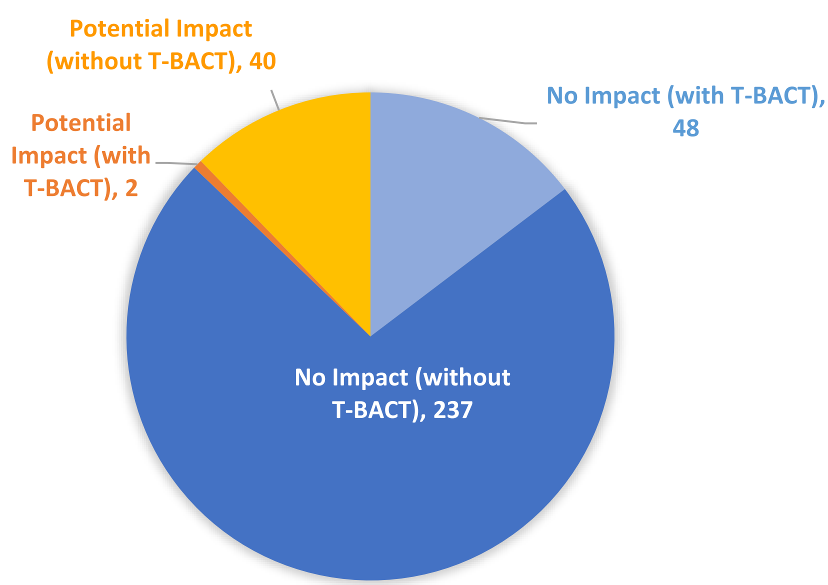

Figure 2: Potential Impacts of 2015 OEHHA Guidelines on Spray Booths

Impacts on Spray Booth Applications with T-BACT

Of the 327 permits reviewed, 50 were permitted with T-BACT. Of those 50 permits with T-BACT, 48 spray booths would have an estimated cancer risk that remained below the threshold of 10 in one million with the application of the 2015 OEHHA Guidelines. Among these spray booths, most of them use coatings containing hexavalent chromium or other metals. Thus, if 48 similar spray booths were permitted in the future using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) that incorporates the 2015 OEHHA Guidelines, no additional pollution controls are expected.

Two spray booths had an estimated cancer risk above 10 in one million with the use of the 2015 OEHHA Guidelines. These two spray booths use aerospace coatings containing hexavalent chromium, and were permitted with high efficiency particulate air (HEPA) filters with an efficiency of 99.999 percent, which satisfies the T-BACT requirement. The permitted cancer risk was kept below 10 in a million with limits on the maximum allowable usage of hexavalent chromium and ethyl benzene. If these two spray booths were permitted using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) which incorporates the 2015 OEHHA Guidelines, the cancer risk would exceed the threshold of 10 in one million assuming the same throughput and emission control technology (HEPA filters) are used. Thus, a new spray booth application with the same operating conditions as these two spray booths would have to either reduce their throughput or use a more effective control technology. An ultra-low penetration air (ULPA) filter provides a removal efficiency of 99.9999 percent or better, and is commercially available with a comparable cost as the HEPA filter. With the use of an ULPA filter, throughput would not need to be reduced. Nonetheless, a filter with a higher efficiency will likely increase the pressure drop across the filter. Depending on the design of the air system, a stronger fan/blower might be needed to accommodate a more efficient filter.

Impacts on Spray Booth Applications without T-BACT

Of the 327 permits reviewed, 277 are permitted without T-BACT. Staff estimates that with the application of the 2015 OEHHA Guidelines the estimated cancer risk for 237 (86 percent) permitted spray booths would remain below a health risk of 1 in one million so no further action, such as the addition of pollution controls or changes to the type or amount of materials identified in the permit, would be expected. These types of permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because the coatings applied have low or no toxics content.

Of the 277 spray booths without T-BACT, 40 spray booths (14 percent) exceeded the cancer risk threshold of 1 in one million when the 2015 OEHHA Guidelines were applied. An in-depth analysis was conducted on the permits issued for these 40 spray booths to better understand the volume and the content of toxic air contaminants in the coatings used. Four spray booths were found to be no longer in service and are not included in the analysis below, leaving 36 permits for spray booths analyzed. Staff collected safety data sheets, usage records, contacted coating suppliers, or conducted site visits to examine the potential impact of the 2015 OEHHA Guidelines.

Among the 36 spray booths that are in operation, ethyl benzene was the most prevalent toxic air contaminant used in coatings with 72 percent of the permits for spray booths use coatings with ethyl benzene. Formaldehyde is the next most common toxic air contaminant used in coatings, representing 8 percent of the permits for spray booths. For the other permits, the formulations had multiple toxic air contaminants, including ethyl benzene and formaldehyde (8 percent), ethyl benzene and nickel (6 percent), as well as ethyl benzene and others (6 percent).

As discussed in more detail below, the 36 permits for spray booths are not expected to be impacted by the 2015 OEHHA Guidelines because the facilities are either no longer using toxic air contaminants, the actual usage of materials containing toxic air contaminants is much lower than permitted levels, or the amount of toxic air contaminants assumed in the permit is higher than the actual amount in the material used. The results of the in-depth analysis is illustrated in Figure 3 below.

Permitted Spray Booths Without T-BACT – Use of Materials With Toxic Air Contaminants

Based on interviews with owner or operators with permitted spray booths, staff found that for 10 of the 36 permits for spray booths, the owner or operator switched coatings and are currently using coatings that do not contain toxic air containments. In some cases, the facility had opted to utilize a new coating while in the remaining cases, the coating had been reformulated. Reformulated coatings typically replace the mineral spirits that contains trace quantities of ethyl benzene with a hydrotreated petroleum distillate that performs the same function but does not contain ethyl benzene. Thus, it is expected that a considerable fraction of owners or operators that are applying for future permits for spray booths will be selecting coatings that do not contain toxic air contaminants as coatings that do not contain toxic air contaminants are available. It is assumed that for the 10 permitted spray booths that originally were using coatings with toxic air contaminants, that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because operators are already making the decision to use coatings that do not contain toxic air contaminants.

Permitted Spray Booths Without T-BACT – Actual Material Usage

Based on interviews and site visits with owner and operators, staff found that the permitted usage of coatings was considerably higher than the actual usage in 16 of 36 permits for spray booths reviewed (25 percent). In many cases, the facility is given a maximum allowable limit on the number of gallons for the overall use and a maximum allowable limit on the number of gallons that can be used that contain a toxic air contaminant. Because the spray booths use multiple coatings within the same booth and most coatings do not contain a toxic air contaminant, the facility may use close to their overall use limit but not approach their limit for coatings that contain toxic air contaminants. Because their actual usage is considerably lower than their maximum allowable usage limit for specific coatings with toxic air contaminants, a lower permitted usage for specific coatings with toxic air contaminants will not impact their operations. By establishing maximum usage limits for coatings with toxic air contaminants that are closer to anticipated actual usage, it is expected that for the 16 permitted spray booths that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) because operators can accept a lower permitted usage limit for materials with toxic air contaminants.

Permitted Spray Booths Without T-BACT – Toxic Air Contaminant Content in Safety Data Sheet

Based on interviews with owner or operators and coating formulators, staff found that for 10 of the spray booths, the Safety Data Sheet had overstated the quantity of toxic air contaminants in their coatings. Safety Data Sheets list the range (in percent by weight) of toxic air contaminants present in the coating formulation. In many cases the formulated coating lists the ethyl benzene content as between 0.5 and 5 percent. However, based on discussions with the coating formulator, the actual ethyl benzene content for the formulated product is actually between 0.2 and 2.5 percent. If these spray booths were to apply for new permits under the proposed SCAQMD Risk Assessment Procedures (Version 8.1), they might consider migrating to reformulated coatings / new coatings with lower or no ethyl benzene content. Alternatively, manufacturers might update the Safety Data Sheet to provide a more accurate estimate with products using ethyl benzene. By either using a more accurate percentage of toxic air contaminant in the coating formulation or using a coating with lower or no ethyl benzene, it is expected that for the 10 permitted spray booths that in the future these permit applications would not be impacted by incorporating the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1).

Summary of Spray Booth Analysis

Based on the detailed review of 327 spray booth permit applications, the implementation of the 2015 OEHHA Guidelines in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) will result in no impact for 99 percent of spray booth permits. Figure 3 below summarizes staff's findings for spray booths that were permitted without T-BACT. For spray booths that were permitted without T-BACT, it is expected that in the future permit applicants will either select a coating with no toxic air contaminants, use products that provide more accurate estimates of toxic air contaminants in the Safety Data Sheet, or accept a lower usage limit for coatings that contain toxic air contaminants rather than install T-BACT.

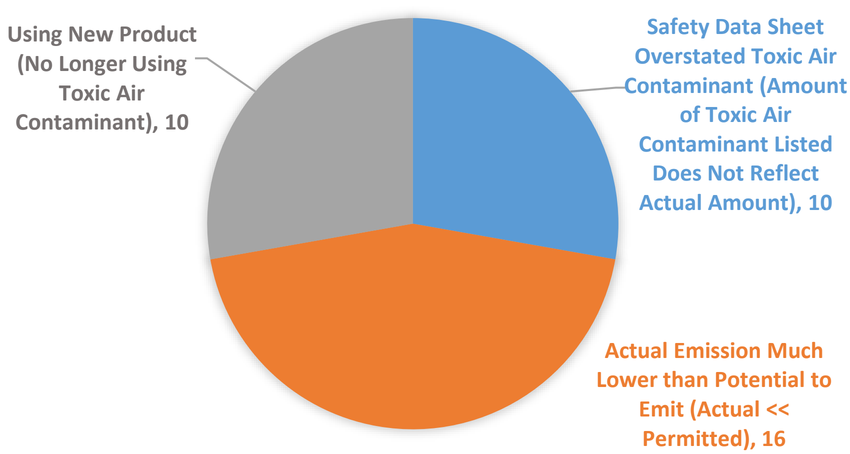

Figure 3: Summary Findings for 36 Spray Booths without T-BACT

Table 1 provides a summary findings for spray booths. Approximately 1 percent (two of the 327) of spray booth permits may need to use a high efficiency filter media such as ULPA filters, or consider reducing their throughput if the 2015 OEHHA Guidelines are utilized. For facilities that were permitted without T-BACT, it is expected that no additional pollution controls would be needed using the 2015 OEHHA Guidelines. Therefore, with a 95 percent confidence level, it is expected that approximately 1 percent of new spray booth permit applications will require additional pollution control equipment if the 2015 OEHHA Guidelines are utilized. With SCAQMD receiving, on average, 280 spray booth permit applications annually, approximately two spray booth permits annually could require higher level ~~of~~ air pollution controls. The expected additional air pollution control would be the replacement of HEPA filters with ULPA filters. It is concluded that the impact of the 2015 OEHHA Guidelines are minimal on spray booth permits. Therefore, staff recommends removing the exemption and referencing the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for spray booths.

Table 1: Summary Findings for Spray Booths with T-BACT

Area of Analysis	Number of Permits	Will T-BACT or Upgrades to T-BACT be Needed?
Total number of spray booths reviewed	327	
Spray booths without T-BACT where the cancer risk with the 2015 OEHHA Guidelines would be:		
• ≤ 1 in one million after initial review	237	
• ≤ 1 in one million after in-depth review		
○ Use of materials with toxic air contaminants	10	No
○ Actual material usage	16	No
○ Toxic air contaminant content in Safety Data Sheet	10	No
○ No longer in operation	4	N/A
Spray booths with T-BACT where the cancer risk with the 2015 OEHHA Guidelines would be:		
• ≤ 10 in one million	48	No
• >10 in one million	2	Yes
Percent of spray booth permits that will need T-BACT or upgrades to T-BACT controls out of 327 permits reviewed	0.6%	

GASOLINE DISPENSING FACILITIES

In the amendments to Rule 1401 in June 2015, SCAQMD staff recommended that retail gasoline transfer and dispensing facilities continue to use the then current SCAQMD Risk Assessment Procedures (Version 7.0) because additional time was needed to better assess the potential impacts of the revised speciation profile that ~~the California Air Resources Board (~~CARB~~)~~ had provided in March 2015 and emission data on gasoline dispensing facilities. As part of this rule development process for PAR 1401, staff evaluated the potential impacts of the revised emission factors and gasoline speciation profiles and how they could affect new gasoline dispensing facilities combined with the use of the 2015 OEHHA Guidelines in proposed SCAQMD Risk Assessment Procedures (Version 8.1).

Gasoline Dispensing Emission Factors

Gasoline dispensing emission factors gasoline speciation profiles for air toxics are developed by ~~the California Air Resources Board (~~CARB~~)~~. In December 2013, CARB revised emission factors for gasoline dispensing facilities and are described in CARB's "Revised Emission Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities." (CARB's 2013 Revised Emission Factors). The emission factors were revised for the processes of loading, breathing, and refueling, and new information was added for hose permeation. The emission factor for spillage remains unchanged. Each of these emission sources is briefly described below:

i) Loading - Emissions occur when a fuel tanker truck unloads gasoline to the storage tanks. The storage tank vapors, displaced during loading, are emitted through its vent pipe. A pressure/vacuum valve installed on the tank vent pipe significantly reduces these emissions.

ii) Breathing - Emissions occur through the storage tank vent pipe as a result of temperature and pressure changes in the tank vapor space.

iii) Refueling - Emissions occur during motor vehicle refueling when gasoline vapors escape either through the vehicle/nozzle interface or the onboard refueling vapor recovery (ORVR) system.

iv) Spillage - Emissions occur from evaporating gasoline that spills during vehicle refueling.

v) Hose Permeation - Emissions caused by the migration of liquid gasoline through the outer hose material and to the atmosphere through permeation.

One of the updates to the 2013 Revised Emission Factors was to add a new subcategory for refueling for Phase II fueling for vehicles equipped with ORVR. CARB's previous emission factors which were adopted in 1999 did not account for vehicles equipped with ORVR. Table 2 presents CARB's 2013 Revised Emission Factors and SCAQMD's proposed controlled gasoline emission factors for the process of loading, breathing, refueling, spillage and hose permeation. SCAQMD staff is recommending the use of CARB's Revised Controlled Gasoline Emission Factors for loading, breathing, spillage and hose permeation. SCAQMD staff, however, is recommending not to incorporate CARB's 2013 revised emission factors for refueling ORVR vehicles, but continuing the use of the current SCAQMD emission factor for refueling.

Table 2: CARB 2013 Revised and SCAQMD Proposed Controlled Gasoline Dispensing Emission Factors (lbs/1,000 gallon)

Emission Source	SCAQMD Current Controlled Gasoline Emission Factor (lbs/1,000 gal)	CARB 2013 Revised Controlled Gasoline Emission Factor (lbs/1,000 gal)	SCAQMD Proposed Controlled Gasoline Emission Factor (lbs/1,000 gal)
Loading	0.42	0.15	Same as CARB
Breathing	0.025	0.024	Same as CARB
Refueling – Phase II with Non-ORVR vehicles	0.32*	0.42	~~Same as CARB~~0.32* (remain unchanged from current emission factor)
Refueling – Phase II with ORVR vehicles	~~NA~~0.32	0.021	0.32* (remain unchanged from current emission factor)
Spillage	0.24	0.24	Same as CARB
Hose Permeation	None	0.009	Same as CARB

*SCAQMD staff is committed to continue working with CARB staff on the refueling emission factor for Phase II EVR with ORVR vehicles. Until then, SCAQMD staff is recommending using the current SCAQMD emission factor for refueling.

Refueling Emission Factor for Phase II with ORVR Vehicles

The SCAQMD staff has reviewed the emission factor for refueling, and believes that CARB's 2013 revised emission factors may overestimate the emission reductions from refueling with Phase II with ORVR vehicles. CARB's approach to derive the refueling emission factor is to apply a 95 percent control efficiency for Phase II enhanced vapor recovery (EVR), and an additional 95 percent control efficiency for ORVR to provide an overall control efficiency for refueling of 99.75 percent. Based on SCAQMD staff's review of the Phase II EVR and ORVR technologies, these two pollution control technologies may not work in series to provide a 99.75 control efficiency. The technical basis of staff's determination is presented below.

Phase II EVR is a system designed to capture displaced vapors that emerge from inside a vehicle's fuel tank, when gasoline is dispensed into the tank. As shown in Figure 4, during refueling, vapors are pulled from the gasoline tank to the underground storage tank for a vehicle that is not equipped with ORVR that is fueled with Phase II EVR. Currently there are two systems certified for Phase II EVR: a balance system and a vacuum-assist system. The balance system transfers vapors from the vehicle and returns them to the underground storage tank based on the pressure differential. A vacuum-assist system relies on a vacuum to draw vapors from the vehicle fuel tank into the underground storage tank. CARB requires use of ORVR-compatible Phase II EVR systems that are designed to sense when an ORVR vehicle is being refueled and reduces the air to liquid ratio to near zero to avoid compatibility emission effects in the underground storage tank. CARB has determined that Phase II EVR systems have a control efficiency of 95 percent.

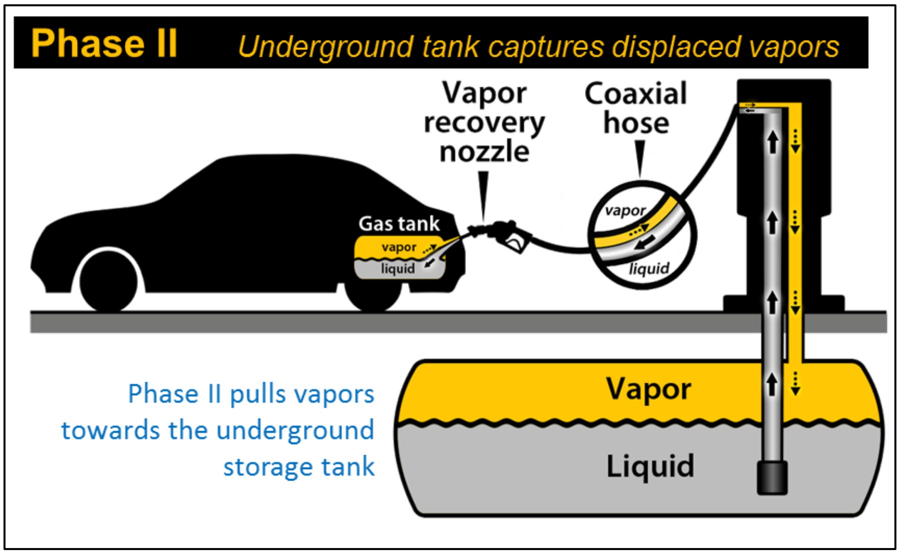

Image Source: Washington State JLARC Report: Gas Vapor Regulations

Figure 4: Phase II Vapor Recovery Underground Tank Captures Displaced Vapors

As shown in Figure 5, an ORVR system captures the gasoline vapors that are displaced during refueling and stores those vapors in a canister filled with activated carbon. When the vehicle engine is started, gasoline vapors stored in the canister are purged and burned in the engine. The carbon bed achieves an average control efficiency of 95% as determined by CARB.

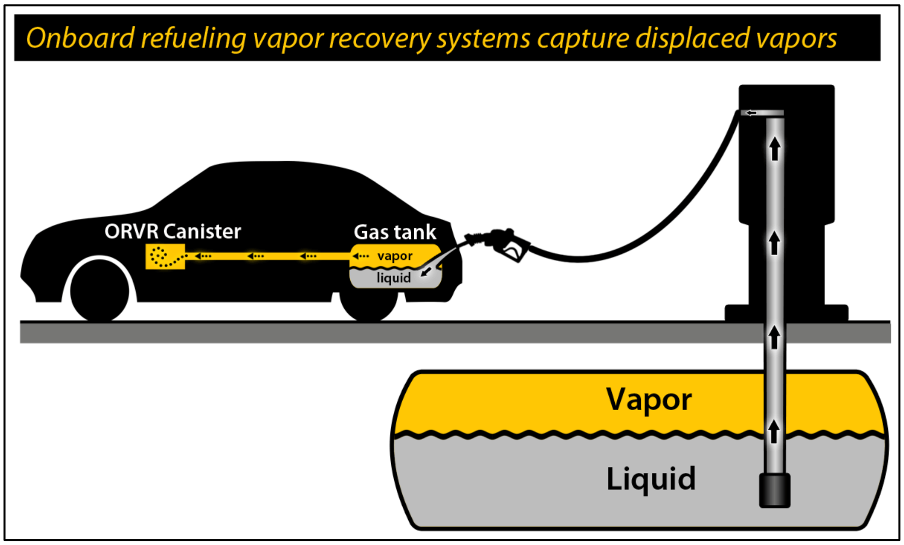

Image Source: Washington State JLARC Report: Gas Vapor Regulations

Figure 5: Onboard Refueling Vapor Recovery System Capture Displaced Vapors

Figure 6 provides a more detailed view of the fuel tank and the modified fillpipe on a vehicle equipped with ORVR. As shown in Figure 6, the ORVR system has mechanisms (i.e. a narrowed fillpipe to form a liquid barrier and a mechanical valve at the end of the fillpipe) to prevent vapor within a vehicle fuel tank from escaping via the fillpipe of the vehicle to the Phase II controls. The vapor that would have otherwise escaped through the fillpipe to the Phase II controls is instead directed to a carbon canister contained within the vehicle, which is the actual means of emission control of the ORVR system, to adsorb hydrocarbons contained in the displaced vapor.

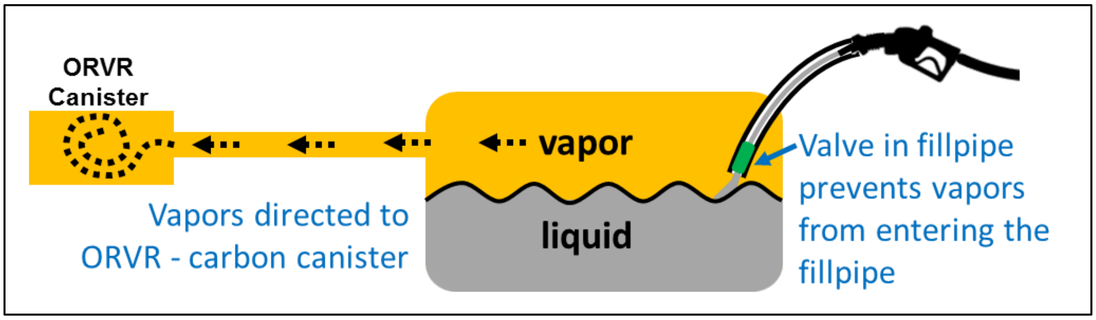

Image Source: Washington State JLARC Report: Gas Vapor Regulations

Figure 6: Detailed View of Fillpipe for Onboard Refueling Vapor Recovery System

CARB's revised emission factor for refueling of ORVR vehicles is calculated assuming that the ORVR system and the Phase II EVR system work consecutively in series to control vapor emissions, allowing a compounding control efficiency of 99.75 percent from both control equipment. However, there is no empirical evidence supporting the assumption that all the vapors escaping from the ORVR system are directed to the fillpipe and can be captured by the Phase II EVR system.

To further illustrate that emission reductions from the Phase II EVR system are not compounded, the United States Environmental Protection Agency (U.S. EPA) has conducted source test studies according to the Federal Test Procedure. The U.S. EPA tests were conducted using sealed housing emissions device (SHED), where emissions from both the fillpipe and the on-board canister were monitored. The U.S. EPA study tested 337 dispensing events, and the results are summarized in a report published by CARB in 2008 (Table 7)[5]. The fillpipe and on-board canister emissions together averaged to 0.25 pounds per 1,000 gallons, suggesting that the revised emission factor recommended by CARB underestimates the emissions from refueling ORVR vehicles. The table further shows a standard deviation of 1.15 which indicates the control efficiency of individual vehicle tested varies significantly from the average emissions of 0.25 pounds per 1,000 gallons.

Additional justifications can be found with the documents U.S. EPA issued on its rule to remove the federal Stage II program from the State Implementation Plans (SIP) requirements. On July 15, 2011, the U.S. EPA issued a proposed rule titled "*Widespread Use for Onboard Refueling Vapor Recovery and Stage II Waiver*." The proposed rule allowed states to consider removing Stage II vapor recovery requirements when revising their SIPs, due to the national widespread use of

[5] Available on the internet at https://www.arb.ca.gov/vapor/archive/2008/orvrtestreport072408.pdf

ORVR. Subsequently, U.S. EPA issued the "*Guidance on Removing Stage II Gasoline Refueling Vapor Recovery Programs from State Implementation Plan*" in 2012. The Guidance document provides both policy and technical recommendations for states seeking to remove or phase-out existing Stage II program, based on the premise that the Stage II program would become largely-redundant due to the widespread use of ORVR.

On the federal level, the control efficiency of Stage II is in the range of 60-75 percent, much lower than the California Phase II program (95 percent). In addition, in areas where certain types of vacuum-assist Stage II control systems are used, the limited compatibility between ORVR and some configurations of this Stage II hardware may result in an area-wide emissions disbenefit. U.S. EPA's regulation stated that with the widespread use of the ORVR-equipped vehicles, Stage II programs have become largely redundant control systems with minimal reduction benefits beyond the ORVR system. SCAQMD and CARB have commented that Phase II EVR are still needed as discussed in more detail under their comment letters[6] submitted in response to U.S. EPA's proposed rule. U.S. EPA's guidance does, however provide additional insight regarding the application of emission reductions from Stage II control systems for vehicles equipped with ORVR further demonstrating that the control efficiency of the ORVR and/or the Stage II systems are only applied once to the respective gasoline throughput. See Appendix A for a detailed discussion.

Additional Refueling Emission Reductions for Phase II with ORVR Vehicles

Although the SCAQMD staff does not believe that it is technically correct to apply an additional 95% control efficiency on the remaining refueling emissions for a vehicle equipped with ORVR, there is evidence that vehicles equipped with ORVR do have emissions at the fillpipe. A study conducted by CARB in 2008[7] measured the gasoline vapor emissions at the vehicle fuel fillpipe of ORVR vehicles at a gasoline dispensing facility with no Phase II EVR system. Although the study demonstrated that the majority of the vapors escaping from the ORVR canister is not routed to the fillpipe, there is a small percentage of vapors that will escape the fillpipe that can be captured by the Phase II EVR system. As discussed below, the amount of vapors escaping the fillpipe that can be captured by the Phase II EVR system is much less than the 0.42 lbs/1,000 gallons that CARB used to estimate emission reductions from Phase II EVR systems for vehicles with ORVR.

The 2008 CARB study was conducted at an "ambient environment" at a gasoline dispensing facility for a rental vehicle company and based on 58 dispensing events. While the test was designed to evaluate fillpipe emissions, the study could not capture emissions from the on-board canister of the ORVR system. Therefore, it does not present total refueling emissions, which includes emissions from both the fillpipe and the on-board canister for ORVR vehicles. Results from the 2008 CARB study showed that fillpipe emissions from ORVR vehicles, which represent the vapors escaping via the fillpipe and not directed to the carbon canister, were 0.043 lb per 1,000 gallons dispensed for summer fuel and 0.094 lb per 1,000 gallons for winter fuel. The low fillpipe emissions for ORVR vehicles are consistent with the design of the ORVR system, which creates a seal in the vehicle fillpipe to route vapors to the onboard canister during dispensing. Moreover,

[6] Available on the internet at https://www.regulations.gov/docketBrowser?rpp=50&so=DESC&sb=postedDate&po=0&dct=PS&D=EPA-HQ-OAR-2010-1076

[7] Available on the internet at https://www.arb.ca.gov/vapor/archive/2008/orvrtestreport072408.pdf

these emissions are a very small fraction of the anticipated emissions escaping from the ORVR canister, which is approximately 0.42 lbs per 1,000 gallons (5 percent of the uncontrolled emission factor of 8.4 lbs per 1,000 gallons).

The SCAQMD staff believes that there is a small amount of vapor that the Phase II EVR system will control during refueling of an ORVR vehicle. SCAQMD staff has been in communication with CARB staff regarding the refueling emissions factor. Both agencies agree that additional time is needed to better understand emission reductions from Phase II EVR for ORVR vehicles. SCAQMD staff is recommending not to incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current emission factor of 0.32 lbs per 1,000 gallons for refueling. Staff is recommending the use of CARB's 2013 emission factors for all other categories (loading, breathing, spillage, and hose permeation). The SCAQMD staff is committed to continue working with CARB staff to refine the refueling emission estimates for Phase II controls with ORVR vehicles. CARB staff received new information which suggests that their current recommended emission factor for refueling is underestimated. CARB will review the available data and information on refueling and prepare an addendum to the 2013 Revised Emission Factors. The addendum will undergo a public process prior to finalizing the refueling emission factor. Once the refueling emission factor is finalized by CARB, staff ~~and~~ will return to the Stationary Source Committee with the updated Risk Assessment Procedures within 30 days and return to the Board ~~with future revisions to refueling emission factors~~as quickly as practicable.

Need for Phase II Enhanced Vapor Recovery with ORVR

Although U.S. EPA has determined that the federal Stage II program had become largely-redundant due to the widespread use of ORVR, the Phase II requirements are still needed in California. In 2011, CARB prepared a comment letter[8] in response to U.S. EPA's proposed rule regarding gasoline vapor recovery control of ozone-precursor emissions titled *Air Quality: Widespread Use for Onboard Refueling Vapor Recovery and Stage II Waiver*. Included in the comment letter is an analysis that supports the need for California's Phase II EVR requirements even with the widespread use of ORVR. It highlights that Phase II EVR is needed for non-ORVR vehicles to achieve the additional VOC reductions of 14.7 tons per day in the year of 2020, and 8.8 tons per day in the year 2028 and beyond. Also, California's Phase II program includes other emission control features, such as in-station diagnostics and standards for nozzle liquid retention, dripless nozzle and spillage, in addition to the control of the vapors displaced during vehicle refueling. Thus, it achieves greater emission reductions than the federal Stage II program requirements and the improvement it provides is essential to meeting mandated federal ambient air quality standards.

Furthermore, the impacts of removing California's Phase II program could be magnified in disadvantaged communities. Due to the lower socioeconomic status in disadvantaged communities, the turnover of the fleet is usually lower. Since vehicles manufactured before year 1998 are not equipped with ORVR, disadvantaged communities could have a higher fraction of non-ORVR vehicles than non-disadvantaged communities, and removal of the Phase II EVR system would put much of the emission disbenefit in the disadvantaged communities.

[8] Available on the internet at https://www.arb.ca.gov/vapor/carb%20response%20useap%20orvr%20widespread%20use%20nprm.pdf.

In addition to emission factors, CARB has also developed speciation profiles of various toxic air contaminants. Out of the toxic compounds emitted from gasoline facilities, benzene, ethylbenzene, and naphthalene have cancer toxicity values. The speciation profiles are different for vapor and liquid phases of gasoline for benzene, ethyl benzene, and naphthalene. Table 3 presents the current and proposed speciation profile in weight percent for the three toxic air contaminants. SCAQMD staff recommends using CARB's proposed gasoline speciation profile.

Table 3: Current and Proposed Weight Percent (lbs/1,000 gallon)

Pollutant (Form)	Current Speciation	Proposed Speciation
Benzene (vapor)	0.30%	0.455%
Ethyl benzene (vapor)	0.118%	0.107%
Naphthalene (vapor)	0%	0.0004%
Benzene (liquid)	1.00%	0.707%
Ethyl benzene (liquid)	1.64%	1.29%
Naphthalene (liquid)	0.14%	0.174%

Analysis of Permitting Impacts for Gasoline Dispensing Facilities Using SCAQMD Risk Assessment Procedures Version 8.1

The proposed SCAQMD Risk Assessment Procedures (Version 8.1) has been revised using the following updated items for gasoline: (1) 2015 OEHHA Guidelines for spray booths and gasoline dispensing facilities, (2) emission factors for gasoline dispensing facilities and gasoline speciation profiles (as discussed earlier), and (3) dispersion model and meteorological data. To assess the impacts of these updates on future gasoline dispensing facilities, staff evaluated gasoline dispensing facilities that applied for a new permit (i.e. permit to construct or permit to operate) from October 1, 2009 through December 31, 2016. If the recalculated risk of a previously issued permit using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) would be higher than Rule 1401 thresholds, then it was deemed that a similar future gasoline dispensing facility permit would potentially be impacted.

Under SCAQMD's Risk Assessment Procedures (Version 7.0), the U.S. EPA's dispersion model ISCST3 (Industrial Source Complex – Short Term, Version 3) was incorporated in the Hotspots Analysis and Reporting Program (HARP) software for the health risk assessment. In the most recent version of HARP (HARP 2), the U.S. EPA dispersion model AERMOD is used to estimate the concentration of pollutants in place of the previously used ISCST3 model. In addition to the new dispersion model, the meteorological data used to estimate cancer risk has been updated. It is SCAQMD's policy to update the meteorological data used for dispersion modeling every three years. In previous years, the use of SCAQMD collected meteorological data was used exclusively. However, in the most recent update of meteorological data, it was discovered that the meteorological data at some SCAQMD sites did not meet the QA/QC criteria for dispersion modeling. Therefore, the SCAQMD meteorological sites were supplemented with Automated Surface Observing System (ASOS) sites. Designed to serve meteorological and aviation observing needs, ASOS sites are located at various airports in the Basin. ASOS data was retrieved from the National Centers for Environmental Information (https://www.ncei.noaa.gov/). Finally, the use of meteorological correction factors for gasoline dispensing facilities have been removed in favor of more precise dispersion factors provided for each meteorological station. Additional information about the updates of the meteorological modeling are included in Appendix VI of SCAQMD's Risk Assessment Procedures (Version 8.1).

Impacts on New Gasoline Dispensing Facilities

Over the seven-year period, 140 new permits of gasoline dispensing facilities were processed. To identify gasoline dispensing facilities that would exceed the maximum individual cancer risk of ten in one million as they are equipped with T-BACT, staff gathered the following data from the permit applications:

- Industry type and application type (new, modified, relocated);
- Permitted throughput, usually expressed as million gallons per year;
- Distance to the nearest residential and commercial receptor;
- Location of the gasoline dispensing facilities; and
- Maximum individual cancer risk

Table 4 provides a summary of the permitted annual throughput for the gasoline dispensing facilities reviewed. Of the 140 new permits, the majority of the applications (64 percent) are permitted at less than one million gallons per year. They include aboveground storage tanks, mobile fuelers, as well as underground storage tanks serving commercial (non-retail) operations. Fifty gasoline dispensing facilities were permitted at an annual throughput above one million gallons per year. Most of these higher throughput facilities are retail service stations.

Table 4: Annual Throughput of Gasoline Dispensing Facilities Permitted between 2009 and 2016

Annual Throughput (MMGals/year)	Number of Gasoline Dispensing Facilities	Industry Type
<1	90	Aboveground storage tanks, mobile fuelers, and others
1-3	9	Aboveground storage tanks and retail gas stations
>3	41	Retail gas stations

Impacts on New Gasoline Dispensing Facilities Permitted Using a Tier 4 Analysis

Over the seven-year period from October 2009 to December 2016, three of the 140 new gasoline dispensing facilities had a maximum individual cancer risk above ten in one million based on Tier 2 screening and therefore, the applicant submitted a more refined site specific Tier 4 analysis (Detailed Risk Assessment) in order to demonstrate compliance with Rule 1401 at the requested throughput. To estimate the potential impacts on those applications, a percentage change, based on a comparison between the Tier 2 screening tables of SCAQMD Risk Assessment Procedures in Version 7.0 and Version 8.1, was applied. The percentage change is site-specific, depending on the facility location and distance to receptor. After applying the percentage change, the estimated health risk for the three gasoline dispensing facilities is expected to decrease and remained below the threshold of ten in one million. Therefore, it is expected that for new gasoline dispensing facilities permitted using Tier 4 analysis that in the future these permit applications would not be impacted by the proposed SCAQMD Risk Assessment Procedures (Version 8.1).

Impacts on New Gasoline Dispensing Facilities Permitted Using Tier 2 Analysis

The cancer risks for the rest of the permit applications (137 of 140) from 2009 to 2016 were determined using Tier 2 Screening Risk Assessment. In order to analyze the impacts to these permits from the use of the 2015 OEHHA Guidelines, staff used the screening tables (Tier 2) in the proposed SCAQMD Risk Assessment Procedures (Version 8.1) to estimate the cancer risk for the permits. Using the proposed SCAQMD Risk Assessment Procedures (Version 8.1), 132 of the 137 gasoline dispensing facilities had estimated cancer risks that remained below the Rule 1401 thresholds. Therefore, no impact is expected for 96 percent of the new permit applications, if these permits were to be processed with the proposed SCAQMD Risk Assessment Procedures (Version 8.1). Five of the 137 facilities had cancer risks that would exceed the threshold. The five facilities are retail service stations equipped with CARB certified Phase I and Phase II EVR systems, which are considered to be T-BACT. The five facilities are located in Whitter (Facility A), Burbank (Facility B), Riverside (Facility C), Perris (Facility D), and Perris (Facility E), respectively. Table 5 summarizes the potential impacts of the proposed SCAQMD Risk Assessment Procedures (Version 8.1). Note that for these five facilities, the permitted allowable throughput was based on Tier 2 Screening Risk Assessment as part of the permitting process. The permit applicants did not need to proceed to a higher tier (Tier 3: Screening Dispersion Modeling or Tier 4: Detailed Risk Assessment) for a more refined risk assessment. However, if Facility A, B[9], C, D and E were to apply for a new permit under the proposed SCAQMD Risk Assessment Procedures (Version 8.1), their allowable throughput would have decreased by 13%, 16%, 40%, 28% and 22%, respectively.

All retail service stations within SCAQMD's jurisdiction are already equipped with CARB certified Phase I and Phase II vapor recovery systems to control gasoline emissions. Phase I vapor recovery refers to the collection of gasoline vapors displaced from storage tanks when cargo tank trucks make gasoline deliveries. Phase II EVR systems control the vapors displaced from the vehicle fuel tanks during refueling. In addition, all gasoline is stored underground with valves installed on the tank vent pipes to further control gasoline emissions. Installation of additional emission control technology is not economical and very unlikely.

[9] Note that this facility is located within 500 feet of a school and permitted prior to the adoption of Rule 1401.1 - Requirements for New and Relocated Facilities near Schools. Under SCAQMD Rule 1401.1, the maximum individual cancer risk shall not exceed one in one million at any school within 500 feet of the toxic-emitting permit unit at the facility. Therefore, if a facility was to apply for a new or modified SCAQMD permit where Facility B is located, it would be subject to Rule 1401.1. The maximum individual cancer risk will be limited to less than one in one million at the school, and the permitted throughput will be substantially lower.

Table 5: Potential Impacts of the Proposed SCAQMD Risk Assessment Procedures (Version 8.1)

Facility	Maximum Individual Cancer Risk Estimated using Current SCAQMD Risk Assessment Procedures (Version 7.0) (per One Million)	Maximum Individual Cancer Risk Estimated using Proposed SCAQMD Risk Assessment Procedures (Version 8.1) (per One Million)
A	9.97	11.3
B	9.72	11.7
C	9.86	16.3
D	9.55	13.8
E	8.82	12.7

~~All retail service stations within SCAQMD's jurisdiction are already equipped with CARB certified Phase I and Phase II vapor recovery systems to control gasoline emissions. Phase I vapor recovery refers to the collection of gasoline vapors displaced from storage tanks when cargo tank trucks make gasoline deliveries. Phase II EVR systems control the vapors displaced from the vehicle fuel tanks during refueling. In addition, all gasoline is stored underground with valves installed on the tank vent pipes to further control gasoline emissions. Installation of additional emission control technology is not economical and very unlikely.~~

On the other hand, cancer risks decrease substantially with distance. Estimated cancer risks are higher when the facility is close to the receptor. For one million gallons of gasoline, the residential maximum individual cancer risk ranges from 2.6 to 5.2 in one million at 25 meters from receptor, and decreases considerably to a range of 0.31 to 0.76 in one million at 100 meters from the receptor. Among the five facilities listed in Table 5, the highest cancer risk is observed at Facility C. Using Facility C as the worst case scenario, the cancer risk calculated using the proposed SCAQMD Risk Assessment Procedures (Version 8.1) would remain below the threshold for the same throughput as previously permitted, if the distance between the emission source and the nearest downwind receptor was 54 meters instead of 41 meters. Thus, retail gasoline dispensing facilities that would like to be permitted with a relatively high throughput might need to give more consideration to its site design by positioning the emission source further away from the sensitive receptor.

Furthermore, while the use of Tier 1 and Tier 2 screening tables are useful to allow most facilities to demonstrate compliance with Rule 1401 without complicated dispersion modeling, there are other more refined modeling options available to applicants such as the use of Tier 3 and Tier 4 analyses. As previously discussed, three of the 140 new applicants demonstrated compliance through Tier 4 modeling. If the Tier 2 screening risk assessment results in a risk estimate that exceeds the risk limits or the permit applicant feels that a more detailed evaluation would result in a lower risk estimate, the applicant has the option of conducting a more detailed analysis using Tier 3 or 4.

Impacts on Modified Gasoline Dispensing Facilities

Staff also evaluated applications submitted for modifications from existing gasoline dispensing facilities to analyze the potential impact on future modified permits. Over the five-year permitting period from October 1, 2009 through October 1, 2014, SCAQMD staff processed approximately 1,200 modified permits for gasoline dispensing facilities. Out of the 1,200 modified permits, staff conducted a detailed review of a subset of 300 permits, which were randomly chosen. This sample size was selected to provide a 95 percent confidence level and a 5 percent margin of error in the analysis.

Of the 300 permits for existing gasoline dispensing facilities filing for a permit for modifications between 2009 and 2014, 267 (~89 percent) modifications were associated with no emission increase and were exempt from Rule 1401. The rest of the permit modifications (33 of 300) were associated with an emission increase and triggered Rule 1401. Of the 33 permit modifications that triggered Rule 1401, 28 gasoline dispensing facilities used Tier 2 analysis and 5 gasoline dispensing facilities used Tier 4 analysis. The approach used to analyze potential impacts to modified permits was the same for new permitted gasoline dispensing facilities.

For the 28 modified permits that used Tier 2 screening analysis, the estimated cancer risks for all 28 gasoline dispensing facilities remained below the Rule 1401 thresholds when using the proposed SCAQMD Risk Assessment Procedures (Version 8.1). For the 5 modified permits that used Tier 4 dispersion modeling, two gasoline dispensing facilities would have an increase in the estimated health risk, but estimated health risk is ≤ 10 in a million. Estimated health risk for the remaining three gasoline dispensing facilities is expected to decrease. Therefore, based on the evaluation of 300 modified permits, no impact to future modified gasoline dispensing facilities is expected with the proposed SCAQMD Risk Assessment Procedures (Version 8.1).

Summary of Analysis on Gasoline Dispensing Facilities

Based on the detailed review of 173 new or modified gasoline dispensing facilities triggering Rule 1401 requirements from October 2009 to December 2016, the implementation of the proposed SCAQMD Risk Assessment Procedures (Version 8.1) will result in no impact for 97 percent of permit applications. Note that these impacts were estimated assuming the emission factor of 0.42 lbs per 1,000 gallons for Phase II refueling of ORVR-equipped vehicles, as a conservative estimate of cancer risk. If the current emission factor of 0.32 lbs per 1,000 gallons are used, the emissions and the associated cancer risk would be lower, resulting in either equal or fewer impacts than those presented above.

With a 95 percent confidence level, approximately three percent of permit applicants may need to proceed to a higher tier analysis (Tier 3: Screening Dispersion Modeling or Tier 4: Detailed Risk Assessment), consider reducing their throughput, or new gasoline dispensing facilities could increase the distance between emission sources and the nearest receptor. With SCAQMD receiving, on average, about 27 permit applications annually, approximately one permit could be affected by the proposed SCAQMD Risk Assessment Procedures (Version 8.1) per year. Therefore, the impact of the proposed amendments on gasoline dispensing facilities is minimal.

Therefore, staff recommends removing the exemption and referencing the proposed SCAQMD Risk Assessment Procedures (Version 8.1) for gasoline dispensing facilities.

LIST OF APPLICABLE TOXIC AIR CONTAMINANTS

Table 1 of Rule 1401 lists the toxic air contaminants that are subject to the rule and used to estimate health risks. The list consists of the compounds that OEHHA has provided acute, chronic, or carcinogenic health values. Periodically, OEHHA publishes new or updated health values and subsequently SCAQMD amends Table 1 to incorporate the new or updated information. Table 1 was last updated in 2010; in the interim, a number of health values have been published by OEHHA. Additionally, several compounds will be included on the list for clarity and consistency with California Air Resources Board's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values which was last updated on February 23, 2017[10].

New Compounds

Caprolactum (Chemical Abstracts Service Number 105-60-2) – In 2013, OEHHA developed acute and chronic Reference Exposure Levels of 50 µg/m^3 and 2.2 µg/m^3 respectively. OEHHA states that exposure to caprolactum has been found to cause upper respiratory and eye irritation in both animals and humans; inflammation of the nasal and laryngeal epithelium in rodents; and reduced weight of offspring for pregnant rats administered high doses orally. According to OEHHA[11], the increased eye blink frequency with eye irritation are manifestations of the same underlying event of ocular trigeminal nerve activation. Thus, the acute reference exposure limit is based on eye blink frequency. The acute reference exposure limit of 50 µg/m^3 was established by applying a species uncertainty factor of 10 to the No Observed Adverse Effect Level (NOAEL) of 500 µg/m^3. The chronic value of 2.2 µg/m^3 was derived by the 95 percent lower confidence limit of the dose producing a 5 percent response rate for the nasal respiratory and olfactory changes and the non-keratinized laryngeal tissue changes found at terminal sacrifice. An uncertainty factor of 60 was applied because of interspecies and study length uncertainties.

The main use of caprolactum is in the polymerization process during the manufacture of Nylon-6. Nylon-6 is a widely used type of nylon and is found in textiles, engineered plastics, and films used in packaging and medical applications. Exposure to caprolactum may occur during the production and recycling of Nylon-6, and offgassing from carpeting and other textiles containing Nylon-6.

Permitted use of caprolactum will occur nearly exclusively in resin manufacturing facilities. As a Volatile Organic Compound, caprolactum emissions are already regulated in resin manufacturing facilities by SCAQMD Rule 1141 – Control of Volatile Organic Compound Emissions from Resin Manufacturing. The provisions in that rule require that volatile organic compound emissions, including caprolactum emissions, be reduced by 95 percent or more from blending, reaction, and processing operations. Therefore, the addition of acute and chronic health risk values are not expected to have any additional impacts on resin manufacturing operations as they already are required to control caprolactum emissions.

[10] Available on the internet at: https://www.arb.ca.gov/toxics/healthval/contable.pdf
[11] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/caprolactam2013.pdf

Carbonyl sulfide (Chemical Abstracts Service Number 463-58-1) – In 2017, OEHHA developed acute and chronic Reference Exposure Levels of 660 µg/m^3 and 10 µg/m^3 respectively[12]. OEHHA found that inhalation of carbonyl sulfide results in adverse health effects in the central nervous system. The NOAEL for carbonyl sulfide is 1,500,000 µg/m^3. The time-adjusted one hour NOAEL is 1,300,000 µg/m^3. The acute reference exposure limit was determined by applying an uncertainty factor of 2,000 to the time-adjusted one hour NOAEL resulting in an acute reference exposure limit of 660 µg/m^3. The uncertainty factor was based on limited information on acute toxicity and there were no pharmacokinetic modeling data available. For chronic exposures, the time-adjusted NOAEL was determined to be 130,000 µg/m^3. An uncertainty factor of 6,000 was applied resulting in a chronic reference exposure limit of 22 µg/m^3. The uncertainty factor was based on default factors for interspecies and intraspecies toxicokinetic and toxicodynamic differences.

For industrial uses, carbonyl sulfide is emitted from some refineries as an end product of sulfur combustion. It is also a potential grain fumigant replacing methyl bromide. In 2012, reported emissions of carbonyl sulfide in SCAQMD was just over 15,000 pounds annually with the largest facility reporting 7,706 pounds of annual emissions.

Refinery sources and potential fumigant sources of carbonyl sulfide are already closely controlled. Refineries reporting carbonyl sulfide emissions already determine health risks by accounting for contributions from carbonyl sulfide in the Air Toxics Hot Spots Program. Additionally, sulfur emissions are regulated as criteria pollutants necessitating the use of control equipment. The inclusion of acute and chronic non-cancer health values for carbonyl sulfide are not expected to require additional pollution controls as the sources of those emissions already are expected to have pollution control.

Compounds with Added Health Risk Values

Butadiene, 1,3- (Chemical Abstracts Service Number 106-99-0) – In 2013, OEHHA developed an acute reference exposure level of 660 µg/m^3 [13]. At the same time, OEHHA also updated the chronic inhalation health value to 2.0 µg/m^3. In 1992, OEHHA established a cancer inhalation unit risk value of 1.7x10-4 (µg/m^3)$^{-1}$. For permitted units, the cancer risk is generally orders of magnitude greater than the acute risk. Therefore the inclusion of an acute reference exposure level for 1,3- butadiene is not expected to have any additional impacts on permitted sources.

Methylene diphenyl diisocyanate – (Chemical Abstracts Service Number 101-68-8) – In 2016, OEHHA developed an acute reference exposure level of 12 ug/m^3 [14] and updated the chronic reference exposure level to 8.0x10^{-2} ug/m^3. The chronic reference exposure level is more than two magnitudes lower than the acute reference exposure level and thus the inclusion of an acute reference exposure level is not expected to have any additional impacts on permitted sources. In addition, a typographical error was corrected for this compound.

Toluene diisocyanates (Chemical Abstracts Service Number 26471-62-5), including toluene-2,4-diisocyante (Chemical Abstracts Service Number 584-84-9) and toluene-2,6-diisocyantate

[12] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/cosrel022117.pdf
[13] Available on the internet at: https://oehha.ca.gov/media/downloads/crnr/072613bentcrel.pdf
[14] Available on the internet at: https://oehha.ca.gov/media/downloads/air/report-hot-spots/finalmdirelmarch2016.pdf

(Chemical Abstracts Service Number 91-08-7) – In 2016, OEHHA developed an acute reference exposure level of 2.0 µg/m^3 for the parent compound of toluene diisocyante and related compounds toluene-2,4-diisocyante and toluene-2,6-diisocyantate[15]. The chronic reference exposure level was also updated at the same time to 8x10-3 µg/m^3. However, the cancer inhalation unit risk, established in 1999, is 1.1x10-5 (µg/m^3)$^{-1}$ resulting in a cancer risk that is generally orders of magnitude greater than the acute risk. For permitted units, the inclusion of an acute reference exposure level for toluene diisocyantes is not expected to have any additional impacts.

Compounds Added for Clarification and Consistency

In two cases, a parent compound is listed in Table 1 of Rule 1401 while some associated compounds are not. To clarify the applicability of the compounds and to make Table 1 more consistent with CARB's Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values (February 23, 2017), the following related compounds in Table 6 below will be added to Table 1 of Rule 1401:

Table 6: Related Compounds Added for Clarification and Consistency

Compound	Chemical Abstracts Service Number	Already Listed Parent Compound
Barium chromate	10294-40-3	Chromium (hexavalent)
Calcium chromate	13765-19-0	Chromium (hexavalent)
Chromic trioxide	1333-82-0	Chromium (hexavalent)
Sodium dichromate	10588-01-9	Chromium (hexavalent)
Strontium chromate	7789-06-2	Chromium (hexavalent)
Zinc chromate	13530-65-9	Chromium (hexavalent)
Hexachlorocyclohexane, alpha	319-85-6	Hexachlorocyclohexanes (mixed or technical grade)
Hexachlorocyclohexane, beta	319-85-7	Hexachlorocyclohexanes (mixed or technical grade)

Similarly, in two other cases, a related compound is listed in Table 1 while the parent compound is not. The following parent compounds will be added to Table 1 of Rule 1401 as shown in Table 7 below.

Table 7: Parent Compounds Added for Clarification and Consistency

Parent Compound	Chemical Abstracts Service Number	Already Listed Related Compound
Fluorides	1101	Hydrogen fluoride
Vanadium	7440-62-2	Vanadium pentoxide

For both the newly added parent and related compounds, the effective date of rule applicability will be the same as the already listed compound.

[15] Available on the internet at: https://oehha.ca.gov/media/downloads/air/report-hot-spots/finaltdirelmarch2016.pdf

Finally, a typographical error was corrected as the same compound, vinylidene chloride and dichloroethylene, 1,1- (Chemical Abstracts Service Number 75-35-4), is listed twice. To avoid confusion, the compound will remain listed twice but the dichloroethylene, 1,1- will refer back to vinylidene chloride.

AFFECTED INDUSTRIES

Implementation of PAR 1401 is expected to potentially increase the estimated cancer risks for spray booths and gasoline dispensing facilities. SCAQMD staff conducted an analysis to better understand the number of sources that could be potential affected by the proposal. Staff estimates two spray booth permits annually could require higher level of air pollution controls. The expected additional air pollution control would be the replacement of HEPA filters with ULPA filters. For gasoline dispensing facilities, one permit applications annually will have a lower permitted throughput, consider increasing their distance of emission sources to the nearest residential receptor, or proceed to a Tier 3 or Tier 4 analysis requiring dispersion modeling. Finally, five refineries will see a negligible increase in cancer risk because of the addition of carbonyl sulfide to the Rule 1401 Toxic Air Contaminant list.

SOCIOECONOMIC ASSESSMENT

PAR 1401 would require the use of the proposed SCAQMD Risk Assessment Procedures (Version 8.1), also referred to as Procedures, when determining health risks for all new and modified permitted equipment and processes at spray booths and gasoline dispensing facilities. The updates to the Procedures could potentially increase the calculated cancer risk for emission sources at the affected facilities. Based on staff's analysis of SCAQMD permits issued from October 1, 2009 through October 1, 2014, two spray booths and one gasoline dispensing facility per year could potentially incur costs to comply with PAR 1401[16]. Spray booths belong to various sectors of the economy such as manufacturing, wholesale, retail, services, and the affected gasoline dispensing facilities belong to the sector of retail services. As spray booths and gasoline dispensing facilities tend to be small businesses, the potentially affected facilities by the proposed amendments are also likely to be small businesses.

For the potentially affected spray booths with new or modified permits, an average of two facilities per year are expected to need to install ULPA filters in lieu of HEPA filters to comply with PAR 1401. The unit cost of ULPA filters is expected to be very similar to the unit cost of HEPA filters. However, ULPA filters require the use of higher horsepower blowers. For a typical size of spray booth, a 15 HP blower will be needed for ULPA filters as opposed to a 10 HP blower for HEPA filters. A 15 HP blower is more expensive than a 10 HP blower, and it also uses more electricity which would result in a higher operation cost. The incremental cost of a 15 HP blower over a 10 HP blower is estimated at $750 ($4,250 for a 15 HP blower *vs* $3,500 for a 10 HP blower). The incremental operating cost related to additional electrical usage is estimated at $595 annually ($0.13/kWh × 2.2 kW × 8 hours/day × 5 days/week × 52 weeks/year).[17] Based on a typical equipment life of five years, the present value of the total incremental costs of purchasing and

[16] For new gasoline dispensing facilities, staff analyzed permits up to December 2016.

[17] $0.13/kWh represents the average commercial electricity rate in the City of Los Angeles (see http://www.electricitylocal.com/states/california/los-angeles/). Additionally, the blower is assumed to be operated at the 50-percent capacity to reach the typical five-year equipment life.

operating a 15 HP blower is estimated to be up to $3,725 per facility [$750 + $595 × 5], or $7,450 for a total of two potentially affected spray booths.[18]

For the potentially affected gasoline dispensing facilities with new or modified permits, an average of one facility per year is expected to proceed to the more complicated Tier 3 or Tier 4 HRA unless the facility can lower its permitted throughput or increase the distance between the emission sources to the nearest receptor. For the purpose of the socioeconomic impact assessment, it is assumed that the affected facility would proceed to a Tier 4 HRA, which would require dispersion modeling to predict the atmospheric concentrations of gaseous and particulate pollutants using site-specific input parameters. Based on a vendor's price quote, the annual cost of dispersion modeling is estimated at $15,000 per gasoline dispensing facility.

Therefore, the overall compliance cost is estimated at $22,450 ($7,450+$15,000) per year based on the assumption that, each year after PAR 1401 adoption, there will be two spray booths and one gasoline dispensing facility applying for new or modified permits that will need to fulfill additional requirements to comply with PAR 1401. It has been a standard socioeconomic practice that, when the annual compliance cost is less than one million current U.S. dollars, the Regional Economic Models Inc. (REMI)'s Policy Insight Plus Model is not used to simulate jobs and macroeconomic impacts. This is because the resultant impacts would be diminutive relative to the baseline regional economy.

CALIFORNIA ENVIRONMENTAL QUALITY ACT ANALYSIS

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, has reviewed the proposed amendments to Rule 1401 pursuant to: 1) CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA. To comply with the requirements in Proposed Amended Rule 1401, new and modified spray booths would require more efficient filters to control emissions, and new and modified gasoline dispensing facilities may either comply by requesting a lower throughput, or by increasing the distance to the nearest residential receptor, or by conducting a Tier 3 or Tier 4 analysis. In any event, there would be no physical change to existing gasoline dispensing facilities and very minimal physical changes to spray booths due to implementing Proposed Amended Rule 1401. SCAQMD staff has determined that it can be seen with certainty that there is no possibility that the proposed ~~amendments to Rule 1401~~ project may have a significant adverse effect on the environment. Therefore, ~~PAR 1401~~ the project is considered to be exempt from CEQA pursuant to CEQA Guidelines Section§ 15061(b)(3) – Activities Covered by General Rule. A Notice of Exemption ~~will be~~ has been prepared pursuant to CEQA Guidelines Section 15062 - Notice of Exemption, and is included as an attachment to the Board package. If the proposed project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

[18] The present value of $3,725 per spray booth is derived by assuming a zero discount rate. The amount would decrease if a greater discount rate is used. Notice this cost may recur every five years if ULPA filters would continue to be required for these facilities and the differences in the capital and operation costs would continue to remain the same between a 15 HP and a 10 HP blower.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity

PAR 1401 is needed to update rule language relating to risk assessment calculations such that they are consistent with those specified in the state OEHHA Risk Assessment Guidelines adopted on March 6, 2015.

Authority

The SCAQMD Governing Board has authority to adopt amendments to Rule 1401 pursuant to the California Health and Safety Code Sections 39002, 39650 et. Seq., 40000, 40001, 40440, 40441, 40702, 40725 through 40728, 41508, 41700, and 42300 et. Seq. ~~41706, 44360 through 44366, and 44390 through 44394.~~

Clarity

PAR 1401 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency

PAR 1401 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication

PAR 1401 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference

By adopting PAR 1401, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Sections 39666 (District new source review rules for toxics), 41700 (prohibited discharges), and 42300 et. Seq., (permit system).~~44360 through 44366 (Risk Assessment).~~

Rule Adoption Relative to Cost-effectiveness

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2016 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all of the control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first. However, PAR 1401 is not a control measure that was included in the 2016 AQMP and was not ranked relative to other criteria pollutant control measures in the 2016 AQMP.

Incremental Cost-effectiveness

Health and Safety Code Section 40920.6 requires an incremental cost effectiveness analysis for Best Available Retrofit Control Technology (BARCT) rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SOx, NoOx, and their precursors. Since PAR 1401 applies to toxic air contaminants, the incremental cost effectiveness analysis requirement does not apply.

COMPARATIVE ANALYSIS

Health and Safety Code section 40727.2 requires a comparative analysis of the proposed amended rule with any Federal or District rules and regulations applicable to the same source. See Table 8 below.

Table 8: Comparative Analysis of PAR 1401 with Rules 212, 1401.1, 1402, and Federal Regulations

Rule Element	PAR 1401	Rule 212	Rule 1401.1	Rule 1402	Equivalent Federal Regulation
Applicability	New, relocated or modified permit unit	New or modified permit unit	New or relocated permit unit	Existing facilities subject to Air Toxics "Hot Spots" Information and Assessment Act of 1987 and facilities with total facility emissions exceeding any significant or action risk level	None
Requirements	Limits maximum individual cancer risk, cancer burden and chronic and acute hazards	Provide public notice to all nearby addresses projects that are located within 1,000 feet of a school, increase risk or nuisance, or increase criteria pollutants above specified thresholds	Limits cancer risk and chronic and acute hazards near schools	Submittal of health risk assessment for total facility emissions when notified. Implement risk reduction measures if facility-wide risk is greater than or equal to action risk level	None
Reporting	None	Verification that public notice has been distributed	None	Progress reports and updates to risk reduction plans	None
Monitoring	None	None	None	None	None
Recordkeeping	None	None	None	None	None

Appendix A – U.S. EPA Guidance on Removing Stage II Gasoline Refueling Vapor Recovery Programs from State Implementation Plan

On a federal level, the control efficiency of Stage II is in the range of 60- 75 percent, much lower than the California Phase II program (95 percent). In addition, in areas where certain types of vacuum-assist Stage II control systems are used, the limited compatibility between ORVR and some configurations of this Stage II hardware may result in an area-wide emissions disbenefit. U.S. EPA's regulation stated that with the widespread use of the ORVR-equipped vehicles, Stage II programs have become largely redundant control systems with minimal reduction benefits beyond the ORVR system. SCAQMD and CARB have commented that Phase II EVR is still needed as discussed in more detail under their comment letters[19] submitted in response to U.S. EPA's proposed rule titled "*Widespread Use for Onboard Refueling Vapor Recovery and Stage II Waiver.*" U.S. EPA's guidance does, however provide additional insight regarding the application of emission reductions from Stage II control systems for vehicles equipped with ORVR further demonstrating that the control efficiency of the ORVR and/or the Stage II systems are only applied once to the respective gasoline throughput (the same control efficiency was applied to both the throughput of Stage II and non-ORVR vehicles.

The U.S. EPA Guidance document provides two equations to calculate impacts on the refueling emission inventory whereas the results could be used by States to support SIP actions (Section 3.3). Equation 1 determines the overall stage II-ORVR increment, which identifies the annual area-wide emission control gain from Stage II installations as ORVR technology phases in, assuming both have the same efficiency. It also indicates the emission reduction potential loss (in year i) from removing Stage II. Equation 1 is shown below:

Equation 1

$$increment_i = (Q_{SII})(1-Q_{ORVRi})(\eta_{iuSII}) - (Q_{SIIva})(CF_i)$$

The first part of the equation identifies the overall Stage II-ORVR increment. The second part of the equation accounts the for vacuum-assist compatibility factor, which is not applicable in California because California's Phase II EVR system requires compatibility with ORVR. Equation 1 estimates the incremental emission control gain with the widespread use of ORVR vehicles by accounting for (1) fraction of gasoline throughput covered by Stage II vapor recovery system (Q_{SII}), the fraction of gasoline dispensed to non-ORVR vehicles ($1-Q_{ORVRi}$) and the in-use control efficiency of the stage II vapor recovery system (η_{iuSII})

Equation 2 determines the delta between the Stage II efficiency and the ORVR efficiency with both technologies in place. It considers the greater efficiency of ORVR relative to non-ORVR vehicles refueling at Stage II-equipped gasoline dispensing facilities. Equation 2 is shown below:

[19] Available on the internet at https://www.regulations.gov/docketBrowser?rpp=50&so=DESC&sb=postedDate&po=0&dct=PS&D=EPA-HQ-OAR-2010-1076

Equation 2

$$delta_i = (Q_{SII})(\eta_{iuSII}) - (Q_{SIIva})(CF_i) - (Q_{ORVRi})(\eta_{ORVR})$$

As demonstration in the two equations above, the control efficiency of the ORVR and / or the Stage II systems are only applied once to the respective gasoline throughput (the same control efficiency was applied to both the throughput of Stage II and non-ORVR vehicles in equation 1). If the two control equipment were to work in series, the control efficiency of the two would have been multiplied together, as the way it was determined by CARB:

ORVR, Phase II EVR = (non-ORVR UEF)*(1 - ORVR CE)*(1 - Ph II EVR CE)
= (8.4 lbs/kgal)*(1 - 0.95)*(1 - 0.95) = 0.021 lbs/kgal

Thus, SCAQMD staff's interpretation that the ORVR and Phase II vapor recovery system may not work in series is consistent with the methodology used by U.S. EPA to determine the impacts of removing the Stage II program.

Appendix B – Comments and Responses

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July 19, 2017

Susan Nakamura
Assistant Deputy Executive Officer
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765

Via email at: snakamura@aqmd.gov

Re: Proposed Amended Rule 1401- New Source Review of Toxic Air Contaminants

Dear Ms. Nakamura:

These comments are presented on behalf of CIOMA, a part of the California Small Business Alliance, members that own and operate facilities that are affected by Proposed Amended Rule 1401- New Source Review of Toxic Air Contaminants.

The California Independent Oil Marketers Association (CIOMA) represents about 300 members, including nearly 90% of all the independent petroleum marketers in the state and about one quarter of the state's 10,000 service stations. Our members provide services to local governments, law enforcement, city and county fire departments, ambulances/emergency vehicles, school district bus fleets, construction firms, marinas, public and private transit companies, hospital emergency generators, trucking fleets, independent fuel retailers (small chains and mom-and-pop gas stations) and California agriculture, among others.

The District is proposing to make several changes to its evaluation procedures for new and modified gasoline dispensing facilities (GDFs) and has not disclosed key details critical to the rule development, which is proceeding on a severely compressed schedule with limited public input. CIOMA's major concerns regarding Proposed Amended Rule 1401 are as follows:

The Proposed Amended Rule 1401 rule development schedule has been aggressively compressed, with technical documents not being provided to stakeholders prior to the set hearing date.

The first working group meeting for Proposed Amended Rule 1401 was held on June 1, 2017; draft rule language and the Draft Staff Report was released on June 16, 2017. Stakeholders were also notified on June 16 of the dates of the second working group meeting and public workshop, scheduled for June 29 and July 12 respectively. Technical documents were 1-1 requested by stakeholders at the first working group meeting and promised by Staff to be available at the second working group meeting.

The second working group meeting was rescheduled for July 6, **one day prior** to the set hearing scheduled for July 7. No technical documentation was provided by Staff at the second working group meeting; Staff stated that the gasoline station appendix would be available by mid-July and the Proposed Risk Assessment Procedures Version 8.1 would be available by August 2. A third working group meeting was scheduled for July 20 at the request of stakeholders due to the lack of available technical documentation to evaluate the proposed changes to Rule 1401.

The gasoline station appendix (Attachment N) was available via hard copy at the public workshop on July 12. Attachment N and its methodology (Appendix X) were emailed to the Proposed Amended Rule 1401 working group list on the night of July 15. Neither document has been posted online to the Proposed Rules page of the SCAQMD website. The Proposed Risk Assessment Procedures (Version 8.1) will not be released until August, when many members of Staff will be unavailable for questions or comment. 1-1

Staff is presenting the proposed rule **one day after** the third working group on July 21. The public hearing for Proposed Amended Rule 1401 is scheduled for September 1, 2017. With much of the technical documentation supporting the proposed changes in the rule being released within the last week, or not yet released, such a short timetable has not allowed for a robust public rulemaking process with proper stakeholder input.

SCAQMD plans to increase the emission factor for refueling activities at GDFs to the level identified by the California Air Resources Board (CARB) for vehicles not equipped with onboard refueling vapor recovery (ORVR) systems.

Staff is planning on increasing its emission factor for refueling activities at GDFs, and differing from CARB and the emissions factor SCAQMD used to develop its own emissions inventory for the AQMP. The majority of vehicles are equipped with ORVR, and for ORVR vehicles CARB identified an emission factor twenty times lower than non-ORVR vehicles. The District needs to provide more technical information for its own proposed emission factor, and identify why it appears to be disregarding ORVR entirely. Stakeholders are not able to determine the analysis behind Staff's increase in the emissions factor and divergence from CARB's determination for ORVR vehicles without access to the Proposed Risk Assessment Procedures (Version 8.1), which will not be available until August. 1-2

The Governing Board adoption hearing for Proposed Adopted Rule 1401 should be delayed from the September 1, 2017 date.

Conclusion

Due to the lack of availability of technical documents to stakeholders, the constricted rulemaking schedule pushed up against the SCAQMD August summer recess, and the need for 1-3

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continued technical analysis due to the implications of the proposed changes, the date of the Governing Board adoption hearing for Proposed Adopted Rule 1401 should be delayed. Stakeholders have not had the proper opportunity to have access to key technical documents critical to proposed changes to the emission factor for refueling activities at GDFs, and will not have the opportunity to make comments in a timely fashion due to the rulemaking and staff schedule. The hearing should be delayed to ensure the proper public rulemaking process takes place and all analysis is completed in a thoughtful, transparent manner. 1-3

Please contact Samuel Bayless at bayless@cioma.com or (916) 646-5999 with any questions.

Sincerely,

Samuel Bayless
Regulatory Issues Specialist
California Independent Oil Marketers Association

CC:
Wayne Nastri, SCAQMD Executive Officer
Philip Fine, Ph.D., SCAQMD Deputy Executive Officer
Ben Benoit, Mayor Pro Tem, City of Wildomar
Joseph Lyou, Ph.D, Governor's Appointee /SCAQMD Governing Board
Judith Mitchell, Councilmember, City of Rolling Hills Estates
Shawn Nelson, Supervisor, Fourth District/County of Orange
Janice Rutherford, Supervisor, Second District/County of San Bernardino
Sheila Kuehl, Supervisor, Third District/County of Los Angeles
Ruthanne Taylor Berger, Board Assistant to Ben Benoit
Mark Abramowitz, Board Assistant to Dr. Joseph Lyou
Marisa Perez, Board Assistant to Judith Mitchell
Denis Bilodeau, Board Assistant to Shawn Nelson
Mark Taylor, Chief of Staff to Janice Rutherford
Andrew Silva, Board Assistant to Janice Rutherford
Diane Moss, Board Assistant to Sheila Kuehl

Response to Comment 1-1

In the first working group meeting, staff presented the proposed emission factors for gasoline dispensing facilities, and agreed to invite a subject matter expert from Engineering & Permitting to the next working group to provide a technical explanation.

Draft Proposed Amended Rule 1401 and the Preliminary Draft Staff Report were released on June 16, more than 75 days before the public hearing.

In the second working group meeting, staff presented more background information and the technical basis of the proposed emission factors (~~link~~http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1401/par1401_wg2_070617.pdf), and provided clarification and justification for the proposal. To address the concerns on the potential impacts on gasoline dispensing facilities, both the Preliminary Draft of Appendix X - Methodology Used to Develop Tier 2 Screening Tables for Gasoline Transfer and Dispensing Facilities and the corresponding Attachment N screening tables from proposed SCAQMD Risk Assessment Procedures (Version 8.1) were released on July 15. A third working group meeting was held to walk the stakeholders through and answer any questions on these two documents.

On July 21, the proposed amendments to Rule 1401 and the associated impacts were presented to the Stationary Source Committee. Staff highlighted the key issues on the proposed emission factors of gasoline dispensing facilities and the rule development schedule. Both issues were thoroughly discussed among Committee members, staff, and stakeholders.

A Draft Staff Report, including additional information on the technologies of the ORVR and Phase II vapor recovery system, as well as the rationale behind using the current SCAQMD emission factor for refueling (0.32 lbs per 1,000 gallons) has been released on August 2. ~~Staff is available to hold another working group meeting in August to address any questions or concerns that may arise.~~ Based on Board Member comments at the Stationary Source Committee on July 21, 2017, Staff held the fourth Working Group Meeting on August 16th to allow CARB present their current view on the refueling emission factor for gasoline dispensing facilities.

In brief, the proposed rule language, the Preliminary Draft Staff Report, Draft Staff Report (which also includes the Socioeconomic Analysis) have been released following the rule development schedule, and additional technical justification has been provided to stakeholders in a timely manner~~ upon request~~.

Response to Comment 1-2

As discussed in Response to Comment 1-1, additional background information and technical justification was provided in the second working group meeting on July 6. The sections relevant to gasoline dispensing facilities from Proposed Risk Assessment Procedures Version 8.1 were released on July 15 and a working group meeting was held on July 20 to address questions and concerns on the documents.

As discussed at the Working Group meetings, based on the available test data from CARB and EPA, SCAQMD staff concluded that the Phase II vapor recovery system and ORVR systems would each achieve a 95% control efficiency. However, there is no empirical evidence to support the assumption that all the vapors escaping from the ORVR system are directed to the fillpipe and can be captured by the Phase II EVR system. For more information, please refer to Response to Comment 2-2.

On the emission factor used for the refueling in gasoline dispensing facilities in the 2016 AQMP, please refer to Comment 2-6.

Response to Comment 1-3

PAR 1401 has followed a typical rule development schedule and has met the requirements of SCAQMD's public process for rulemaking. Upon request, additional technical justification has also been provided to stakeholders in a timely manner. Staff is available for follow up meetings to answer questions or provide clarifications before the Public Hearing.

pillsbury

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July 25, 2017

Ms. Kalam Cheung
Planning, Rule Development and Area Sources
South Coast Air Quality Management District
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Email: kcheung@aqmd.gov

Re: **Costco Wholesale Corporation Comments on SCAQMD Proposed Amended Rule 1401**

Dear Ms. Cheung:

Costco Wholesale Corporation appreciates this opportunity to provide comments on the South Coast Air Quality Management District's Proposed Amended Rule (PAR) 1401 – New Source Review of Toxic Air Contaminants. As you know, for years Costco has stood at the forefront of emissions control efforts concerning California gasoline dispensing facilities (GDFs). Costco has worked closely with the District and the California Air Resources Board (ARB) over many years to develop and test cutting-edge in-station diagnostic (ISD) technologies designed to automatically detect vapor recovery system failures and avoid volatile organic compound (VOC) emissions through early detection and repair. In many cases, VOC emissions reduction technologies tested and adopted by Costco have gone well beyond what the regulations require. This is because Costco has made a commitment to conduct all of its operations in an environmentally responsible and sustainable manner, recognizing that in order for Costco to thrive, our world and shared environment must also thrive. 2-1

We believe that sound environmental policy requires use of the latest and best scientific data available. Accordingly, we commend the District for proposing amendments to District Rule 1401 that strive to incorporate the most up-to-date information available regarding the emissions performance of today's GDFs. As you know, advances in enhanced vapor recovery (EVR) technology in the past few decades have literally changed the face of GDF regulation. Onboard refueling vapor recovery (ORVR) technology, which results in capture of greater than 95% of all organic vapors from a passenger car gas tank during refueling, is required to be

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installed on new passenger cars and is now present on the vast majority of cars on California's roads. In addition, Phase I and II EVR technologies installed in gasoline underground storage tanks and gasoline pump nozzles, respectively, provide additional control of gasoline vapors displaced from USTs and vehicle gas tanks during refilling, further ensuring an extremely low VOC emissions profile at today's GDFs. Market penetration of these technologies has risen dramatically in just the last decade alone, meaning that estimates of GDF emissions today are now, thankfully, far lower than estimates from ten years ago.

Thus, Costco was very pleased to work with the District and ARB over that past decade not only to implement EVR at its California GDFs, but also to gather the data necessary to update the statewide VOC and toxics emissions factors applicable to GDFs. Prior GDF emission factors were adopted in 1999 and did not account for technological advances in Phase I, Phase II and ORVR technologies implemented over the next 15 years. For that reason, ARB invited several air districts and other stakeholders to collaborate in a multi-year study of GDF emissions using current technologies. As you know, on December 23, 2013 ARB released its "Revised Emission Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities" (ARB 2013 GDF Factors)[1] updating emissions factors for Phase I transfers and Phase II refueling, and adding new emissions sub-categories for Phase II refueling of ORVR-equipped vehicles and gasoline dispensing hose permeation. We understand the District participated closely in this process. 2-1

In relevant part, PAR 1401 seeks to update the District's new source review rule for toxic emissions sources by requiring the use of proposed SCAQMD Risk Assessment Procedures Version 8.1 in risk assessments for all new and modified spray booths and GDFs. This Version 8.1 also proposes to incorporate all of ARB's updates to GDF speciation profiles and emissions factors except for one: the factor for refueling of ORVR-equipped vehicles by Phase II-equipped pumps. ARB has determined that refueling of non-ORVR-equipped vehicles by Phase II nozzles results in VOC emissions of 0.42 pound/1,000 gallons of gasoline throughput, and that refueling of ORVR-equipped vehicles by Phase II nozzles results in a lower emissions profile of 0.021 pound/1,000 gallons gasoline throughput. Here, the District's Version 8.1 of the Risk Assessment Procedures proposes an emission factor of 0.42 pound/1,000 gallons gasoline throughput for refueling of ORVR vehicles **or** non-ORVR vehicles at a Phase II nozzle. This would assume that addition of ORVR control provides no emissions benefit **whatsoever** in reducing refueling emissions at a Phase II pump. 2-2

[1] The ARB 2013 GDF Factors document and its attachments are available on ARB's website at https://www.arb.ca.gov/vapor/gdf-emisfactor/gdf-emisfactor.htm.

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This would flatly contradict ARB's studied finding in the 2013 ARB GDF Factors document. As a result of its multi-year analysis and study of GDF VOC emissions, ARB concluded that, while ORVR systems average 95% capture efficiency of gas tank emissions during refueling (i.e., capture of vapors in the onboard carbon canister for routing to the engine), the **additional** use of a Phase II nozzle (which has its own 95% control efficiency) will prevent escape of most of these remaining uncaptured vapors into the atmosphere. *See* ARB 2013 GDF Factors, Attachment 1, p. 7 (95% control efficiency of Phase II provides additional benefit to 95% control of ORVR).

2-2

Empirical evidence of the significant compound effect of multiple vapor controls was established in a 2008 ARB empirical study of emissions from ORVR-equipped vehicles during refueling. ARB's study found that the addition of Phase II controls to ORVR control provided roughly an order of magnitude improvement in emission reduction, versus ORVR control **without** Phase II. *See* California Air Resources Board, *Measurement of Gasoline Vapor Emissions From Vehicles Equipped with On Board Vapor Recovery*, p. 15, Table 7 (July 24, 2008).[2] The table reproduced below from ARB's 2008 study summarized the data comparing the two emissions scenarios:

(*see next page…*)

[2] The 2008 ARB study can be found on ARB's website at http://www4.aqmd.gov/enewsletterpro/uploadedimages/000001/Celia/1401/orvrtestreport072408.pdf

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Table 7
Emissions data for ORVR Vehicles from ARB tests at gasoline dispensing facilities and from EPA/Manufacturer SHED tests

Emission Measurements	Emissions, lbs per 1000 gallons dispensed		
	CaRFG3 Summer Fuel 6.9 RVP	Federal Test Procedure Fuel, 9 RVP	CaRFG3 Winter Fuel, 11.9 RVP
ARB Test Procedure 201.2 at gasoline dispensing facilities			
Fillpipe, no Phase II, mean ± standard deviation (This study)	0.043 ± 0.08		0.094 ± 0.18
Average odometer reading, miles, for vehicles in this study, 2006 – 2007 model years	13,400		14,100
Fillpipe, with Phase II EVR (Average of two ARB studies.)[6]			0.01
Estimated reduction of fillpipe emissions for ORVR vehicle with Phase II control (winter fuel, RVP not specified)[7]			0.09
EPA/Manufacturers ORVR vehicle emissions measurement according to the Federal Test Procedure			
Fillpipe and on-board canister emissions ± std deviation (Average for 337 dispensing events)[8]		0.25 ± 1.15	
Average odometer reading, miles		19,100	
Number of vehicles failing the 0.2 gram/gallon ORVR standard = 17, or 5.3% of vehicles tested			

As ARB's data show, VOC fillpipe emissions during refueling of CaRFG Winter Fuel at a non-Phase II equipped nozzle were estimated to be roughly 0.1 pound/1,000 gallons gasoline throughput (data line 1), while VOC fillpipe emissions during refueling of CaRFG Winter Fuel at a Phase II-equipped nozzle were estimated at 0.01 pound/1,000 gallons gasoline throughput (data line 3). Thus, according to ARB, the addition of Phase II control when refueling an ORVR-equipped vehicle improved the overall VOC capture efficiency by 10 times over use of ORVR alone. This squarely contradicts the District's use of the same emissions factor (0.42) for ORVR + Phase II and for ORVR alone. 2-2

In September 2011, ARB again concluded in a White Paper responding to EPA's proposed "widespread use" finding and Stage II waiver that the use of ORVR together with Phase II control significantly reduced refueling emissions versus use of ORVR alone. ARB noted that emissions of hydrocarbon VOCs when refueling a non-ORVR vehicle from a Phase II pump were nearly 40 times higher (0.38 pound/1,000 gallons gasoline dispensed) than when ORVR control is added (0.01 2-3

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pound/1,000 gallons gasoline dispensed), as shown in the below excerpt from the White Paper:

Table 2
Emission Factors for Vehicle Fueling Operations
(pounds of hydrocarbon per thousand gallons dispensed)

Vapor Displaced From Vehicle Fuel Tank				Drip, Spill & Liquid Retention		Pressure Driven Emissions From Underground Storage Tank	
With Phase II		Without Phase II					
ORVR	Non-ORVR	ORVR	Non-ORVR	EVR	Non-EVR	EVR	Non-EVR
0.01	0.38	0.07	7.5	0.24	0.42	0.0045	0.044

See ARB White Paper, *Preliminary Analysis of U.S. EPA's Proposed Rule on Onboard Refueling Vapor Recovery Widespread Use Determination and California's Enhanced Vapor Recovery Requirements*, p. 6 (Sept. 8, 2011).[3] In its letter to EPA accompanying the White Paper, ARB argued against the removal of Phase II EVR requirements in California despite EPA's finding of ORVR "widespread use," noting that "(ORVR) and Stage II (Phase II) are ***both*** designed to control the vehicle refueling emissions and ***both*** are effective." *See* Letter from James Goldstene to EPA Air and Radiation Docket and Information Center, p. 1 (Sept. 8, 2011).[4] 2-3

To date, District staff have provided no empirical data or evidence to substantiate their rejection of the ARB 2013 GDF emission factor for ORVR/Phase II refueling, nor has the District provided evidence or data to refute ARB's empirical analyses. In the public workshops on this rule, District staff have repeatedly asserted that they are "confident" that the ARB emissions factor is based on "double counting" of emissions controls. Staff further assert that their conclusion is based on an "engineering disagreement" with ARB. But District staff have not presented any empirical emissions data to support these assertions, nor has ARB provided any public response to date as to the validity of District staff's claims. 2-4

We believe it is problematic from a policy perspective for the District to adopt an emission factor in direct contravention of an emissions factor set by ARB based on empirical evidence and years of analysis, particularly where the District is unable to

[3] The White Paper and accompanying ARB letter to EPA can be found on ARB's website at https://www.arb.ca.gov/vapor/carb%20response%20useap%20orvr%20widespread%20use%20nprm.pdf.

[4] See link above for copy of ARB letter to EPA.

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produce data or evidence of its own to justify the rejection of ARB's findings. When the District disagrees with ARB over engineering conclusions that are amenable to **empirical** determination – especially as to emissions factors that should have uniform statewide applicability – we believe it is incumbent on District staff to work out their differences with ARB and ultimately defer to evidence and data. 2-4

We also believe that it is potentially dangerous ground for District staff to take a position suggesting that Phase II controls have **zero** benefit to controlling refueling emissions versus use of ORVR alone. This position would have farther-reaching consequences for the District than just in this rulemaking. As the District knows, California opposed EPA's "widespread use" determination Indeed, in the 2016 Air Quality Management Plan, the District has **already** taken Basinwide credit for emissions reductions from GDFs by applying the suite of ARB 2013 GDF Factors (*see* 2016 AQMP, Appendix III, pp. III-1-15 to III-1-16),[5] putting the District in the position of potentially contradicting its own AQMP by only selectively adopting **some** but not all of the ARB 2013 GDF Factors. 2-5 2-6

As we have explained in the public workshops and working groups on PAR 1401, Costco wholeheartedly agrees with the District's adoption of the ARB 2013 GDF Factors, but simply believes that the available data from ARB supports adoption of **all** of the ARB factors, including the ORVR/Phase II factor. Costco agrees with District Staff's position that the GDF emissions factors themselves do not require actual rulemaking, so we believe this one remaining oversight can and should be remedied by District Staff – if not in conjunction with this rulemaking, then immediately following it.

Everyone – the District, regulated entities, and the public – has a strong interest in ensuring accurate emissions inventories from the thousands of GDFs across California. We all have a shared interest in ensuring evidence- and science-based rulemaking. Unlike many of the policy debates that can sometimes emerge from rulemaking, empirical issues like this can and should be resolved definitively and cooperatively, in order to avoid unnecessary administrative work fixing those issues later. As always, Costco remains committed to working with the District to address these issues quickly and efficiently, so that both the public and the regulated community have an accurate picture of the significant emissions reduction progress at gasoline pumps throughout the District. 2-7

[5] The District's AQMP, Appendix III, is available at http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/appendix-iii.pdf?sfvrsn=6.

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Thank you again for the opportunity to work together with the District on this important Rule revision.

Very truly yours,

Michael S. McDonough

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Response to Comment 2-1

As noted, staff from several districts including SCAQMD participated as part of the California Air Pollution Control Officer Association (CAPCOA) Vapor Recovery Subcommittee in the review of CARB's revised emission factors. At the time of release, CARB is also committed to continue its efforts to revise the newly released emission factors.

Response to Comment 2-2

SCAQMD staff agrees that the ORVR system averages a 95% control efficiency of gas tank emissions during refueling, but disagrees that the use of a Phase II nozzle could further control all emissions escaping from the ORVR system.

The ORVR system has mechanisms to prevent vapor within a vehicle fuel tank from escaping via the fillpipe of the vehicle (i.e. a narrowed fillpipe to form a liquid barrier and a mechanical valve at the end of the fillpipe). The vapor that would have otherwise escaped through the fillpipe is directed to a carbon canister, which is the actual means of emission control of the ORVR system, to adsorb hydrocarbons contained in the displaced vapor.

SCAQMD staff carefully reviewed the 2008 ARB study referenced by the commenter. The 2008 CARB study was conducted at an "ambient environment" (i.e. at a gasoline dispensing facility for a rental vehicle company). While the test was designed to evaluate fillpipe emissions, the study could not capture emissions from the on-board canister of the ORVR system. As the commenter correctly pointed out, the top part of Table 7 lists the fillpipe emissions of refueling ORVR vehicles. SCAQMD agrees that for emissions that pass through the fillpipe, they would be controlled by the Phase II-equipped nozzle.

The key to the different interpretations of the 2008 ARB study between the commenter and SCAQMD staff is that the study focuses on fillpipe emissions. As discussed above, the 2008 emission tests were conducted at the fillpipe exhaust where exhaust from the ORVR canister is not detected. Therefore, the 2008 study does not present total refueling emissions, which include emissions from both the fillpipe and the on-board canister for ORVR vehicles. Indeed, the bottom part of Table 7 lists the source test results from EPA/manufactures ORVR vehicle emissions measurement according to the Federal Test Procedure. Unlike the 2008 CARB study, which was conducted in ambient conditions, the EPA tests were conducted using a sealed housing emissions device (SHED), where emissions from both the fillpipe and the on-board canister were monitored. The EPA study tested for 337 dispensing events. The fillpipe and on-board canister emissions together averaged to 0.25 lbs per 1,000 gallons. The table further shows a standard deviation of 1.15 which indicates the control efficiency of individual vehicle tested varies significantly from the average emissions of 0.25 lbs. per 1,000 gallons.

The SCAQMD staff believes that there is a small amount of vapor that the Phase II EVR system will control during refueling of an ORVR vehicle. SCAQMD staff has been in communication with CARB staff regarding the refueling emissions factor. Both agencies agree that additional time is needed to better understand emission reductions from Phase II EVR for ORVR vehicles. SCAQMD staff is recommending not to incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current emission factor of 0.32 lbs per 1,000 gallons for refueling. Staff is recommending the use of CARB's 2013 emission factors for all other categories (loading, breathing, spillage, and hose permeation).

SCAQMD staff is committed to continue working with CARB staff to refine the emission estimates for Phase II refueling with ORVR vehicles and will return to the Board with future revisions to refueling emission factors.

Response to Comment 2-3

SCAQMD staff agrees that "(ORVR) and Stage II (Phase II) are both designed to control the vehicle refueling emissions and both are effective." As discussed in the staff report, Phase II EVR is needed for non-ORVR vehicles to achieve the additional VOC reductions of 14.7 tons per day in the year of 2020, and 8.8 tons per day in the year 2028 and beyond. Also, California's Phase II program includes other emission control features, such as in-station diagnostics (ISD) and standards for nozzle liquid retention, dripless nozzle and spillage, in addition to the control of the vapors displaced during vehicle refueling. Thus, it achieves greater emission reductions than the federal Stage II program requirements, and the improvement it provides is essential to meet mandated federal ambient air quality standards. While both the ORVR and Phase II vapor recovery systems are effective, they target different fleets (ORVR vehicles vs. non-ORVR vehicles respectively) and different processes (ORVR controls refueling and evaporative emissions as compared to Phase II EVR, which controls emissions at the fillpipe as well as nozzle operations such as spillage, drips, and liquid retention, and provides early diagnostic information via ISD).

Response to Comment 2-4

Staff released the proposed emission factors for gasoline dispensing facilities in the first working group meeting, and provided the technical justification in the second working group.

Furthermore, as discussed in Response to Comment 2-3, the 2008 CARB study only measured fillpipe emissions, while the EPA SHED study captured both fillpipe and on-board canister (from the ORVR vehicles) emissions. It is also important to point out that CARB's Phase II emission factor includes pressure driven losses from the storage tanks at a GDF. Whereas, the EPA SHED study does not include such emissions.

As discussed in Comment 2-2, SCAQMD staff is committed to working with CARB staff on the refueling emission factor. Until then, SCAQMD staff is recommending not to incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current refueling emission factor of 0.32 lbs per 1,000 gallons.

Response to Comment 2-5

See Response to Comment 2-3.

Response to Comment 2-6

An emission inventory is a live document that gets updated when new information is available. For each AQMP, the emission inventory is developed using the best available information at the time of the development. For the 2016 AQMP, the emission inventory was "frozen" in late 2015 to allow time for conducting the modeling analyses. At that time, SCAQMD staff was having ongoing discussions with CARB staff on the concerns regarding the emission factors for refueling and spillage.

Information necessary to produce the emission inventory for the South Coast Air Basin is obtained from the SCAQMD and other governmental agencies, including CARB, the California Department of Transportation (Caltrans), and the Southern California Association of Governments (SCAG). While SCAQMD is responsible for developing the emission inventory for stationary sources, CARB is the agency responsible for developing the emissions inventory for gasoline dispensing facilities.

In addition, the attainment of the 2008 ozone standard mainly relies on NOx reductions. Even if the VOC emission reductions from Phase II refueling were overestimated, the change in VOC would not have resulted in significant impacts on the ozone concentrations in the design sites in the attainment year. More details about the ozone modeling approach and the ozone isopleths can be found in in the 2016 AQMP (Appendix V - Modeling and Attainment Demonstration, Attachment 4 8-hour Ozone Isopleths for 2031).

Response to Comment 2-7

SCAQMD staff agrees with the comment that this rulemaking should move forward and that once CARB and SCAQMD staff agree on an emission factor for refueling, the emission factor in the Risk Assessment Procedures can be updated at a later time. SCAQMD staff is committed to continue working with CARB staff to refine the emission factor for Phase II refueling.

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Susan Nakamura
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21865 Copley Drive
Diamond Bar, CA 91765

Via e-mail at: snakamura@aqmd.gov

Re: Proposed Amended Rule 1401

Dear Ms. Nakamura:

CIOMA appreciates this opportunity to provide feedback on South Coast Air Quality Management District (SCAQMD) Proposed Amended Rule 1401 and associated documentation.

The California Independent Oil Marketers Association (CIOMA) represents about 300 members, including nearly 90% of all the independent petroleum marketers in the state and about one quarter of the state's 10,000 service stations. Our members provide services to local governments, law enforcement, city and county fire departments, ambulances/emergency vehicles, school district bus fleets, construction firms, marinas, public and private transit companies, hospital emergency generators, trucking fleets, independent fuel retailers (small chains and mom-and-pop gas stations) and California agriculture, among others.

CIOMA and the other trade associations signed on the letter would like to reiterate our earlier concerns about SCAQMD's abbreviated rule development schedule, and urge the District to allow sufficient time for adequate review and comment of proposals in the future. 3-1

We appreciate the information that District Staff released on August 9 identifying that they will not be increasing their refueling emission factor for gasoline dispensing facilities (as had been identified in previous Working Group meetings). We urge SCAQMD to lower that emission factor in light of the fact that it has been well documented that the current factor (i.e. 0.32 lb/1000 gallons dispensed) is overly conservative. Roughly 90% of all gasoline is dispensed to vehicles equipped with onboard refueling vapor recovery (ORVR)[1] (and that percentage continues to increase). Furthermore, extensive testing by both EPA and the California Air Resource Board (ARB) has shown that refueling emissions from ORVR-equipped vehicles—without taking credit for any additional reductions associated with Phase II vapor recovery—are considerably lower than 0.32 lb/1000 gal. Prior EPA analysis of 1,160 tests conducted within a Sealed Housing for Evaporative Determination determined that average refueling emissions from ORVR-equipped vehicles were just 0.068 g/gal = 0.15 lb/1000 gal[2]. Prior ARB tests reported 3-2

[1] The 90% estimate is from ARB (George Lew), "Updated ORVR Penetration Calculations", memorandum to Joe Guerrero (ARB), July 11, 2006, Table 1.
[2] EPA (Glenn Passavant, Office of Transportation and Air Quality), "ORVR In-Use Efficiency Assessment", memo to Public Docket EPA-HQ-OAR-2010-1076, March 29, 2011.

that refueling emissions from ORVR-equipped vehicles as 0.043 lb/1000 gal for California
summer fuel and 0.094 lb/1000 gal for California winter fuel.[3] The District should not continue 3-2
to ignore these data.

At yesterday's Working Group, ARB staff indicated their intension to revise the refueling
emission factor to consider these ORVR test data by the end of the year. Given the pending
revisions, we strongly recommend that SCAQMD retain Version 7.0 of the "Risk Assessment 3-3
Procedures for Rules 1401, 1401.1 and 212" for gasoline dispensing facilities until all of the
relevant emission factors can be updates. Based on ARB's representations, that update should be
possible by the end of the year.

If you have any questions, please contact me at (916) 646-5999 or by email at bayless@cioma.com.

Sincerely,

Samuel Bayless
Regulatory Issues Specialist
California Independent Oil Marketers Association

WSPA

Western States Petroleum Association

California Small Business Alliance

[3] ARB, "Measurement of Gasoline Vapor Emissions from Vehicles Equipped with On-Board Vapor Recovery", Project Number V-08-012, July 24, 2008.

Response to Comment 3-1

PAR 1401 has followed a standard rule development schedule providing a draft rule and preliminary draft staff report 75 days before the public hearing. The revisions to the proposed rule are relatively small. The revisions to the SCAQMD Risk Assessment Guidelines are on less than 10 pages. The SCAQMD staff has worked with stakeholders to provide additional technical justification. Please see Response to Comment 1-1 for more details on the development schedule of PAR 1401.

Response to Comment 3-2

In the fourth Working Group Meeting on August 16, 2017, CARB staff presented some new information suggesting that CARB's 2013 emission factor of 0.021 lbs per 1,000 gallons for Phase II refueling of ORVR vehicles underestimates the emissions. CARB is committed to preparing a draft addendum to revise the emission factor, which will likely be higher than CARB's 2013 estimates. SCAQMD staff is proposing that the Version 7.0 refueling emission factor which is the current SCAQMD refueling emission factor of 0.32 lbs per 1,000 gallons continue to be used for Phase II refueling in the proposed Risk Assessment Procedures (Version 8.1), as presented in the Draft Staff Report released on August 2, 2017. Once CARB finalizes the refueling emission factor, SCAQMD staff will return to the Stationary Source Committee within 30-days and the Board as soon as practicable with the revised refueling emission factor.

In addition, based on staff's review of gasoline dispensing facilities that were permitted over a five-year period, using the 2013 emission factors with the previously proposed emission factor of 0.42 lbs per 1,000 gallons (includes emissions from refueling and breathing), combined with the 2015 OEHHA Guidelines and updated meteorological data (Risk Assessment Procedures (Version 8.1)) resulted in no impacts to gasoline dispensing facilities that were modified and less than four percent impact to new gasoline dispensing facilities (less than one new gasoline dispensing facility per year). For the approximately less than 1 per year of new gasoline dispensing facilities that are potentially impacted, there are several compliance options: If they want to retain their requested throughput they can conduct a higher tier risk analysis which is approximately $15,000, re-orient their refueling pumps further from sensitive land uses such as residences, schools, and day cares, or lower their throughput request. In addition, since staff's analysis of the impacts was based on 0.42 lbs per 1000 gallons, the impacts to gasoline dispensing facilities using the recommended current refueling emission factor of 0.32 lbs per 1,000 gallons would be less than what was analyzed in the Draft Staff Report.

Response to Comment 3-3

CARB intends to prepare a draft addendum to revise the refueling emission factor, which will need to go through CARB's internal review, CAPCOA review, and a public review and comment period prior to finalization. In the June 2015 amendment to Rule 1401 all sources except spray booths and gasoline dispensing facilities were required to use the 2015 OEHHA Guidelines and staff committed to return with procedures to address spray booths and gasoline dispensing facilities as expeditiously as possible so as to level the playing field for all sources. The proposed Risk Assessment Procedures (Version 8.1) incorporates not only the gasoline refueling emission factor, but also the 2015 OEHHA Guidelines, updated gasoline speciation profile, and updated meteorological data. As described in the Resolution for Proposed Amended Rule 1401, SCAQMD staff is committed to returning to the Stationary Source Committee within 30 days after CARB finalizes revisions to the refueling emission factor for Phase II EVR and ORVR systems and to return to the Governing Board as quickly as practicable with revisions to update the SCAQMD Risk Assessment Procedures for Rules 1401, 1401.1, and 212 to reflect the refueling emission factor revisions from CARB.

ATTACHMENT H

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
South Coast AQMD (909) 396-2000 • www.aqmd.gov

SUBJECT: **NOTICE OF EXEMPTION FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT**

PROJECT TITLE: **PROPOSED AMENDED RULE 1401 - NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS**

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and has prepared a Notice of Exemption for the project identified above.

SCAQMD staff has reviewed the proposed amendments to Rule 1401 – New Source Review of Toxic Air Contaminants pursuant to: 1) CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA.

SCAQMD staff has determined that it can be seen with certainty that there is no possibility that the proposed amendments to Rule 1401 may have a significant adverse effect on the environment. Therefore, the project is considered to be exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062 - Notice of Exemption. If the proposed project is approved, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

Any questions regarding this Notice of Exemption should be sent to Sam Wang (c/o Planning, Rule Development and Area Sources) at the above address. Mr. Wang can also be reached at (909) 396-2649. Ms. Kalam Cheung is also available at (909) 396-3281 to answer any questions regarding the proposed amended rule.

Date: August 11, 2017

Signature: [signature]
Barbara Radlein
Program Supervisor, CEQA Section
Planning, Rules, and Area Sources

Reference: California Code of Regulations, Title 14

NOTICE OF EXEMPTION

To:	County Clerks Counties of Los Angeles, Orange, Riverside and San Bernardino	**From:**	South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765

Project Title: Proposed Amended Rule (PAR) 1401 - New Source Review of Toxic Air Contaminants

Project Location: The SCAQMD has jurisdiction over the four-county South Coast Air Basin (all of Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB). The SCAQMD's jurisdiction includes the federal nonattainment area known as the Coachella Valley Planning Area, which is a sub-region of Riverside County and the SSAB.

Description of Nature, Purpose, and Beneficiaries of Project:
In 2015, the SCAQMD's Governing Board amended Rule 1401 and approved the corresponding SCAQMD Risk Assessment Procedures (Version 7.0) which incorporated the use of the 2015 Office of Environmental Health Hazard Assessment (OEHHA) Risk Assessment Guidelines (2015 OEHHA Guidelines) when estimating health risks. However, two source categories, spray booths and gasoline dispensing facilities, were excluded from the 2015 amendments to Rule 1401 to allow staff additional time to evaluate the potential permitting impacts of using the 2015 OEHHA Guidelines to estimate health risks for these source categories per the requirements in Rule 1401 subparagraphs (e)(3)(A) and (e)(3)(B). PAR 1401 is proposing to remove the exemption and require spray booths and gasoline dispensing facilities to begin using the proposed SCAQMD Risk Assessment Procedures (Version 8.1), which incorporates: 1) 2015 OEHHA Guidelines; 2) revised gasoline dispensing emission factors and speciation profiles; and 3) current air dispersion model (AERMOD) and updated meteorological data. Additionally, PAR 1401 will update the list of toxic air contaminants in Table I of Rule 1401 to be consistent with the current list used by OEHHA.

Public Agency Approving Project:	**Agency Carrying Out Project:**
South Coast Air Quality Management District	South Coast Air Quality Management District

Exempt Status:
CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule

Reasons why project is exempt: SCAQMD staff has reviewed PAR 1401 pursuant to: 1) CEQA Guidelines Section 15002(k) – General Concepts, the three-step process for deciding which document to prepare for a project subject to CEQA; and 2) CEQA Guidelines Section 15061 – Review for Exemption, procedures for determining if a project is exempt from CEQA. To comply with PAR 1401 requirements, new and modified spray booths would require more efficient filters to control emissions and new and modified gasoline dispensing facilities may either comply by requesting a lower throughput, or by increasing the distance to the nearest residential receptor, or by conducting a Tier 3 or Tier 4 analysis. In any event, there would be no physical change to gasoline dispensing facilities and very minimal physical change to spray booths due to implementing PAR 1401. Therefore, SCAQMD staff has determined that it can be seen with certainty that there is no possibility that PAR 1401 may have a significant adverse effect on the environment. Thus, PAR 1401 is considered to be exempt from CEQA pursuant to CEQA Guidelines Section 15061(b)(3) – Activities Covered by General Rule.

Date When Project Will Be Considered for Approval (subject to change):
SCAQMD Governing Board Hearing: September 1, 2017; SCAQMD Headquarters

CEQA Contact Person:	**Phone Number:**	**Email:**	**Fax:**
Mr. Sam Wang	(909) 396-2649	swang1@aqmd.gov	(909) 396-3982
Rules Contact Person:	**Phone Number:**	**Email:**	**Fax:**
Ms. Kalam Cheung	(909) 396-3281	kcheung@aqmd.gov	(909) 396-3324

Date Received for Filing: ________________ **Signature:** *(Signed Upon Board Approval)*

Barbara Radlein
Program Supervisor, CEQA Section
Planning, Rule Development & Area Sources

ATTACHMENT I

South Coast Air Quality Management District

RISK ASSESSMENT PROCEDURES for Rules 1401, 1401.1 and 212

Version 8.1

September 1, 2017

Preface

This document describes the procedures for preparing risk assessments under Rule 1401 - New Source Review of Toxic Air Contaminants, Rule 1401.1 - Requirements for New and Relocated Facilities Near Schools, and Rule 212 – Standards for Approving Permits and Issuing Public Notice. This version of the Risk Assessment Procedures for Rules 1401, 1401.1 and 212 updates the previous Version 8.0 which was updated in 2015 to incorporate the California Office of Environmental Health Hazard Assessment "Air Toxics Hot Spots Program Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments" (2015 OEHHA Guidelines). This is intended to be a "living" document, which staff will update periodically with updated meteorological data and dispersion model versions. This preface and the summary table provide an easy reference to identify the changes between versions of the SCAQMD's Risk Assessment Procedures and Attachments containing the screening tables. The major revisions to this document (Version 8.1) from the previous version (Version 8.0) include:

- Revising the emission factors and speciation profiles for gasoline dispensing facilities (refer to Appendix X);
- Adding screening tables for spray booth sources (refer to Appendix XI and Attachment N, Tables 13.1 – 13.3);
- Updating the meteorological data for all screening tables (refer to Appendix VI); and
- Updating the list of TACs approved by OEHHA subject to Rule 1401 (refer to Attachment N);
- Reorganization of tables in Attachment N for ease of use.

Summary of Changes

SCAQMD Risk Assessment Procedures	**Version 8.1**	**Version 8.0**	**Version 7.0**
Date of Rule 1401 Adoption	September 1, 2017	June 5, 2015	March 4, 2005
Applies to Permit Applications Deemed Complete On Or After	October 1, 2017	July 5, 2015	July 1, 2005
OEHHA Reference Document	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, adopted on March 6, 2015	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, adopted on March 6, 2015	Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments, finalized in August 2003
SCAQMD Permit Application Package	Attachment N	Attachment M (does not apply to spray booths or gasoline dispensing facilities)	Attachment L
Dispersion Model	AERMOD (Version 16216r)	AERMOD (Version 14134)	ISC-ST3 (Version 99155)
Meteorological Data Model	AERMET (Version 16216)	AERMET (Version 14134)	N/A
Meteorological Data Years	2010-2016	2006-2012	1981

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APPENDICES

INTRODUCTION

Risk assessment procedures, including procedures for a simple risk screening, were originally developed by South Coast Air Quality Management District (SCAQMD) staff for the adoption of Rule 1401 - New Source Review of Toxic Air Contaminants, in June 1990. Since that time, this document has been revised several times to reflect updated risk assessment methodologies.

The purpose of this document is to:

- Assist applicants and engineers to evaluate Rule 1401 and 1401.1 compliance;
- Provide explanations and sample risk calculations; and
- Provide industry worksheets.

This document describes the procedures for preparing risk assessments under Rule 1401 and Rule 212 – Standards for Approving Permits and Issuing Public Notice. It also applies to Rule 1401.1 – Requirements for New and Relocated Facilities Near Schools for sources located near schools. It is intended to be a "living" document. That is, as new Toxic Air Contaminants (TACs) are added, risk values changed, or procedures revised, the document will be updated. This version of "Risk Assessment Procedures for Rules 1401, 1401.1 and 212" is based on the "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" (2015 OEHHA Guidelines) prepared by the Office of Environmental Health Hazard Assessment (OEHHA) and approved on March 6, 2015. The 2015 OEHHA Guidelines, which may be found at: https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0, supersedes OEHHA'S 2003 version of risk assessment guidelines. The 2015 OEHHA Guidelines incorporates age sensitivity factors which will increase cancer risk estimates to residential and sensitive receptors by approximately three times, and more than three times in some cases depending on whether the TAC has multiple pathways of exposure in addition to inhalation. Under the 2015 OEHHA Guidelines, even though the toxic emissions from a facility have not increased, the estimated cancer risk to a residential receptor will increase. Cancer risks for off-site worker receptors are similar between the existing and revised methodology because the methodology for adulthood exposures remains relatively unchanged.

SCAQMD's Risk Assessment Procedures (Version 8.0) was updated June 2015 to incorporate the 2015 OEHHA Guidelines. Spray booths and gasoline dispensing facilities were exempted under Rule 1401 from using Version 8.0 to allow SCAQMD staff more time to assess the permitting impacts with this change. Version 8.1 (this current document) uses the same risk assessment procedures as Version 8.0, but now includes spray booths and gasoline dispensing facilities to reflect amendments to Rule 1401 in 2017.

Background

There are four steps involved in the risk assessment process; 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization. Each step is briefly discussed below.

Hazard Identification

For air toxics sources, hazard identification involves determining the type of adverse health effect associated with exposure of the pollutant of concern emitted by a facility, including whether a pollutant is considered a human carcinogen or a potential human carcinogen.

Exposure Assessment

The purpose of exposure assessment is to estimate the extent of public exposure to emitted substances for potential cancer, non-cancer health hazards for chronic and acute, and repeated 8-hour exposures. This involves estimation of long-term (annual), short-term (1-hour maximum), and 8-hour average exposure levels.

Dose-Response Assessment

Dose-response assessment is the process of characterizing the relationship between exposure to a chemical by its modeled concentration. Dose can be calculated as follows:

Dose = Concentration x Exposure

Risk Characterization

This is the final step of the risk assessment in which the information from exposure assessment and dose-response assessment are combined to assess total risk to the surrounding community.

SCAQMD Rule 1401 History

Rule 1401, adopted June 1, 1990 and amended December 7, 1990, specified limits for Maximum Individual Cancer Risk (MICR) and excess cancer cases for new, relocated, or modified equipment which emits carcinogenic air contaminants. The rule was amended July 10, 1998 to include non-carcinogenic compounds. The rule was amended on March 17, 2000 to remove the requirement to assess cumulative risk from emissions from units permitted after 1990 that are located within 100 meters of the new equipment under evaluation for permit. And, the rule has been amended several times to change the list of regulated compounds (both additions and deletions) and their corresponding risk values (cancer potency factors and reference exposure levels). Most recently, Rule 1401 was amended on June 5, 2015 to incorporate the 2015 OEHHA Guidelines for calculating health risks.

Requirements

This document describes the procedures for determining cancer and non-cancer health effects for equipment subject to Rules 1401, 1401.1, and 212.

In general, these rules apply only if there is an increase in TAC emissions from new, relocated, or modified equipment. Details regarding applicability of these rules to facilities or equipment can be found within the rules themselves at: http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book.

Under Rule 1401, the following requirements must be met before a permit is granted for affected equipment.

- The cumulative increase from all TACs emitted from a single piece of equipment in MICR shall not exceed:
  - one in one million (1.0 x 10^{-6} or 1E-06) if Best Available Control Technology for Toxics (T-BACT) is not used; or,
  - ten in one million (10 x 10^{-6} or 10E-06) if T-BACT is used;

- The cumulative cancer burden from all TACs emitted from a single piece of equipment (increase in cancer cases in the population) shall not exceed 0.5; and,

- Neither the Chronic Hazard Index (HIC), the 8-hour Chronic Hazard Index (HIC8), nor the total Acute Hazard Index (HIA) from all TACs emitted from a single piece of equipment shall exceed 1.0 for any target organ system, or an alternate hazard index level deemed to be safe.

Rule 1401.1 is designed to be more health protective for school children than Rule 1401 by establishing more stringent risk requirements related to facility-wide cancer risk and non-cancer HIA and HIC for new and relocated facilities emitting TACs near schools, thereby reducing the exposure of toxic emissions to school children. For new facilities, the rule requires the facility-wide cancer risk to be less than one in one million at any school or school under construction within 500 feet of the facility. If there are no schools within 500 feet, the same risk levels must be met at any school or school under construction within 500 to 1,000 feet unless there is a residential or sensitive receptor within 150 feet of the facility. For relocating facilities, the facility must demonstrate, for each school or school under construction within 500 feet of the facility, that either: 1) the risk at the school from the facility in its new location is no greater than the risk at that same school when the facility was at its previous location, or 2) the facility-wide cancer risk at the school does not exceed one in one million. Unlike other SCAQMD risk-based rules, the required risk thresholds of Rule 1401.1 do not change based on whether or not the source is equipped with T-BACT.

Rule 212 also applies to Rule 1401 exempt sources. Rule 212 (c)(3) requires public notification if the MICR, based on Rule 1401 risk assessment procedures, exceeds one in one million, due to a project's proposed construction, modification, or relocation for facilities with more than one permitted equipment unless the applicant can show the total facility-wide MICR is below ten in a million. For facilities with a single permitted piece of equipment, the MICR level must not exceed ten in a million. The circulation and distribution of the notifications must meet the criteria in Rule 212.

OVERVIEW

This document provides several tiers for preparing a risk assessment, from a quick look-up table to a detailed risk assessment involving air quality dispersion modeling analysis. Permit applicants may use any of these tiers to demonstrate compliance with the risk limits of Rule 1401. The applicant should include a copy of the risk assessment, including all electronic modeling files, with the permit application.

The tiers are designed to be used in order of increasing complexity with each higher tier providing a more refined estimate of risk than the lower tier. If compliance cannot be demonstrated using one tier, the permit applicant may proceed to the next tier. A permit applicant who can show compliance by using a lower tier does not need to perform an analysis for the higher tiers. In general, for most permits a detailed analysis is not required. The tiers are:

- Tier 1: Screening Emission Levels
- Tier 2: Screening Risk Assessment
- Tier 3: Screening Dispersion Modeling
- Tier 4: Detailed Risk Assessment

Please note that the 2015 OEHHA Guidelines "Tier" approach differs from these SCAQMD Risk Procedures "Tier" compliance. The OEHHA Tiers refer to the incorporation of stochastic modeling for the facility and population specific exposure parameters. In contrast, the SCAQMD Tiers refer to increasing complexity for deriving pollutant concentrations based on facility emissions. Regulatory compliance may be demonstrated with any SCAQMD Tier.

In addition, this document briefly discusses the T-BACT identification process for Rule 1401.

PRELIMINARY TASKS

Before conducting any of these risk assessment tiers, three preliminary tasks must be performed:

1. **Determine if the permitting action or equipment is exempt from the provisions of Rule 1401.** Exemptions are granted for:
   - Permit renewal or change of ownership;
   - Modifications with no increase in risk;
   - Functionally identical equipment replacement;
   - Equipment previously exempt under Rule 219 - Equipment not Requiring a Written Permit Pursuant to Regulation II and filing for a permit to operate within one year of removing the Rule 219 exemption;
   - Modifications to terminate research projects; and
   - Emergency internal combustion engines (ICEs) exempt under Rule 1304 - Exemptions.

   An additional exemption is granted for demonstrations of contemporaneous emission reductions such that no receptor experiences a total increase in MICR of greater than one in one million and the contemporaneous reduction occurs within 100 meters of the equipment. If the equipment falls under one of these exemptions, no further risk assessment is required.

2. **Identify the TACs emitted by the permit unit**. The risk assessment must include those TACs emitted by the permit unit which were listed in the rule when the permit application was deemed complete by SCAQMD staff (refer to Table I of Rule 1401). The first table in the Attachment lists the TACs subject to Rules 1401, 1401.1 and Rule 212. Determine the date on which the application was deemed complete and refer to the appropriate Attachments.

   Default toxic emission factors for TACs associated with combustion equipment have been developed for use in the AB2588 Program[1]. If better source specific data is available, such as

[1]SCAQMD's Supplemental Instructions are available on the SCAQMD website at: http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf

SCAQMD approved source tests, manufacturer's data, or fuel analysis, it should be used rather than the default emission factors.

If no TACs listed in the applicable version of Rule 1401 are emitted by the equipment, no further risk assessment is required.

3. **Estimate the quantity of emissions from the permit unit.** The appropriate emission estimation technique depends on the type of source. Techniques include emission testing, a mass balance or other engineering calculation, or emission factors for specific types of processes. The emissions used for the risk calculation should be post-control emissions (that is, reductions in emissions due to enforceable controls and permit conditions should be taken into account). SCAQMD Engineering and Permitting staff should be consulted regarding approved techniques for identifying toxic air contaminants and estimating emissions for specific sources.

   The SCAQMD also has a broader mandate to ensure that permits are not granted to facilities which may endanger public health (California Health and Safety Code Section 41700). In addition, under Rule 212, the applicant may be required to evaluate other compounds that are determined to be potentially toxic. Therefore, an applicant may be required to evaluate risks from compounds not listed in the Attachment as part of the permitting process if they are a concern for a specific source. These may include substances with irritant effects or other adverse health effects.

DEFINITIONS

Before proceeding, it is important to understand some of the terms used when performing a health risk assessment. These terms are commonly used throughout this document.

Dispersion Factor (χ/Q)
The concentration of a contaminant decreases as it travels away from the site of release and spreads out or "disperses." χ/Q are numerical estimates of the amount of dispersion that occurs under specific conditions. The amount of dispersion depends on the distance traveled, the height of release, and meteorological conditions such as wind speed and atmospheric stability. The dispersion factors for the screening risk assessment procedure give the estimated annual average ground-level concentration ($\mu g/m^3$) resulting from a source emitting one ton/year of a contaminant. For a more detailed explanation of derivation of χ/Q for each meteorological station, please refer to Appendix VI.

Molecular Weight Adjustment Factor (MWAF)
MWAFs should be used when calculating the cancer risk. For most of the toxic metals, the OEHHA cancer potency factor applies to the weight of the toxic metal atom contained in the overall compound. This ensures that the cancer potency factor is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal.

For most of the Hot Spots toxic metals, the OEHHA cancer potency factors, acute and chronic Reference Exposure Levels (RELs) apply to the weight of the toxic metal atom contained in the overall compound. Some of the Hot Spots compounds contain various elements along with the toxic metal atom (e.g., "Nickel hydroxide," CAS number 12054-48-7, has a formula of H2NiO2). Therefore, an adjustment to the reported pounds of the overall compound is needed before applying the OEHHA cancer potency factor for "Nickel and compounds" to such a compound. This ensures that the cancer potency factor, acute or chronic REL is applied only to the fraction of the overall weight of the emissions that are associated with health effects of the metal. In other cases, the Hot Spots metals are already reported as the metal atom equivalent (e.g., CAS 7440-02-0, "Nickel"), and these cases do not use any further molecular weight adjustment. The appropriate MWAF to be used along with the OEHHA cancer potency factors, acute and chronic RELs for Hot Spots metals can be found in the MWAF column of the table containing OEHHA and California Air Resources Board's (CARB) Approved Health Values for use in Hot Spots Facility Risk Assessments (Consolidated Health Values Table), which is available at: https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Cancer Potency (CP) Factor

The CP factor is a measure of the cancer potency of a carcinogen. Cancer potency describes the potential risk of developing cancer per unit of average daily dose over a 70-year lifetime. The CP factors in these procedures were approved by the state Scientific Review Panel and prepared by OEHHA. The CP can be found in the Consolidated Health Values Table, which is available at: https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Reference Exposure Level (REL)

The concentration level at or below which no adverse non-cancer health effects are anticipated for a specified exposure duration is termed the REL. RELs are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. RELs are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. The REL can be found in the Consolidated Health Values Table, which is available at: https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Multi-Pathway (MP) Adjustment Factor

The MP adjustment factor is used for substances that may contribute to risk from exposure pathways other than inhalation. These substances deposit on the ground in particulate form and contribute to risk through ingestion of soil or backyard garden vegetables or through other routes. The MP adjustment factor estimates the total risk in comparison to a given inhalation risk. MP adjustment factors are provided in Attachment N, Tables 3.1 and 3.2. These factors allow permit units that emit multi-pathway pollutants to use the risk screening procedure rather than proceeding directly to preparing a detailed risk assessment.

Daily Breathing Rate (DBR)

Exposure to airborne chemicals occurs through inhalation and subsequent absorption into the body, potentially resulting in adverse health effects depending on toxicological properties of the chemical and other exposure parameters. For residential exposures, the breathing rates are determined for specific age groups (i.e., third trimester, 0-2, 2-16, and 16-30 years). CARB is developing an updated Risk Management Policy (RMP) that includes recommendations for inhalation exposures. Information regarding CARB's RMP can be located at: http://www.arb.ca.gov/toxics/toxics.htm. For residential exposures, CARB's RMP recommends using the high end DBR (e.g., 95th percentile) for children from the third trimester through age 2, and 80th percentile DBR for all other ages. This is reflected in Attachment N, Tables 4.1A – 4.2D. For worker exposures, it is assumed that the working age begins at 16 years, and that exposures to facility emissions occur during the work shift which is typically up to eight hours per day during work days.

Age Sensitivity Factor (ASF)
Scientific data have shown that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA developed ASFs to take into account the increased sensitivity to carcinogens during early-in-life exposure. OEHHA recommends an ASF of 10 for exposures that occur from the third trimester of pregnancy to 2 years, and an ASF of 3 for exposures that occur from 2 years through 15 years of age.

Exposure Duration (ED)
A 30-year ED (residency time) should be used for residential and sensitive receptor locations. A 25-year ED should be used for off-site workers (i.e., receptor locations in commercial or industrial areas).

Fraction of Time Spent at Home (FAH)
OEHHA and CARB have evaluated information from activity patterns databases to estimate the percentage of the day that people are at home. This information is used to adjust cancer risk from a facility's emissions, assuming that exposure to the facility's emissions are not occurring away from home. The FAH factor does not apply for workers since the worker is assumed to be present at the work site 100 percent of the work day. For Tiers 1, 2, and 3 screening purposes, the FAH is assumed to be 1 for ages third trimester to 16. As a default, children are assumed to attend a daycare or school in close proximity to their home and no discount should be taken for time spent outside of the area affected by the facility's emissions. People older than age 16 are assumed to spend only 73 percent of their time at home.

Exposure Frequency (EF)
EF is the number of days per year of exposure for the given scenario (i.e. residential, worker). OEHHA recommends the use of 350 days/year for residential exposure (applicable to 30-year risk assessments), and 250 days/year for worker exposure. This equates to EF = 0.96 for residential exposure and EF = 0.68 for worker exposure.

Averaging Time (AT)
AT is the lifetime exposure period OEHHA used to develop the cancer potency values. CP factors are developed as estimates of cancer risk from exposure to a lifetime dose (i.e. 70 years) of a carcinogen. Since cancer risks are calculated on a yearly basis to account for age-specific factors (e.g., ASF, DBR, etc.) the CP factor must be divided by its original 70-year AT in the risk equation to generate an annual CP factor to be used in the cancer risk calculations. For AT, OEHHA recommends the use of 70 years.

Worker Adjustment Factor (WAF)
In risk assessments, long-term averages are typically used for cancer risk calculations for residents and workers. Therefore, for an off-site worker, the long-term average should represent what the worker breathes during their work shift. However, the long-term averages calculated from AERMOD typically represent exposures for receptors that were present 24 hours a day and seven days a week which is the schedule of a residential receptor. When modeling a non-continuously emitting source (e.g., operating for eight hours per day and five days per week), the long-term concentration has to be adjusted so that it is only based on the hours when the worker is present. WAF is the ratio between

residential exposure and facility schedule. For screening purposes, the off-site worker schedule is assumed to always overlap with the facility's operating schedule.

Tier 1: Screening Emission Levels

OVERVIEW OF TIER 1

Tier 1 involves a simple look-up table (Attachment N, Table 1.0) in which the equipment's emissions are compared to screening levels. The screening levels are pollutant emission thresholds which are not expected to produce a MICR greater than one in one million nor a hazard index greater than one.

Tier 1 can be used by applicants to determine whether or not a detailed risk analysis will be required when filing for a permit. It can also be used by applicants and SCAQMD staff to determine whether a permit is required based on paragraph (s)(2) in Rule 219.

Tier 1 may be used only for a single emission source and a single TAC. However, it can be used for multiple pollutants if the Multiple Pollutant Screening Level Procedure (described below) is followed.

INSTRUCTIONS FOR TIER 1

The Tier 1 analysis is performed as follows:

1. Determine the maximum annual emissions (for cancer and non-cancer 8-hour and chronic TACs) and determine the maximum hourly emissions (for non-cancer acute TACs).
2. Compare the emissions to the screening levels for that contaminant in Attachment N, Table 1.0. Columns are labeled with the distance to the nearest receptor.
3. If the maximum annual emissions or the maximum hourly emissions do not exceed the screening levels, the equipment will comply with Rule 1401 and does not require notice under Rule 212 for toxics.
4. If the maximum annual emissions or the maximum hourly emissions exceed the screening levels, proceed to Tier 2.

The screening levels in Attachment N, Table 1.0 were determined by back calculation, using the highest χ/Q established in Attachment N, Tables 6.1 A through 7.6 B that would not exceed a cancer risk of one in one million or an HIC, HIC8 or HIA of one.

MULTIPLE POLLUTANT SCREENING LEVEL PROCEDURE

1. Calculate the Pollutant Screening Index for each TAC (PSI_{TAC}). For each carcinogenic and/or 8-hour or chronic compound, divide the maximum annual emissions (in pounds per year) of each TAC (Q_{lbpy}) by the Annual Pollutant Screening Level ($PSL_{TAC,\ Annual}$) in pounds per year, as contained in Attachment N, Table 1.0. For each acute compound, divide the maximum hourly emission (in pounds per hour, Q_{lbph}) of each TAC by the Hourly Pollutant Screening Level ($PSL_{TAC,\ Hourly}$) as contained in Attachment N, Table 1.0.

$$PSI_{TAC,\ Cancer,\ 8\text{-}hr,\ or\ Chronic} = Q_{lbpy,TAC} / PSL_{TAC,\ Annual}$$

$$PSI_{TAC,\ Acute} = Q_{lbph,TAC} / PSL_{TAC,\ Hourly}$$

2. Calculate the Application Screening Index (ASI). Sum up the individual Pollutant Screening Indices for all chronic, 8-hour and carcinogenic pollutants (PSI_P) and, separately, for all acute TACs.

$$ASI_{cancer,8\text{-}hr,chronic} = PSI_{TAC1,cancer,8\text{-}hr,chronic} + PSI_{TAC2,cancer,8\text{-}hr,chronic} + PSI_{TAC3,cancer,8\text{-}hr,chronic} + \ldots$$

$$ASI_{acute} = PSI_{TAC1,acute} + PSI_{TAC2,acute} + PSI_{TAC3,acute} + \ldots$$

3. Neither the $ASI_{cancer,8\text{-}hr,chronic}$, nor the ASI_{acute} can exceed one.

Refer to Example 2 (starting on page 33) for multiple pollutant screening.

If step 3 cannot be met, proceed to Tier 2.

Tier 2: Screening Risk Assessment

OVERVIEW OF TIER 2

Tier 2 is a screening risk assessment, which includes procedures for determining the level of risk from a source for cancer risk, cancer burden, HIA, HIC8, and HIC. If the estimated risk from Tier 2 screening is below Rule 1401 limits, then a more detailed evaluation is not necessary. Examples of calculations are provided at the end of the description of Tier 4 risk assessment. (See page 27)

If the screening risk assessment results in a risk estimate that exceeds the risk limits or the permit applicant feels that a more detailed evaluation would result in a lower risk estimate, the applicant has the option of conducting a more detailed analysis using Tier 3 or 4.

To perform a Tier 2 screening risk assessment, the following information is needed:

- **Maximum annual emissions** of each carcinogen and non-cancer 8-hour and chronic TAC, and the **maximum hourly emissions** of each non-cancer acute TAC;
- The **distance** from the permit unit to the nearest off-site residential and worker receptor(s);
- Certain source characteristics, such as **stack height** and/or **building dimensions**;
- **Operating schedule**: whether the permit unit will operate more or less than 12 hour/day; and
- **Geographic location** of the permit unit (e.g., city).

In order to perform a Tier 2 screening risk assessment, it is necessary to identify the nearest receptor location. For the purpose of calculating the MICR, HIC8 and HIC, a receptor is any location outside the boundaries of the facility at which a person could experience repeated, continuous exposure. For the purpose of calculating the HIA, a receptor is any location outside the boundaries of the facility at which a person could experience exposure over a short timeframe. Receptor locations include residential, commercial and industrial areas, and other locations where sensitive receptors may be located. Residential receptor locations include current residential land uses and areas which may be developed for residential uses in the future, given existing or planned zoning. Commercial/industrial receptor locations include areas zoned for manufacturing, light or heavy industry, office or retail activity. Sensitive receptor locations include any residence including private homes, condominiums, apartments, and living quarters; schools, including preschools and daycare centers; health facilities such as hospitals, retirement and nursing homes, long term care hospitals, hospices; in addition to prisons, dormitories or similar live-in housing, where children, chronically ill individuals or other sensitive persons could be exposed to TACs.

When identifying receptor locations in order to calculate cancer risk, HIC8 or HIC, the potential for chronic (long-term) exposure should be considered. Land uses at which it is not possible for individuals to be exposed on a long-term basis such as roadways or highways should not be used. When identifying receptor locations to calculate HIA, all off-site locations where there is the potential for acute exposure should be considered (i.e. fenceline receptor). Refer to Rule 1401 for more information regarding receptor locations to be considered.

For assessment of residential cancer risk, the risk is calculated in individual age bins (e.g., third trimester, 0-2 years, etc.) rather than a single lifetime calculation, whereas, for off-site worker, the default assumption is that working age begins at 16 years.

INSTRUCTIONS FOR CALCULATING MAXIMUM INDIVIDUAL CANCER RISK (MICR)

The MICR Calculation Worksheet in Appendix I can be used to help with the calculation. This worksheet can be included in the permit application as documentation of the MICR calculation.

MICR is calculated as follows:

$$\textbf{MICR} = \textbf{Cancer Potency (CP)} \times \textbf{Dose (D)} \times 10^{-6}$$

Where:

$$\textbf{Dose} = \textbf{Concentration} \times \textbf{Exposure}$$

$$\textbf{Concentration} = \textbf{GLC} = (Q_{tpy} \times \chi/Q) \times \textbf{MWAF}$$

$$CEF_R = (Exposure_{0.25\text{-}0} + Exposure_{0\text{-}2} + Exposure_{2\text{-}16} + Exposure_{16\text{-}30}) \times EF_R / AT$$

$$Exposure_{AgeBin} = DBR_{AgeBin} \times ED_{AgeBin} \times ASF_{AgeBin} \times FAH_{AgeBin}$$

$$Exposure_R = CEF_R \times MP_R$$

$$CEF_W = DBR_W \times ED_W \times EF_W / AT$$

$$Exposure_W = CEF_W \times MP_W \times WAF$$

You may also use the following equation using **default combined exposure factor**, found in Tables 4.1D and 4.2D of Attachment N**:**

$$MICR_R = CP \times Q_{tpy} \times \chi/Q \times MWAF \times CEF_R \times MP_R \times 10^{-6}$$

$$MICR_W = CP \times Q_{tpy} \times \chi/Q \times MWAF \times CEF_W \times MP_W \times WAF \times 10^{-6}$$

For Tier 2 screening risk assessment procedures for short-term projects, refer to Appendix XII.

Terminology Reference Guide

Term	Description	Where to Find
GLC	Ground Level Concentration = Q_{tpy} x χ/Q	
Q_{tpy}	Maximum emission rate (tons/year)	Emission estimate specific to permit unit
χ/Q	Concentration at a receptor distance / Emission Rate [($\mu g/m^3$)/(tons/year)]	Attachment N, applicable Table by source type
MWAF	Molecular Weight Adjustment Factor	Consolidated Health Values Table[2]
CP	Cancer Potency $(mg/kg\text{-}day)^{-1}$	
REL	Reference Exposure Level ($\mu g/m^3$)	
MP	Multi-Pathway Adjustment Factor (if applicable)	Attachment N, Table 3.1 and 3.2
CEF	Combined Exposure Factor	Attachment N, Tables 4.1 A – 4.2 D
DBR	Daily breathing rate (L/kg body weight-day)	Attachment N, Tables 4.1 A – 4.2 D
ASF	Age Specific factor (unitless)	Attachment N, Tables 4.1 A – 4.2 D
ED_R	Exposure Duration (30 years) – Residential	Attachment N, Tables 4.1 A – 4.1 E
ED_W	Exposure Duration (25 years) – Worker	Attachment N, Tables 4.2 A – 4.2 D
FAH	Fraction of Time Spent at Home (unitless)	Attachment N, Tables 4.1 A – 4.1 E
EF_R	Exposure Frequency, Residential = 0.96 (350 days / 365 days), unitless	Attachment N, Tables 4.1 A – 4.1 E
EF_W	Exposure Frequency, Worker = 0.68 (250 days / 365 days), unitless	Attachment N, Tables 4.2 A – 4.2 D
AT	Averaging Time (lifetime exposure = 70 years)	
WAF	Worker Adjustment Factor	Attachment N, Tables 5.1 and 5.2
10^{-6}	Micrograms to milligrams conversion, liters to cubic meters conversion	Not applicable

Step 1: Estimate Emission Rate (Q_{tpy})

The maximum annual emissions of the TAC in tons/year (Q_{tpy}) must be estimated. The emission rate must be expressed in tons/year because the χ/Q are expressed in tons/year.

[2] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Step 2: Determine Release Type

Determine whether the permit unit is best characterized as a point source or a volume source:

- A **point source** is one that releases its emissions through a stack (designed with acceptable stack height). If the point source has a raincap or a horizontal release, a Tier 3 or 4 assessment is required.
- A **volume source** includes emissions that are unrestricted by any physical means (e.g. pipes or vents and/or vacuum or fan), including releases inside of a building or as fugitive emissions.

For permit units that have both point and volume releases, use the table that will result in the highest χ/Q value, or apportion the emissions between the point and volume sources.

Step 3: Determine Release Height

For a **point source**, determine the **stack height**, which is the distance from ground level to the top of the stack.

Acceptable Stack Height. Although a taller stack provides better dispersion, there are limits to the degree to which this factor can be incorporated into the risk assessment. Rule 1401 specifies that the stack height used to determine risk shall not exceed the "Acceptable Stack Height" for the permit unit. Acceptable stack height is defined as 2.5 times the height of the equipment or 2.5 times the height of the building housing the equipment, and may not exceed 65 meters (213 feet), unless the applicant demonstrates to the satisfaction of SCAQMD staff that a greater height is necessary. For example, for a building that is 14 feet high, the acceptable stack height is 35 feet, measured from ground level.

For a **volume source**, determine the **building height**, which is the distance from ground level to the top of the building in which the permit unit is located, and the **floor area**, which is the dimensions (length x width) of the building in which the permit unit is located.

An **area source** is similar to a volume source in that the emissions take place over an area (as opposed to a point such as from a stack). However, in an area source, the pollutants are released at a uniform height. Examples of area sources are storage piles, slag dumps, lagoons or ponds, and liquid spills. Toxic hydrocarbon emissions from open top and floating roof storage tanks are also often treated as elevated area sources. Use Tier 3 or 4 for area sources.

Step 4: Determine Operating Schedule

Determine whether the equipment will operate:

- 12 hours/day or less; or
- More than 12 hours/day

Step 5: Identify the Appropriate Meteorological Station

Appendix VI provides the locations of meteorological stations in the South Coast Air Basin (Basin) used for these calculations. Using Appendix VI, Figure VI-1, or the links below, determine the Source/Receptor Area (SRA) for the permit unit. Use Appendix VI, Table VI-1 to determine the meteorological site most appropriate to use for the permit unit's SRA. Additional information on how to select the appropriate SRA can be found on SCAQMD's website at http://www3.aqmd.gov/webappl/gisaqi2/VEMap3D.aspx; and http://www.aqmd.gov/docs/default-source/default-document-library/map-of-monitoring-areas.pdf.

Step 6: Identify Type of Receptor and Distance from Receptor

Identify the nearest receptor locations. Receptor locations are off-site locations where persons may be exposed to emissions of a TAC from the equipment. Receptor locations include residential, commercial, and industrial land use areas, and other locations where sensitive populations may be located. For all receptor locations, the distance should be measured from the source to the edge of the property line of the nearest receptor.

Residential receptor locations include current residential land uses and areas that may be developed for residential uses in the future, based on existing and planned zoning.

Worker receptor locations include areas zoned for manufacturing, light or heavy industry, retail activity, or other locations that are regular work sites.

Sensitive receptor locations include any residence including private homes, condominiums, apartments, and living quarters, schools, preschools, daycare centers and health facilities such as hospitals, retirement and nursing homes, long term care hospitals, hospices in addition to prisons, dormitories, or similar live-in housing.

When identifying receptor locations to calculate MICR, the potential for chronic (long-term) exposure should be considered. Land uses at which it is not possible for individuals to be exposed on a long-term basis, either presently or in the future, should not be considered receptor locations for purposes of calculating MICR. Examples of such locations include flood channels, or roadways.

For a point source, the receptor distance is the distance from the center of the stack to the nearest receptor location.

For a volume source, the receptor distance is the distance from the edge of the building to the nearest receptor location.

Experience shows that in most cases, the receptor distance will be 50 meters or more. However, the table also provides χ/Q values for a 25-meter distance. The 25-meter distance should be used for circumstances in which there is a receptor located very close to the permit unit, for example, a residence located with a business, another business adjacent to the facility, or a sensitive receptor located less than 50 meters from the permit unit.

If the closest receptor location is a worker receptor, then the MICR must also be calculated for the closest residential or sensitive receptor. The greater of the two MICR values is used to determine compliance with the risk limits in the rule.

Care should be taken when estimating these distances since concentrations decrease rapidly with increasing distance. It is acceptable to linearly interpolate to estimate dispersion factors between the downwind distances given in the tables. If the receptor lies over 1,000 meters from the permit unit, use the concentration for 1,000 meters.

Step 7: Select χ/Q Value

Several tables are provided for χ/Q, based on the source parameters and the meteorological station. Select the appropriate χ/Q value from the table based on the **meteorological station, source characteristics** (i.e., stack height for point sources and building height and building area for volume sources) and the **receptor distance.** All screening tables are available in the Attachment – Permit Application Package "N" (also referred to as Attachment N), which is to be used in conjunction with these procedures. The Attachment contains χ/Q values for non-combustion sources; combustion sources such as diesel reciprocating internal combustion engines, natural gas reciprocating internal combustion engines, and natural gas boilers; crematoriums; short-term projects; and spray booths, as well as MICR values for gasoline dispensing facilities. Information regarding the methodology used to develop these screening tables can be found in Appendix VI through XIII.

Step 8: Identify MWAF

Using the Consolidated Health Values Table[3], identify the MWAF for the TAC.

Step 9: Identify CP Factor and REL

Using the Consolidated Health Values Table[3], identify the CP and REL for the TAC.

Step 10: Identify MP Adjustment Factor

Using Attachment N, Tables 3.1 and 3.2, identify the MP adjustment factor for the TAC, if applicable.

The MP adjustment factors are to be used only in urban residential or worker exposure situations. Note that there are separate MP adjustment factors for worker (MP_W), resident (MP_R) and short-term ($MP_{R,ST}$ and $MP_{W,ST}$) exposure (see Attachment N, Tables 3.1 and 3.2) since their potential routes and duration of exposure varies. If the facility is in the vicinity of other potential routes of population exposure such as agricultural areas, drinking water reservoirs, lakes or ponds used for fish that are consumed regularly, or areas used for livestock grazing, then these MP screening assumptions are not appropriate and a more detailed multi-pathway assessment (Tier 4) must be performed.

[3] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

For a more detailed description of the derivation of the MP adjustment factors, please see Appendix II.

Step 11: Select CEF

Using Attachment N, Tables 4.1 A – 4.2 D, select the appropriate CEF. The CEF for each exposure type (residential, worker, or short-term) combines default exposure parameters for DBR, ASF, ED, FAH, EF, and AT into a single value.

Step 12: Calculate WAF

For sources operating and emitting continuously (24 hours per day and 7 days per week), the worker is assumed to breathe the long-term annual concentration during their work shift and no adjustments are necessary when estimating the cancer risk. In these cases, the WAF is equal to one. For non-continuous sources operating, the appropriate WAF can be calculated using the following equation:

$$WAF = (H_{residential} / H_{source}) \times (D_{residential} / D_{source})$$

Where;
WAF = Worker adjustment factor
$H_{residential}$ = The number of hour per day the long-term concentration is based on (always 24 hours)
H_{source} = The number of hours the source operates per day
$D_{residential}$ = The number of days the per week the long-term residential concentration is based on (always 7 days)
D_{source} = The number of days the source operates per week

Although the 2015 OEHHA Guidelines allow the use of a discount factor (DF) when assessing inhalation cancer health impacts, if the off-site worker's schedule partially overlaps with the source's emission schedule, the DF should only be used when there are limits on the hours of operation specified in the facility's operating permits. Since SCAQMD permits do not typically include limits on the hours of operation, it is not appropriate to apply the DF when calculating the health impacts.

MICRs for Multiple TACs

If the equipment emits more than one TAC, the total MICR must be calculated. The total MICR is the sum of the MICRs for each of the TACs emitted by the equipment.

INSTRUCTIONS FOR CALCULATING CANCER BURDEN

The cancer burden is the estimated increase in the occurrence of cancer cases in a population as a result of exposures to TAC emissions from the equipment over a 70-year exposure duration. The cancer burden for a population unit (city, census tract, sub-area or grid) is the product of the number of persons in the population and the estimated individual risk from TACs. The cancer burden only needs to be calculated if the resulting MICR from a 30-year exposure duration is greater than one in one million.

The following procedure may be used to perform an acceptable screening analysis for cancer burden due to a single source of TAC:

- Re-calculate total MICR from all TACs from a single permit unit using a 70-year exposure duration, as is required in the 2015 OEHHA Guidelines[4]. The CEF for the 70-year exposure duration can be found in Attachment N, Table 4.1 E.

- Estimate the distance at which the MICR from a 70-year exposure duration falls below one in one million. This distance can be estimated by back-calculating the distance that would result in a MICR of one in one million, using the χ/Q values in Attachment N source specific tables.

- Define a zone of impact in the shape of a circle. The radius (r) of this circle is the distance between the equipment and the point at which the risk falls below one in one million. The area of this circle is calculated using the equation for the area of a circle, which is 3.14 x r^2.

- Estimate the residential population within this zone of impact based on census data or a worst-case estimate. Generally, the residential population in the Basin is less than 4,000 persons/km^2, but some areas are as high as 7,000 persons/km^2.

  For areas where census data is available, it should be used. Where there is no census data, 7,000 persons/km^2 should be used for the areas with high population densities and 4,000 persons/km^2 should be used for areas with low population densities (such as locations along the Pacific Ocean). Where the population densities are unknown, use 7,000 persons/km^2.

- Calculate the screening level cancer burden by multiplying the total residential population in the zone of impact by the maximum individual cancer risk.

If the χ/Q in the Attachment N source specific tables are not sufficient to estimate the distance at which MICR falls below one in one million, then a more refined risk assessment is warranted.

[4] OEHHA, 2015. Section 8, "Risk Characterization for Carcinogens and Noncarcinogens and the Requirements for Hot Spots Risk Assessments." Available at: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf.

INSTRUCTIONS FOR CALCULATING HIC, HIC8, AND HIA

Some TACs have the potential to cause non-cancer health risk due to short term (acute) or long term (chronic) exposures. The screening risk assessment for those TACs must estimate HIA, HIC8, and/or HIC as applicable. Like the calculation procedure for MICR, one must first identify when the application was deemed complete and select the appropriate set of risk tables found in the attachments (e.g. Attachment M, Attachment L, etc).

The REL is used as an indicator of potential adverse non-cancer health effects. An inhalation REL is a concentration level ($\mu g/m^3$) at which no adverse health effects are anticipated. Inhalation RELs are provided in the Consolidated Health Values Table[5].

When a health impact calculation is performed for a single substance, it is called the **Hazard Quotient (HQ)**. When several TACs affect the same organ system in the body (e.g., respiratory system, nervous system, reproductive system), there can be a cumulative effect on the target organ. In these cases, the sum of the HQs of all chemicals emitted that impact the same target organ, called total **Hazard Index (HI)**, is evaluated. The Target Organs Tables for each TAC are available on CARB's website[6].

Detailed procedures for calculating the total HI are provided in the 2015 OEHHA Guidelines. The equations used to calculate the HIC, HIC8, and HIA per target organ are as follows:

$$\text{Total HIC}_{\text{target organ}} = \{[Q_{tpy,TAC1} \times (\chi/Q) \times MP_{TAC1} \times MWAF]/\text{Chronic REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{tpy,TAC2} \times (\chi/Q) \times MP_{TAC2} \times MWAF]/\text{Chronic REL}_{TAC2}\}_{\text{target organ}} + \ldots.$$

$$\text{Total HIC8}_{\text{target organ}} = \{[Q_{tpy,TAC1} \times (\chi/Q) \times WAF \times MWAF]/\text{8-Hour REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{tpy,TAC1} \times (\chi/Q) \times WAF \times MWAF]/\text{8-Hour REL}_{TAC2}\}_{\text{target organ}} + \ldots..$$

$$\text{Total HIA}_{\text{target organ}} = \{[Q_{lbph,TAC1} \times (\chi/Q)_{hr} \times MWAF]/\text{Acute REL}_{TAC1}\}_{\text{target organ}} + \{[Q_{lbph,TAC2} \times (\chi/Q)_{hr} \times MWAF]/\text{Acute REL}_{TAC2}\}_{\text{target organ}} + \ldots..$$

Note that the HIC is based upon an annual average emission per year whereas the HIA is based upon a maximum 1-hour emission level and the HIA does not use an MP. In addition, the 8-hour RELs were developed only for repeated, chronic daily 8-hour exposures (e.g. a typical worker or resident exposed to a facility that operates equal to or more than 8 hours per day and 5 days per week). The HIC8 is based upon the daily average 8-hour exposure only for those chemicals with 8-hour RELs. There are currently only a limited number of substances with an 8-hour inhalation REL.

[5] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.
[6] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

PROCEDURE FOR ALTERNATE HI LEVEL EXEMPTION

Rule 1401 provides an exemption from the HI limit of one in cases in which a higher exposure level is deemed to be safe. This exemption has never been used. Under this exemption, the HIC and/or HIA limit of one does not apply if the applicant substantiates to the satisfaction of SCAQMD staff that at all receptor locations and for every target organ system, the total HIC and HIA levels resulting from emissions from the equipment will not exceed alternate HI levels determined by OEHHA to be protective against adverse health effects. This applies only to TACs listed in Rule 1401 at the time the application was deemed complete. Refer to the attachments for the appropriate list of TACs.

Applicants should indicate in their permit application that they wish to apply for an exemption under the alternative HI provisions of the rule. The permit application should include both a risk assessment estimating the HIA and HIC levels and relevant information supporting the exemption. Depending on the particular health risks in question, additional information such as characterization of the surrounding population, the location of sensitive receptors, or other data may be required.

SCAQMD staff will consult with OEHHA staff regarding the request for the alternative HI level. If OEHHA staff finds that the levels of exposure to the public will not exceed levels that are protective against adverse health effects, the application will be eligible for the exemption.

In some cases, OEHHA staff may establish a general policy recommending different acceptable exposure levels for different exposed populations. For example, if exposure to a certain compound is particularly harmful to children but less of a concern for adults, OEHHA staff may determine as a general policy that higher exposure levels are acceptable in locations where children would not be exposed. OEHHA policy in these cases would be a basis for eligibility for the alternate HI exemption.

Tier 3: Screening Dispersion Modeling

Tier 3 uses a screening dispersion model to estimate risk. This tier requires more expertise than Tiers 1 and 2. For guidance on performing a Tier 3 analysis, refer to the SCAQMD website at: http://www.aqmd.gov/home/permits/risk-assessment.

Tier 3 screening dispersion modeling should only be used for equipment with a single emission or release point. If there are multiple emission or release points, Tier 4 must be used. In addition, Tier 3 would only be beneficial for applications involving source parameters that differ substantially from those used to derive χ/Q values in Attachment N source specific tables and Appendices VII through XII.

To perform a Tier 3 analysis, the following is needed:

- Air dispersion modeling expertise;
- The most recently approved version of U.S. EPA's screening dispersion model AERSCREEN, which can be downloaded from www.epa.gov/scram; and
- Additional equipment information such as stack gas temperature, stack gas exit velocity or flow rate, stack inside diameter, and surface characteristics (albedo, Bowen ratio, and surface roughness) of the appropriate meteorological station (see Appendix VI, Table VI-1).

It should be noted that AERSCREEN estimates peak 1-hour concentrations for HIA calculations. For the MICR and HIC calculations, use the annual average concentration estimated in the AERSCREEN output. Note that when modeling an area source in AERSCREEN, only the 1-hour concentration is estimated. The U.S. EPA's user's guide for screening models states the following for area sources: "Do not use the multiplying factors to correct for averaging times greater than 1 hour. Concentrations close to an area source will not vary as much as those for point sources in response to varying wind directions, and the meteorological conditions which are likely to give maximum 1-hour concentrations can persist for several hours. Therefore it is recommended that the maximum 1-hour concentration be conservatively assumed to apply for averaging periods out to 24 hours.[7]"

In a Tier 3 approach, the Tier 2 equations for MICR, HIC, and HIA continue to be used except that a screening dispersion model is used to estimate each pollutant concentration. Thus, the Tier 3 equations to be used are as follows:

$$\mathbf{MICR_R = CP \times PeakConc \times CEF_R \times MP_R \times 10^{-6} \times MWAF}$$

$$\mathbf{MICR_W = CP \times PeakConc \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF}$$

$$\mathbf{Total\ HIC_{target\ organ} = \Sigma\ \{[AveConc_{TAC} \times MP \times MWAF]/Chronic\ REL_{TAC}\}_{target\ organ}}$$

$$\mathbf{Total\ HIC8_{target\ organ} = \Sigma\ \{[AveConc_{TAC} \times WAF \times MWAF]/8\text{-}Hour\ REL_{TAC}\}_{target\ organ}}$$

$$\mathbf{Total\ HIA_{target\ organ} = \Sigma\ \{[PeakConc_{TAC} \times MWAF]/Acute\ REL_{TAC}\}_{target\ organ}}$$

[7] U.S. EPA, October 1992. Section 4.5.4, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources Revised", EPA 454/R-92-019. Available at: https://www3.epa.gov/scram001/guidance/guide/EPA-454R-92-019_OCR.pdf.

PeakConc is the peak 1-hour pollutant concentration estimated by AERSCREEN and AveConc is the annual average concentration in the AERSCREEN output file. Refer to the section on Tier 2, Screening Risk Assessment for explanation of the other variables in the equations.

If the MICR, HIC, HIC8, and HIA do not exceed the rule limits, then the equipment complies with Rule 1401 and no further analysis is required. If any risk value exceeds the rule limits, then proceed to Tier 4.

Tier 4: Detailed Risk Assessment

Tier 4 is a detailed risk assessment using the Hotspots Analysis and Reporting Program Version 2 (HARP 2) software developed by CARB which replaces the prior version of HARP and incorporates the information contained in the 2015 OEHHA Guidelines. The HARP 2 software and documentation can be obtained at http://www.arb.ca.gov/toxics/harp/harp.htm. The U.S. EPA's air quality dispersion model AERMOD is used by HARP 2 to estimate the concentration of pollutants in place of the previously used Industrial Source Complex - Short Term Version 3 (ISCST3) model. ISCST3 dispersion modeling will no longer be allowed for determining TAC concentrations. CARB recommends AERMOD for Hot Spots risk assessments. AERMOD documentation is available at: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod. Meteorological data for use in HARP 2 and AERMOD can be downloaded from http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod.

Tier 4 is an option if neither Tier 2 nor Tier 3 can demonstrate compliance, or if the applicant wishes to obtain a more refined estimate of the cancer and non-cancer risks. Since Tier 4 involves detailed dispersion modeling using actual meteorological data from the station that is most representative of the facility's meteorological conditions, it will often result in a less conservative estimate of the risk than either Tiers 2 or 3. Tier 4 modeling will be most useful for analyses that have source parameters that differ substantially from defaults used to develop the source specific tables in Attachment N, Tables 6.1 A – 13.3 and Appendices VII through XII, and/or analyses whose closest receptors do not lie immediately downwind of the emission sources.

A detailed risk assessment should be performed by individuals with experience and training in air quality dispersion modeling and risk assessment. In addition, SCAQMD modeling staff should be consulted and a modeling protocol be approved before performing a detailed risk assessment which deviates from SCAQMD's methodology. For guidance on performing a detailed risk assessment, refer to SCAQMD website at: http://www.aqmd.gov/home/permits/risk-assessment. AERMOD should be run using the averaging times PERIOD and 1-hour.

Written guidance on preparing a detailed risk assessment is contained in the 2015 OEHHA Guidelines which may be obtained at: http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html.

SCAQMD modeling staff has prepared supplemental risk assessment guidance which must be followed by all applicants submitting Tier 4 assessments. SCAQMD's supplemental guidance is available at: http://www.aqmd.gov/home/regulations/compliance/toxic-hot-spots-ab-2588/health-risk-assessment. HARP 2 settings should follow the options described in Appendix II. Lastly, SCAQMD guidance on using AERMOD can be found at: http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/modeling-guidance.

EXAMPLE 1: MICR, CANCER BURDEN, and HIC CALCULATION

The facility does not have operating schedule restrictions and is located in an industrial and residential area. Chromium 6+ (Hexavalent chromium) is emitted from the manufacturing process from one piece of equipment, which is fitted with control equipment considered as T-BACT. Chromium 6+ is a carcinogen and has chronic non-carcinogenic risks.

The application was deemed complete on October 1, 2017.
The nearest receptor distances:
Worker (Industrial) = 328 feet (100 meters)
Residential = 492 feet (150 meters)
Operating Schedule: 24 hours/day, 7 days/week since no schedule restrictions are included in the permit conditions.
Stack height = 28 feet
Facility location: Ontario, CA
TACs: Chromium 6+

Emission rates for the TACs are listed in Table A below.
Note: The maximum hourly emissions should be estimated based on the maximum operating parameters in any hour.

Table A

TAC	**Emission Rate**		
	Q_{lbph} (lbs/hr)	**Q_{lbpy} (lbs/yr)**	**Q_{tpy} (tons/yr)**
Chromium 6+	2.63E-07	2.30E-03	1.15E-06

(The list of TACs and their corresponding emission rates are for illustration purposes only. They may not reflect actual conditions.)

First, identify the appropriate risk assessment tables based upon when the application was deemed complete. In this case, the tables for applications deemed complete on or after October 1, 2017 (i.e., Permit Application Package "N") are used.

Second, calculate MICR for those TACs that have Inhalation CP Values from the Consolidated Health Values Table[8]. Note that the MICR calculated here is for a 30-year exposure duration. Table B below identifies the TACs and their corresponding Inhalation CP Values for MICR calculations.

[8] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Table B

TAC	**Inhalation (CP)** (mg/kg-day)$^{-1}$
Chromium 6+	5.10E+02

Based on the above table, MICR will be evaluated for residential and worker receptors for Chromium 6+.

From the Consolidated Health Values Table[9], determine if the emitted pollutant has carcinogenic, HIC, HIC8, and/or HIA health values. The results are as follows:

Table C

TAC	**MICR (cancer)**	**HIC (chronic)**	**HIC8 (chronic)**	**HIA (Acute)**
Chromium 6+	√ (MP)	√ (MP)		

MP indicates that the adjustment factor will be different than 1.0. MP adjustment factors can be found in Attachment N, Tables 3.1 and 3.2.

Tier 1: Screening Emission Levels

The nearest receptor location, in this case the worker location of 100 meters, should be used. *Please note that this step is used to approximate the equipment's potential risk.*

For Tier 1, the equipment's TACs emissions (annual and/or maximum hourly) should be compared with the screening levels for the Chromium 6+ in Attachment N, Table 1.0 as appropriate. The annual emission rate for Chromium 6+ in Table 1.0 is 4.31E-04 pounds per year at a distance of 100 meters. No maximum hourly emissions are presented in Table 1.0 because no acute value has been adopted in Rule 1401 for Chromium 6+.

Please note that the cumulative cancer/chronic risk cannot exceed the emissions presented in Table 1.0. In this example, this facility did not pass Tier 1 since the annual emissions (2.30E-03 lb/yr) are greater than those presented in Table 1.0 (4.31E-04 lb/yr) and would have to proceed to Tier 2 to demonstrate compliance with Rule 1401.

Tier 2: Screening Risk Assessment

Step 1: Estimate Q_{tpy}

According to Table A of the example, **Q_{tpy} = 1.15E-06**.

Step 2: Determine Release Type

[9] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

The TAC is released from one piece of equipment fitted with control equipment and vented through a stack. This would be treated as a **point source**.

Step 3: Determine Release Height

The piece of equipment has a stack height of **28 feet**.

Step 4: Determine Operating Schedule

The equipment can operate 24 hours/day and 7 days/week as there are no restrictions on hours of use in the permit. Therefore, the operating schedule is **more than 12 hours/day**.

Step 5: Identify the Appropriate Meteorological Station

The facility is located in Ontario and according to Appendix VI, Figure VI-1, the closest monitoring station is **Ontario International Airport (KONT)**.

Step 6: Identify Type of Receptor and Distance from Receptor

There are two identified receptor types **– a worker receptor located 100 meters** away and a **residential receptor located 150 meters** away.

Step 7: Select χ/Q Value

Since the point source operates more than 12 hours/day and is 28 feet high, the χ/Q values from Attachment N, Table 6.2 B for Ontario at a distance of 100 meters (**4.02**) and 150 meters (**2.78**) were used. The χ/Q value at 150 meters was interpolated between 100 meters and 200 meters.

Step 8: Identify MWAF

The MWAF value for Chromium 6+ (**1**) was found in the Consolidated Health Values Table[10].

Step 9: Identify CP and REL

The CP value (**5.10E+02**) and chronic REL value (**2.00E-01**) for Chromium 6+ was found in the Consolidated Health Values Table[11]. Note that there is no acute REL value for Chromium 6+.

Step 10: Identify MP

The MP values (**Cancer MP_R = 1.60, Cancer MP_W = 1.02, Chronic MP_R = 2.44, Chronic MP_W = 1.00**) for Chromium 6+ was found in Attachment N, Tables 3.1 and 3.2.

[10] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Step 11: Select CEF

The CEF values (**CEF_R = 677.40, CEF_W = 55.86**) for residential and worker exposures were found in Attachment N, Tables 4.1 D and 4.2 D.

Step 12: Calculate WAF

Since the point source operates 24 hours/day and 7 days/week, the WAF value (**1.0**) was found in Attachment N, Table 5.2.

MICR Calculation

(1) Worker: $\mathbf{MICR_W = CP \times Q_{tpy} \times \chi/Q \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_W	MP_w	WAF	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	4.02	55.86	1.02	1	1	1.34E-07

(2) Resident: $\mathbf{MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_R	MP_R	MWAF	MICR
Chromium 6+	5.10E+02	1.15E-06	2.78	677.40	1.60	1	1.77E-06

Please note that the higher of the worker and residential cancer risks needs to be selected. In this example, the maximum cancer risk is at the residential receptor.

Cancer Burden Calculation

Cancer burden should always be calculated if the MICR exceeds one in a million, regardless of the type of receptor. Since the cancer risk at the residential receptor was calculated to be **1.77×10^{-6}**, the cancer burden needs to be calculated.

Re-calculate the MICR using a 70-year exposure duration

Since cancer burden is based on a 70-year exposure period, and our previous MICR calculation was based on a 30-year exposure period, the MICR needs to be re-calculated. Using CEF_R = 766.78 (Attachment N, Table 4.1 E), the new MICR ($MICR_{70}$) at the residential receptor is calculated to be 2.00×10^{-6}.

Estimate of distance at which $MICR_{70}$ falls below one in one million.

The distance at which the $MICR_{70}$ falls below one in one million requires you to take the reciprocal of the calculated $MICR_{70}$ multiplied by 1.0×10^{-6}. This factor (F) will be the multiplier to the χ/Q value used in determining the MICR.

$$F = (1 / MICR) \times 1.0 \times 10^{-6}$$

$F = (1 / 2.00 \times 10^{-6}) \times 1.0 \times 10^{-6}$

$F = 0.500$

Determination of the new downwind distance will be based upon a new χ/Q value calculated by multiplying the originally used χ/Q value by F.
Therefore,

New $\chi/Q = 2.78 \times 0.500$

New $\chi/Q = 1.39$

Using Attachment N, Table 6.2 B, the new χ/Q lies between downwind distances of 200 to 300 meters. Interpolating for the new downwind distance gives is 219 meters.

This new downwind distance is where the MICR will fall below one in one million.

Define Zone of Impact
The Zone of Impact is calculated using the new downwind distance as the radius of a circle and calculating the area of that circle.

Therefore,

Zone of Impact = $3.14\ r^2$

Zone of Impact = $3.14\ (0.219\ \text{km})^2$

Zone of Impact = $0.151\ \text{km}^2$

Estimate the population within the Zone of Impact
The Zone of Impact should include both worker and residential populations.

For areas where census data is available, it should be used. Where there is no census data, 7,000 persons/km^2 should be used for the areas with high population densities and 4,000 persons/km^2 should be used for areas with low population densities. Where the population densities are unknown, use 7,000 persons/km^2.

In this example we have no information on census data or population density, therefore,

Zone of Impact Population = Zone of Impact x Population Density

Zone of Impact Population = $0.151\ \text{km}^2 \times 7{,}000$ person/ km^2

Zone of Impact Population = 1,055 persons

Calculate Cancer Burden
For a screening level analysis, the cancer burden is estimated using the zone of impact population multiplied by the calculated $MICR_{70}$.

Therefore,

Cancer Burden = 910 persons x 2.00×10^{-6}

Cancer Burden = 0.00211

HI Calculations

HIC, HIC8 and HIA should be calculated for each target organ. Since no HIA or HIC8 health values have been adopted for Chromium 6+, only the HIC is estimated.

HIC:

$$\textbf{HIC} = \Sigma\,[(Q_{tpy}) \times (\chi/Q)_{chronic} \times MP \times MWAF]/(\text{Chronic REL})$$

The HIC for the TAC in this example are calculated as follows:

Chromium 6+:

Worker: HIC = [1.15E-06 x 4.02 x 1.00 x 1] / (2.00E-01) **= 2.31E-05**

Resident: HIC = [1.15E-06 x 2.78 x 2.44 x 1] / (2.00E-01) **= 3.90E-05**

Since there is only one TAC, the HI does not need to be summed across the target organs.

Summary of Results

	MICR	HIC	HIC8	HIA
Worker	**1.34E-07**	**2.31E-05**	**N/A**	**N/A**
Resident	**1.77E-06**	**3.90E-05**	**N/A**	**N/A**
Rule 1401 Threshold	**10E-06**	**1.0**	**1.0**	**1.0**
Exceeds Threshold?	**No**	**No**	**N/A**	**N/A**

RESULT:

- ***MICRs for residential and commercial receptors do not exceed 10E-06 (ten in one million).***
- ***Cancer burden is less than 0.5.***
- ***HICs for residential and commercial receptors are less than 1.***
- ***There are no health values associated with HIC8 or HIA and those hazard indices have not been calculated.***

The equipment in this example contains T-BACT; therefore, it would pass the Rule 1401 MICR limit. A Tier 3 or 4 analysis is not necessary.

EXAMPLE 2: MICR, CANCER BURDEN, HIC, HIC8, and HIA CALCULATIONS

An industrial operation generates arsenic, benzene, and dioxin emissions.

The application was deemed complete on October 1, 2017.
Volume source: Building dimensions 40 feet (W) x 70 feet (L) x 17 feet (H)
The nearest receptor distances are:
Worker (Industrial) = 328 feet (100 meters)
Residential = 1640 feet (500 meters)
Permitted Operating Schedule: 8 hours/day, 5 days/week, 50 weeks/year = 2,000 hours/year
Facility location: Azusa, CA
TACs: Arsenic, Benzene, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (Dioxin), Nickel hydroxide

Emission rates for the TACs are listed in Table A below.
Note: The maximum hourly emissions should be estimated based on the maximum operating parameters in any hour.

Table A

TAC	Emission Rate		
	Q_{lbph} (lbs/hr)	Q_{lbpy} (lbs/yr)	Q_{tpy} (tons/yr)
Arsenic	8.30E-06	1.66E-02	8.30E-06
Benzene	7.50E-03	1.50E+01	7.50E-03
Dioxin	6.10E-10	1.22E-06	6.10E-10
Nickel hydroxide	2.30E-03	4.60E+00	2.30E-03

(The list of TACs and their corresponding emission rates are for illustration purposes only. They may not reflect actual conditions.)

First, identify the appropriate risk assessment tables (included in the appendices) based upon when the application was deemed complete. In this case, the tables for applications deemed complete on or after October 1, 2017 (i.e., Permit Application Package "N") are used.

Second, calculate MICR for those TACs that have Inhalation Cancer Potency Values from the Consolidated Health Values Table[11]. Table B below identifies the TACs and their corresponding Inhalation Cancer Potency Values for MICR calculations.

[11] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Table B

TAC	Inhalation Cancer Potency (CP) $(mg/kg\text{-}day)^{-1}$
Arsenic	1.20E+01
Benzene	1.00E-01
Dioxin	1.30E+05
Nickel hydroxide	9.10E-01

Based on the above table, MICR will be evaluated for residential and worker receptors for arsenic, benzene, dioxin, and nickel hydroxide.

From the Cosolidated Health Values Table[12], we can also determine if the emitted pollutant is carcinogenic, HIC, HIC8, and/or HIA. The results are as follows:

TAC	MICR (cancer)	HIC (chronic)	8-hr HIC (chronic)	HIA (Acute)
Arsenic	√ (MP)	√ (MP)	√	√
Benzene	√	√	√	√
Dioxin	√ (MP)	√ (MP)		
Nickel hydroxide	√	√	√	√

MP indicates that the adjustment factor will be different than 1.0. Multi-pathway factors can be found in Attachment N, Tables 3.1 and 3.2.

Next, for chronic and acute substances, review the Target Organs Tables[12] to determine the target organs affected by TACs due to chronic and/or acute toxicity. Tables C, D, and E below indicate the target organs affected by the TACs with chronic toxicity, chronic 8-hour toxicity, and acute toxicity, respectively. In the table, check marks (√) indicate the affected target organs. Conservatively, it can be assumed that all TACs affect the same target organ, therefore, a breakdown of the affected target organ by TAC is not needed for the analysis.

[12] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

Table C (Chronic Toxicity)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			√	√						√	√	√
Benzene							√					
Dioxin	√			√	√		√				√	
Nickel hydroxide				√			√				√	

AL:	Alimentary system (liver)	HEM:	Hematopoietic system
BN:	Bones and teeth	IMM:	Immune system
CV:	Cardiovascular system	KID:	Kidney
REP/DEV:	Reproductive/Developmental	NS:	Nervous system
END:	Endocrine system	RESP:	Respiratory system
EYE:	Eye	SKIN:	Skin

Table D (Chronic 8-hour Toxicity)

TAC	AL	BN	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			√	√						√	√	√
Benzene							√					
Dioxin												
Nickel hydroxide								√			√	

Table E (Acute Toxicity)

TAC	AL	CV	REP/DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic		√	√						√		
Benzene			√			√	√				
Dioxin											
Nickel hydroxide							√				

Tier 1: Screening Emission Levels

The nearest receptor location, in this case the worker location of 100 meters, should be used.

For Carcinogenic and/or Chronic Compounds:

Calculate the Pollutant Screening Index for each pollutant (PSI_P).

$$PSI_P = Q_{lbpy,P} / PSL_P$$

The Q_{lbpy} is based upon the annual emissions of each TAC (lbs/yr). The PSLs are found in Attachment N, Table 1.0 and are expressed in lb/yr.

Sum up the individual Pollutant Screening Indices for each pollutant ($\sum PSI_P$).

TAC	$Q_{lbpy,P}$	PSL_P	PSI_P
Arsenic	1.66E-02	3.81E-03	4.36
Benzene	1.50E+01	4.44E+00	3.38
Dioxin	1.22E-06	1.33E-07	9.17
Nickel hydroxide	4.60E+00	1.92E-01	23.96
		$\sum PSI_P$ =	**40.87**

Calculate the Application Screening Index (ASI).

$$ASI_{cancer\ and/or\ chronic} = \Sigma\ PSI_P = 40.87$$

For Acute Compounds:

Calculate the Pollutant Screening Index for each pollutant (PSI_P).

$$PSI_P = Q_{lbph,P} / PSL_P$$

The Q_{lbph} is based upon the maximum hourly emissions (lb/hr). The PSLs for acute compounds are found in Attachment N, Table 1.0 and are expressed in lb/hr.

Sum up the individual pollutant screening indices for each acute pollutant ($\sum PSI_P$).

TAC	$Q_{lbph,P}$	PSL_P	PSI_P
Arsenic	8.30E-06	2.76E-04	0.03
Benzene	7.50E-03	3.73E-02	0.20
Nickel hydroxide	2.30E-03	4.36E-04	5.28
		∑ PSIp =	**5.51**

Calculate the Application Screening Index (ASI).

$$ASI_{acute} = \Sigma \ PSI_P = 5.51$$

Please note that the cumulative cancer/chronic risk and the cumulative acute hazard index exceeded 1. In this example, this facility did not pass Tier 1 as the ASI exceeded 1 for cancer/chronic and acute. Since this Tier 1 screening was calculated to be greater than 1, the applicant would have to proceed with further health risk screening assessment procedures.

Tier 2: Screening Risk Assessment

Step 1: Estimate Emission Rate (Q_{tpy})

The emission rates are listed in Table A of the example.

Step 2: Determine Release Type

The TAC is released from a building with dimensions of 40 feet x 70 feet (2,800 ft^2 area) and height of 17 feet. This would be treated as a **volume source**.

Step 3: Determine Release Height

Since the source is a volume source, the release height is not relevant.

Step 4: Determine Operating Schedule

The facility operates 8 hours/day and 5 days/week as specified in the permit conditions. Therefore, the operating schedule is **less than 12 hours/day**.

Step 5: Identify the Appropriate Meteorological Station

The facility is located in Azusa and according to Appendix VI, Figure VI-1, the closest monitoring station is **Azusa (AZUS)**.

Step 6: Identify Type of Receptor and Distance from Receptor

There are two identified receptor types **– a worker receptor located 100 meters** away and a **residential receptor located 500 meters** away.

Step 7: Select χ/Q Value

Since the volume source of 2,800 ft^2 and height of 17 feet operates less than 12 hours/day, the χ/Q values from Attachment N, Table 7.1 A for Azusa at a distance of 100 meters (**0.84**) and 500 meters (**0.05**) were used.

Step 8: Identify MWAF

The MWAF values for all TACs were found in the Consolidated Health Values Table[13].

Step 9: Identify CP and REL

The CP values and chronic REL values for all TACs were found in the Consolidated Health Values Table[12].

Step 10: Identify MP

The MP values for all TACs were found in Attachment N, Tables 3.1 and 3.2.

Step 11: Select CEF

The CEF values (**CEF_R = 677.40, CEF_W = 55.86**) for residential and worker exposures were found in Attachment N, Tables 4.1 D and 4.2 D.

Step 12: Calculate WAF

Since the volume source operates 8 hours/day and 5 days/week, the WAF value (**4.2**) was found in Attachment N, Table 5.1.

[13] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

MICR Calculation

(1) Worker: $\mathbf{MICR_W = CP \times Q_{tpy} \times \chi/Q \times CEF_W \times MP_W \times WAF \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_W	MP_w	WAF	MWAF	MICR
Arsenic	1.20E+01	8.30E-06	0.84	55.86	4.52	4.2	1	8.87E-08
Benzene	1.00E-01	7.50E-03	0.84	55.86	1.00	4.2	1	1.48E-07
Dioxin	1.30E+05	6.10E-10	0.84	55.86	7.58	4.2	1	1.18E-07
Nickel hydroxide	9.10E-01	2.30E-03	0.84	55.86	1.00	4.2	0.6332	2.61E-07
							TOTAL	**6.16E-07**

(2) Resident: $\mathbf{MICR_R = CP \times Q_{tpy} \times \chi/Q \times CEF_R \times MP_R \times 10^{-6} \times MWAF}$

TAC	CP	Q_{tpy}	χ/Q	CEF_R	MP_R	MWAF	MICR
Arsenic	1.20E+01	8.30E-06	0.05	677.40	9.71	1	3.28E-08
Benzene	1.00E-01	7.50E-03	0.05	677.40	1.00	1	2.54E-08
Dioxin	1.30E+05	6.10E-10	0.05	677.40	25.72	1	6.91E-08
Nickel hydroxide	9.10E-01	2.30E-03	0.05	677.40	1.00	0.6332	4.49E-08
						TOTAL	**1.72E-07**

Please note that the higher of the worker and residential cancer risks needs to be selected. In this example, the maximum cancer risk is at the worker receptor.

Cancer Burden Calculation

Cancer burden should always be calculated if the MICR exceeds one in a million, regardless of the type of receptor. For this example, cancer burden was not calculated because neither worker nor residential risk exceeded one in a million.

HI Calculations

HIC, HIC8, and HIA should be calculated for each target organ. Conservatively, it can be assumed that all TACs affect the same target organ to calculate the worst-case HI.

HIC:

Worker: $HIC_W = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times MP_W \times MWAF]/(\text{Chronic REL})$

Resident: $HIC_R = \Sigma [(Q_{tpy}) \times (\chi/Q)_{chronic} \times MP_R \times MWAF]/(\text{Chronic REL})$

Based on the Target Organs Tables[14], the target organs for the TACs for chronic toxicity have been listed in Table C. The Chronic Hazard Index for the TACs in this example are calculated as follows:

Arsenic:

HIC_W = [8.30E-06 x 0.84 x 28.37 x 1] / (1.50E-02) = **1.32E-02**

HIC_R = [8.30E-06 x 0.05 x 88.03 x 1] / (1.50E-02) **= 2.44E-03**

Benzene:

HIC_W = [7.50E-03 x 0.84 x 1.00 x 1] / (3.00E+00) = **2.10E-03**

HIC_R = [7.50E-03 x 0.05 x 1.00 x 1] / (3.00E+00) **= 1.25E-04**

Dioxin:

HIC_W = [6.10E-10 x 0.84 x 307.60 x 1] / (4.00E-05) = **8.62E-05**

HIC_R = [6.10E-10 x 0.05 x 6.73 x 1] / (4.00E-05) **= 2.35E-04**

Nickel hydroxide:

HIC_W = [2.30E-03 x 0.84 x 1.00 x 0.6332] / (1.40E-02) = **8.74E-02**

HIC_R = [2.30E-03 x 0.05 x 1.00 x 0.6332] / (1.40E-02) **= 5.20E-03**

8. Worker: HIC_W (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**REP/ DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**RESP**	**SKIN**
Arsenic			1.32E-02	1.32E-02						1.32E-02	1.32E-02	1.32E-02
Benzene							2.10E-03					
Dioxin	8.62E-05			8.62E-05	8.62E-05		8.62E-05				8.62E-05	
Nickel hydroxide				8.74E-02			8.74E-02				8.74E-02	
TOTAL	8.62E-05		1.32E-02	**1.01E-01**	8.62E-05		8.96E-02			1.32E-02	**1.01E-01**	1.32E-02

(2) Resident: HIC_R (summed across each target organ)

TAC	**AL**	**BN**	**CV**	**REP/ DEV**	**END**	**EYE**	**HEM**	**IMM**	**KID**	**NS**	**RESP**	**SKIN**
Arsenic			2.44E-03	2.44E-03						2.44E-03	2.44E-03	2.44E-03
Benzene							1.25E-04					
Dioxin	2.35E-04			2.35E-04	2.35E-04		2.35E-04				2.35E-04	
Nickel hydroxide				5.20E-03			5.20E-03				5.20E-03	
TOTAL	2.35E-04		2.44E-03	**7.87E-03**	2.35E-04		5.56E-03			2.44E-03	**7.87E-03**	2.44E-03

[14] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

HIC8:

Worker: $\mathbf{HIC8_W = \Sigma\,[(Q_{tpy})\ x\ (\chi/Q)_{chronic}\ x\ WAF\ x\ MWAF]/(8\text{-}hour\ Chronic\ REL)}$

Resident: $\mathbf{HIC8_R = \Sigma\,[(Q_{tpy})\ x\ (\chi/Q)_{chronic}\ x\ MWAF]/(8\text{-}hour\ Chronic\ REL)}$

Based on the Target Organs Table[15], the target organs for the TACs with HIC8 RELs have been listed in Table D. The HIC8 for the TACs in this example are calculated as follows:

Arsenic: $HIC8_W$ = [8.30E-06 x 0.84 x 4.2 x 1] / (1.50E-02) = **1.95E-03**

$HIC8_R$ = [8.30E-06 x 0.05 x 1] / (1.50E-02) **= 2.77E-05**

Benzene: $HIC8_W$ = [7.50E-03 x 0.84 x 4.2 x 1] / (3.00E+00) = **8.82E-03**

$HIC8_R$ = [7.50E-03 x 0.05 x 1] / (3.00E+00) **= 1.25E-04**

Dioxin: **There are no HIC8 REL values established for dioxin.**

Nickel hydroxide: $HIC8_W$ = [2.30E-03 x 0.84 x 4.2 x 0.6332] / (6.00E-02) = **8.56E-02**

$HIC8_R$ = [2.30E-03 x 0.05 x 0.6332] / (6.00E-02) **= 1.21E-03**

9. Worker: $HIC8_W$ (summed across each target organ)

TAC	AL	BN	CV	REP/ DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			1.95E-03	1.95E-03						1.95E-03	1.95E-03	1.95E-03
Benzene							8.82E-03					
Dioxin												
Nickel hydroxide								8.56E-02			8.56E-02	
TOTAL			1.95E-03	1.95E-03			8.82E-03	8.56E-02		1.95E-03	**8.76E-02**	1.95E-03

(2) Resident: $HIC8_R$ (summed across each target organ)

TAC	AL	BN	CV	REP/ DEV	END	EYE	HEM	IMM	KID	NS	RESP	SKIN
Arsenic			2.77E-05	2.77E-05						2.77E-05	2.77E-05	2.77E-05
Benzene							1.25E-04					
Dioxin												
Nickel hydroxide								1.21E-03			1.21E-03	
TOTAL			2.77E-05	2.77E-05			1.25E-04	1.21E-03		2.77E-05	**1.24E-03**	2.77E-05

15 Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

HIA:

For all acute compounds with RELs developed for a 1-hour averaging period, the HIA are estimated using the equation below:

Worker & Resident: HIA= [Q_{lbph} x $(\chi/Q)_{lbhr}$ x MWAF]/(Acute REL)

Based on the Target Organs Tables[16], the target organs for the TACs have been listed in Table E. The χ/Q values were taken from Attachment N, Table 7.7.

Note: The χ/Q values in Table 7.7 are based upon the maximum hourly emission rates.

Arsenic: HIA_W = [8.30E-06 x 107.4 x 1] / (2.00E-01) = **4.5E-03**

HIA_R = [8.30E-06 x 10.44 x 1] / (2.00E-01) **= 4.3E-04**

Benzene: HIA_W = [7.50E-03 x 107.4 x 1] / (2.70E+01) = **3.0E-02**

HIA_R = [7.50E-03 x 10.44 x 1] / (2.70E+01) **= 2.9E-03**

Dioxin: **There are no HIA REL values established for dioxin.**

Nickel hydroxide: HIA_W = [2.30E-03 x 107.4 x 0.6332] / (2.00E-01) = **7.8E-01**

HIA_R = [2.30E-03 x 10.44 x 0.6332] / (2.00E-01) = **7.6E-02**

(1) Worker: HIA_W (summed across each target organ)

TAC	**AL**	**CV**	**REP/ DEV**	**EYE**	**HEM**	**IMM**	**NS**	**RESP**	**SKIN**
Arsenic		5.61E-03	5.61E-03				5.61E-03		
Benzene			3.75E-02		3.75E-02	3.75E-02			
Dioxin									
Nickel hydroxide						9.84E-01			
TOTAL		5.61E-03	4.31E-02		3.75E-02	**1.02E+00**	5.61E-03		

[16] Available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

(2) Resident: HIA_R (summed across each target organ)

TAC	AL	CV	REP/ DEV	EYE	HEM	IMM	NS	RESP	SKIN
Arsenic		4.15E-04	4.15E-04				4.15E-04		
Benzene			2.78E-03		2.78E-03	2.78E-03			
Dioxin									
Nickel hydroxide						7.29E-02			
TOTAL		4.15E-04	3.20E-03		2.78E-03	**7.57E-02**	4.15E-04		

Summary of Results

	MICR	HIC	HIC8	HIA
Worker	6.16×10^{-7}	1.01E-01	8.76E-02	1.02E+00
Resident	1.72×10^{-7}	7.87E-03	1.24E-03	7.57E-02
Rule 1401 Threshold	1.0×10^{-6}	1.0	1.0	1.0
Exceeds Threshold?	**No**	**No**	**No**	**Yes**

RESULT:

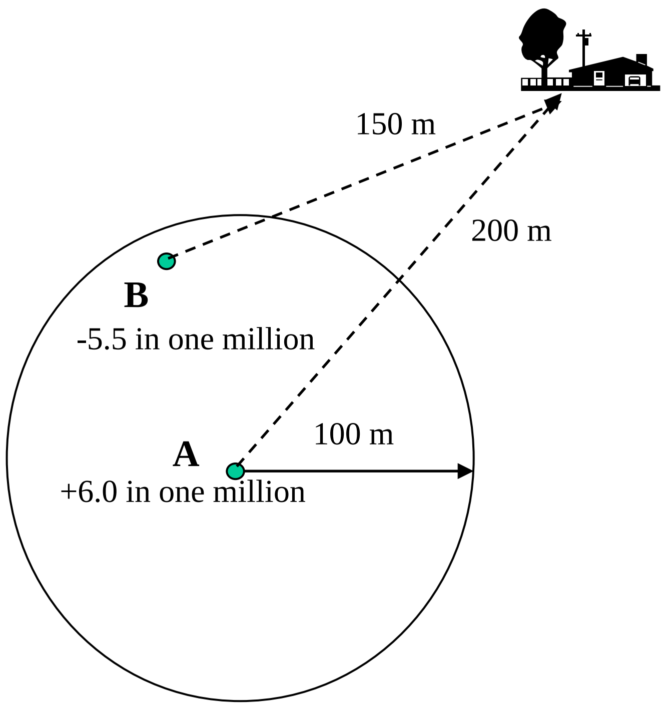
- ***MICRs for residential and commercial receptors do not exceed 1 x 10^{-6} (one in one million).***
- ***Calculation of cancer burden is not necessary.***
- ***HIC and HIC8 for residential and off-site worker receptors, and HIA for residential receptors are less than 1.0 for all organ systems.***
- ***HIA for off-site worker receptors is greater than 1.0 for all organ systems.***

The equipment in this example does not contain T-BACT; therefore, it would pass the Rule 1401 limits for all but acute. A Tier 3 or 4 analysis is required for the HIA.

EXAMPLE 3: CONTEMPORANEOUS RISK REDUCTION

Rule 1401(g)(2)(A): The requirements of paragraph (d)(1) and (d)(4) shall not apply if the applicant demonstrates that a contemporaneous risk reduction resulting in a decrease in emissions will occur such that both of the following conditions are met:
(i) no receptor location will experience a total increase in MICR of greater than one in one million due to the cumulative impact of both the permit unit and the contemporaneous risk reduction, and
(ii) the contemporaneous risk reduction occurs within 100 meters of the permit unit.
T-BACT shall be used on permit units exempted under this subparagraph if the MICR from the permit unit exceeds one in one million (1.0 x 10^{-6}).

Note: All permit applications associated with the increases and decreases in risk for contemporaneous risk reduction must be submitted together and the reduction in risk must occur before the start of operation of the equipment that will have an increase in risk.



Assumptions:

Units A and B: Only have cancer impacts.

Unit A: New equipment, installed with T-BACT, MICR = 6.0 in one million

Unit B: Existing equipment with decreased MICR of 5.5 in one million due to change in operating conditions or process. Unit B emissions, prior to modification, resulted in an 8 in a million risk for the nearest receptor. After modification, Unit B risk is 2.5 in a million which is a decrease of 5.5 in a million.

Receptor R1: The increased risk for Receptor R1 is the MICR for Unit A less the decrease in risk for Unit B.

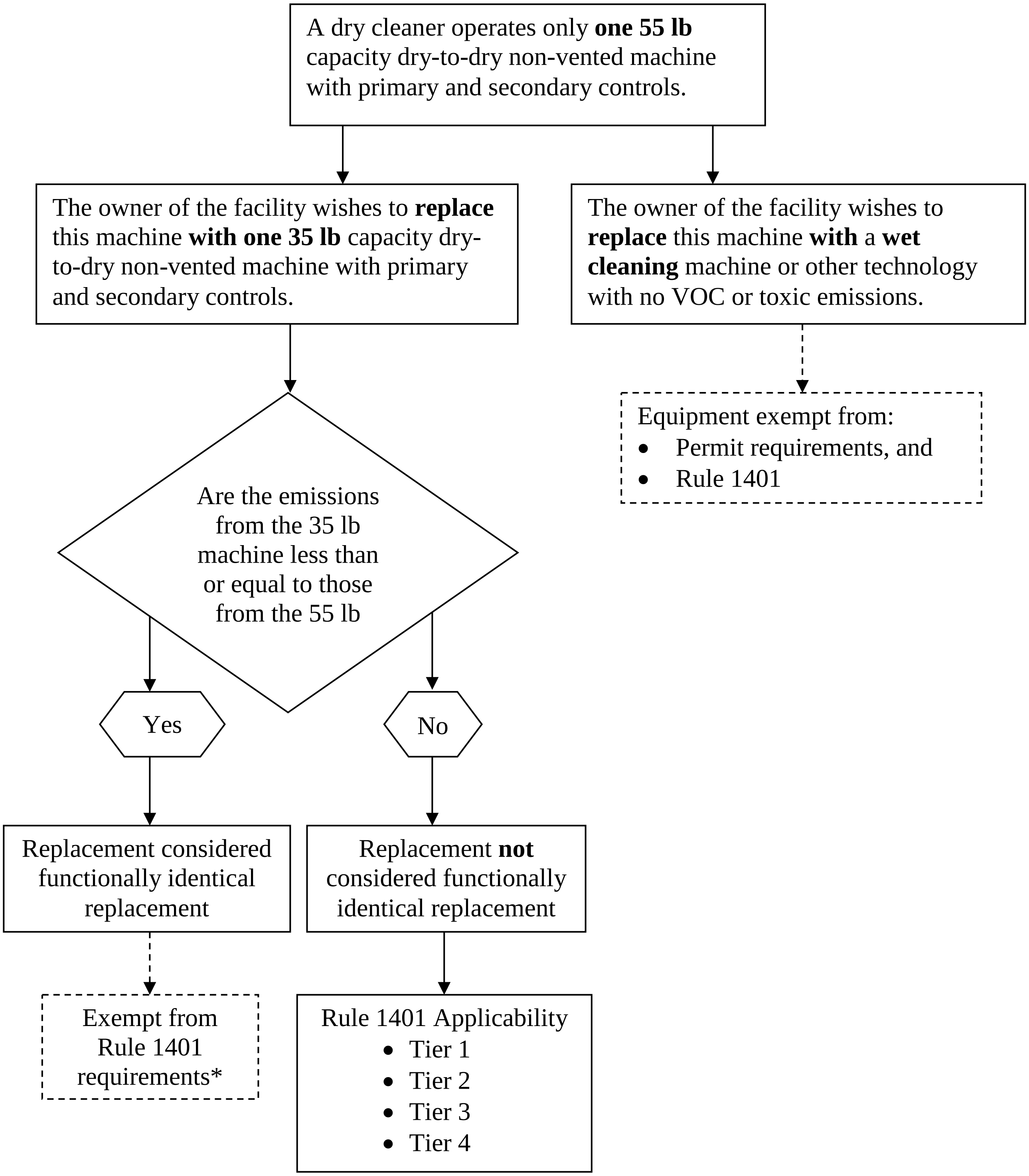
6.0 – 5.5 = **0.5 in one million**.

Note: This demonstaration is best achieved with a Tier 4 analysis (detailed air dispersion modeling) and must be performed for all possible receptors.

RESULT:

- ***Equipment was installed using T-BACT.***
- ***No receptor experiences an increase in risk greater than one in** one **million.***
- ***The contemporaneous risk reduction occurs within 100 meters of the new equipment.***
- ***If all other rule requirements are met, a permit would be issued.***

EXAMPLE 4: FUNCTIONALLY IDENTICAL EQUIPMENT REPLACEMENT



• Rule 1421(d)(1)(F) allows for the functionally identical equipment replacement of **only one** machine. Please note that all perchloroethylene machines must comply with Rule 1402 as well. As of December 31, 2020, no new or existing dry cleaning facility may use a perchloroethylene dry cleaning system.

BEST AVAILABLE CONTROL TECHNOLOGY FOR TOXICS

T-BACT is not required if the MICR is less than or equal to one in one million. If cancer risk is greater than one in a million, T-BACT is required and must reduce risk to less than or equal to ten in one million.

SIC Codes, which describe industry types or classifications, or SCC Codes, which describe emitting processes or equipment, can be used to help identify T-BACT. If no standard is available, SCAQMD staff works with the applicant to identify T-BACT when required.

SCAQMD staff is continually examining and updating control technologies that comply with the definition presented in Rule 1401(c)(2). However, in many situations T-BACT is equivalent to BACT. The applicant is encouraged to contact the SCAQMD permit processing division for current T-BACT information.

T-BACT EXAMPLES

Type of Industry:	*Wood Finishing*
Type of Emitting Process:	***Wood Coatings***
Specific TAC Emissions:	***Ethylbenzene, Formaldehyde***
Applicable BACT:	*Thermal Oxidizer*
T-BACT:	*Thermal Oxidizer*

BACT = T-BACT

With T-BACT, risk is ten in one million or less

T-BACT is acceptable

Type of Industry:	*Metal Plating*
Type of Emitting Process:	***Nickel Plating, Chromium Plating***
Specific TAC Emissions:	***Nickel, Hexavalent chromium***
Applicable BACT:	*Wet Scrubber*
T-BACT:	*HEPA*

With T-BACT, risk is 10 in one million or less

T-BACT is acceptable

APPENDIX I

CALCULATION WORKSHEETS

MICR Calculation Worksheet
HIA Calculation Worksheet
HIC Calculation Worksheet
HIC8 Calculation Worksheet

MICR CALCULATION WORKSHEET

Facility Name: ____

Facility Address: ____

Description of Equipment: ____

Equipment is (circle one): **Point Source** or **Volume Source**

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	CP (Table 8.1)	MICR MP (Att. N, Table)	
				Resident	Worker
1.					
2.					
3.					

Equipment operates (circle one) ≤ **12 hr/day** or > **12 hr/day**

If equipment is a **point source**, enter **Stack Height:** _________ ft

If equipment is a **volume source**, enter **Building Height:** ______ ft & **Floor Area:** ______ ft^2

Distance **to nearest residential or sensitive receptor:**_______ m &

Off-site worker receptor: ______ m

Nearest **SCAQMD meteorological station:** _________________ (Appendix VI, Figure VI-1 & Table VI-1)

Select **χ/Q** and **WAF Tables** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **CP** and **MP** from Attachment N, Table3.1 and the Consolidated Health Values Table found at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

χ/Q value for nearest residential/sensitive receptor: ________
for nearest off-site worker receptor: ________

WAF value for nearest residential/sensitive receptor: 1.0
for nearest off-site worker receptor: ______

CEF value for nearest residential/sensitive receptor: 677.40
for nearest off-site worker receptor: 55.86

MICR CALCULATION

TACs	CP		Q_{tpy}		χ/Q		CEF		MP		WAF		10^{-6}		MWAF		MICR
1.		x		x		x		x		x		x	10^{-6}	x		=	
2.		x		x		x		x		x		x	10^{-6}	x		=	
3.		x		x		x		x		x		x	10^{-6}	x		=	
4.		x		x		x		x		x		x	10^{-6}	x		=	

MICR =________________________

HIC CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.)

Facility Name: ______________________________

Facility Address: ______________________________

Description of Equipment: ______________________________

Equipment operates (circle one) ≤ **12 hr/day** or > **12 hr/day**

Equipment is (circle one): **Point Source** or **Volume Source**

If equipment is a **point source**, enter:

Stack Height: __________ ft

If equipment is a **volume source**, enter

Building Height: __________ ft & **Floor Area**: _________ ft^2

Distance **to nearest residential or sensitive receptor:** ___________ meters

Distance to **nearest off-site worker receptor**: ___________ meters

Nearest **SCAQMD meteorological station:** ________________ (Appendix VI, Figure VI-1 & Table VI-1)

Select **χ/Q** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **Chronic REL** and **Chronic MP** from Attachment N, Table 3.2 and the Consolidated Health Values Table, found at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	Dispersion Factor (χ/Q)	Chronic Reference Exposure Level (REL)	Chronic Multi-pathway Factor (MP)
1.					
2.					
3.					
2.					
3.					

HIC CALCULATION:

Σ [(Q_{tpy}) x (χ/Q) x MP] / (Chronic REL) for each TAC

TACs	Q_{tpy}		χ/Q		MP		REL		HIC
1.		**x**		**x**		/		=	
2.		**x**		**x**		/		=	
3.		**x**		**x**		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

HIC8 CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.)

Facility Name: ____
Facility Address: ____
Description of Equipment: ____
Equipment operates (circle one) **≤ 12 hr/day** or **> 12 hr/day**
Equipment is (circle one): **Point Source** or **Volume Source**
If equipment is a **point source**, enter:
Stack Height: __________ ft
If equipment is a **volume source**, enter
Building Height: __________ ft & **Floor Area**: _________ ft²
Distance **to nearest residential or sensitive receptor:** ___________ meters
Distance to **nearest off-site worker receptor**: ___________ meters
Nearest **SCAQMD meteorological station:** _________________ (Appendix VI, Figure VI-1 & Table VI-1)
Select **χ/Q** as follows (circle tables selected)

	Point Source	Volume Source
≤ 12 hr/day	Att. N, Tables 6.1 A, 6.2 A, 6.3 A	Att. N, Tables 7.1 A, 7.2 A, 7.3 A, 7.4 A, 7.5 A, 7.6 A
> 12 hr/day	Att. N, Tables 6.1 B, 6.2 B, 6.3 B	Att. N, Tables 7.1 B, 7.2 B, 7.3 B, 7.4 B, 7.5 B, 7.6 B

Select **8-Hour Chronic REL from the Consolidated Health Values Table found at https://www.arb.ca.gov/toxics/healthval/contable.pdf;** and **WAF from Attachment N, Tables 5.1 or 5.2 for off-site worker receptor only**

Toxic Air Contaminants Emitted by Equipment	Maximum Annual Emissions, Q_{lbpy} (lb/yr)	Maximum Annual Emissions, Q_{tpy} (ton/yr)	Dispersion Factor (χ/Q)	Worker Adjustment Factor (WAF)	Chronic Reference Exposure Level (REL)
1.					
2.					
3.					

HIC8 CALCULATION:

Σ [(Q_{tpy}) x (χ/Q) x WAF] / (8-Hour Chronic REL) for each TAC

TAC	Q_{tpy}		χ/Q		WAF		REL		HIC8
1.		x		x		/		=	
2.		x		x		/		=	
3.		x		x		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

HIA CALCULATION WORKSHEET

Target Organ/System*: (Target Organs Tables are available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.)

Facility Name: ______________________________

Facility Address: ______________________________

Description of Equipment: ______________________________

Equipment is (circle one): **Point Source** or **Volume Source**

If equipment is a **point source**, enter:

Stack Height: ___________ ft

If equipment is a **volume source**, enter

Building Height: ___________ ft & **Floor Area**: ____________ ft^2

Distance **to nearest residential or sensitive receptor:** ____________ meters

Distance to **nearest off-site worker receptor**: ____________ meters

Nearest **SCAQMD meteorological station:** __________________ (Appendix VI, Figure VI-1 & Table VI-1)

Select **χ/Q:** ____________

Select **χ/Q**: from Attachment N, Table 6.4 if Point Source or from Attachment N, Table 7.7 if Volume Source

Select **Acute REL** from the Consolidated Health Values Table found at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Toxic Air Contaminants Emitted by Equipment	Maximum Hourly Emissions, Q_{lbph} (lb/hr)	Peak Hourly Dispersion Factor χ/Q	Acute Reference Exposure Level (REL)
1.			
2.			
3.			

HIA CALCULATION:

$[Q_{lbph} \times (\chi/Q)] / (\text{Acute REL})$

	TAC	Q_{lbph}		χ/Q		REL		HIA
1.			**x**		/		=	
2.			**x**		/		=	
3.			**x**		/		=	

* A worksheet needs to be filled out for each affected target organ/system.

APPENDIX II

DERIVATION OF TIER 2 MP ADJUSTMENT FACTORS

INTRODUCTION

Toxic air contaminants (TACs) enter the body through a number of routes: inhalation; absorption through the skin; and ingestion from contaminated food, water, milk and soil. To account for uptake of toxics through routes of exposure other than inhalation, risk assessments often include a multi-pathway exposure analysis.

To simplify the screening risk assessment, MP adjustment factors were developed. The inhalation risk is multiplied by the MP adjustment factors to account for the additional health risk due to other pathways of exposure.

The MP adjustment factors were developed using the Risk Assessment Standalone Tool (RAST) build 15071, a computer software package that calculates risks based on ground level concentrations (GLC). Assumptions and parameters used to develop the MP adjustment factors are listed below:

Risk assessment options:

- Deposition velocity – 0.02 m/sec
- OEHHA default exposures are assumed for mother's milk, homegrown produce, and soil exposure
- A 'warm' climate, typical for Southern California is assumed for the dermal exposure pathway
- For non-cancer chronic risk estimates, the "OEHHA Derived Method" risk analysis method is used. In this approach, the inhalation pathway is always considered a driving pathway, the next two dominant (driving) exposure pathways use the high-end point-estimates of exposure, while the remaining exposure pathways use mean point estimates.
- For residential cancer risk estimates, the "RMP (Derived) Method" risk analysis method is used. In this method, if inhalation is one of the top two dominant pathways, the method uses the breathing rate at 95th percentile of exposure for $\leq$ 2 years of age, and the breathing rate at the 80th percentile exposure for > 2 years of age. If inhalation is not the top two dominant pathways, it uses mean. For worker cancer risk, the "OEHHA Derived Method" risk analysis method is used.
- Pathways considered for residential exposure include inhalation, soil ingestion, dermal absorption, homegrown produce, and mother's milk.
- Pathways considered for worker exposure include inhalation, soil ingestion, and dermal absorption.
- The cancer risk estimates, including the Derived equations (both OEHHA and Adjusted), are based on 30-year exposures.
- The chronic MP adjustment factors (resident and worker) for the group listing of polychlorinated biphenyls (CAS number 57465-28-8) has been assigned those of its individual subspecies (243.908 and 10.82, respectively). (The group listing of PCBs does not include the Toxicity Equivalency Factors as developed by the World Health Organization 1997 and as adopted by the 2015 OEHHA Guidelines). PCB 126 (',3',',4',5-Pentachlorobiphenyl, CAS number 57465-28-8) was used in the calculation of the screening approach since it has the most stringent REL. In a case that a facility provides

speciated PCB data, or other justification is available, different MP adjustment factors can be used subject to SCAQMD approval.

APPENDIX III

PROCEDURES FOR ADDRESSING NON-DETECTED COMPOUNDS AND BLANKS IN RISK ASSESSMENT

INTRODUCTION

This appendix describes guidelines for estimating emissions of non-detected toxic air contaminants (TACs) and using blanks in emissions estimations for purposes of preparing health risk assessments for Rules 1401, 1402 and the Air Toxics "Hot Spots" Program (AB2588 Program). Procedures are the same for preparing risk assessments for Rules 1401, 1402 and the AB2588 Program, however the lists of compounds are different. Rule 1401 uses only cancer potency factors (CP) and reference exposure levels (RELs) approved by the Scientific Review Panel and prepared by the state Office of Environmental Health Hazard Assessment (OEHHA), whereas Rule 1402 and the AB2588 Program use different sources for CPs and RELs, including draft numbers.

Under previous policy, the SCAQMD required that if a TAC could be present in emissions from a source but not detected during air testing, it must be assumed to be present below the limit of detection (LOD). This approach has been applied to stack testing, to measurements such as laboratory analysis of materials, and other monitoring and measurement methods. The concentration of non-detected TACs were to be reported as one-half (1/2) of the LOD.

Concerns were raised that this policy of carrying undetected TACs through a health risk assessment at half the LOD could inflate risk estimates and might require facilities to install control equipment for emissions that may not be present. In addition, it would not be possible to detect the TAC after its emissions had been controlled and reduced.

Also, in the past, the SCAQMD did not allow any adjustments in the measured values of samples based on the results of reagent blanks. Concerns were raised that in certain cases the concentration of TACs measured in reagent blanks should be deducted from the actual measured samples.

To address these concerns, SCAQMD staff worked closely with affected facilities such as publicly owned treatment works (POTWs) and others during previous rulemaking efforts for Rules 1401 and 1402 to develop guidelines for addressing non-detected TACs and blanks in risk assessment.

OVERVIEW

The new approach begins with an initial level of screening to determine whether or not a TAC is likely to be present and therefore should be tested for. If the conditions in the screening guidelines are met, no further testing or analysis is required. If a TAC does not pass the screening guidelines, the facility must quantify and report the emissions of the compound through testing or other methods as approved by SCAQMD staff. The reported emission levels are calculated based on the number of test runs or analyses that are below the LOD.

SCREENING GUIDELINES

For a TAC to be excluded from testing or analysis and hence quantification for health risk assessment, it must meet either condition A, B, or C listed below.

Proof for exclusion of any TAC based on literature studies on physical nature or chemistry of the compounds to substantiate the findings, and any prior analysis or testing shall be deemed complete for SCAQMD approval. Any prior testing must have been conducted according to SCAQMD's approved test methods or other recognized standards, as approved by SCAQMD staff.

If a list of TACs to be tested for is agreed upon but is subsequently discovered by the facility or the SCAQMD that additional compounds may be present, SCAQMD staff may require that the facility test for the presence of the additional TACs.

The screening criteria to be used for determining the presence of TACs are the following.

Condition A: No likelihood of the presence of a TAC

A facility may choose to demonstrate that there is no likelihood of a TAC being present in the raw materials, process streams or materials introduced into the equipment or process. The methodology or documentation to show proof of the non-existence of the TAC must be deemed complete with the source test protocol or test method analysis protocol for SCAQMD approval. If the evidence to substantiate the absence of a TAC is insufficient, or SCAQMD staff has reason to believe that the TAC may be present, it must be tested for and quantified (see Cases 1, 2, and 3).

For example, a facility operator can demonstrate the absence of cadmium in emissions from the melting of lead ingots in a pot furnace by presenting the following documentation:

- Certified analysis of the lead ingots showing that cadmium is not a constituent of the ingot.
- Description of the process substantiating that no other material is added to the furnace that will contribute to cadmium emissions. The operator must also provide analysis for the fuel used in the process to demonstrate that it does not contain cadmium.
- Documentation substantiating that melting lead ingots without cadmium present in the ingot in a pot furnace will not result in the emissions of cadmium when the firebricks or pot liner are heated during the melting operations.

In addition, the facility operator may submit test results based on tests performed within the last two years, or a longer period if the facility can demonstrate that no significant changes have occurred to the SCAQMD-approved test method, process equipment or process materials that indicate cadmium was reported as below LOD.

Condition B: Absence of a TAC or its precursors in the process

If there is any evidence that precursors, which could lead to formation of a TAC during a process or reaction, may be present, then a facility may have to test for the TAC. To be excluded from testing and quantification requirements, the facility must provide documentation to demonstrate, based on test results, that none of the essential precursors are present in the material or process. This is similar to the previous criteria and differs only in that precursor compounds that could contribute to the formation of the subject TAC must also be identified as not being present.

An example is emission of dioxins from a waste incinerator. In this case, test data may be available to show that there are no dioxins present in the waste stream being incinerated. However, the presence of chlorine and hydrocarbons in the combustion process could result in the formation of products of incomplete combustion (PICs) such as dioxins or other toxic compounds. Testing for these compounds would be required unless the facility operator demonstrates that none of the essential precursors are present in the waste stream or the process itself.

Condition C: Special TAC list for POTWs

Unlike other industrial sources whose potential toxic air emissions are relatively well defined and which contain limited species, proving the absence of TACs from emissions from POTWs is more difficult. This is because the instantaneous discharge of wastewater from various residential, commercial and industrial system users could potentially result in the presence of different toxic contaminants in the influent sewage. Therefore, it is recommended that a special TAC list be developed for POTWs to select appropriate TACs for testing and determination of health risk associated with air emissions from liquid phase and sludge treatment processes.

The special TAC list for POTWs will be approved by SCAQMD staff with consideration given to information including but not limited to the following:

1. The Pooled Emission Estimating Program (PEEP) identified and selected compounds under the AB2588 Program, as approved by SCAQMD staff.
2. The Joint Emissions Inventory Program (JEIP) identified and selected compounds under SCAQMD Rule 1179 – Publicly Owned Treatment Works Operations inventory requirements, as approved by SCAQMD staff.
3. TACs that have a reasonable likelihood of being present in the air emissions of POTWs, based on other test results or information sources, as approved by SCAQMD staff.

Additionally, based on the specific sources of sewage for certain POTWs, specific TACs in addition to the ones identified through the above steps could be added or deleted from the list on a case-by-case basis.

Based on the special TAC list for POTWs as developed from the above procedure and subject to approval by SCAQMD staff, facilities will be required to quantify the listed compounds through testing or other methods approved by SCAQMD staff for inclusion in the health risk assessment. The facility will not have to test for compounds not included in the special TAC list for POTWs, and the inclusion of non-listed TACs in the health risk assessment is not required. However, if after the industry-specific list is developed and approved, the facility or the SCAQMD later discovers information that additional TACs may be present, SCAQMD staff may revise the industry-specific list and may require the facility to quantify emissions of such TACs that were previously excluded from quantification.

QUANTIFICATION OF EMISSIONS BASED ON SOURCE TEST RESULTS

The cases listed below explain the process for quantification of emissions based on the source test results.

Treatment of Test Runs Below LOD

If some test runs are below LOD, quantification of the TAC depends on the percent of the test runs and analyses that are below LOD. Three possible scenarios are discussed below. In all of these cases, all of the following three conditions must be met:

1. All tests should be performed using SCAQMD-approved test methods, triplicate sample runs and SCAQMD-approved detection limits. When non-detected values are reported, the actual analytical limit of detection for all runs and the number of sample runs shall be reported; and
2. The data from the analyses or tests were obtained within a period of two years prior to the time the data is to be used by SCAQMD staff, unless the facility demonstrates to the SCAQMD's satisfaction that earlier test data remain valid due to lack of significant changes in test methods, process equipment or process materials; and
3. For cyclic operations or variations in feedstock, the tests or analyses conducted should be representative of the variations in loads, feed rates and seasons, if applicable. In such cases, an adequate number of test runs should be conducted for all cyclic or seasonal operations.

Case #1: TAC is not detected in any test runs or analyses

In situations in which all test runs and analyses consistently indicate levels below the LOD, the compound can be identified as "not detected" and its inclusion in the health risk assessment will not be required, provided all three conditions listed above are met.

Case #2: TAC is detected in less than 10% of the test runs or analyses

In situations in which a compound has been detected and the percentage of samples in which it is detected is less than ten percent, and provided that all three conditions listed above are met, the following procedure shall be used to average the results:

1. For those runs or analyses that were below LOD, assign zero.
2. Average the measured values obtained for the runs that were above LOD with zero values for the runs below LOD and report the final average result for use in the risk estimation.

Case #3: TAC is detected in 10% or more of the test runs or analyses

In cases in which ten or more percent of the test runs and analyses show measured values of a TAC above the LOD, and provided that all three condition listed above are met, the following procedure shall be used to average the results:

1. For those runs or analysis that were below LOD, assign one half (1/2) of the corresponding LOD for each run.

2. Average the measured values obtained for the runs that were above LOD wi1/2 LOD values for the runs below LOD and report the final average result for use in the risk estimation.

In cases in which there are fewer than ten samples (for example, two triplicate samples have been taken) and a TAC has been detected in one or more samples, the following procedures shall be used.

- If the TAC is detected in one sample, use Case #2.
- If the TAC is detected in two or more samples, use Case #3.

Use of Reagent Blanks

Reagent blank values may be subtracted from sample values under the conditions specified below. In order to use these procedures, it will be necessary to obtain from SCAQMD staff, prior to the test or analyses, a determination as to the maximum allowable value for the blank.

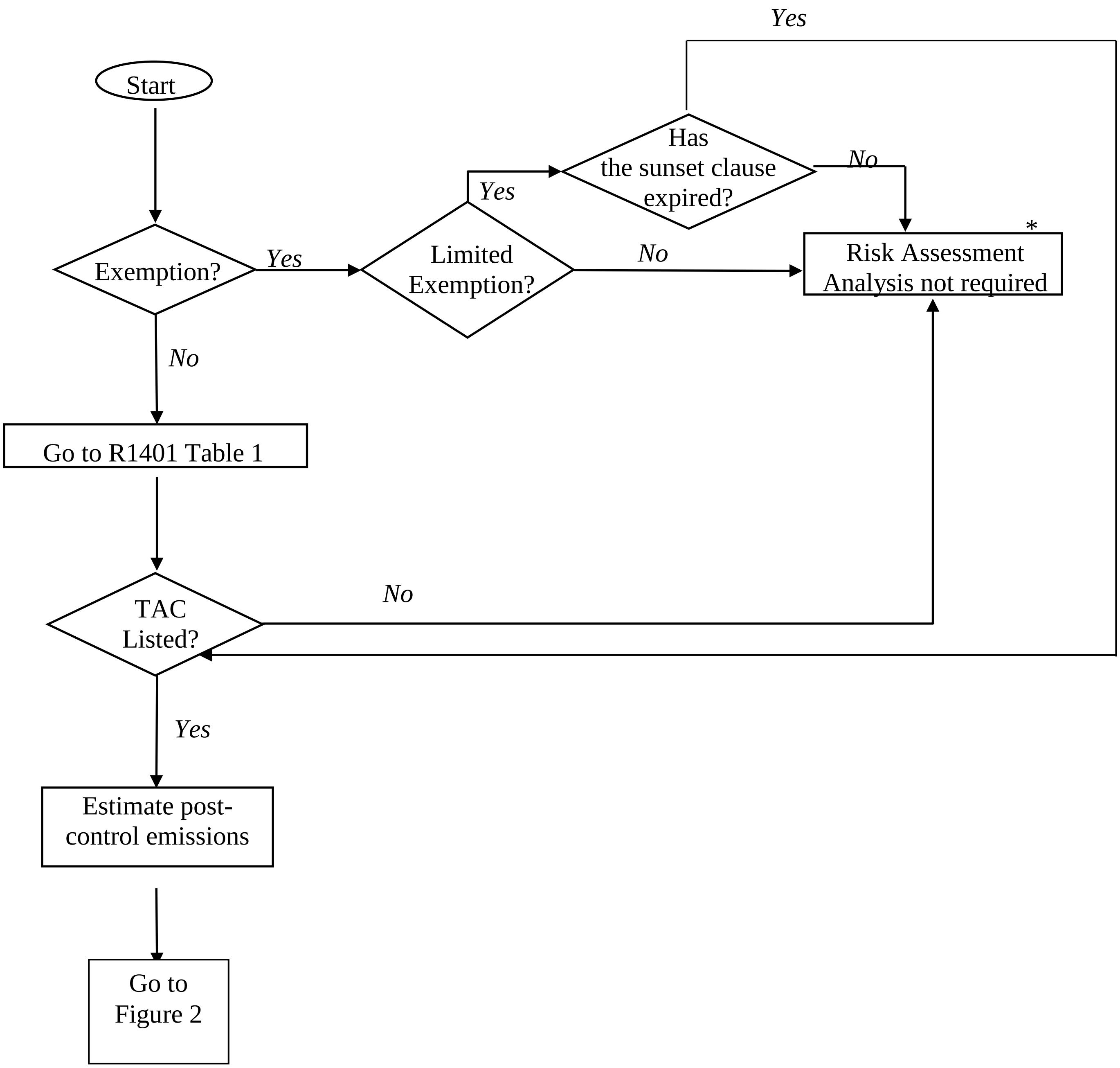
If the level of the TAC in the reagent blank is less than or equal to the maximum allowable blank, the reagent blank may be subtracted. The data must be reported with and without the correction. If the level of the TAC in the reagent blank is greater than the maximum allowable blank and the concentration of the sample is greater than three times the reagent blank value, then the maximum allowable reagent blank value can be subtracted. The data must be reported with and without correction.

APPENDIX IV

FLOW CHARTS AND DIAGRAMS

Note: The reader needs to ascertain the date in which the subject equipment's permit application was deemed complete. This date is used to identify the correct set of permitting tables (see Attachments) to be used for permit processing.

Figure 1
Preliminary Tasks



* Consult with SCAQMD staff for other TACs not listed in Attachment N, Table 1.0, which potentially endanger public health or may require a Rule 212 evaluation.

Figure 2
Tier 1 - Screening Levels

Tier 1 involves comparing emissions or source specific units from a piece of equipment to Screening Levels

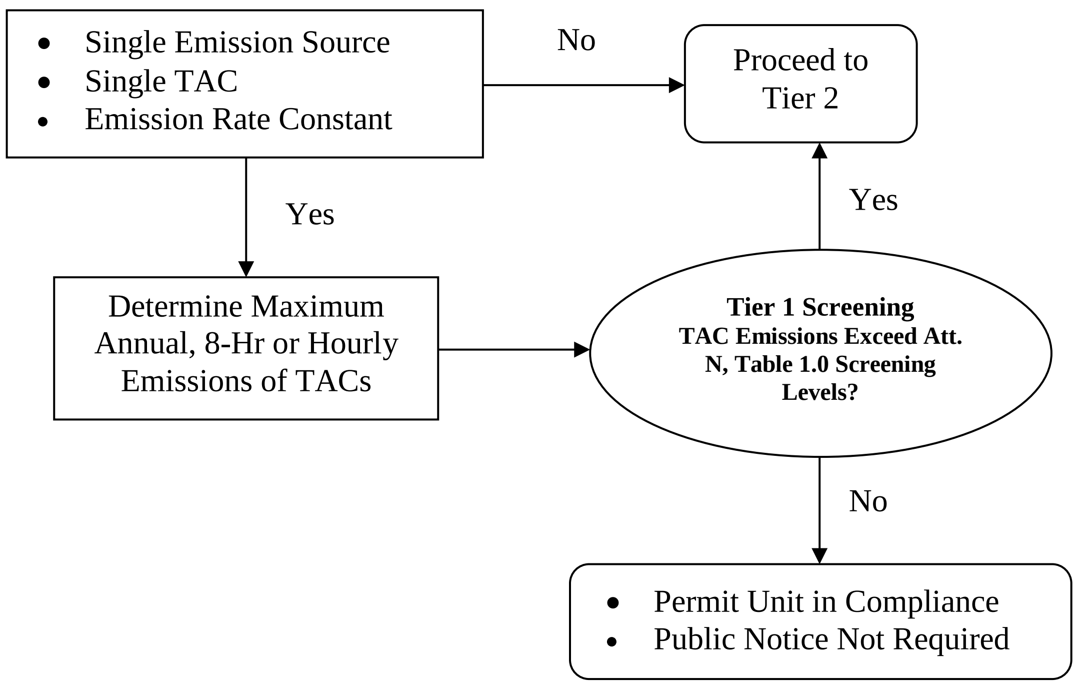
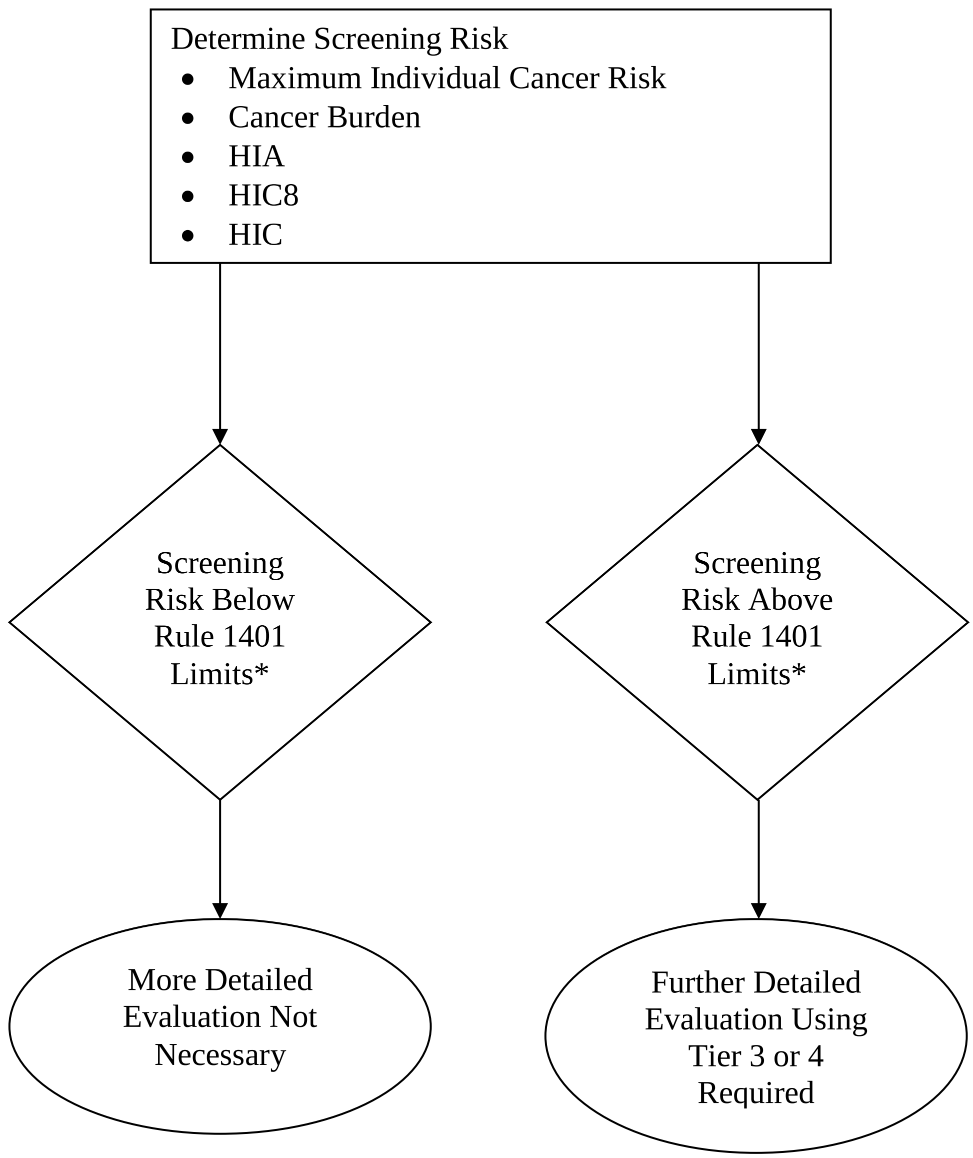


Figure 3A
Tier 2 - Screening Levels

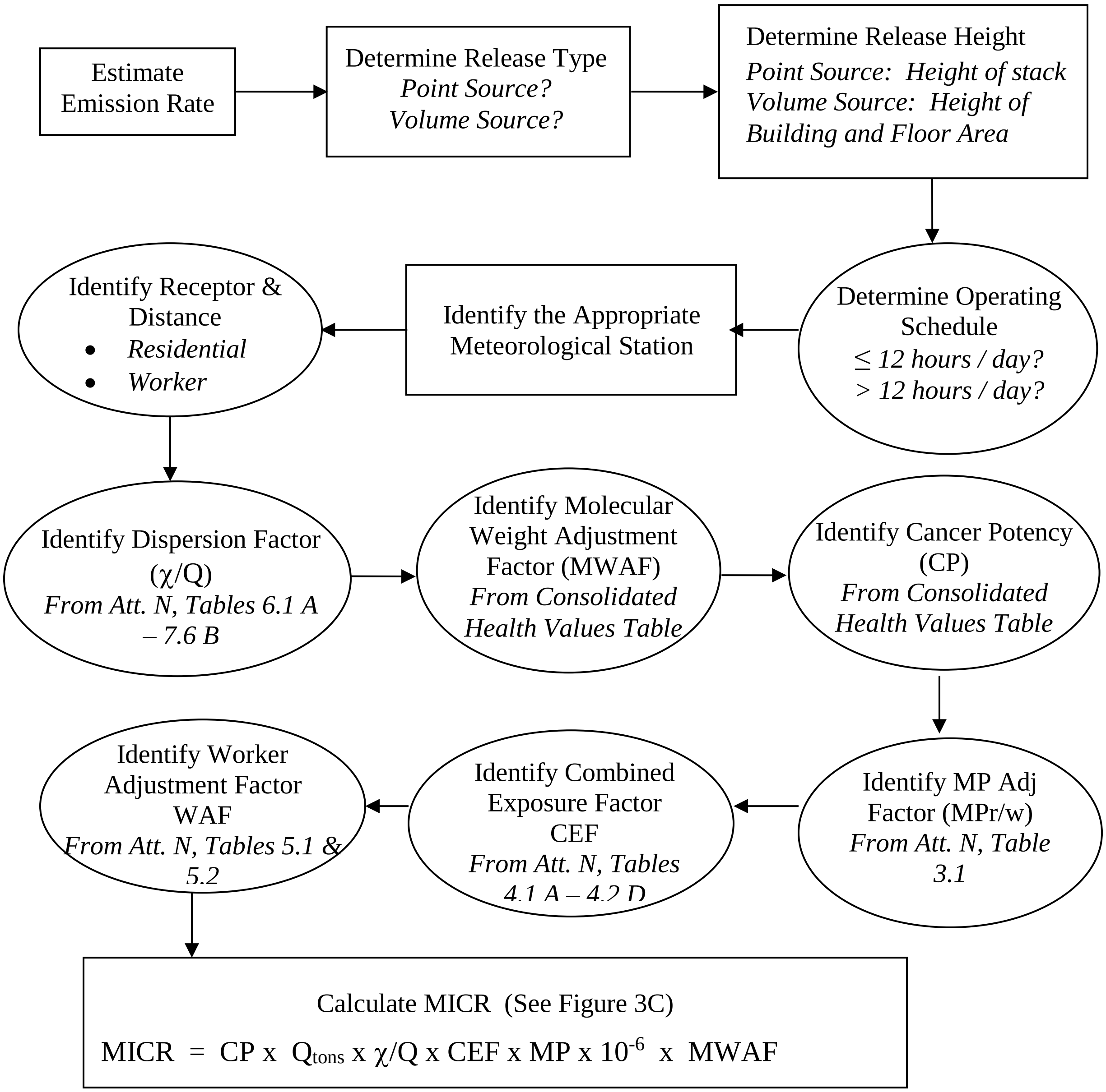
Tier 2 is a screening risk assessment, which includes procedures for determining level of risk from MICR, Cancer Burden, HIA, HIC8 & HIC



** Level of Concern:*

- *MICR exceeds one in one million with no T-BACT*
- *MICR exceeds ten in one million with T-BACT*
- *Cancer burden exceeds 0.5*
- *HIA, HIC8 or HIC exceeds 1 for any target organ system*

Figure 3B
Tier 2 - MICR Calculation



If MICR exceeds one in one million, cancer burden must also be estimated. (See Figure 4.)

Note that the Consolidated Health Values Table is available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

Figure 3C
Tier 2 - MICR Equation

$$MICR = CP \times Q_{tons} \times \chi/Q \times CEF \times MP \times 10^{-6} \times MWAF$$

CP = Cancer Potency [(mg/kg-day)$^{-1}$]
Q_{tons} = Maximum Emission Rate [tons/yr]
χ/Q = Dispersion Factor [(µg/m^3) / (tons/yr)]
CEF = Combined Exposure Factor (unitless)
MP = Multi-Pathway Adjustment Factor
10^{-6} = Conversion Factor (Micrograms to Milligrams, Liters to Cubic Meter)
MWAF = Molecular Weight Adjustment Factor

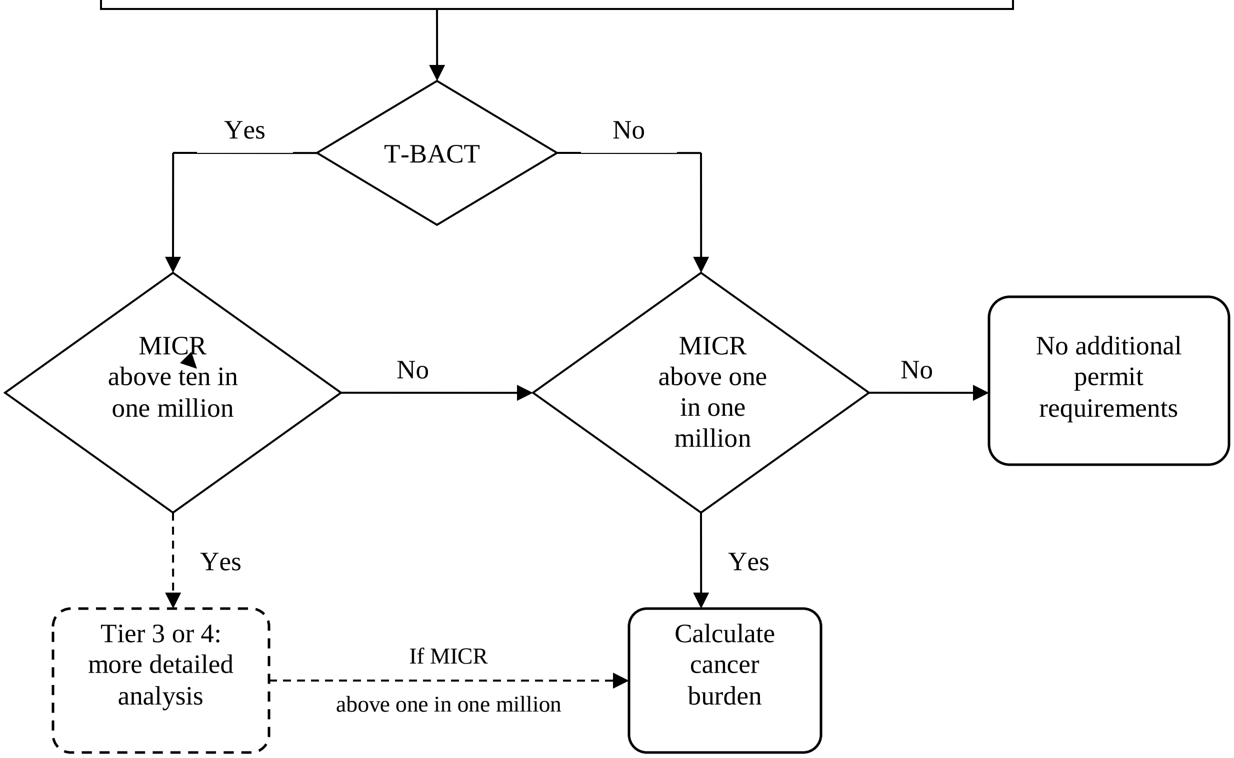


Figure 3D
Tier 2 - χ/Q

(χ/Q): *Numerical estimates of the amount of decrease in concentration of a contaminant as it travels away from the site of release.*

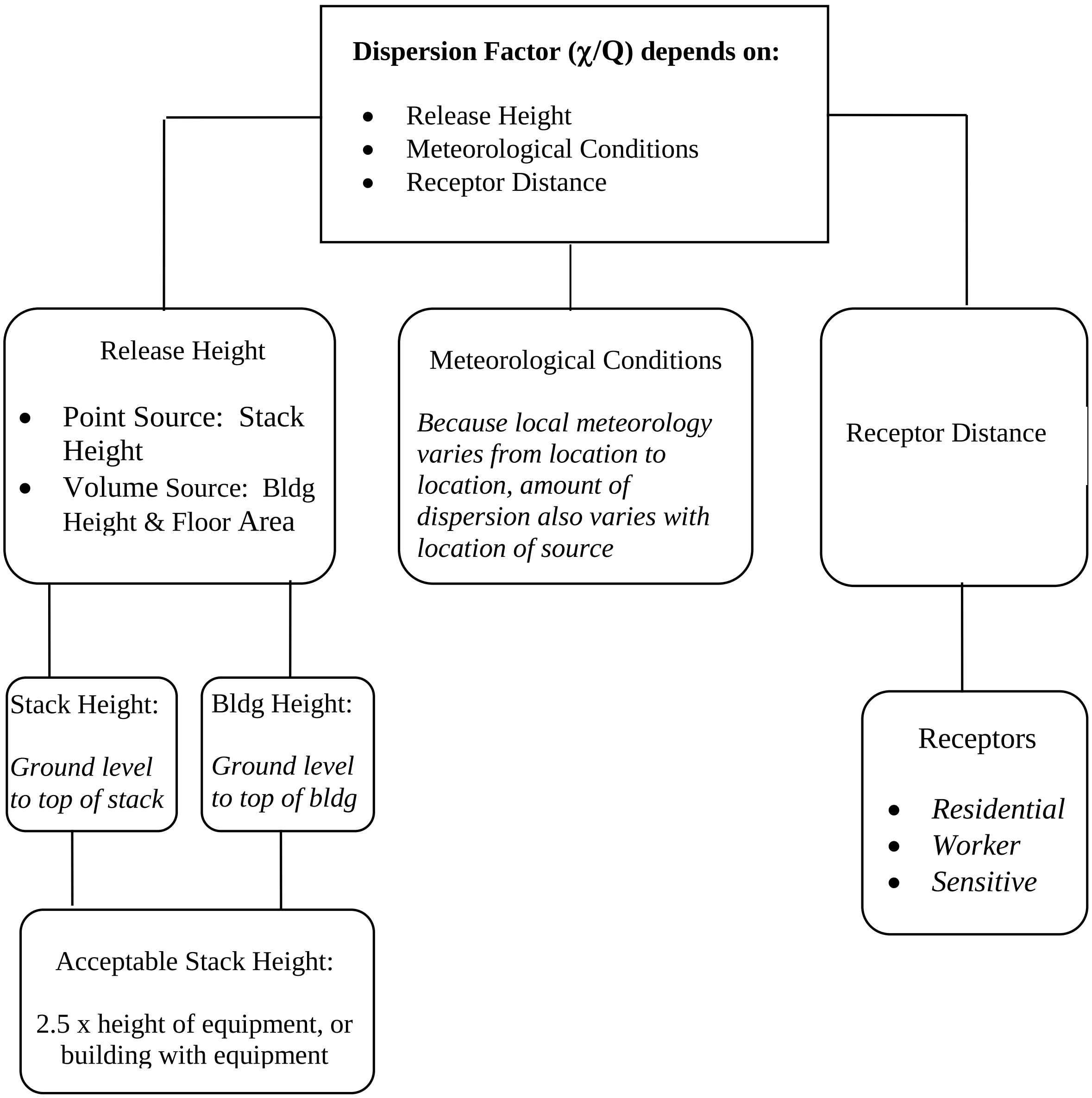


Figure 3E
Tier 2 - MP Adjustment Factor

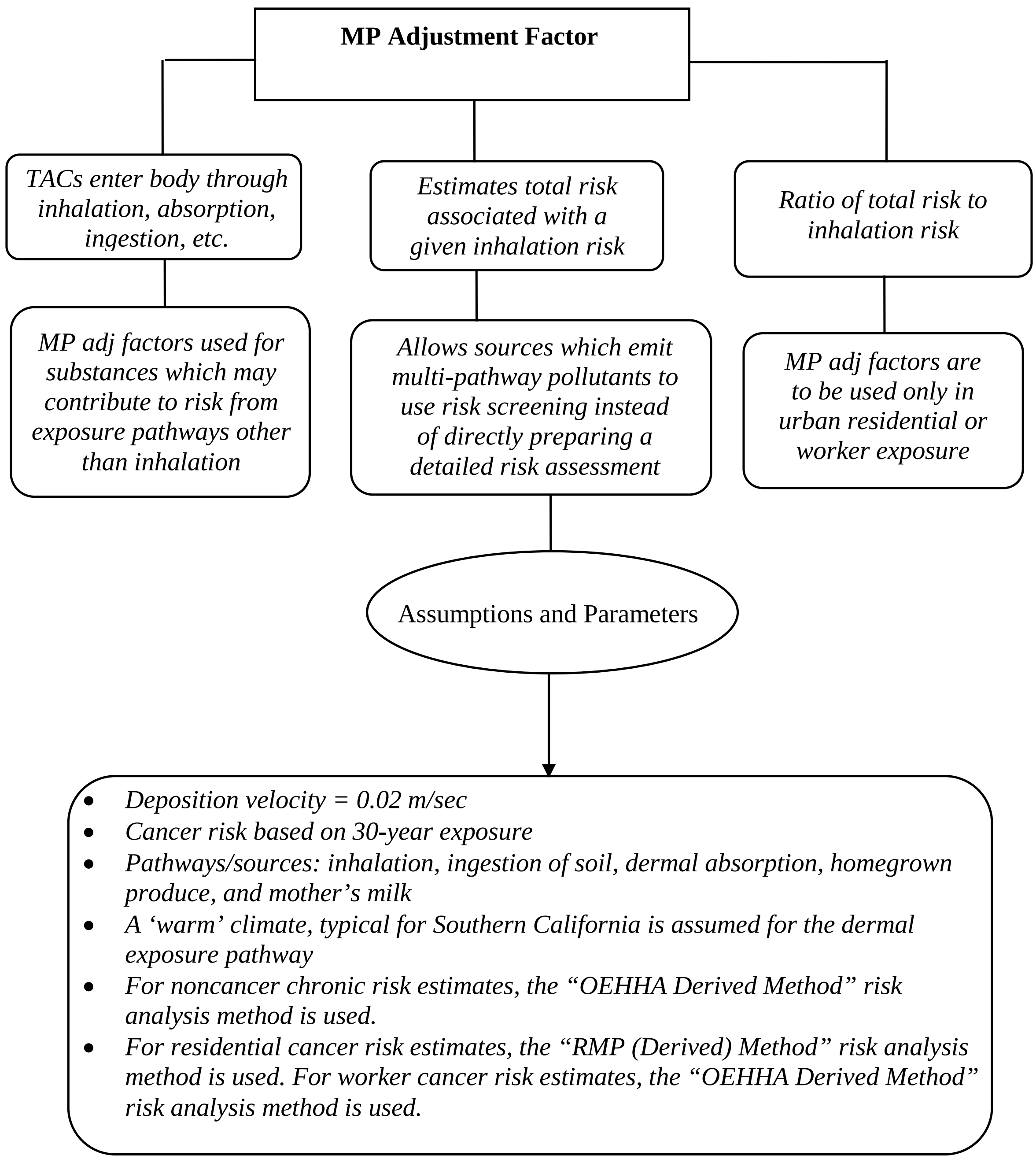


Figure 3F
Tier–2 - CEF

CEF

Combines default exposure parameters for:

- Daily Breathing Rate (DBR)
- Age Sensitivity Factor (ASF)
- Exposure Duration (ED)
- Fraction of Time Spent at Home (FAH)
- Exposure Frequency (EF)
- Average Time (AT)

From Att. N, Tables 4.1 A – 4.2 D

Figure 4
Cancer Burden

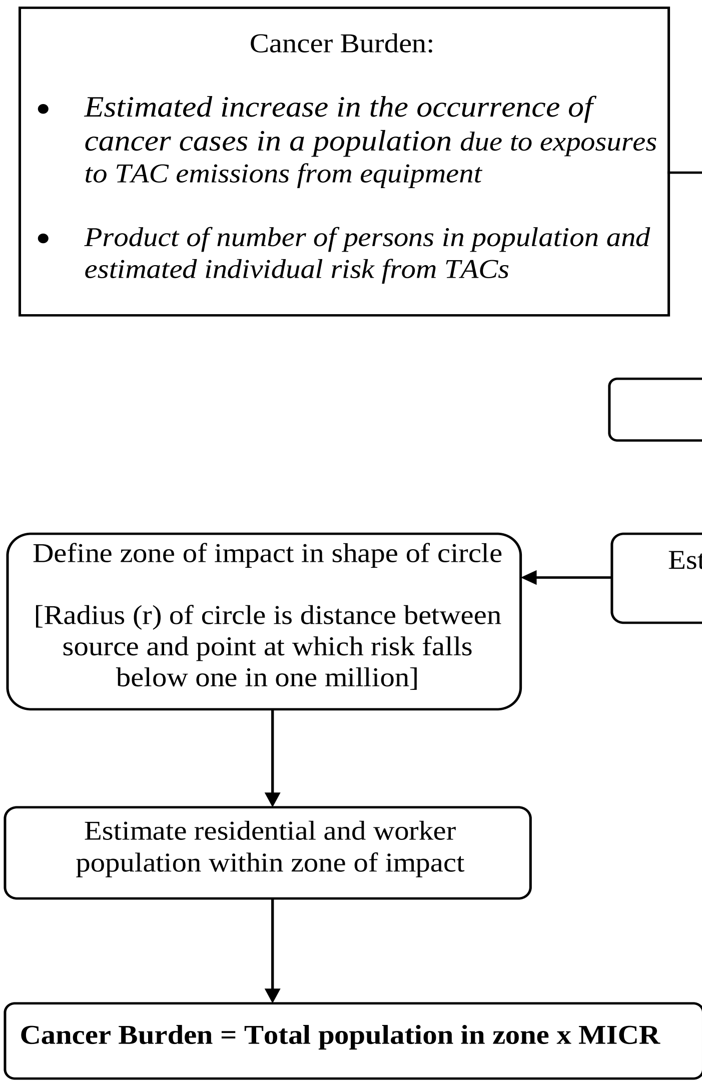
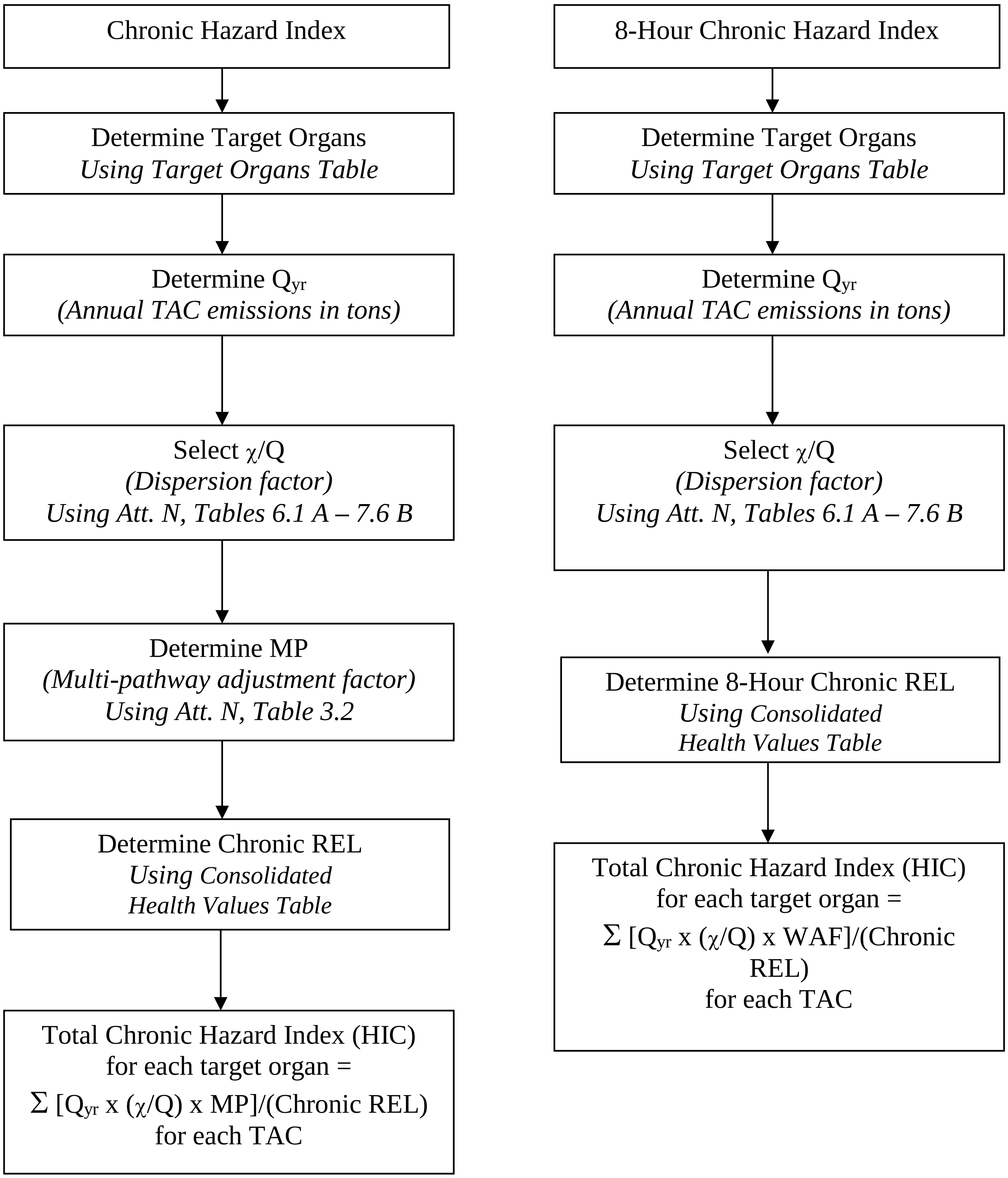
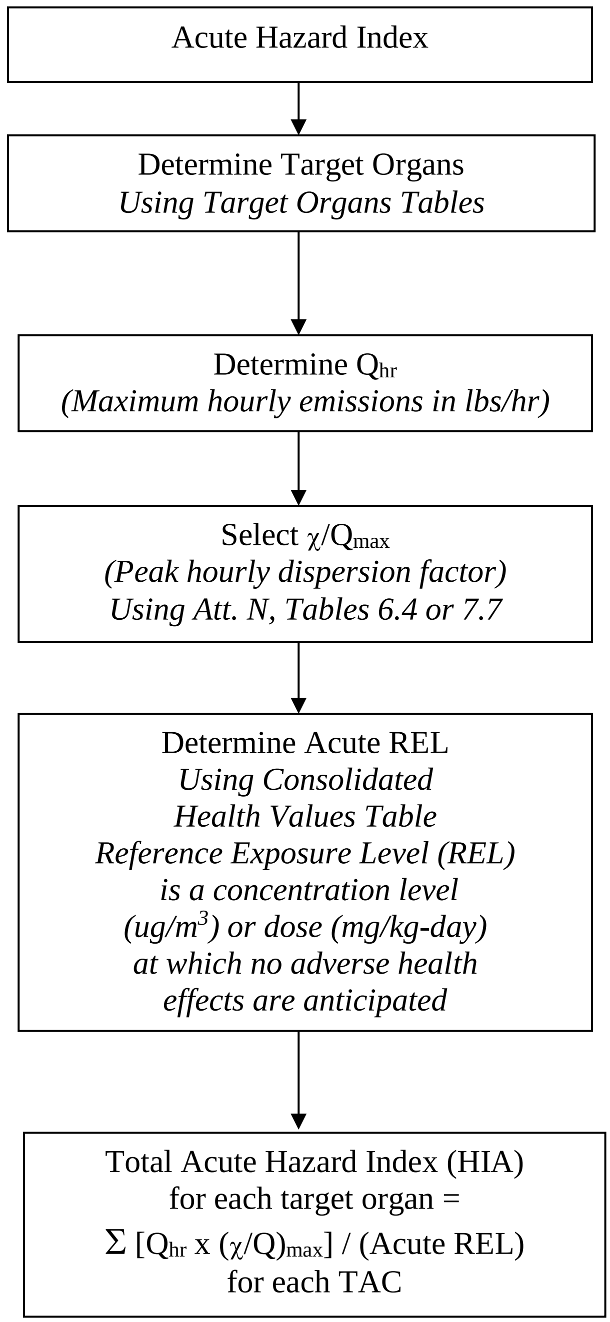


Figure 5
HIC and HIC8



Note that the Consolidated Health Values Table is available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf and the Target Organs Tables are available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

Figure 6
HIA



Note that the Consolidated Health Values Table is available on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf and the Target Organs Tables are available on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

APPENDIX V

RULE 1401 EXEMPTION PROVISIONS

Exemption Provisions

Rule 1401 (g)(1)(A): Permit Renewal or Change of Ownership

Any equipment which is in continuous operation, without modification or change in operating conditions, for which a new permit to operate is required solely because of permit renewal or change of ownership.

Rule 1401 (g)(1)(B): Modification with No Increase in Risk

A modification of a permit unit that causes a reduction or no increase in the cancer burden, MICR or acute or chronic HI at any receptor location.

Rule 1401 (g)(1)(C): Functionally Identical Replacement

A permit unit replacing a functionally identical permit unit, provided there is no increase in maximum rating or increase in emissions of any toxic air contaminants. For replacement of dry cleaning permit units only, provided there is no increase in any toxic air contaminants.

Rule 1401 (g)(1)(D): Equipment Previously Exempt Under Rule 219

Equipment which previously did not require a written permit pursuant to Rule 219 that is no longer exempt, provided that the equipment was installed prior to the Rule 219 amendment eliminating the exemption and a complete application for the permit is received within one (1) year after the Rule 219 amendment removing the exemption.

Rule 1401 (g)(1)(E): Modifications to Terminate Research Projects

Modifications restoring the previous permit conditions of a permit unit, provided that: the applicant demonstrates that the previous permit conditions were modified solely for the purpose of installing innovative control equipment as part of a demonstration or investigation designed to advance the state of the art with regard to controlling emissions of toxic air contaminants; the emission reductions achieved by the demonstration project are not used for permitting any equipment with emission increases under the contemporaneous emission reduction exemption as specified in paragraph (g)(2); the demonstration project is completed within two (2) years; and a complete application is submitted no later than two (2) years after the date of issuance of the permit which modified the conditions of the previous permit for the purpose of the demonstration or investigation.

Rule 1401 (g)(1)(F): Emergency Internal Combustion Engines

Emergency internal combustion engines that are exempted under Rule 1304.

Rule 1401 (g)(1)(G): Wood Product Stripping (Expired)

Wood product stripping permit units, provided that the risk increases due to emissions from the permit unit owned or operated by the applicant for which complete applications were submitted on or after July 10, 1998 will not exceed a MICR of 100 in one million (1.0 x 10^{-4}) or a total acute or chronic hazard index of five (5) at any receptor location. This exemption shall not apply to permit applications received after January 10, 2000, or sooner if the Executive Officer makes a determination that T-BACT is available to enable compliance with the requirements of paragraphs (d)(1), (d)(2) and (d)(3).

Rule 1401 (g)(1)(H): Gasoline Transfer and Dispensing Facilities (Expired)

For gasoline transfer and dispensing facilities, as defined in Rule 461 – Gasoline Transfer and Dispensing, the Executive Officer shall not, for the purposes of paragraphs (d)(1) through (d)(5), consider the risk contribution of methyl tert-butyl ether for any gasoline transfer and dispensing permit applications deemed complete on or before December 31, 2003. If the state of California extends the phase-out requirement for methyl tert-butyl ether as an oxygenate in gasoline, the limited time exemption shall be extended to that expiration date or December 31, 2004, whichever is sooner.

Rule 1401 (g)(2): Contemporaneous Risk Reduction

Simultaneous risk reduction such that an increase in MICR or HI from a equipment will be mitigated by a risk reduction from another equipment within 100 meters and the net impact on any receptor will be less than or equal to an increased MICR of 1 in 1 million or an HI of 1, provided that both applications for the increase and decrease are deemed complete together, the risk reduction occurs first, and the reduction is enforceable.

APPENDIX VI

AIR QUALITY DISPERSION MODELING METHODOLOGY AND METEOROLOGICAL STATIONS/DATA

Introduction

This appendix discusses the general modeling methodologies used in the development of the screening tables contained in SCAQMD's Risk Assessment Procedures for Rule 1401 and 212 (Version 8.1) and *Attachment N*. Information on the meteorological data used in the analyses and how the data was processed are also included in the discussion below. The meteorological data is available on SCAQMD's website[1] for use in Tier 4 health risk assessments.

Air Quality Dispersion Modeling Methodology

Air quality modeling was performed using the air quality dispersion model AERMOD. As of December 9, 2006, U.S. EPA promulgated AERMOD as a replacement for ISCST3 as the recommended dispersion model. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

Air quality dispersion modeling performed for the development of the screening tables in Attachment N used U.S. EPA's most recent approved version of AERMOD, which is version 16216r. AERMOD was executed using the urban option, which is SCAQMD policy for all permitting in its jurisdiction. The U.S. EPA regulatory non-default option of flat terrain was implemented and the SCAQMD's AERMOD-ready meteorological data was used. The County populations used are based on the 2010 estimates from the U.S. Census Bureau. The Los Angeles County population was 9,818,605; Orange County population was 3,010,232; Riverside County population was 2,189,641; and San Bernardino County population was 2,035,210.

For all modeling performed, a polar receptor grid was utilized with ten degree azimuth increments at the following downwind distances: 25, 50, 75, 100, 200, 300, 500, and 1,000 meters. The peak model-predicted impacts at each downwind distance over the 36 azimuth angles are used to develop the screening risk tables.

For all modeling that included building downwash effects as part of the analysis, the U.S. EPA's Building Profile Input Program for PRIME (BPIP-PRIME) version 04274 was used. BPIP-PRIME calculates downwash values that are used as input for models like AERMOD. The AERMOD modeling system (including all associated processors) is available on the U.S. EPA's website[2].

For more information regarding the modeling parameters and assumptions used to develop the screening tables for each specific category, please refer to the applicable appendix.

[1] SCAQMD's AERMOD-ready meteorological data is available for download here: http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod

[2] U.S. EPA's Support Center for Regulatory Atmospheric Modeling (SCRAM), AERMOD Modeling System. Available at: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod

Meteorological Stations

All modeling was performed using SCAQMD's meteorological data processed for AERMOD, as shown in Figure VI-1 below. The locations for each of the 24 stations are given in Table VI-1. It is SCAQMD's policy to continuously update the AERMOD-ready meteorological data every three years; therefore, applicants are advised to check for the most recent version of meteorological data available for use prior to starting any dispersion modeling projects.

The meteorological data used to produce the screening tables in Attachment N was processed with U.S. EPA's AERMET Version 16216. Raw meteorological data from SCAQMD's monitoring stations and the Automated Surface Observing System (ASOS)[3] stations were collected for the years of 2010 – 2016. Hourly wind and temperature data were collected from both SCAQMD and ASOS stations, while cloud cover and 1-minute wind data was only available from the ASOS stations. The ASOS 1-minute wind data was processed with U.S. EPA's processor AERMINUTE Version 15272 and included in AERMET for ASOS stations with the use of a wind speed threshold of 0.5 m/s, which is consistent with U.S. EPA's guidelines[4]. The ADJ_U* option was used in AERMET for all stations, as this is now a regulatory option in AERMOD. The ADJ_U* option adjusts the surface friction velocity parameter in the surface file to improve model performance for sources that have peak concentrations under low wind, stable atmospheric conditions[5].

Surface characteristics, such as albedo, Bowen ratio, and surface roughness, were determined from U.S. EPA's processor AERSURFACE Version 13016. Each station's Bowen ratio varies by year based on the year's precipitation total compared to the 30-year climatological average precipitation. This comparison resulted in a year being classified as Average, Dry, or Wet. For the period of 2010 – 2016, most years fell into the Dry category, with the exception of 2010 and 2016.

After the meteorological data was processed with AERMET, the data went through QA/QC to determine if it passed the U.S. EPA thresholds of less than ten percent missing data by quarter and less than 15 percent calm hours by quarter. The most recent five years of data meeting the QA/QC criteria were then determined for each station, with some stations being eliminated for use in dispersion modeling applications. A number of SCAQMD stations that had been available in the past were determined to no longer be useable for this update, due to not passing the U.S. EPA's QA/QC criteria, or the station being discontinued, or due to having a co-located ASOS station available. Additionally, the ASOS stations within the Basin were included to provide robust coverage for dispersion modeling purposes.

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[3] The ASOS program is a collaboration between the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). For more information on the ASOS program, please see http://www.nws.noaa.gov/asos/.

[4] See Section 8.4.6 of the U.S. EPA's Appendix W: Guidelines on Air Quality Models. May 22, 2017. https://www3.epa.gov/ttn/scram/appendix_w-2016.htm

[5] See Section IV.A.2 of the Revisions to the Guideline on Air Quality Models. May 22, 2017. https://www3.epa.gov/ttn/scram/appendix_w-2016.htm

Choosing a Meteorological Station for Modeling

The meteorological station that best represents the facility's meteorological conditions (such as prevailing winds), terrain, and surrounding land use should be used in all modeling analyses. This means that the closest meteorological station to the facility is not always the most representative meteorologically. The SCAQMD is broken up into 38 source/receptor areas (SRAs) as shown in Figure VI-1. If the prevailing meteorological conditions at the facility are similar to the meteorological station in the facility's SRA, then the SRA station can be used. All technical justification used in choosing the appropriate meteorological station for dispersion modeling and health risk assessment should be included in the report submitted with the analysis and all electronic modeling files. Please contact SCAQMD modeling staff for questions related to choosing the most appropriate meteorological station for your analysis.

Table VI-1: Locations of SCAQMD's AERMOD-Ready Meteorological Data and Corresponding Applicable SRA

Station Abbr.	Meteorological Station	Lat./Long. Coordinates		Elevation (m)	Source/Receptor Area (SRA)
		Latitude	Longitude		
AZUS	Azusa	34.1365	-117.9239	182	8, 9, 10
BNAP	Banning	33.9208	-116.8584	660	28, 29
CELA	Central L.A.	34.0664	-118.2267	87	1
ELSI	Lake Elsinore	33.6765	-117.3310	406	25, 26, 27
FONT	Fontana	34.1001	-117.4920	367	34
MSVJ	Mission Viejo	33.6300	-117.6756	170	19, 20, 21
PERI	Perris	33.7889	-117.2278	442	24, 27, 28
PICO	Pico Rivera	34.0103	-118.0686	58	5, 10, 11
RDLD	Redlands	34.0597	-117.1472	481	35, 38
UPLA	Upland	34.1036	-117.6292	379	32, 36
KBUR	Burbank Airport	34.1997	-118.3654	236	7, 8, 15
KCNO	Chino Airport.	33.9756	-117.6249	198	22, 33
KCQT	USC/Downtown L.A.	34.0236	-118.2912	55	1, 12
KFUL	Fullerton Airport	33.8715	-117.9856	29	16, 17
KHHR	Hawthorne Airport	33.9235	-118.3329	19	3, 12
KLAX	Los Angeles Int'l Airport	33.9382	-118.3866	30	3
KLGB	Long Beach Airport	33.8118	-118.1472	10	4, 18
KONT	Ontario Airport	34.0531	-117.5769	289	33
KPSP	Palm Springs Airport	33.8222	-116.5043	125	30, 31
KRAL	Riverside Airport	33.9528	-117.4352	245	22, 23
KSMO	Santa Monica Airport	34.0210	-118.4471	53	2
KSNA	John Wayne Int'l Airport	33.6798	-117.8675	17	17, 18, 20
KTRM	Desert Hot Springs Airport	33.6317	-116.1641	-36	27, 30, 31
KVNY	Van Nuys Airport	34.2123	-118.4915	235	6, 13, 15

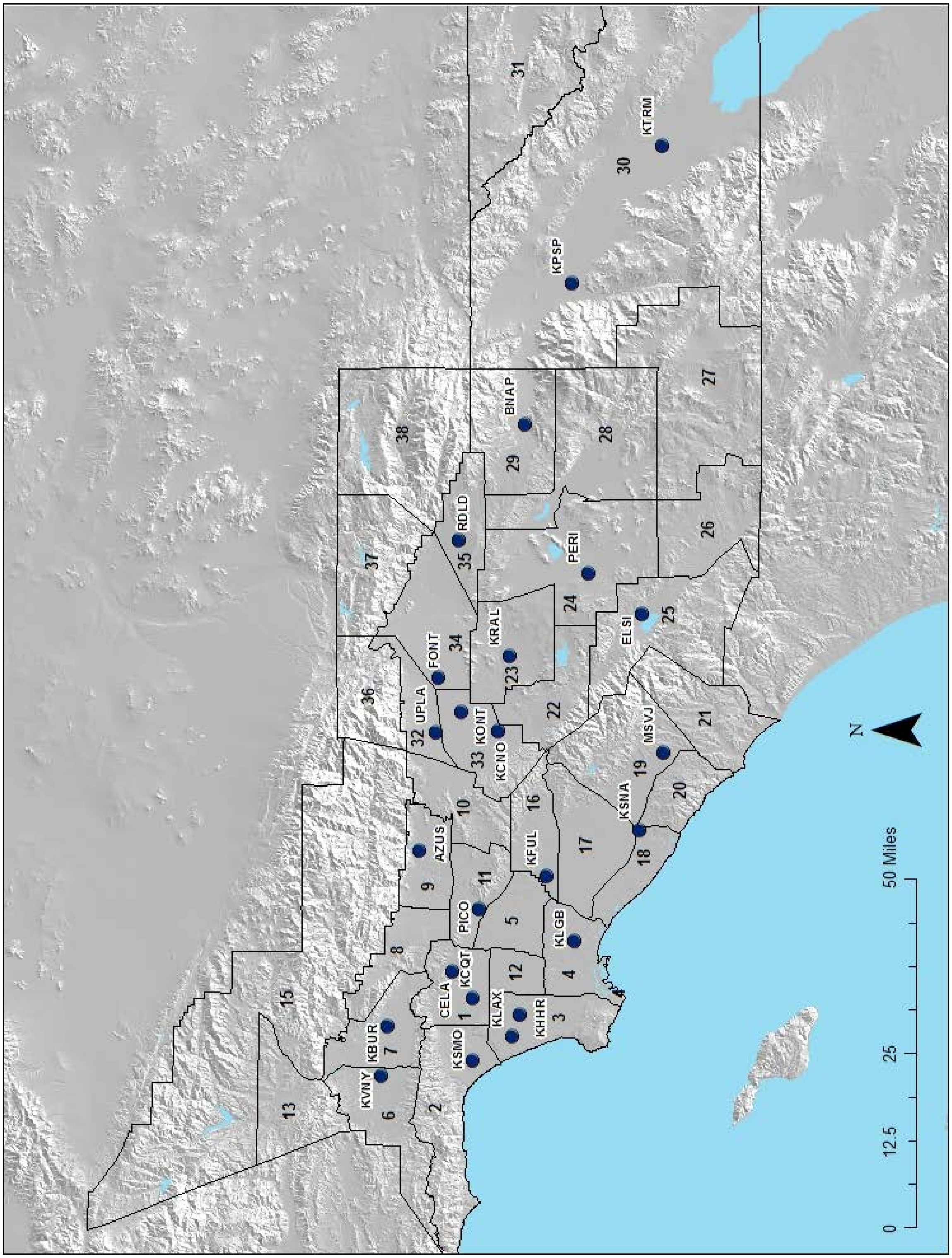

Figure VI-1: Meteorological Monitoring Stations and SRAs in the South Coast Air Basin

APPENDIX VII

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR NON-COMBUSTION SOURCES

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to estimate cancer risks from non-combustion sources. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD.

Emission Inventory Methods

In order to determine the appropriate emission rates to use, please contact the appropriate SCAQMD Engineering and Permitting staff (http://www.aqmd.gov/contact/permitting-staff) for more information.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

The non-combustion sources were modeled as either a point source or volume source. The point source was modeled as a stack using a constant ambient temperature at the release point (0 K in AERMOD), a 0.3 meter stack diameter and 10 m/s exit velocity with varying release heights. Consistent with the modeling prepared for SCAQMD's Risk Assessment Procedures (Version 8.0), building downwash effects were analyzed for point sources with a 20 meter by 30 meter building, 4 meters high. Table VII-1 shows the parameters used to model the point sources while Table VII-2 shows the parameters used for the volume sources. The source IDs are used to differentiate between the different parameters for each source configuration.

Table VII-1: Model Parameters for Point Sources

Source ID	**Stack Height**		**Stack Diameter**		**Stack Temperature**		**Stack Velocity**		**Flowrate**
	(ft)	**(m)**	**(in)**	**(m)**	**(^{0}F)**	**(K)**	**(ft/s)**	**(m/s)**	**(ft^3/min)**
P1	14	4.27	12	0.30	Ambient	0*	32.81	10	1,546.1
P2	25	7.62	12	0.30	Ambient	0*	32.81	10	1,546.1
P3	50	15.24	12	0.30	Ambient	0*	32.81	10	1,546.1

Note: * The temperature used in AERMOD was set to 0 K, which indicates that the ambient temperature was used in the model run.

Table VII-2: Model Parameters for Volume Sources

Source ID	Release Height		Lateral Dimension		Vertical Dimension		σ_y	σ_z
	(ft)	**(m)**	**(ft)**	**(m)**	**(ft)**	**(m)**	**(m)**	**(m)**
V1	7.50	2.29	38.73	11.80	15.00	4.57	2.75	2.13
V2	7.50	2.29	70.71	21.55	15.00	4.57	5.01	2.13
V3	15.00	4.57	70.71	21.55	30.00	9.14	5.01	4.25
V4	7.50	2.29	122.47	37.33	15.00	4.57	8.68	2.13
V5	15.00	4.57	122.47	37.33	30.00	9.14	8.68	4.25
V6	15.00	4.57	212.13	64.66	30.00	9.14	15.04	4.25

A sample AERMOD model input file is provided in Appendix XIII, Exhibit VII.

APPENDIX VIII

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR COMBUSTION SOURCES (NATURAL GAS BOILERS, NATURAL GAS INTERNAL COMBUSTION ENGINES, DIESEL INTERNAL COMBUSTION ENGINES)

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to estimate cancer risks from natural gas-fueled boilers, natural gas-fueled internal combustion engines (ICEs), and diesel-fueled ICEs. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD.

Emission Inventory Methods

In order to determine the appropriate/default emission rates to use for fuel combustion sources, please refer to "Supplemental Instructions, Reporting Procedures for AB2588 Facilities for Reporting their Quadrennial Air Toxics Emissions Inventory, Annual Emissions Reporting Program" (http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/supplemental-instructions-for-ab2588-facilities.pdf) for more information.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Combustion source stacks were modeled as a point source with the stack parameters presented in Table VIII-1. These parameters were based on the San Joaquin Valley Unified Air Pollution Control District's modeling parameters for combustion sources[22]. Consistent with the modeling prepared for SCAQMD's Risk Assessment Procedures for Rule 1401, building downwash effects were analyzed with a 20 meter by 30 meter building, 4 meters high.

[22] San Joaquin Valley Unified Air Pollution Control District, Final Draft Staff Report with Appendices for Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document, found at https://www.valleyair.org/busind/pto/staff-report-5-28-15.pdf, accessed on June 15, 2017

Table VIII-1: Model Parameters for Combustion Sources

Source ID	Release Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(in)	(m)	(^{0}F)	(K)	(ft/s)	(m/s)	(ft^3/min)
B1	29.53	9	1.46	0.4	332.3	440	16.40	5	11.5
B2	29.53	9	1.83	0.5	386.3	470	22.97	7	25.1
B3	29.53	9	2.01	0.55	386.3	470	29.53	9	39.1
B4	32.81	10	2.45	0.67	386.3	470	32.81	10	64.5
B5	32.81	10	2.63	0.72	431.3	495	39.37	12	89.4
B6	45.93	14	4.02	1.1	332.3	440	32.81	10	173.8
B7	52.49	16	5.49	1.5	314.3	430	39.37	12	387.8
N1	13.12	4	0.26	0.07	1070.3	850	131.23	40	2.8
N2	13.12	4	0.29	0.08	1070.3	850	213.25	65	6.0
N3	13.12	4	0.51	0.14	1142.3	890	180.45	55	15.5
N4	16.40	5	0.69	0.19	1016.3	820	196.85	60	31.1
N5	22.97	7	1.28	0.35	890.3	750	213.25	65	114.4
D1	9.84	3	0.33	0.09	908.3	760	213.25	65	7.6
D2	9.84	3	0.44	0.12	908.3	760	180.45	55	11.4
D3	9.84	3	0.48	0.13	908.3	760	262.47	80	19.4
D4	9.84	3	0.55	0.15	926.3	770	295.28	90	29.1
D5	13.12	4	0.62	0.17	980.3	800	524.93	160	66.4

A sample AERMOD model input file is provided in Appendix XIII, Exhibit VIII.

APPENDIX IX

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR CREMATORIUMS

Introduction

The purpose of this report is to document the methods used by SCAQMD staff to estimate cancer risks from the industry-wide source category of crematoriums. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD for crematoriums ONLY.

Emission Inventory Methods

For emission rates associated with crematoriums, please contact the appropriate SCAQMD Engineering and Permitting staff (http://www.aqmd.gov/contact/permitting-staff).

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Based on information from SCAQMD Engineering and Permitting staff, the model parameters for a standard crematorium is a 13 foot building with a single stack located six feet above the roof of the building. The stack was modeled as a point source with the following stack parameters – 19 feet stack height, 19.03 ft/s exit velocity, 1300ºF exit temperature. Due to the sensitivity to building downwash effects, there are three different square building sizes analyzed: 5,000, 10,000, and 15,000 ft^2.

Table IX-1: Model Parameters for Crematories

Source ID*	Release Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(in)	(m)	(^{0}F)	(K)	(ft/s)	(m/s)	(ft^3/min)
P1, P2, P3	19	5.79	20	0.508	1,300	977.59	19	5.8	2,490.9

*Same point source model parameters with three separate building sizes to account for differing building downwash effects.

A sample AERMOD model input file is provided in Appendix XIII, Exhibit IX.

APPENDIX X

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR GASOLINE TRANSFER AND DISPENSING FACILITIES

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to estimate cancer risks from retail gasoline dispensing facilities. The methods are consistent with SCAQMD's Risk Assessment Procedures (Version 8.1), which incorporates the 2015 OEHHA Guidelines. The methods used to estimate emissions, pollutant concentrations, and cancer risks are discussed here. Screening tables of maximum cancer risks at various locations in the Basin and at various residential and occupational distances are provided in Attachment N. This appendix concludes with an example calculation using the cancer risk tables.

Emission Inventory Methods

Rule 461 – Gasoline Transfer and Dispensing currently has annual throughput reporting requirements. It is designed to regulate gasoline vapor emissions from gasoline transfer and dispensing processes which contain volatile organic compounds and TACs such as benzene, ethylbenzene, toluene, xylenes, and naphthalene. The rule was initially adopted in 1976 and has been amended a number of times, most recently on March 7, 2008. Therefore, risk from these facilities can be calculated from the available information.

Emissions from gasoline transfer and dispensing mainly occur during loading, breathing, refueling, spillage, and hose permeation as described below:

Loading – Emissions occur when a fuel tanker truck unloads gasoline to the storage tanks. The storage tank vapors, displaced during loading, are emitted through its vent pipe. A pressure/vacuum valve installed on the tank vent pipe significantly reduces these emissions.

Breathing – Emissions occur through the storage tank vent pipe as a result of temperature and pressure changes in the tank vapor space.

Refueling – Emissions occur during motor vehicle refueling when gasoline vapors escape either through the vehicle/nozzle interface or the on-board vapor recovery (ORVR) system.

Spillage – Emissions occur from evaporating gasoline that spills during vehicle refueling.

Hose Permeation – Emissions occur when liquid gasoline or gasoline vapors diffuse through the dispensing hose outer surface to the atmosphere.

All retail service stations under SCAQMD jurisdiction have Phase I and II vapor recovery systems to control gasoline emissions. Phase I vapor recovery refers to the collection of gasoline vapors displaced from storage tanks when cargo tank trucks make gasoline deliveries. Phase II vapor recovery systems control the vapors displaced from the vehicle fuel tanks during refueling. In addition, all gasoline is stored underground with valves installed on the tank vent pipes to further control gasoline emissions. Out of the TACs emitted from the gasoline stations, only benzene, ethylbenzene, and naphthalene have cancer toxicity values.

The emission factors for each of the five processes are summarized in Table X-1. The factors given in the table follow CARB's 2013 Revised Controlled Gasoline Emission Factors except for Phase II Onboard Refueling Vapor Recovery (ORVR). SCAQMD staff has been in communication with CARB staff regarding the refueling emissions factor. Both agencies agree that additional time is needed to better understand emission reductions from Phase II EVR for ORVR vehicles. SCAQMD staff is recommending not to incorporate CARB's 2013 revised emission factor for Phase II refueling of ORVR vehicles, but to continue the use of SCAQMD's current emission factor of 0.32 lbs per 1,000 gallons for refueling. Staff is recommending the use of CARB's 2013 emission factors for all other categories (loading, breathing, spillage, and hose permeation). The SCAQMD staff is committed to continue working with CARB staff to refine the refueling emission estimates for Phase II controls with ORVR vehicles and will return to the Board with future revisions to refueling emission factors. It is important to note that for purposes of modeling, Phase II emissions are broken up into refueling and breathing for dispersion modeling purposes.

Table X-1. Gasoline Emission Factors for Retail Service Stations Process		**Loading**	**Breathing**	**Refueling**	**Hose Permeation**	**Spillage**
Controlled Gasoline EF (lbs/1,000 gal)		0.15	0.024	0.32	0.009	0.24
Benzene	**Weight Percent**	0.455%	0.455%	0.455%	0.455%	0.707%
	Emission Factor (lbs/1,000 gal)	0.000683	0.000109	0.00146	0.000041	0.0017
Ethylbenzene	**Weight Percent**	0.107%	0.107%	0.107%	0.107%	1.29%
	Emission Factor (lbs/1,000 gal)	0.000161	0.0000257	0.000342	0.00000963	0.0031
Naphthalene	**Weight Percent**	0.0004%	0.0004%	0.0004%	0.0004%	0.174%
	Emission Factor (lbs/1,000 gal)	0.0000006	0.000000096	0.00000128	0.000000036	0.000418

Note: *The weight percentages of the TACs evaluated for cancer risk are based on a weighted summer (214 days per year) and winter (151 days per year) gasoline speciation.
*Gasoline speciation profile: https://www.arb.ca.gov/ei/speciate/refspec.htm
*Actual modeling emission factors may vary due to rounding.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Emissions from gasoline service stations are non-buoyant and ground-based (or nearly ground-based). In addition, the peak impacts from this type of facility occur in close proximity to the source. Under these circumstances the local terrain is relatively unimportant; therefore flat terrain is assumed in the dispersion modeling.

The California Air Pollution Control Officers Association (CAPCOA) has developed industry-wide risk assessment guidelines for gasoline service stations[23] (1997 CAPCOA Guidelines) and has started the process to update these guidelines using the 2015 OEHHA Guidelines and SCAQMD staff is participating in that Working Group. The current industry-wide risk assessment guidance was approved in 1997. These risk assessment guidelines were developed to promote consistency throughout the State. However, CAPCOA recognized that many of the districts in the state have developed modeling methods and procedures unique to their situations. To address these differences among districts, CAPCOA allows for a district to deviate from the published guidelines as evidenced by the following statement in the industry-wide risk assessment guidelines for gas stations[23]:

> *This effort was initiated to provide a cost effective and uniform method for calculating gasoline station emission inventories and risk assessment for the thousands of gasoline stations throughout the State. However, districts may use other emission information and modeling procedures appropriate in their district.*

The modeling performed here follows the 1997 CAPCOA Guidelines unless otherwise noted.

Loading and breathing emissions exit the underground storage tank vent pipe and are thus treated as a point source. The height and diameter of the vent are assumed to be 3.66 meters (12 feet) and 0.05 meters (2 inches), respectively.

Refueling, spillage, and hose permeation emissions are modeled as volume sources with horizontal dimensions of 13 meters by 13 meters to correspond to the dimensions of the pump islands and a vertical dimension of 5 meters to correspond to the height of the canopy. For refueling and hose permeation, the release height is assumed to be 1 meter to approximate the height of a vehicle fuel tank inlet, whereas spillage emissions are assumed to be released at ground level since nearly all the gasoline from spillage reaches the ground. These dimensions match the 1997 CAPCOA Guidelines recommendations except for the vertical dimension of the volume source; CAPCOA recommends 4 meters. The SCAQMD has been requiring gas station risk assessments for permitting since early 1990s using a vertical dimension of the volume source corresponding to the pump island canopy top. Assuming a 5-meter vertical dimension continues this modeling practice.

According to the 1997 CAPCOA Guidelines, the effects of building downwash on the calculated cancer risk were determined by using three different scenarios with a 10 meter long by 5 meter wide, by 4 meter high building. The building downwash algorithms only affect point sources and do not affect volume or area sources. Results of the modeling indicated that the placement of the buildings and their subsequent potential to create downwash have very little effect on the resultant risks from the vent pipes. Thus, CAPCOA concluded that it is not necessary to include building downwash when determining the dispersion from the vent pipes when using ISCST3. In order to determine the effects of building downwash using AERMOD, a similar analysis was conducted by SCAQMD staff with the same building dimensions using the BPIP-PRIME computer program. The modeling results showed that building downwash caused the maximum ground level

[10] The 1997 CAPCOA AB2588 Gasoline Service Station Industrywide Risk Assessment Guidelines are available on the internet at: https://www.arb.ca.gov/ab2588/rrap-iwra/GasIWRA.pdf

concentrations to more than double. Therefore, building downwash has a significant effect on the maximum concentrations and subsequent cancer risk and thus, cannot be ignored.

The vent pipe, volume sources, and building are assumed to be located at the center of the service station property. Ideally, the locations of the vent pipes, pump islands, and buildings would be determined on a site by site basis. Unfortunately, that level of detail is not feasible for the development of screening tables due to the large number of facilities.

It is assumed that the gas station described above operates continuously throughout the year. Further, it is assumed that 80 percent of the daily emissions occur equally each hour from 6:00 a.m. to 8:00 p.m. and the remaining 20 percent of the daily emissions occur equally each hour from 8:00 p.m. to 6:00 a.m.

A sample AERMOD model input file for the generic retail service station described above is included in Appendix XIII, Exhibit X.

The peak model-predicted impacts at each downwind distance over the 36 azimuth angles are used to develop the screening cancer risk tables for gasoline service stations (see Attachment N, Tables 12.1A – 12.2B).

Cancer Risk Screening Tables

Based on a review of the 16 TACs emitted from gasoline, only three (benzene, ethylbenzene, and naphthalene) result in cancer effects and were analyzed for cancer risk. Cancer risk screening tables were developed for a generic retail gasoline service station. The modeled stations are assumed to have Phase I and II vapor recovery with cancer risk calculated for different locations; see Table X-1 for the control efficiencies and emission factors assumed for the modeling.

The following paragraphs describe how the cancer risks from a typical gasoline service station can be estimated from the screening tables as follows: First, determine which of the 24 meteorological site locations in these tables best represents the facility's meteorological conditions and location. The SCAQMD is broken up into 38 source/receptor areas (SRAs) as shown in Appendix VI, Figure VI-1. As shown in Appendix VI, Table VI-1, each of the 24 meteorological sites is assigned to the appropriate SRAs, which can then be used to choose the corresponding meteorological site for each gasoline dispensing facility.

Next, determine the distance from the service station to the nearest residential and off-site worker location. Tables 12.1 A – 12.2 B in Attachment N provide the maximum cancer risks for a gasoline dispensing station with either underground or aboveground storage tanks with a one million gallons per year throughput at various residential and off-site worker distances, respectively. Using the data from these tables and steps described above, determine the applicable cancer risks.

Lastly, multiply the cancer risks by the requested annual gasoline throughput of the service station. An example of a risk calculation is provided for a hypothetical gasoline service station on page X-8.

Results

Figure X-1 shows the TAC species apportionment in gasoline and Figure X-2 shows the source apportionment of the calculated cancer risks for underground storage tanks. Using the results from the Ontario Airport meteorological station and at a downwind distance of 25 meters, emissions from spillage account for 48.5 percent of the cancer risk, while benzene is the air toxics which drives the cancer risk, accounting for 84 percent. This is consistent with the discussion of the relative toxicity of substances in gasoline found in Appendix I of the 1997 CAPCOA Guidelines, which shows that benzene is the most important TAC driving the cancer risks at gasoline service stations.

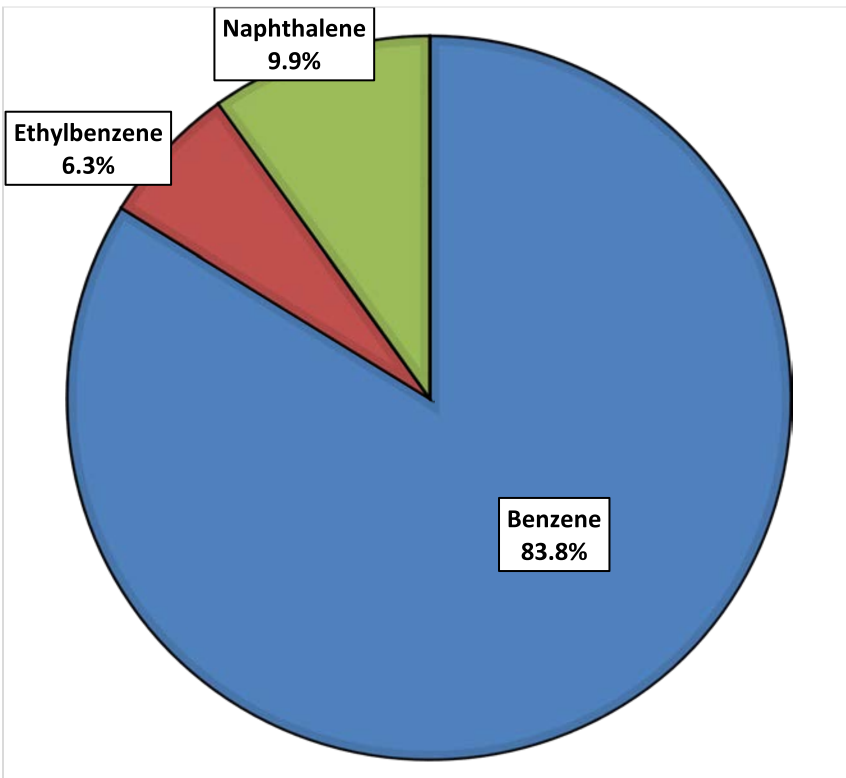

Figure X-1: Cancer Risk by Toxic Compound

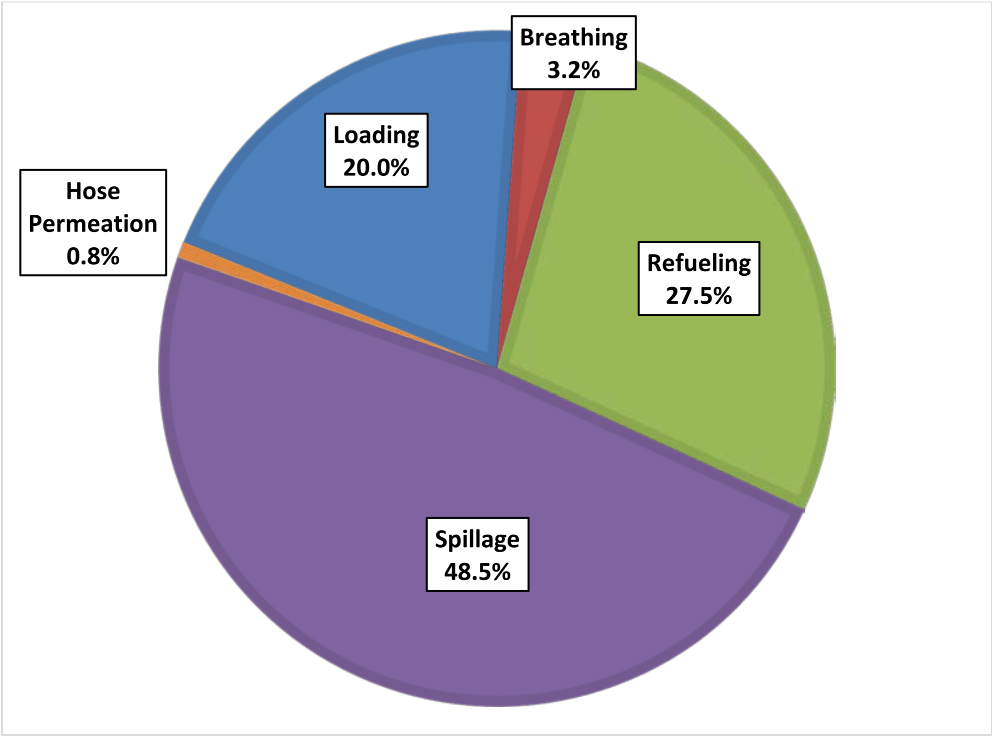

Figure X-2: Cancer Risk by Source

Sensitivity Analysis Regarding Non-Cancer Risks

A sensitivity analysis examining the chronic and acute non-cancer risks was prepared using CARB's speciation profile of 16 TACs in gasoline, the Ontario International Airport meteorological station, a receptor distance of 25 meters, and a throughput of one million gallons per year. The TACs included in CARB's speciation profile are n-butyl alcohol, benzene, isoprene, naphthalene, 2-methyl naphthalene, o-xylene, 1,2,4-trimethylbenzene, cumene, ethylbenzene, p-xylene, m-xylene, toluene, hexane, cyclohexane, propylene, and 2,2,4-trimethylpentane. As seen in Table X-2, the sensitivity analysis calculated the Hazard Index (HI) for each of the 16 TACs, which was then summed, regardless of target organ.

Table X-2: Sensitivity Analysis Results for Non-Cancer Risks

TACs	Chronic HI	Acute HI
Benzene	0.01996	0.02967
Ethylbenzene	0.000025909	0
Naphthalene	0.000654	0
Toluene	0.000925	0.000102
m-Xylene	0.0001846	0.00008009
o-Xylene	0.0001013	0.00004398
p-Xylene	0.0000774	0.00003357
Hexane	0.00002951	0
Propylene	0.0000000398	0
1,2,4-trimethylbenzene	0	0
2,2,4-trimethylpentane	0	0
2-methyl naphthalene	0	0
Cumene	0	0
Cyclohexane	0	0
Isoprene	0	0
n-Butyl Alcohol	0	0
Max Chronic HI	**0.01996**	**0.02967**
Million Gallons of Throughput to reach HI = 1.0	**50.09**	**33.7**

The results of the sensitivity analysis show that benzene is the driver for both the chronic and acute hazard indices, with risks from benzene being two orders of magnitude higher than the next highest TAC. Using CARB's speciation profile, seven of the 16 TACs did not have RELs associated with them. The maximum chronic HI was 0.02 and the maximum acute HI was 0.03 at a throughput of one million gallons of gasoline per year. The results demonstrate that for the maximum permitted risk of ten in a million, the acute and chronic HI are much lower (< 0.1) than the threshold of 1.0. Therefore, the chronic and acute non-cancer health effects do not need to be calculated, which is consistent with the 1997 CAPCOA Guidelines.

Example Calculation

The following example demonstrates how SCAQMD staff plans to estimate cancer risk values for retail gasoline dispensing facilities based on information received and using Attachment N, Tables 12.1 A – 12.2 B.

The calculation steps are as follows:

1. **Cancer Risk (CR):** Cancer risk values are estimated for each retail gasoline dispensing facility based on facility location, process information, and receptor proximity.
   a. *Residential CR:* Use the facility location and the distance to the nearest resident to identify the risk. The residential CRs for retail gasoline dispensing are contained in Attachment N, Tables 12.1A and 12.2A.
   b. *Off-Site Worker CR:* Use the facility location and the distance to the nearest worker to identify the risk. The off-site worker CRs for retail gasoline dispensing are contained in Table 12.1B and 12.2B.
   c. *Maximum Individual CR (MICR):* Select the greater CR between the residential and occupational CRs (as identified above).

Please note the following when calculating risk values for gasoline dispensing facilities:

- The gasoline dispensing risk tables (Attachment N, Tables 12.1 A – 12.2 B) are based on a gasoline throughput of one million (MM) gallons per year (gal/yr). The annual facility throughput should be multiplied by the values contained in the gasoline dispensing risk tables to calculate the appropriate facility risk.
- The SCAQMD maintains 24 meteorological stations that are processed for modeling purposes, as shown in Appendix VI, Figure VI-1 and Appendix VI, Table VI-1. The meteorological station that best represents the facility's meteorological conditions (such as prevailing winds), terrain, and surrounding land use should be used. This means that the closest meteorological station to the facility is not always the most representative meteorologically.
- The gasoline dispensing risk tables (Attachment N, Tables 12.1 A – 12.2 B) are based on discrete downwind distances. If the actual downwind distance is not listed in the tables, then linear interpolation between distance cells is acceptable.
- Although gasoline vapors and its TAC constituents (for example, benzene, toluene, and xylene) have non-cancer impacts, **the risks from retail gasoline dispensing facilities are dominated by cancer risk**. Therefore, the hazard index will not be calculated for inclusion in the gasoline dispensing risk tables.

Example: **A retail gasoline dispensing facility with an underground storage tank submits the following information with their application: 15 MM gal/yr gasoline requested throughput, located in Yorba Linda, nearest residential receptor 200 meters away, and nearest off-site worker receptor 25 meters away.**

In this example, the actual downwind distances match the distances found in the tables. However, when the actual downwind distances are not in the tables, then using linear interpolation to calculate between the distance cells is acceptable to obtain cancer risks for the actual downwind distances.

2. **Cancer Risk (CR):**

   a. *Residential CR:* According to Appendix VI, Table VI-1, Yorba Linda is located in SRA 16 and the appropriate meteorological station is in Fullerton (KFUL). Using Attachment N, Table 12.1 A for the Fullerton meteorological station, the residential cancer risk is 0.104 in one million (200 meters) for 1 MM gal/yr. Since the facility's requested gasoline throughput for this example is 15 MM gal/yr, the corresponding residential cancer risk is 1.56 in one million.

   $$\textbf{Residential CR} = \frac{0.104 \text{ in one million}}{(1 \text{ MM gal/yr})} \times 15 \text{ MM gal/yr}$$

Residential CR = 1.56 in one million

   b. *Worker CR:* According to Appendix VI, Table VI-1, Yorba Linda is located in SRA 16 and the appropriate meteorological station is in Fullerton (KFUL). Using Attachment N, Table 12.1 B, the occupational cancer risk is 0.225 in one million (25 meters) for 1 MM gal/yr. Since the facility's gasoline throughput for this example is 15 MM gal/yr, the corresponding occupational cancer risk is 3.38 in one million.

   $$\textbf{Occupational CR} = \frac{0.225 \text{ in one million}}{(1 \text{ MM gal/yr})} \times 15 \text{ MM gal/yr}$$

Occupational CR = 3.38 in one million

   c. *MICR:* The MICR for this retail gasoline facility is **3.38** in one million (occupational receptor).

APPENDIX XI

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR SPRAY BOOTHS

Introduction

The purpose of this appendix is to document the methods used by SCAQMD staff to develop the screening tables for spray booths. The methods are consistent with SCAQMD's risk assessment procedures for Rule 1401 and were used to update the Rule 1401 Tier 2 screening tables using AERMOD.

Emission Inventory Methods

In order to determine the appropriate emission rates to use, please contact the appropriate SCAQMD Engineering and Permitting staff (http://www.aqmd.gov/contact/permitting-staff) for more information.

Modeling Parameters

For the general dispersion modeling methodology and meteorological stations used in the development of the screening tables, please see Appendix VI.

Based on information from SCAQMD Engineering and Permitting staff, the model parameters were developed for two typical spray booth configurations, each with a single stack vent located 6 feet above the roof of a building. Each spray booth was modeled as a point source using the parameters shown in Table XI-1. Building downwash effects were analyzed, with a building size of 20 meters by 70 meters and a building height of 6 feet below each stack height.

Table XI-1: Model Parameters for Spray Booths

Source ID	Stack Height		Stack Diameter		Stack Temperature		Stack Velocity		Flowrate
	(ft)	(m)	(ft)	(m)	(^{0}F)	(K)	(ft/s)	(m/s)	(ft^3/min)
P1	16	4.88	2.83	0.864	Ambient	0*	26.43	8.05	10,000
P2	24	7.32	2.83	0.864	Ambient	0*	26.43	8.05	10,000

Note: * The temperature used in AERMOD was set to 0 K, which indicates that the ambient temperature was used in the model run.

A sample AERMOD model input file is provided in Appendix XIII, Exhibit XI.

APPENDIX XII

METHODOLOGY USED TO DEVELOP TIER 2 SCREENING TABLES FOR SHORT-TERM PROJECTS

Introduction

When performing a Tier 2 analysis for short-term projects (such as portable equipment, air pollution control equipment used for soil remediation projects, etc), the combined exposure factor and appropriate multi-pathway factor needs to be determined based on the duration of the project.

When conducting a Tier 2 analysis for short-term projects, you may also use the following equation using a **default exposure value (CEF):**

$$\mathbf{MICR_{(R,ST)} = CP \times Q_{tpy} \times \chi/Q \times CEF_{(R,ST)} \times MP_{(R,ST)} \times 10^{-6} \times MWAF}$$

$$\mathbf{MICR_{(W,ST)} = CP \times Q_{tpy} \times \chi/Q \times CEF_{(W,ST)} \times MP_{(W,ST)} \times WAF \times 10^{-6} \times MWAF}$$

Term	Description	Where to Find
Q_{tpy}	Maximum emission rate (tons/yr)	Emission estimate specific to permit unit
χ/Q	Concentration at a receptor distance / Emission Rate [(μg/m^3)/(tons/yr)]	Attachment N, Tables 6.1 A – 7.6 B
MWAF	Molecular Weight Adjustment Factor	Consolidated Health Values Table found at https://www.arb.ca.gov/toxics/healthval/contable.pdf
CP	Cancer Potency (mg/kg-day)$^{-1}$	
MP	Multi-Pathway Adjustment Factor (if applicable)	Attachment N, Table 3.1
CEF	Combined Exposure Factor	Attachment N, Tables 4.1 A – 4.2 D
WAF	Worker Adjustment Factor	Attachment N, Tables 5.1 and 5.2
10^{-6}	Micrograms to milligrams conversion, liters to cubic meters conversion	not applicable

Please note that SCAQMD Engineering and Permitting staff (http://www.aqmd.gov/contact/permitting-staff) should be consulted prior to the use of these exposure factors to determine if these factors are appropriate for the air quality permit application. Permit conditions limiting the duration of the use of equipment consistent with the analysis will be imposed, and information regarding the project duration will need to be well documented for the short-term projects.

Since these short-term calculations are only meant for projects with limits on the operating duration, these short-term cancer risk assessments can be thought of as being the equivalent to a 30-year cancer risk estimate and the appropriate thresholds would still apply (i.e. for a 5-year project, the maximum emissions during the 5-year period would be assessed on the more sensitive population, from the third trimester to age 5, after which the project's emissions would drop to 0 for the remaining 25 years to get the 30-year equivalent cancer risk estimate).

APPENDIX XIII

AERMOD INPUT FILES USED TO DEVELOP TIER 2 SCREENING TABLES

Exhibit VII - Sample AERMOD Input Files for Non-Combustion Sources

Non-Combustion Point Sources (P1, P2, P3)

```
CO STARTING
   TITLEONE R1401 Risk Assessment Procedures
   TITLETWO Continuous Operation
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   POLLUTID Any
   RUNORNOT RUN
   URBANOPT 9818605 LA
CO FINISHED
SO STARTING
   LOCATION P1 POINT     0.0    0.0    0.0
   LOCATION P2 POINT     0.0    0.0    0.0
   LOCATION P3 POINT     0.0    0.0    0.0
   SRCPARAM P1   2.88E-02    4.27    0      10.0       0.3
   SRCPARAM P2   2.88E-02    7.62    0      10.0       0.3
   SRCPARAM P3   2.88E-02   15.24    0      10.0       0.3
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P1    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDWID P1   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P1   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P1   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P1   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P1   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P1   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P1   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P1   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P1   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P1   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P1   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P1   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P1  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P1  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P1  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P1  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P1  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P1  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P1    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P2    4.00    4.00    4.00    4.00    4.00    4.00
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SO BUILDWID P2   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P2   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P2   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P2   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P2   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P2   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P2   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P2   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P2   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P2   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P2   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P2  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P2  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P2  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P2  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P2  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P2  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
```

```
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P2    0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDHGT P3    4.00    4.00    4.00    4.00    4.00    4.00
SO BUILDWID P3   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P3   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P3   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDWID P3   24.91   29.05   32.32   34.60   35.84   35.98
SO BUILDWID P3   35.03   33.02   30.00   33.02   35.03   35.98
SO BUILDWID P3   35.84   34.60   32.32   29.05   24.91   20.00
SO BUILDLEN P3   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P3   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P3   34.60   35.84   35.98   35.03   33.02   30.00
SO BUILDLEN P3   33.02   35.03   35.98   35.84   34.60   32.32
SO BUILDLEN P3   29.05   24.91   20.00   24.91   29.05   32.32
SO BUILDLEN P3   34.60   35.84   35.98   35.03   33.02   30.00
SO XBADJ    P3  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P3  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P3  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO XBADJ    P3  -16.51  -17.52  -17.99  -17.92  -17.30  -16.16
SO XBADJ    P3  -14.53  -12.45  -10.00  -12.45  -14.53  -16.16
SO XBADJ    P3  -17.30  -17.92  -17.99  -17.52  -16.51  -15.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    P3    0.00    0.00    0.00    0.00    0.00    0.00
   URBANSRC P1
   URBANSRC P2
   URBANSRC P3
   SRCGROUP  P1  P1
   SRCGROUP  P2  P2
   SRCGROUP  P3  P3
SO SRCGROUP  ALL
SO FINISHED
RE STARTING
   GRIDPOLR POL1 STA
              ORIG     0.0     0.0
              DIST  25 50 75 100 200 300 500 1000
              GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  1       P1  FIRST  BM1T1P1.TXT
   PLOTFILE  PERIOD  P1         BM1T2P1.TXT
   PLOTFILE  1       P2  FIRST  BM1T1P2.TXT
   PLOTFILE  PERIOD  P2         BM1T2P2.TXT
   PLOTFILE  1       P3  FIRST  BM1T1P3.TXT
   PLOTFILE  PERIOD  P3         BM1T2P3.TXT
OU FINISHED
```

Non-Combustion Volume Source (V1)

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures
   TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   URBANOPT 9818605 LA
   POLLUTID ANY
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION V1 VOLUME 0.0  0.0  0.0
```

```
   SRCPARAM V1       0.0288      2.29    2.75   2.13
   URBANSRC ALL
   SRCGROUP V1       V1
   SRCGROUP ALL
SO FINISHED
RE STARTING
   GRIDPOLR UPOL1 STA
                  ORIG 0.0 0.0
                  DIST 33  58  83  108  208  308  508  1008
                  GDIR 36 0.0 10.0
   GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 V1 1ST  BM1T1V1.TXT
   PLOTFILE PERIOD V1 BM1T2V1.TXT
OU FINISHED
```

Non-Combustion Volume Source (V2 and V3)

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures
   TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   URBANOPT 9818605 LA
   POLLUTID ANY
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION V2 VOLUME  0.0 0.0 0.0
   LOCATION V3 VOLUME  0.0 0.0 0.0
   SRCPARAM V2      0.0288     2.29    5.01    2.13
   SRCPARAM V3      0.0288     4.57    5.01    4.25
   URBANSRC ALL
   SRCGROUP V2       V2
   SRCGROUP V3       V3
   SRCGROUP ALL
SO FINISHED
 RE STARTING
   GRIDPOLR UPOL1 STA
                    ORIG 0.0 0.0
                    DIST 40  65  90  115  215  315  515  1015
                    GDIR 36 0.0 10.0
   GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 V2 1ST  BM1T1V2.TXT
   PLOTFILE 1 V3 1ST  BM1T1V3.TXT
   PLOTFILE PERIOD V2 BM1T2V2.TXT
   PLOTFILE PERIOD V3 BM1T2V3.TXT
OU FINISHED
```

Non-Combustion Volume Source (V4 and V5)

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures
   TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
```

```
   URBANOPT 9818605 LA
   POLLUTID ANY
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION V4 VOLUME  0.0 0.0 0.0
   LOCATION V5 VOLUME  0.0 0.0 0.0
   SRCPARAM V4      0.0288     2.20    8.68    2.13
   SRCPARAM V5      0.0288     4.57    8.68    4.25
   URBANSRC ALL
   SRCGROUP V4       V4
   SRCGROUP V5       V5
   SRCGROUP ALL
SO FINISHED
RE STARTING
   GRIDPOLR UPOL1 STA
                ORIG 0.0 0.0
                DIST 51  76  101  126  226  326  526  1026
                GDIR 36 0.0 10.0
   GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 V4 1ST  BM1T1V4.TXT
   PLOTFILE 1 V5 1ST  BM1T1V5.TXT
   PLOTFILE PERIOD V4 BM1T2V4.TXT
   PLOTFILE PERIOD V5 BM1T2V5.TXT
OU FINISHED
```

Non-Combustion Volume Source (V6)

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures
   TITLETWO 24 hrs/day; 7 days/week; 52 weeks/yr
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   URBANOPT 9818605 LA
   POLLUTID ANY
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION V6 VOLUME  0.0 0.0 0.0
   SRCPARAM V6       0.02885   4.57   15.04    4.25
   URBANSRC ALL
   SRCGROUP V6       V6
   SRCGROUP ALL
SO FINISHED
RE STARTING
   GRIDPOLR UPOL1 STA
                ORIG 0.00 0.00
                DIST 71  96  121  146  246  346  546  1046
                GDIR 36 0.00 10.00
   GRIDPOLR UPOL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 V6 1ST  BM1T1V6.TXT
   PLOTFILE PERIOD V6 BM1T2V6.TXT
OU FINISHED
```

Exhibit VIII - Sample AERMOD Input File for Combustion Sources

```
CO STARTING
   TITLEONE Combustion Screening Table
   TITLETWO Continuous Operation
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   POLLUTID Any
   RUNORNOT RUN
   URBANOPT 9818605 LA
CO FINISHED
SO STARTING
   LOCATION D1 POINT     0.0    0.0    0.0
   LOCATION D2 POINT     0.0    0.0    0.0
   LOCATION D3 POINT     0.0    0.0    0.0
   LOCATION D4 POINT     0.0    0.0    0.0
   LOCATION D5 POINT     0.0    0.0    0.0
   LOCATION N1 POINT     0.0    0.0    0.0
   LOCATION N2 POINT     0.0    0.0    0.0
   LOCATION N3 POINT     0.0    0.0    0.0
   LOCATION N4 POINT     0.0    0.0    0.0
   LOCATION N5 POINT     0.0    0.0    0.0
   LOCATION B1 POINT     0.0    0.0    0.0
   LOCATION B2 POINT     0.0    0.0    0.0
   LOCATION B3 POINT     0.0    0.0    0.0
   LOCATION B4 POINT     0.0    0.0    0.0
   LOCATION B5 POINT     0.0    0.0    0.0
   LOCATION B6 POINT     0.0    0.0    0.0
   LOCATION B7 POINT     0.0    0.0    0.0
   SRCPARAM D1   2.88E-02     3.0     760     65.0      0.09
   SRCPARAM D2   2.88E-02     3.0     760     55.0      0.12
   SRCPARAM D3   2.88E-02     3.0     760     80.0      0.13
   SRCPARAM D4   2.88E-02     3.0     770     90.0      0.15
   SRCPARAM D5   2.88E-02     4.0     800    160.0      0.17
   SRCPARAM N1   2.88E-02     4.0     850     40.0      0.07
   SRCPARAM N2   2.88E-02     4.0     850     65.0      0.08
   SRCPARAM N3   2.88E-02     4.0     890     55.0      0.14
   SRCPARAM N4   2.88E-02     5.0     820     60.0      0.19
   SRCPARAM N5   2.88E-02     7.0     750     65.0      0.35
   SRCPARAM B1   2.88E-02     9.0     440      5.0      0.40
   SRCPARAM B2   2.88E-02     9.0     470      7.0      0.50
   SRCPARAM B3   2.88E-02     9.0     470     9.0      0.55
   SRCPARAM B4   2.88E-02    10.0     470    10.0      0.67
   SRCPARAM B5   2.88E-02    10.0     495    12.0      0.72
   SRCPARAM B6   2.88E-02    14.0     440    10.0      1.10
   SRCPARAM B7   2.88E-02    16.0     430    12.0      1.50
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D1              4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID D1             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D1             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D1             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID D1             24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D1             35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D1             35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN D1             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D1             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D1             34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN D1             33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D1             29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D1             34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    D1            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D1            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D1            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    D1            -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D1            -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D1            -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D1              0.00     0.00     0.00     0.00     0.00     0.00
```

```
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D2            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID D2           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D2           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D2           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID D2           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D2           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D2           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN D2           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D2           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D2           34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN D2           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D2           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D2           34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    D2          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D2          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D2          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    D2          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D2          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D2          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D2            0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D3            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID D3           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D3           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D3           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID D3           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D3           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D3           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN D3           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D3           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D3           34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN D3           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D3           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D3           34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    D3          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D3          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D3          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    D3          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    D3          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    D3          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    D3            0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT D4            4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID D4           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D4           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D4           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID D4           24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID D4           35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID D4           35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN D4           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D4           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D4           34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN D4           33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN D4           29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN D4           34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    D4          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
```

```
XBADJ    D4          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D4          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D4          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D4          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D4          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D4            0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT D5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID D5           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D5           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D5           35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID D5           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID D5           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID D5           35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN D5           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D5           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D5           34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN D5           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN D5           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN D5           34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    D5          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D5          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D5          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    D5          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    D5          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    D5          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    D5            0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N1            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N1           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N1           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N1           35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N1           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N1           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N1           35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N1           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N1           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N1           34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N1           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N1           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N1           34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N1          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N1          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N1          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N1          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N1          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N1          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N1            0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N2            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N2           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N2           35.03    33.02    30.00    33.02    35.03    35.98
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BUILDWID N2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N2          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N2          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N2          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N2          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N2          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N2          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N2          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N2           0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N3           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N3          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N3          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N3          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N3          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N3          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N3          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N3          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N3           0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT N4           4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID N4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID N4          24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID N4          35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID N4          35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN N4          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N4          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N4          34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN N4          33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN N4          29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN N4          34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    N4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N4         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N4         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    N4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    N4         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    N4         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    N4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N4           0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    N4           0.00     0.00     0.00     0.00     0.00     0.00
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YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N4	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	N5	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	N5	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	N5	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	N5	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	N5	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	N5	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	N5	35.84	34.60	32.32	29.05	24.91	20.00
BUILDLEN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	N5	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLEN	N5	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	N5	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	N5	34.60	35.84	35.98	35.03	33.02	30.00
XBADJ	N5	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	N5	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	N5	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
XBADJ	N5	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	N5	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	N5	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	N5	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B1	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	B1	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B1	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B1	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	B1	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B1	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B1	35.84	34.60	32.32	29.05	24.91	20.00
BUILDLEN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	B1	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLEN	B1	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	B1	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	B1	34.60	35.84	35.98	35.03	33.02	30.00
XBADJ	B1	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	B1	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	B1	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
XBADJ	B1	-16.51	-17.52	-17.99	-17.92	-17.30	-16.16
XBADJ	B1	-14.53	-12.45	-10.00	-12.45	-14.53	-16.16
XBADJ	B1	-17.30	-17.92	-17.99	-17.52	-16.51	-15.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
YBADJ	B1	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDHGT	B2	4.00	4.00	4.00	4.00	4.00	4.00
BUILDWID	B2	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B2	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B2	35.84	34.60	32.32	29.05	24.91	20.00
BUILDWID	B2	24.91	29.05	32.32	34.60	35.84	35.98
BUILDWID	B2	35.03	33.02	30.00	33.02	35.03	35.98
BUILDWID	B2	35.84	34.60	32.32	29.05	24.91	20.00
BUILDLEN	B2	33.02	35.03	35.98	35.84	34.60	32.32
BUILDLEN	B2	29.05	24.91	20.00	24.91	29.05	32.32
BUILDLEN	B2	34.60	35.84	35.98	35.03	33.02	30.00
BUILDLEN	B2	33.02	35.03	35.98	35.84	34.60	32.32

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   BUILDLEN B2          29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B2          34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B2         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B2         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B2         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B2           0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B3           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID B3          24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B3          35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B3          35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID B3          24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B3          35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B3          35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN B3          33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B3          29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B3          34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN B3          33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B3          29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B3          34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B3         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B3         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B3         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B3           0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B4           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDWID B4          24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B4          35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B4          35.84    34.60    32.32    29.05    24.91    20.00
   BUILDWID B4          24.91    29.05    32.32    34.60    35.84    35.98
   BUILDWID B4          35.03    33.02    30.00    33.02    35.03    35.98
   BUILDWID B4          35.84    34.60    32.32    29.05    24.91    20.00
   BUILDLEN B4          33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B4          29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B4          34.60    35.84    35.98    35.03    33.02    30.00
   BUILDLEN B4          33.02    35.03    35.98    35.84    34.60    32.32
   BUILDLEN B4          29.05    24.91    20.00    24.91    29.05    32.32
   BUILDLEN B4          34.60    35.84    35.98    35.03    33.02    30.00
   XBADJ    B4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B4         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B4         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   XBADJ    B4         -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
   XBADJ    B4         -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
   XBADJ    B4         -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B4           0.00     0.00     0.00     0.00     0.00     0.00
   BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT B5           4.00     4.00     4.00     4.00     4.00     4.00
```

```
BUILDHGT B5            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B5           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B5           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B5           35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B5           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B5           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B5           35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B5           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B5           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B5           34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B5           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B5           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B5           34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    B5          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B5          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B5          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    B5          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B5          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B5          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B5            0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B6            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B6           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B6           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B6           35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B6           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B6           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B6           35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B6           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B6           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B6           34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B6           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B6           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B6           34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    B6          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B6          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B6          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    B6          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B6          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B6          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    B6            0.00     0.00     0.00     0.00     0.00     0.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT B7            4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID B7           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B7           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B7           35.84    34.60    32.32    29.05    24.91    20.00
BUILDWID B7           24.91    29.05    32.32    34.60    35.84    35.98
BUILDWID B7           35.03    33.02    30.00    33.02    35.03    35.98
BUILDWID B7           35.84    34.60    32.32    29.05    24.91    20.00
BUILDLEN B7           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B7           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B7           34.60    35.84    35.98    35.03    33.02    30.00
BUILDLEN B7           33.02    35.03    35.98    35.84    34.60    32.32
BUILDLEN B7           29.05    24.91    20.00    24.91    29.05    32.32
BUILDLEN B7           34.60    35.84    35.98    35.03    33.02    30.00
XBADJ    B7          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B7          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B7          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
XBADJ    B7          -16.51   -17.52   -17.99   -17.92   -17.30   -16.16
XBADJ    B7          -14.53   -12.45   -10.00   -12.45   -14.53   -16.16
XBADJ    B7          -17.30   -17.92   -17.99   -17.52   -16.51   -15.00
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   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    B7             0.00     0.00     0.00     0.00     0.00     0.00
   URBANSRC D1
   URBANSRC D2
   URBANSRC D3
   URBANSRC D4
   URBANSRC D5
   URBANSRC N1
   URBANSRC N2
   URBANSRC N3
   URBANSRC N4
   URBANSRC N5
   URBANSRC B1
   URBANSRC B2
   URBANSRC B3
   URBANSRC B4
   URBANSRC B5
   URBANSRC B6
   URBANSRC B7
   SRCGROUP  D1  D1
   SRCGROUP  D2  D2
   SRCGROUP  D3  D3
   SRCGROUP  D4  D4
   SRCGROUP  D5  D5
   SRCGROUP  N1  N1
   SRCGROUP  N2  N2
   SRCGROUP  N3  N3
   SRCGROUP  N4  N4
   SRCGROUP  N5  N5
   SRCGROUP  B1  B1
   SRCGROUP  B2  B2
   SRCGROUP  B3  B3
   SRCGROUP  B4  B4
   SRCGROUP  B5  B5
   SRCGROUP  B6  B6
   SRCGROUP  B7  B7
SO FINISHED
RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST  25 50 75 100 200 300 500 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  1       D1  FIRST  BM1T1D1.TXT
   PLOTFILE  PERIOD  D1         BM1T2D1.TXT
   PLOTFILE  1       D2  FIRST  BM1T1D2.TXT
   PLOTFILE  PERIOD  D2         BM1T2D2.TXT
   PLOTFILE  1       D3  FIRST  BM1T1D3.TXT
   PLOTFILE  PERIOD  D3         BM1T2D3.TXT
   PLOTFILE  1       D4  FIRST  BM1T1D4.TXT
   PLOTFILE  PERIOD  D4         BM1T2D4.TXT
   PLOTFILE  1       D5  FIRST  BM1T1D5.TXT
   PLOTFILE  PERIOD  D5         BM1T2D5.TXT
   PLOTFILE  1       N1  FIRST  BM1T1N1.TXT
   PLOTFILE  PERIOD  N1         BM1T2N1.TXT
   PLOTFILE  1       N2  FIRST  BM1T1N2.TXT
   PLOTFILE  PERIOD  N2         BM1T2N2.TXT
   PLOTFILE  1       N3  FIRST  BM1T1N3.TXT
   PLOTFILE  PERIOD  N3         BM1T2N3.TXT
   PLOTFILE  1       N4  FIRST  BM1T1N4.TXT
   PLOTFILE  PERIOD  N4         BM1T2N4.TXT
   PLOTFILE  1       N5  FIRST  BM1T1N5.TXT
   PLOTFILE  PERIOD  N5         BM1T2N5.TXT
   PLOTFILE  1       B1  FIRST  BM1T1B1.TXT
```

```
   PLOTFILE  PERIOD  B1         BM1T2B1.TXT
   PLOTFILE  1       B2  FIRST  BM1T1B2.TXT
   PLOTFILE  PERIOD  B2         BM1T2B2.TXT
   PLOTFILE  1       B3  FIRST  BM1T1B3.TXT
   PLOTFILE  PERIOD  B3         BM1T2B3.TXT
   PLOTFILE  1       B4  FIRST  BM1T1B4.TXT
   PLOTFILE  PERIOD  B4         BM1T2B4.TXT
   PLOTFILE  1       B5  FIRST  BM1T1B5.TXT
   PLOTFILE  PERIOD  B5         BM1T2B5.TXT
   PLOTFILE  1       B6  FIRST  BM1T1B6.TXT
   PLOTFILE  PERIOD  B6         BM1T2B6.TXT
   PLOTFILE  1       B7  FIRST  BM1T1B7.TXT
   PLOTFILE  PERIOD  B7         BM1T2B7.TXT
OU FINISHED
```

Exhibit IX - Sample AERMOD Input File for Crematories

```
CO STARTING
   TITLEONE Modeling for R1401 Risk Assessment Procedures
   TITLETWO Crematory - Continuous Operation
   MODELOPT CONC FLAT
   AVERTIME 1   PERIOD
   URBANOPT 9818605 LA
   POLLUTID Any
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION P1 POINT     0.0    0.0    0.0
   LOCATION P2 POINT     0.0    0.0    0.0
   LOCATION P3 POINT     0.0    0.0    0.0
   SRCPARAM P1   2.885E-02   5.791  977.59    5.8      0.508
   SRCPARAM P2   2.885E-02   5.791  977.59    5.8      0.508
   SRCPARAM P3   2.885E-02   5.791  977.59    5.8      0.508
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P1    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDWID P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDWID P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDWID P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDWID P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDWID P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDLEN P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDLEN P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDLEN P1   30.36    30.36    29.44    27.62    24.97    21.55
SO BUILDLEN P1   24.97    27.62    29.44    30.36    30.36    29.44
SO BUILDLEN P1   27.62    24.97    21.55    24.97    27.62    29.44
SO BUILDLEN P1   30.36    30.36    29.44    27.62    24.97    21.55
SO XBADJ    P1  -12.48   -13.81   -14.72   -15.18   -15.18   -14.72
SO XBADJ    P1  -13.81   -12.48   -10.78   -12.48   -13.81   -14.72
SO XBADJ    P1  -15.18   -15.18   -14.72   -13.81   -12.48   -10.78
SO XBADJ    P1  -12.48   -13.81   -14.72   -15.18   -15.18   -14.72
SO XBADJ    P1  -13.81   -12.48   -10.78   -12.48   -13.81   -14.72
SO XBADJ    P1  -15.18   -15.18   -14.72   -13.81   -12.48   -10.78
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P1    0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P2    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDWID P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDWID P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDWID P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDWID P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDWID P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDLEN P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDLEN P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDLEN P2   42.94    42.94    41.64    39.07    35.31    30.48
SO BUILDLEN P2   35.31    39.07    41.64    42.94    42.94    41.64
SO BUILDLEN P2   39.07    35.31    30.48    35.31    39.07    41.64
SO BUILDLEN P2   42.94    42.94    41.64    39.07    35.31    30.48
SO XBADJ    P2  -17.65   -19.53   -20.82   -21.47   -21.47   -20.82
SO XBADJ    P2  -19.53   -17.65   -15.24   -17.65   -19.53   -20.82
SO XBADJ    P2  -21.47   -21.47   -20.82   -19.53   -17.65   -15.24
SO XBADJ    P2  -17.65   -19.53   -20.82   -21.47   -21.47   -20.82
SO XBADJ    P2  -19.53   -17.65   -15.24   -17.65   -19.53   -20.82
SO XBADJ    P2  -21.47   -21.47   -20.82   -19.53   -17.65   -15.24
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
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SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P2    0.00     0.00     0.00     0.00     0.00     0.00
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDHGT P3    3.96     3.96     3.96     3.96     3.96     3.96
SO BUILDWID P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDWID P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDWID P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDWID P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDWID P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDWID P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDLEN P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDLEN P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDLEN P3   52.59    52.59    50.99    47.85    43.25    37.33
SO BUILDLEN P3   43.25    47.85    50.99    52.59    52.59    50.99
SO BUILDLEN P3   47.85    43.25    37.33    43.25    47.85    50.99
SO BUILDLEN P3   52.59    52.59    50.99    47.85    43.25    37.33
SO XBADJ    P3  -21.62   -23.92   -25.50   -26.30   -26.30   -25.50
SO XBADJ    P3  -23.92   -21.62   -18.67   -21.62   -23.92   -25.50
SO XBADJ    P3  -26.30   -26.30   -25.50   -23.92   -21.62   -18.67
SO XBADJ    P3  -21.62   -23.92   -25.50   -26.30   -26.30   -25.50
SO XBADJ    P3  -23.92   -21.62   -18.67   -21.62   -23.92   -25.50
SO XBADJ    P3  -26.30   -26.30   -25.50   -23.92   -21.62   -18.67
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
SO YBADJ    P3    0.00     0.00     0.00     0.00     0.00     0.00
   URBANSRC P1
   URBANSRC P2
   URBANSRC P3
   SRCGROUP  P1  P1
   SRCGROUP  P2  P2
   SRCGROUP  P3  P3
SO SRCGROUP  ALL
SO FINISHED
RE STARTING
   GRIDPOLR POL1 STA
                 ORIG     0.0     0.0
                 DIST  25 50 75 100 200 300 500 1000
                 GDIR     36     10.0     10.0
   GRIDPOLR POL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0    2010
   UAIRDATA 3190 2010
   PROFBASE 0    METERS
ME FINISHED
OU STARTING
   RECTABLE  1       FIRST
   RECTABLE  ALLAVE  FIRST
   PLOTFILE  1       P1  FIRST  BM1T1P1.TXT
   PLOTFILE  PERIOD  P1         BM1T2P1.TXT
   PLOTFILE  1       P2  FIRST  BM1T1P2.TXT
   PLOTFILE  PERIOD  P2         BM1T2P2.TXT
   PLOTFILE  1       P3  FIRST  BM1T1P3.TXT
   PLOTFILE  PERIOD  P3         BM1T2P3.TXT
OU FINISHED
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Exhibit X - Sample AERMOD Input Files for Gasoline Transfer and Dispensing Facilities (Underground Storage Tanks and Aboveground Storage Tanks)

```
Underground Gasoline Tank

CO STARTING
   TITLEONE SCAQMD R461 SCREEN TABLE PREPARATION
   TITLETWO Template - Underground, 10mX5mX4m building in middle
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   URBANOPT 9818605 LA
   POLLUTID ANY
   RUNORNOT RUN
CO FINISHED
SO STARTING
   LOCATION P1      POINT   0.0  0.0  0.0
   LOCATION P3      POINT   0.0  0.0  0.0
   LOCATION P5      POINT   0.0  0.0  0.0
   LOCATION P2      POINT   0.0  0.0  0.0
   LOCATION P4      POINT   0.0  0.0  0.0
   LOCATION P6      POINT   0.0  0.0  0.0
   LOCATION V1      VOLUME  0.0  0.0  0.0
   LOCATION V4      VOLUME  0.0  0.0  0.0
   LOCATION V7      VOLUME  0.0  0.0  0.0
   LOCATION V2      VOLUME  0.0  0.0  0.0
   LOCATION V5      VOLUME  0.0  0.0  0.0
   LOCATION V8      VOLUME  0.0  0.0  0.0
   LOCATION V3      VOLUME  0.0  0.0  0.0
   LOCATION V6      VOLUME  0.0  0.0  0.0
   LOCATION V9      VOLUME  0.0  0.0  0.0
   SRCPARAM P1      9.84E-06    3.66   291.5   0.00063    0.051
   SRCPARAM P2      1.57E-06    3.66   288.7   0.00010    0.051
   SRCPARAM P3      2.30E-06    3.66   291.5   0.00063    0.051
   SRCPARAM P4      3.68E-07    3.66   288.7   0.00010    0.051
   SRCPARAM P5      9.56E-09    3.66   291.5   0.00063    0.051
   SRCPARAM P6      1.53E-09    3.66   288.7   0.00010    0.051
   SRCPARAM V1      2.10E-05    1.0     3.02    2.33
   SRCPARAM V2      2.44E-05    0.0     3.02    2.33
   SRCPARAM V3      5.90E-07    1.0     3.02    2.33
   SRCPARAM V4      4.91E-06    1.0     3.02    2.33
   SRCPARAM V5      4.44E-05    0.0     3.02    2.33
   SRCPARAM V6      1.38E-07    1.0     3.02    2.33
   SRCPARAM V7      2.04E-08    1.0     3.02    2.33
   SRCPARAM V8      6.00E-06    0.0     3.02    2.33
   SRCPARAM V9      5.74E-10    1.0     3.02    2.33
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P5      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
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BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
BUILDHGT P6      4.00     4.00     4.00     4.00     4.00     4.00
BUILDWID P1      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P1     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P1     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P1      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P1     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P1     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P2      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P2     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P2     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P2      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P2     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P2     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P3      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P3     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P3     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P3      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P3     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P3     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P4      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P4     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P4     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P4      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P4     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P4     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P5      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P5     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P5     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P5      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P5     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P5     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P6      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P6     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P6     10.87    10.26     9.33     8.12     6.66     5.00
BUILDWID P6      6.66     8.12     9.33    10.26    10.87    11.16
BUILDWID P6     11.11    10.72    10.00    10.72    11.11    11.16
BUILDWID P6     10.87    10.26     9.33     8.12     6.66     5.00
BUILDLEN P1     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P1      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P1     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P1     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P1      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P1     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P2     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P2      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P2     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P2     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P2      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P2     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P3     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P3      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P3     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P3     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P3      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P3     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P4     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P4      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P4     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P4     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P4      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P4     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P5     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P5      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P5     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P5     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P5      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P5     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P6     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P6      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P6     10.26    10.87    11.16    11.11    10.72    10.00
BUILDLEN P6     10.72    11.11    11.16    10.87    10.26     9.33
BUILDLEN P6      8.12     6.66     5.00     6.66     8.12     9.33
BUILDLEN P6     10.26    10.87    11.16    11.11    10.72    10.00
XBADJ    P1     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
XBADJ    P1     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
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   XBADJ    P1     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P1     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P1     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P1     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P2     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P2     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P2     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P2     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P2     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P2     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P3     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P3     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P3     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P3     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P3     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P3     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P4     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P4     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P4     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P4     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P4     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P4     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P5     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P5     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P5     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P5     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P5     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P5     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P6     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P6     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P6     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P6     -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P6     -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P6     -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
   URBANSRC P1
   URBANSRC P2
   URBANSRC P3
   URBANSRC P4
   URBANSRC P5
   URBANSRC P6
   URBANSRC V1
   URBANSRC V2
   URBANSRC V3
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   URBANSRC V4
   URBANSRC V5
   URBANSRC V6
   URBANSRC V7
   URBANSRC V8
   URBANSRC V9
   EMISFACT P1     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P1     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT P2     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P2     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT P3     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P3     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT P4     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P4     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT P5     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P5     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT P6     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT P6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT P6     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V1     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V1     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V2     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V2     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V3     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V3     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V4     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V4     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V5     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V5     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V6     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V6     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V7     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V7     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V7     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V7     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V8     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V8     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V8     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V8     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   EMISFACT V9     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
   EMISFACT V9     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V9     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
   EMISFACT V9     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
   SRCGROUP BE     P1  P2  V1  V2  V3
   SRCGROUP EB     P3  P4  V4  V5  V6
   SRCGROUP NA     P5  P6  V7  V8  V9
SO FINISHED
RE STARTING
   GRIDPOLR POL1 STA
                  ORIG 0.0 0.0
                  DIST 34  59  84  109  209  309  509  1009
                  GDIR 36 10.0 10.0
   GRIDPOLR POL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
```

```
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 BE 1ST  UM1T1BE.TXT
   PLOTFILE 1 EB 1ST  UM1T1EB.TXT
   PLOTFILE 1 NA 1ST  UM1T1NA.TXT
   PLOTFILE PERIOD BE UM1T2BE.TXT
   PLOTFILE PERIOD EB UM1T2EB.TXT
   PLOTFILE PERIOD NA UM1T2NA.TXT
OU FINISHED
```

Aboveground Gasoline Tank

```
CO STARTING
   TITLEONE SCAQMD R461 SCREEN TABLE PREPARATION
   TITLETWO Template - Aboveground, 10mX5mX4m building in middle
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   POLLUTID ANY
   RUNORNOT RUN
   URBANOPT 9818605 LA
CO FINISHED
SO STARTING
   LOCATION P1      POINT   0.0  0.0  0.0
   LOCATION P3      POINT   0.0  0.0  0.0
   LOCATION P5      POINT   0.0  0.0  0.0
   LOCATION P2      POINT   0.0  0.0  0.0
   LOCATION P4      POINT   0.0  0.0  0.0
   LOCATION P6      POINT   0.0  0.0  0.0
   LOCATION V1      VOLUME  0.0  0.0  0.0
   LOCATION V4      VOLUME  0.0  0.0  0.0
   LOCATION V7      VOLUME  0.0  0.0  0.0
   LOCATION V2      VOLUME  0.0  0.0  0.0
   LOCATION V5      VOLUME  0.0  0.0  0.0
   LOCATION V8      VOLUME  0.0  0.0  0.0
   LOCATION V3      VOLUME  0.0  0.0  0.0
   LOCATION V6      VOLUME  0.0  0.0  0.0
   LOCATION V9      VOLUME  0.0  0.0  0.0
   SRCPARAM P1   2.75E-05   3.66    291.0   0.0018   0.051
   SRCPARAM P2   3.47E-06   3.66    289.0   0.00022  0.051
   SRCPARAM P3   6.44E-06   3.66    291.0   0.0018   0.051
   SRCPARAM P4   8.13E-07   3.66    289.0   0.00022  0.051
   SRCPARAM P5   2.67E-08   3.66    291.0   0.0018   0.051
   SRCPARAM P6   3.38E-09   3.66    289.0   0.00022  0.051
   SRCPARAM V1   1.36E-05    1.0     3.02    2.33
   SRCPARAM V2   2.44E-05    0.0     3.02    2.33
   SRCPARAM V3   5.90E-07    1.0     3.02    2.33
   SRCPARAM V4   3.19E-06    1.0     3.02    2.33
   SRCPARAM V5   4.44E-05    0.0     3.02    2.33
   SRCPARAM V6   1.38E-07    1.0     3.02    2.33
   SRCPARAM V7   1.32E-08    1.0     3.02    2.33
   SRCPARAM V8   5.99E-06    0.0     3.02    2.33
   SRCPARAM V9   5.73E-10    1.0     3.02    2.33
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P1      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P2      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P3      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
   BUILDHGT P4      4.00     4.00     4.00     4.00     4.00     4.00
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   BUILDHGT P4      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P4      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P4      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P4      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P5      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDHGT P6      4.00      4.00      4.00      4.00      4.00      4.00
   BUILDWID P1      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P1     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P1     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P1      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P1     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P1     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P2      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P2     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P2     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P2      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P2     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P2     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P3      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P3     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P3     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P3      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P3     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P3     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P4      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P4     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P4     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P4      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P4     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P4     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P5      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P5     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P5     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P5      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P5     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P5     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P6      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P6     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P6     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDWID P6      6.66      8.12      9.33     10.26     10.87     11.16
   BUILDWID P6     11.11     10.72     10.00     10.72     11.11     11.16
   BUILDWID P6     10.87     10.26      9.33      8.12      6.66      5.00
   BUILDLEN P1     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P1      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P1     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P1     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P1      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P1     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P2     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P2      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P2     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P2     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P2      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P2     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P3     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P3      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P3     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P3     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P3      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P3     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P4     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P4      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P4     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P4     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P4      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P4     10.26     10.87     11.16     11.11     10.72     10.00
   BUILDLEN P5     10.72     11.11     11.16     10.87     10.26      9.33
   BUILDLEN P5      8.12      6.66      5.00      6.66      8.12      9.33
   BUILDLEN P5     10.26     10.87     11.16     11.11     10.72     10.00
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   BUILDLEN P5      10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P5       8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P5      10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P6      10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P6       8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P6      10.26    10.87    11.16    11.11    10.72    10.00
   BUILDLEN P6      10.72    11.11    11.16    10.87    10.26     9.33
   BUILDLEN P6       8.12     6.66     5.00     6.66     8.12     9.33
   BUILDLEN P6      10.26    10.87    11.16    11.11    10.72    10.00
   XBADJ    P1      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P1      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P1      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P1      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P1      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P1      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P2      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P2      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P2      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P2      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P2      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P2      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P3      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P3      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P3      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P3      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P3      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P3      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P4      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P4      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P4      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P4      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P4      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P4      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P5      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P5      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P5      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P5      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P5      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P5      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P6      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P6      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P6      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   XBADJ    P6      -5.36    -5.55    -5.58    -5.44    -5.13    -4.67
   XBADJ    P6      -4.06    -3.33    -2.50    -3.33    -4.06    -4.67
   XBADJ    P6      -5.13    -5.44    -5.58    -5.55    -5.36    -5.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P1       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P2       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P3       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P4       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P5       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6       0.00     0.00     0.00     0.00     0.00     0.00
   YBADJ    P6       0.00     0.00     0.00     0.00     0.00     0.00
```

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YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
YBADJ    P6      0.00     0.00     0.00     0.00     0.00     0.00
URBANSRC P1
URBANSRC P2
URBANSRC P3
URBANSRC P4
URBANSRC P5
URBANSRC P6
URBANSRC V1
URBANSRC V2
URBANSRC V3
URBANSRC V4
URBANSRC V5
URBANSRC V6
URBANSRC V7
URBANSRC V8
URBANSRC V9
EMISFACT P1     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P1     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT P2     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P2     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT P3     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P3     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT P4     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P4     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT P5     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P5     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT P6     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT P6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT P6     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V1     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V1     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V1     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V2     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V2     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V2     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V3     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V3     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V3     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V4     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V4     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V4     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V5     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V5     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V5     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V6     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V6     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V6     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V7     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V7     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V7     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V7     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V8     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V8     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V8     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V8     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
EMISFACT V9     HROFDY 0.48 0.48 0.48 0.48 0.48 0.48
EMISFACT V9     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V9     HROFDY 1.37  1.37  1.37  1.37  1.37  1.37
EMISFACT V9     HROFDY 1.37  1.37  0.48 0.48 0.48 0.48
SRCGROUP BE     P1  P2  V1  V2  V3
SRCGROUP EB     P3  P4  V4  V5  V6
```

```
   SRCGROUP NA     P5  P6  V7  V8  V9
SO FINISHED
RE STARTING
   GRIDPOLR POL1 STA
                ORIG 0.0 0.0
                DIST 34  59  84  109  209  309  509  1009
                GDIR 36 10.0 10.0
   GRIDPOLR POL1 END
RE FINISHED
ME STARTING
   SURFFILE AZUS_v9.SFC
   PROFFILE AZUS_v9.PFL
   SURFDATA 0 2010
   UAIRDATA 3190 2010
   SITEDATA 99999 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE 1 BE 1ST  AM1T1BE.TXT
   PLOTFILE 1 EB 1ST  AM1T1EB.TXT
   PLOTFILE 1 NA 1ST  AM1T1NA.TXT
   PLOTFILE PERIOD BE AM1T2BE.TXT
   PLOTFILE PERIOD EB AM1T2EB.TXT
   PLOTFILE PERIOD NA AM1T2NA.TXT
OU FINISHED
```

EXHIBIT XI - Sample AERMOD Input File for Spray Booths

```
CO STARTING
   TITLEONE Spraybooth, 8-hour
   MODELOPT CONC FLAT
   AVERTIME 1 PERIOD
   URBANOPT 9818605 LA
   POLLUTID OTHER
   RUNORNOT RUN
   ERRORFIL Spraybooth.err
CO FINISHED
SO STARTING
   LOCATION P1          POINT          0.000        0.000          0.0
   LOCATION P2          POINT          0.000        0.000          0.0
   SRCPARAM P1             0.0865     4.877     0.000   8.05709     0.864
   SRCPARAM P2             0.0865     7.315     0.000   8.04963     0.864
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P1              3.05      3.05      3.05      3.05      3.05      3.05
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDHGT P2              5.49      5.49      5.49      5.49      5.49      5.49
   BUILDWID P1             31.85     42.74     52.32     60.32     66.48     70.62
   BUILDWID P1             72.62     72.41     70.00     72.41     72.62     70.62
   BUILDWID P1             66.48     60.32     52.32     42.74     31.85     20.00
   BUILDWID P1             31.85     42.74     52.32     60.32     66.48     70.62
   BUILDWID P1             72.62     72.41     70.00     72.41     72.62     70.62
   BUILDWID P1             66.48     60.32     52.32     42.74     31.85     20.00
   BUILDWID P2             31.85     42.74     52.32     60.32     66.48     70.62
   BUILDWID P2             72.62     72.41     70.00     72.41     72.62     70.62
   BUILDWID P2             66.48     60.32     52.32     42.74     31.85     20.00
   BUILDWID P2             31.85     42.74     52.32     60.32     66.48     70.62
   BUILDWID P2             72.62     72.41     70.00     72.41     72.62     70.62
   BUILDWID P2             66.48     60.32     52.32     42.74     31.85     20.00
   BUILDLEN P1             72.41     72.62     70.62     66.48     60.32     52.32
   BUILDLEN P1             42.74     31.85     20.00     31.85     42.74     52.32
   BUILDLEN P1             60.32     66.48     70.62     72.62     72.41     70.00
   BUILDLEN P1             72.41     72.62     70.62     66.48     60.32     52.32
   BUILDLEN P1             42.74     31.85     20.00     31.85     42.74     52.32
   BUILDLEN P1             60.32     66.48     70.62     72.62     72.41     70.00
   BUILDLEN P2             72.41     72.62     70.62     66.48     60.32     52.32
   BUILDLEN P2             42.74     31.85     20.00     31.85     42.74     52.32
   BUILDLEN P2             60.32     66.48     70.62     72.62     72.41     70.00
   BUILDLEN P2             72.41     72.62     70.62     66.48     60.32     52.32
   BUILDLEN P2             42.74     31.85     20.00     31.85     42.74     52.32
   BUILDLEN P2             60.32     66.48     70.62     72.62     72.41     70.00
   XBADJ    P1            -36.20    -36.31    -35.31    -33.24    -30.16    -26.16
   XBADJ    P1            -21.37    -15.93    -10.00    -15.93    -21.37    -26.16
   XBADJ    P1            -30.16    -33.24    -35.31    -36.31    -36.20    -35.00
   XBADJ    P1            -36.20    -36.31    -35.31    -33.24    -30.16    -26.16
   XBADJ    P1            -21.37    -15.93    -10.00    -15.93    -21.37    -26.16
   XBADJ    P1            -30.16    -33.24    -35.31    -36.31    -36.20    -35.00
   XBADJ    P2            -36.20    -36.31    -35.31    -33.24    -30.16    -26.16
   XBADJ    P2            -21.37    -15.93    -10.00    -15.93    -21.37    -26.16
   XBADJ    P2            -30.16    -33.24    -35.31    -36.31    -36.20    -35.00
   XBADJ    P2            -36.20    -36.31    -35.31    -33.24    -30.16    -26.16
   XBADJ    P2            -21.37    -15.93    -10.00    -15.93    -21.37    -26.16
   XBADJ    P2            -30.16    -33.24    -35.31    -36.31    -36.20    -35.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P1              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   YBADJ    P2              0.00      0.00      0.00      0.00      0.00      0.00
   URBANSRC ALL
   EMISFACT P2          HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
```

```
   EMISFACT P2           HROFDY 0.0 0.0 1.0 1.0 1.0 1.0
   EMISFACT P2           HROFDY 1.0 1.0 1.0 1.0 0.0 0.0
   EMISFACT P2           HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT P1           HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT P1           HROFDY 0.0 0.0 1.0 1.0 1.0 1.0
   EMISFACT P1           HROFDY 1.0 1.0 1.0 1.0 0.0 0.0
   EMISFACT P1           HROFDY 0.0 0.0 0.0 0.0 0.0 0.0
   SRCGROUP P1       P1
   SRCGROUP P2       P2
SO FINISHED
RE STARTING
   GRIDPOLR GRID STA
                 ORIG 0.00 0.00
                 DIST 25 50 75 100 200 300 500 1000
                 GDIR 36 0.00 10.00
   GRIDPOLR GRID END
RE FINISHED
ME STARTING
   SURFFILE E:\SCRAM\2017MetUpdate\Outputs\AZUS_v9.SFC
   PROFFILE E:\SCRAM\2017MetUpdate\Outputs\AZUS_v9.PFL
   SURFDATA 3102 2010
   UAIRDATA 3190 2010
   PROFBASE 0.0 METERS
ME FINISHED
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   PLOTFILE  1       P1  FIRST  AM1T1P1.TXT
   PLOTFILE  1       P2  FIRST  AM1T1P2.TXT
   PLOTFILE  PERIOD  P1         AM1T2P1.TXT
   PLOTFILE  PERIOD  P2         AM1T2P2.TXT
   SUMMFILE Spraybooth.sum
OU FINISHED
```

South Coast Air Quality Management District

PERMIT APPLICATION PACKAGE "N"

For Use in Conjunction with the
RISK ASSESSMENT PROCEDURES
for Rules 1401, 1401.1, and 212

Version 8.1

PERMIT APPLICATION PACKAGE "N"
For use in conjunction with the
RISK ASSESSMENT PROCEDURES
FOR RULES 1401, 1401.1, AND 212,

VERSION 8.1

Table 1.0 - Screening Emission Levels

THESE ARE NOT EMISSION LIMITS. Exceedances of these levels indicate that a screening health risk assessment should be performed.

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	CAS No	Cancer	Chronic	8-hr Chronic	Acute	Emissions at 25 m, lb/yr	Emissions at 50 m, lb/yr	Emissions at 100 m, lb/yr	Emissions at 25 m, lb/hr	Emissions at 50 m, lb/hr	Emissions at 100 m, lb/hr
Acetaldehyde	75-07-0	4/99[5/93]	12/19/2008	12/19/2008	12/19/2008	5.31E+00 (ca)	1.94E+01 (ca)	4.44E+01 (ca)	1.04E-01	2.59E-01	6.49E-01
Acetamide	60-35-5	4/1/1999				7.59E-01 (ca)	2.77E+00 (ca)	6.35E+00 (ca)			
Acrolein	107-02-8		12/19/2008	12/19/2008	12/19/2008	6.00E+00 (8hr)	2.19E+01 (8hr)	5.02E+01 (8hr)	5.52E-04	1.38E-03	3.45E-03
Acrylamide	79-06-1	4/99[7/90]				1.18E-02 (ca)	4.30E-02 (ca)	9.87E-02 (ca)			
Acrylic Acid	79-10-7				4/1/1999				1.33E+00	3.30E+00	8.28E+00
Acrylonitrile	107-13-1	4/99[1/91]	12/1/2001			5.31E-02 (ca)	1.94E-01 (ca)	4.44E-01 (ca)			
Allyl Chloride	107-05-1	4/1/1999				2.53E+00 (ca)	9.22E+00 (ca)	2.12E+01 (ca)			
2-Aminoanthraquinone	117-79-3	4/1/1999				1.61E+00 (ca)	5.87E+00 (ca)	1.35E+01 (ca)			
Ammonia	7664-41-7		2/1/2000		4/1/1999	7.20E+03 (ch)	2.62E+04 (ch)	6.02E+04 (ch)	7.07E-01	1.76E+00	4.42E+00
Aniline	62-53-3	4/1/1999				9.32E+00 (ca)	3.40E+01 (ca)	7.79E+01 (ca)			
Arsenic And Compounds (Inorganic)	7440-38-2	7/1/1990	12/19/2008	12/19/2008	12/19/2008	4.56E-04 (ca)	1.66E-03 (ca)	3.81E-03 (ca)	4.42E-05	1.10E-04	2.76E-04
Arsine	7784-42-1		12/19/2008	12/19/2008	12/19/2008	1.29E-01 (8hr)	4.68E-01 (8hr)	1.07E+00 (8hr)	4.42E-05	1.10E-04	2.76E-04
Asbestos	1332-21-4	3/1/1986				7.25E-07 (ca)	2.64E-06 (ca)	6.06E-06 (ca)			
Benzene	71-43-2	1/1/1985	6/27/2014	6/27/2014	6/27/2014	5.31E-01 (ca)	1.94E+00 (ca)	4.44E+00 (ca)	5.96E-03	1.49E-02	3.73E-02
Benzidine (And Its Salts)	92-87-5	4/99[1/91]				1.06E-04 (ca)	3.87E-04 (ca)	8.89E-04 (ca)			
Benzidine Based Dyes	0	4/99[1/91]				1.06E-04 (ca)	3.87E-04 (ca)	8.89E-04 (ca)			
Direct Black	1937-37-7	4/99[1/91]				1.06E-04 (ca)	3.87E-04 (ca)	8.89E-04 (ca)			
Direct Blue	2602-46-2	4/99[1/91]				1.06E-04 (ca)	3.87E-04 (ca)	8.89E-04 (ca)			
Direct Brown (Technical Grade)	16071-86-6	4/99[1/91]				1.06E-04 (ca)	3.87E-04 (ca)	8.89E-04 (ca)			
Benzyl Chloride	100-44-7	4/1/1999			4/1/1999	3.13E-01 (ca)	1.14E+00 (ca)	2.61E+00 (ca)	5.30E-02	1.32E-01	3.31E-01
Beryllium And Compounds	7440-41-7	4/99[7/90]	12/1/2001			6.33E-03 (ca)	2.30E-02 (ca)	5.29E-02 (ca)			
Bis(2-Chloroethyl)Ether (Dichloroethyl Ether)	111-44-4	4/1/1999				2.13E-02 (ca)	7.74E-02 (ca)	1.78E-01 (ca)			
Bis(Chloromethyl)Ether	542-88-1	4/99[1/91]				1.16E-03 (ca)	4.21E-03 (ca)	9.66E-03 (ca)			
Potassium Bromate	7758-01-2	4/99[10/93]				1.08E-01 (ca)	3.95E-01 (ca)	9.07E-01 (ca)			
1,3-Butadiene	106-99-0	7/1/1992	7/29/2013	7/29/2013	7/29/2013	8.86E-02 (ca)	3.23E-01 (ca)	7.41E-01 (ca)	1.46E-01	3.63E-01	9.11E-01
Cadmium And Compounds	7440-43-9	1/1/1987	1/1/2001			3.54E-03 (ca)	1.29E-02 (ca)	2.96E-02 (ca)			
Caprolactum	105-60-2		6/1/2013	6/1/2013	6/1/2013	6.00E+01 (8hr)	2.19E+02 (8hr)	5.02E+02 (8hr)	1.10E-02	2.75E-02	6.90E-02
Carbon Disulfide	75-15-0		5/13/2002		4/1/1999	2.88E+04 (ch)	1.05E+05 (ch)	2.41E+05 (ch)	1.37E+00	3.41E+00	8.56E+00
Carbon Tetrachloride (Tetrachloromethane)	56-23-5	9/1/1987	1/1/2001		4/1/1999	3.54E-01 (ca)	1.29E+00 (ca)	2.96E+00 (ca)	4.20E-01	1.05E+00	2.62E+00
Carbonyl Sulfide	463-58-1		2/21/2017	2/21/2017	2/21/2017	8.57E+01 (8hr)	3.12E+02 (8hr)	7.17E+02 (8hr)	1.46E-01	3.63E-01	9.11E-01
Chlorinated Paraffins	108171-26-2	4/1/1999				5.97E-01 (ca)	2.17E+00 (ca)	4.99E+00 (ca)			
Chlorine	7782-50-5		2/1/2000		4/1/1999	7.20E+00 (ch)	2.62E+01 (ch)	6.02E+01 (ch)	4.64E-02	1.16E-01	2.90E-01
Chlorine Dioxide	10049-04-4		1/1/2001			2.16E+01 (ch)	7.87E+01 (ch)	1.81E+02 (ch)			
4-Chloro-O-Phenylenediamine	95-83-0	4/1/1999				3.32E+00 (ca)	1.21E+01 (ca)	2.78E+01 (ca)			

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	**CAS No**	**Cancer**	**Chronic**	**8-hr Chronic**	**Acute**	**Emissions at 25 m, lb/yr**	**Emissions at 50 m, lb/yr**	**Emissions at 100 m, lb/yr**	**Emissions at 25 m, lb/hr**	**Emissions at 50 m, lb/hr**	**Emissions at 100 m, lb/hr**
Chlorobenzene	108-90-7		1/1/2001			3.60E+04 (ch)	1.31E+05 (ch)	3.01E+05 (ch)			
Chloroform	67-66-3	12/1/1990	4/1/2000		4/1/1999	2.80E+00 (ca)	1.02E+01 (ca)	2.34E+01 (ca)	3.31E-02	8.26E-02	2.07E-01
Pentachlorophenol	87-86-5	4/1/1999				2.95E+00 (ca)	1.08E+01 (ca)	2.47E+01 (ca)			
2,4,6-Trichlorophenol	88-06-2	4/99[1/91]				7.59E-01 (ca)	2.77E+00 (ca)	6.35E+00 (ca)			
Chloropicrin	76-06-2		12/1/2001		4/1/1999	1.44E+01 (ch)	5.24E+01 (ch)	1.20E+02 (ch)	6.40E-03	1.60E-02	4.00E-02
P-Chloro-O-Toluidine	95-69-2	4/1/1999				1.97E-01 (ca)	7.17E-01 (ca)	1.65E+00 (ca)			
Chromium 6+	18540-29-9	1/1/1986	1/1/2001			6.53E-05 (ca)	2.38E-04 (ca)	5.46E-04 (ca)			
Barium Chromate	10294-40-3	1/1/1986	1/1/2001			3.18E-04 (ca)	1.16E-03 (ca)	2.66E-03 (ca)			
Calcium Chromate	13765-19-0	1/1/1986	1/1/2001			1.96E-04 (ca)	7.13E-04 (ca)	1.64E-03 (ca)			
Lead Chromate	7758-97-6	1/1/1986	1/1/2001			4.06E-04 (ca)	1.48E-03 (ca)	3.39E-03 (ca)			
Sodium Dichromate	10588-01-9	1/1/1986	1/1/2001			1.64E-04 (ca)	5.99E-04 (ca)	1.37E-03 (ca)			
Strontium Chromate	7789-06-2	1/1/1986	1/1/2001			2.56E-04 (ca)	9.31E-04 (ca)	2.14E-03 (ca)			
Chromic Trioxide (As Chromic Acid Mist)	1333-82-0	1/1/1986	1/1/2001			1.25E-04 (ca)	4.57E-04 (ca)	1.05E-03 (ca)			
Copper And Compounds	7440-50-8				4/1/1999				2.21E-02	5.51E-02	1.38E-01
P-Cresidine	120-71-8	4/1/1999				3.54E-01 (ca)	1.29E+00 (ca)	2.96E+00 (ca)			
Cresols (Mixtures Of)	1319-77-3		1/1/2001			2.16E+04 (ch)	7.87E+04 (ch)	1.81E+05 (ch)			
M-Cresol	108-39-4		1/1/2001			2.16E+04 (ch)	7.87E+04 (ch)	1.81E+05 (ch)			
O-Cresol	95-48-7		1/1/2001			2.16E+04 (ch)	7.87E+04 (ch)	1.81E+05 (ch)			
P-Cresol	106-44-5		1/1/2001			2.16E+04 (ch)	7.87E+04 (ch)	1.81E+05 (ch)			
Cupferron	135-20-6	4/1/1999				2.42E-01 (ca)	8.80E-01 (ca)	2.02E+00 (ca)			
Hydrogen Cyanide (Hydrocyanic Acid)	74-90-8		4/1/2000		4/1/1999	3.24E+02 (ch)	1.18E+03 (ch)	2.71E+03 (ch)	7.51E-02	1.87E-01	4.69E-01
2,4-Diaminoanisole	615-05-4	4/1/1999				2.31E+00 (ca)	8.42E+00 (ca)	1.93E+01 (ca)			
2,4-Diaminotoluene	95-80-7	4/1/1999				1.33E-02 (ca)	4.84E-02 (ca)	1.11E-01 (ca)			
1,2-Dibromo-3-Chloropropane (Dbcp)	96-12-8	4/99[1/92]				7.59E-03 (ca)	2.77E-02 (ca)	6.35E-02 (ca)			
P-Dichlorobenzene	106-46-7	4/99[1/91]	1/1/2001			1.33E+00 (ca)	4.84E+00 (ca)	1.11E+01 (ca)			
3,3-Dichlorobenzidine	91-94-1	4/99[1/91]				4.43E-02 (ca)	1.61E-01 (ca)	3.70E-01 (ca)			
1,1,-Dichloroethane (Ethylidene Dichloride)	75-34-3	4/1/1999				9.32E+00 (ca)	3.40E+01 (ca)	7.79E+01 (ca)			
Di(2-Ethylhexyl)Phthalate (Dehp)	117-81-7	4/99[1/92]				1.21E+00 (ca)	4.41E+00 (ca)	1.01E+01 (ca)			
Diethanolamine	111-42-2		12/1/2001			1.15E+02 (ch)	3.49E+02 (ch)	7.12E+02 (ch)			
P-Dimethylaminoazo benzene	60-11-7	4/1/1999				1.16E-02 (ca)	4.21E-02 (ca)	9.66E-02 (ca)			
N,N-Dimethyl Formamide	68-12-2		1/1/2001			2.88E+03 (ch)	1.05E+04 (ch)	2.41E+04 (ch)			
2,4-Dinitrotoluene	121-14-2	4/1/1999				1.71E-01 (ca)	6.24E-01 (ca)	1.43E+00 (ca)			
1,4-Dioxane (1,4-Diethylene Dioxide)	123-91-1	4/99[1/91]	4/1/2000		4/1/1999	1.97E+00 (ca)	7.17E+00 (ca)	1.65E+01 (ca)	6.63E-01	1.65E+00	4.14E+00
1,2-Diphenylhydrazine {Hydrazobenzene}	122-66-7	1/1/1988				6.47E-02 (ca)	1.96E-01 (ca)	4.01E-01 (ca)			
Epichlorohydrin (1-Chloro-2,3-Epoxypropane)	106-89-8	4/99[1/92]	1/1/2001		4/1/1999	6.64E-01 (ca)	2.42E+00 (ca)	5.55E+00 (ca)	2.87E-01	7.16E-01	1.79E+00
1,2-Epoxybutane	106-88-7		1/1/2001			7.20E+02 (ch)	2.62E+03 (ch)	6.02E+03 (ch)			

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	**CAS No**	**Cancer**	**Chronic**	**8-hr Chronic**	**Acute**	**Emissions at 25 m, lb/yr**	**Emissions at 50 m, lb/yr**	**Emissions at 100 m, lb/yr**	**Emissions at 25 m, lb/hr**	**Emissions at 50 m, lb/hr**	**Emissions at 100 m, lb/hr**
Ethyl Benzene	100-41-4	11/7/2007	2/1/2000			6.11E+00 (ca)	2.22E+01 (ca)	5.11E+01 (ca)			
Ethyl Chloride (Chloroethane)	75-00-3		4/1/2000			1.08E+06 (ch)	3.93E+06 (ch)	9.03E+06 (ch)			
Ethylene Dibromide (1,2-Dibromoethane)	106-93-4	7/1/1985	12/1/2001			2.13E-01 (ca)	7.74E-01 (ca)	1.78E+00 (ca)			
Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	9/1/1985	1/1/2001			7.38E-01 (ca)	2.69E+00 (ca)	6.17E+00 (ca)			
Ethylene Glycol	107-21-1		4/1/2000			1.44E+04 (ch)	5.24E+04 (ch)	1.20E+05 (ch)			
Ethylene Oxide (1,2-Epoxyethane)	75-21-8	11/1/1987	1/1/2001			1.71E-01 (ca)	6.24E-01 (ca)	1.43E+00 (ca)			
Ethylene Thiourea	96-45-7	4/1/1999				1.18E+00 (ca)	4.30E+00 (ca)	9.87E+00 (ca)			
Flourides	1101		8/14/2003		4/1/1999	8.21E+01 (ch)	2.99E+02 (ch)	6.86E+02 (ch)	5.30E-02	1.32E-01	3.31E-01
Hydrogen Fluoride (Hydrofluoric Acid)	7664-39-3		8/14/2003		4/1/1999	8.31E+01 (ch)	3.03E+02 (ch)	6.95E+02 (ch)	5.30E-02	1.32E-01	3.31E-01
Formaldehyde	50-00-0	3/1/1992	12/19/2008	12/19/2008	12/19/2008	2.53E+00 (ca)	9.22E+00 (ca)	2.12E+01 (ca)	1.21E-02	3.03E-02	7.59E-02
Glutaraldehyde	111-30-8		1/1/2001			2.88E+00 (ch)	1.05E+01 (ch)	2.41E+01 (ch)			
Ethylene Glycol Butyl Ether (EGBE)	111-76-2				4/1/1999				3.09E+00	7.71E+00	1.93E+01
Ethylene Glycol Ethyl Ether (EGEE)	110-80-5		2/1/2000		4/99[1/92]	2.52E+03 (ch)	9.18E+03 (ch)	2.11E+04 (ch)	8.17E-02	2.04E-01	5.11E-01
Ethylene Glycol Ethyl Ether Acetate (EGEEA)	111-15-9		2/1/2000		4/1/1999	1.08E+04 (ch)	3.93E+04 (ch)	9.03E+04 (ch)	3.09E-02	7.71E-02	1.93E-01
Ethylene Glycol Methyl Ether (EGME)	109-86-4		2/1/2000		4/1/1999	2.16E+03 (ch)	7.87E+03 (ch)	1.81E+04 (ch)	2.05E-02	5.12E-02	1.28E-01
Ethylene Glycol Methyl Ether Acetate (EGMEA)	110-49-6		2/1/2000			3.24E+03 (ch)	1.18E+04 (ch)	2.71E+04 (ch)			
Hexachlorobenzene	118-74-1	4/99[1/91]				2.95E-02 (ca)	1.08E-01 (ca)	2.47E-01 (ca)			
Hexachlorocyclohexanes	608-73-1	4/99[1/91]				2.47E-03 (ca)	8.98E-03 (ca)	2.06E-02 (ca)			
Alpha-Hexachlorocyclohexane	319-84-6	4/99[1/91]				2.47E-03 (ca)	8.98E-03 (ca)	2.06E-02 (ca)			
Beta-Hexachlorocyclohexane	319-85-7	4/99[1/91]				2.47E-03 (ca)	8.98E-03 (ca)	2.06E-02 (ca)			
Gamma-Hexachlorocyclohexane (Lindane)	58-89-9	4/1/1999				8.97E-03 (ca)	3.27E-02 (ca)	7.50E-02 (ca)			
N-Hexane	110-54-3		4/1/2000			2.52E+05 (ch)	9.18E+05 (ch)	2.11E+06 (ch)			
Hydrazine	302-01-2	4/99[7/90]	1/1/2001			3.13E-03 (ca)	1.14E-02 (ca)	2.61E-02 (ca)			
Hydrochloric Acid (Hydrogen Chloride)	7647-01-0		2/1/2000		4/1/1999	3.24E+02 (ch)	1.18E+03 (ch)	2.71E+03 (ch)	4.64E-01	1.16E+00	2.90E+00
Hydrogen Sulfide	7783-06-4		4/1/2000		4/99[7/90]	3.60E+02 (ch)	1.31E+03 (ch)	3.01E+03 (ch)	9.28E-03	2.31E-02	5.80E-02
Isophorone	78-59-1		12/1/2001			7.20E+04 (ch)	2.62E+05 (ch)	6.02E+05 (ch)			
Isopropyl Alcohol (Isopropanol)	67-63-0		2/1/2000		4/1/1999	2.52E+05 (ch)	9.18E+05 (ch)	2.11E+06 (ch)	7.07E-01	1.76E+00	4.42E+00
Lead And Compounds (Inorganic)	7439-92-1	4/1/1997				1.11E-01 (ca)	4.04E-01 (ca)	9.27E-01 (ca)			
Lead Acetate	301-04-2	4/1/1997				1.74E-01 (ca)	6.34E-01 (ca)	1.45E+00 (ca)			
Lead Phosphate	7446-27-7	4/1/1997				1.45E-01 (ca)	5.27E-01 (ca)	1.21E+00 (ca)			
Lead Subacetate	1335-32-6	4/1/1997				1.44E-01 (ca)	5.25E-01 (ca)	1.20E+00 (ca)			
Maleic Anhydride	108-31-6		12/1/2001			2.52E+01 (ch)	9.18E+01 (ch)	2.11E+02 (ch)			
Manganese And Compounds	7439-96-5		12/19/2008	12/19/2008		1.46E+00 (8hr)	5.31E+00 (8hr)	1.22E+01 (8hr)			
Mercury And Compounds (Inorganic)	7439-97-6		12/19/2008	12/19/2008	12/19/2008	2.80E-01 (ch)	1.02E+00 (ch)	2.34E+00 (ch)	1.33E-04	3.30E-04	8.28E-04
Mercuric Chloride	7487-94-7		12/19/2008	12/19/2008	12/19/2008	2.80E-01 (ch)	1.02E+00 (ch)	2.34E+00 (ch)	1.33E-04	3.30E-04	8.28E-04

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	**CAS No**	**Cancer**	**Chronic**	**8-hr Chronic**	**Acute**	**Emissions at 25 m, lb/yr**	**Emissions at 50 m, lb/yr**	**Emissions at 100 m, lb/yr**	**Emissions at 25 m, lb/hr**	**Emissions at 50 m, lb/hr**	**Emissions at 100 m, lb/hr**
Methanol	67-56-1		4/1/2000		4/1/1999	1.44E+05 (ch)	5.24E+05 (ch)	1.20E+06 (ch)	6.18E+00	1.54E+01	3.86E+01
Methyl Bromide (Bromomethane)	74-83-9		2/1/2000		4/1/1999	1.80E+02 (ch)	6.56E+02 (ch)	1.50E+03 (ch)	8.61E-01	2.15E+00	5.38E+00
Methyl Tertiary-Butyl Ether	1634-04-4	11/1/1999	2/1/2000			2.95E+01 (ca)	1.08E+02 (ca)	2.47E+02 (ca)			
Methyl Chloroform (1,1,1-Trichloroethane)	71-55-6		2/1/2000		4/1/1999	3.60E+04 (ch)	1.31E+05 (ch)	3.01E+05 (ch)	1.50E+01	3.74E+01	9.38E+01
Methyl Ethyl Ketone (2-Butanone)	78-93-3				4/1/1999				2.87E+00	7.16E+00	1.79E+01
Methyl Isocyanate	624-83-9		12/1/2001			3.60E+01 (ch)	1.31E+02 (ch)	3.01E+02 (ch)			
4,4'-Methylene Bis (2-Chloroaniline) (MOCA)	101-14-4	4/1/1999				3.54E-02 (ca)	1.29E-01 (ca)	2.96E-01 (ca)			
Methylene Chloride (Dichloromethane)	75-09-2	7/1/1989	2/1/2000		4/1/1999	1.52E+01 (ca)	5.53E+01 (ca)	1.27E+02 (ca)	3.09E+00	7.71E+00	1.93E+01
4,4'-Methylene Dianiline (And Its Dichloride)	101-77-9	4/1/1999	12/1/2001			4.60E-03 (ca)	1.68E-02 (ca)	3.85E-02 (ca)			
Methylene Diphenyl Isocyanate	101-68-8		1/1/2001			2.52E+01 (ch)	9.18E+01 (ch)	2.11E+02 (ch)			
Michler's Ketone (4,4'-Bis(Dimethylamino) Benzophenone)	90-94-8	4/1/1999				6.18E-02 (ca)	2.25E-01 (ca)	5.17E-01 (ca)			
N-Nitrosodi-N-Butylamine	924-16-3	4/99[1/92]				4.83E-03 (ca)	1.76E-02 (ca)	4.04E-02 (ca)			
N-Nitrosodi-N-Propylamine	621-64-7	4/99[1/91]				7.59E-03 (ca)	2.77E-02 (ca)	6.35E-02 (ca)			
N-Nitrosodiethylamine	55-18-5	4/99[1/91]				1.48E-03 (ca)	5.38E-03 (ca)	1.23E-02 (ca)			
N-Nitrosodimethylamine	62-75-9	4/99[1/91]				3.32E-03 (ca)	1.21E-02 (ca)	2.78E-02 (ca)			
N-Nitrosodiphenylamine	86-30-6	4/1/1999				5.91E+00 (ca)	2.15E+01 (ca)	4.94E+01 (ca)			
N-Nitroso-N-Methylethylamine	10595-95-6	4/99[7/90]				2.42E-03 (ca)	8.80E-03 (ca)	2.02E-02 (ca)			
N-Nitrosomorpholine	59-89-2	4/99[7/92]				7.93E-03 (ca)	2.89E-02 (ca)	6.63E-02 (ca)			
N-Nitrosopiperidine	100-75-4	4/99[7/92]				5.65E-03 (ca)	2.06E-02 (ca)	4.73E-02 (ca)			
N-Nitrosopyrrolidine	930-55-2	4/99[7/90]				2.53E-02 (ca)	9.22E-02 (ca)	2.12E-01 (ca)			
Nickel And Compounds	7440-02-0	8/1/1991	3/23/2012	3/23/2012	3/23/2012	5.84E-02 (ca)	2.13E-01 (ca)	4.88E-01 (ca)	4.42E-05	1.10E-04	2.76E-04
Nickel Acetate	373-02-4	8/1/1991	3/23/2012	3/23/2012	3/23/2012	1.76E-01 (ca)	6.40E-01 (ca)	1.47E+00 (ca)	1.33E-04	3.32E-04	8.31E-04
Nickel Carbonate	3333-67-3	8/1/1991	3/23/2012	3/23/2012	3/23/2012	1.18E-01 (ca)	4.30E-01 (ca)	9.87E-01 (ca)	8.93E-05	2.23E-04	5.58E-04
Nickel Carbonyl	13463-39-3	8/1/1991	3/23/2012	3/23/2012	3/23/2012	1.70E-01 (ca)	6.19E-01 (ca)	1.42E+00 (ca)	1.28E-04	3.20E-04	8.03E-04
Nickel Hydroxide	12054-48-7	8/1/1991	3/23/2012	3/23/2012	3/23/2012	9.22E-02 (ca)	3.36E-01 (ca)	7.71E-01 (ca)	6.98E-05	1.74E-04	4.36E-04
Nickelocene	1271-28-9	8/1/1991	3/23/2012	3/23/2012	3/23/2012	1.18E-01 (ca)	4.31E-01 (ca)	9.89E-01 (ca)	8.95E-05	2.23E-04	5.59E-04
Nickel Oxide	1313-99-1	8/1/1991	3/23/2012	3/23/2012	3/23/2012	7.43E-02 (ca)	2.71E-01 (ca)	6.21E-01 (ca)	5.62E-05	1.40E-04	3.51E-04
Nickel Refinery Dust From The Pyrometallurgical Process	0	8/1/1991	3/23/2012	3/23/2012	3/23/2012	5.84E-02 (ca)	2.13E-01 (ca)	4.88E-01 (ca)	4.42E-05	1.10E-04	2.76E-04
Nickel Subsulfide	12035-72-2	8/1/1991	3/23/2012	3/23/2012	3/23/2012	2.39E-01 (ca)	8.71E-01 (ca)	2.00E+00 (ca)	1.81E-04	4.51E-04	1.13E-03
Nitric Acid	7697-37-2				4/1/1999				1.90E-02	4.74E-02	1.19E-01
P-Nitrosodiphenylamine	156-10-5	4/1/1999				2.42E+00 (ca)	8.80E+00 (ca)	2.02E+01 (ca)			
Particulate Emissions From Diesel-Fueled Engines	9901	8/1/1998	8/1/1998			4.83E-02 (ca)	1.76E-01 (ca)	4.04E-01 (ca)			
Perchloroethylene (Tetrachloroethylene)	127-18-4	10/1/1991	10/1/1991		4/1/1999	2.53E+00 (ca)	9.22E+00 (ca)	2.12E+01 (ca)	4.42E+00	1.10E+01	2.76E+01
Phenol	108-95-2		4/1/2000		4/1/1999	7.20E+03 (ch)	2.62E+04 (ch)	6.02E+04 (ch)	1.28E+00	3.19E+00	8.00E+00
Phosgene	75-44-5				4/1/1999				8.83E-04	2.20E-03	5.52E-03

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	CAS No	Cancer	Chronic	8-hr Chronic	Acute	Emissions at 25 m, lb/yr	Emissions at 50 m, lb/yr	Emissions at 100 m, lb/yr	Emissions at 25 m, lb/hr	Emissions at 50 m, lb/hr	Emissions at 100 m, lb/hr
Phosphine	7803-51-2		9/3/2002			2.88E+01 (ch)	1.05E+02 (ch)	2.41E+02 (ch)			
Phosphoric Acid	7664-38-2		2/1/2000			2.52E+02 (ch)	9.18E+02 (ch)	2.11E+03 (ch)			
Phthalic Anhydride	85-44-9		1/1/2001			7.20E+02 (ch)	2.62E+03 (ch)	6.02E+03 (ch)			
PCB (Polychlorinated Biphenyls) (Unspeciated Mixture) [Lowest Risk]	1336-36-3	4/1/1999				4.01E-02 (ca)	1.46E-01 (ca)	3.35E-01 (ca)			
PCB (Polychlorinated Biphenyls) (Unspeciated Mixture) [Low Risk]	1336-36-3	4/1/1999				7.02E-03 (ca)	2.55E-02 (ca)	5.87E-02 (ca)			
PCB (Polychlorinated Biphenyls) (Unspeciated Mixture) [High Risk]	1336-36-3	4/1/1999				1.40E-03 (ca)	5.11E-03 (ca)	1.17E-02 (ca)			
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	32598-13-3	8/29/2003	8/29/2003			1.48E-04 (ca)	5.40E-04 (ca)	1.24E-03 (ca)			
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	70362-50-4	1/31/2011	1/31/2011			4.94E-05 (ca)	1.80E-04 (ca)	4.13E-04 (ca)			
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	32598-14-4	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	74472-37-0	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	31508-00-6	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	65510-44-3	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	57465-28-8	8/29/2003	8/29/2003			1.48E-07 (ca)	5.40E-07 (ca)	1.24E-06 (ca)			
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	38380-08-4	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	69782-90-7	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	52663-72-6	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	32774-16-6	1/31/2011	1/31/2011			4.94E-07 (ca)	1.80E-06 (ca)	4.13E-06 (ca)			
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	39635-31-9	1/31/2011	1/31/2011			4.94E-04 (ca)	1.80E-03 (ca)	4.13E-03 (ca)			
Polychlorinated Dibenzo-P-Dioxins (PCDD)	1086	8/1/1986	2/1/2000			1.59E-08 (ca)	5.79E-08 (ca)	1.33E-07 (ca)			
2,3,7,8-Tetrachlorodi benzo-P-Dioxin	1746-01-6	8/1/1986	2/1/2000			1.59E-08 (ca)	5.79E-08 (ca)	1.33E-07 (ca)			
1,2,3,7,8-Pentachlorodi benzo-P-Dioxin	40321-76-4	8/1/2003	8/1/2003			1.59E-08 (ca)	5.79E-08 (ca)	1.33E-07 (ca)			
1,2,3,4,7,8-Hexachlorodi benzo-P-Dioxin	39227-28-6	4/1/1999	2/1/2000			1.59E-07 (ca)	5.79E-07 (ca)	1.33E-06 (ca)			
1,2,3,6,7,8-Hexachlorodi benzo-P-Dioxin	57653-85-7	4/1/1999	2/1/2000			1.59E-07 (ca)	5.79E-07 (ca)	1.33E-06 (ca)			
1,2,3,7,8,9-Hexachlorodi benzo-P-Dioxin	19408-74-3	4/1/1999	2/1/2000			1.59E-07 (ca)	5.79E-07 (ca)	1.33E-06 (ca)			
1,2,3,4,6,7,8-Heptachloro dibenzo-P-Dioxin	35822-46-9	4/1/1999	2/1/2000			1.59E-06 (ca)	5.79E-06 (ca)	1.33E-05 (ca)			
1,2,3,4,6,7,8,9-Octachloro dibenzo-P-Dioxin	3268-87-9	1/31/2011	1/31/2011			5.30E-05 (ca)	1.93E-04 (ca)	4.43E-04 (ca)			
Polychlorinated Dibenzofurans (PCDF)	1080	8/1/1986	2/1/2000			2.25E-08 (ca)	8.19E-08 (ca)	1.88E-07 (ca)			
2,3,7,8-Tetrachlorodibenzofuran	5120-73-19	4/1/1999	2/1/2000			2.25E-07 (ca)	8.19E-07 (ca)	1.88E-06 (ca)			
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	1/31/2011	1/31/2011			7.49E-07 (ca)	2.73E-06 (ca)	6.26E-06 (ca)			

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	CAS No	Cancer	Chronic	8-hr Chronic	Acute	Emissions at 25 m, lb/yr	Emissions at 50 m, lb/yr	Emissions at 100 m, lb/yr	Emissions at 25 m, lb/hr	Emissions at 50 m, lb/hr	Emissions at 100 m, lb/hr
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1/31/2011	1/31/2011			7.49E-08 (ca)	2.73E-07 (ca)	6.26E-07 (ca)			
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	4/1/1999	2/1/2000			2.25E-07 (ca)	8.19E-07 (ca)	1.88E-06 (ca)			
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	4/1/1999	2/1/2000			2.25E-07 (ca)	8.19E-07 (ca)	1.88E-06 (ca)			
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	4/1/1999	2/1/2000			2.25E-07 (ca)	8.19E-07 (ca)	1.88E-06 (ca)			
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	4/1/1999	2/1/2000			2.25E-07 (ca)	8.19E-07 (ca)	1.88E-06 (ca)			
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	4/1/1999	2/1/2000			2.25E-06 (ca)	8.19E-06 (ca)	1.88E-05 (ca)			
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	4/1/1999	2/1/2000			2.25E-06 (ca)	8.19E-06 (ca)	1.88E-05 (ca)			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	1/31/2011	1/31/2011			7.49E-05 (ca)	2.73E-04 (ca)	6.26E-04 (ca)			
Polycyclic Aromatic Hydrocarbon (PAH)	1150	4/99[4/94]				1.45E-02 (ca)	4.41E-02 (ca)	9.00E-02 (ca)			
Benz(A)Anthracene	56-55-3	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Benzo(A)Pyrene	50-32-8	4/99[4/94]				5.89E-04 (ca)	2.15E-03 (ca)	4.93E-03 (ca)			
Benzo(B)Fluoranthene	205-99-2	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Benzo(J)Fluoranthene	205-82-3	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Benzo(K)Fluoranthene	207-08-9	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Chrysene	218-01-9	4/99[4/94]				5.89E-02 (ca)	2.15E-01 (ca)	4.93E-01 (ca)			
Dibenz(A,H)Acridine	226-36-8	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Dibenz(A,H)Anthracene	53-70-3	4/99[4/94]				1.62E-03 (ca)	5.91E-03 (ca)	1.36E-02 (ca)			
Dibenz(A,J)Acridine	224-42-0	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
Dibenzo(A,E)Pyrene	192-65-4	4/99[4/94]				5.89E-04 (ca)	2.15E-03 (ca)	4.93E-03 (ca)			
Dibenzo(A,H)Pyrene	189-64-0	4/99[4/94]				5.89E-05 (ca)	2.15E-04 (ca)	4.93E-04 (ca)			
Dibenzo(A,I)Pyrene	189-55-9	4/99[4/94]				5.89E-05 (ca)	2.15E-04 (ca)	4.93E-04 (ca)			
Dibenzo(A,L)Pyrene	191-30-0	4/99[4/94]				5.89E-05 (ca)	2.15E-04 (ca)	4.93E-04 (ca)			
7H-Dibenzo(C,G)Carbazole	194-59-2	4/99[4/94]				5.89E-04 (ca)	2.15E-03 (ca)	4.93E-03 (ca)			
7,12-Dimethylbenz(A) Anthracene	57-97-6	4/99[4/94]				2.66E-05 (ca)	9.69E-05 (ca)	2.22E-04 (ca)			
1,6-Dinitropyrene	42397-64-8	4/99[4/94]				5.89E-05 (ca)	2.15E-04 (ca)	4.93E-04 (ca)			
1,8-Dinitropyrene	42397-65-9	4/99[4/94]				5.89E-04 (ca)	2.15E-03 (ca)	4.93E-03 (ca)			
Indeno(1,2,3-C,D)Pyrene	193-39-5	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
3-Methylcholanthrene	56-49-5	4/99[4/94]				3.02E-04 (ca)	1.10E-03 (ca)	2.53E-03 (ca)			
5-Methylchrysene	3697-24-3	4/99[4/94]				5.89E-04 (ca)	2.15E-03 (ca)	4.93E-03 (ca)			
Naphthalene	91-20-3	8/4/2004	4/1/2000			4.43E-01 (ca)	1.61E+00 (ca)	3.70E+00 (ca)			
5-Nitroacenaphthene	602-87-9	4/99[4/94]				5.12E-02 (ca)	1.86E-01 (ca)	4.28E-01 (ca)			
6-Nitrochrysene	7496-02-8	4/99[4/94]				5.89E-05 (ca)	2.15E-04 (ca)	4.93E-04 (ca)			
2-Nitrofluorene	607-57-8	4/99[4/94]				5.89E-02 (ca)	2.15E-01 (ca)	4.93E-01 (ca)			
1-Nitropyrene	5522-43-0	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
4-Nitropyrene	57835-92-4	4/99[4/94]				5.89E-03 (ca)	2.15E-02 (ca)	4.93E-02 (ca)			
1,3-Propane Sultone	1120-71-4	4/1/1999				2.21E-02 (ca)	8.06E-02 (ca)	1.85E-01 (ca)			

Table 1.0 – Screening Emission Levels (continued)

Pollutant		Date Toxicity Criteria Last Updated				Annual Pollutant Screening Level			Hourly Pollutant Screening Level		
Toxic Air Contaminant	CAS No	Cancer	Chronic	8-hr Chronic	Acute	Emissions at 25 m, lb/yr	Emissions at 50 m, lb/yr	Emissions at 100 m, lb/yr	Emissions at 25 m, lb/hr	Emissions at 50 m, lb/hr	Emissions at 100 m, lb/hr
Propylene (Propene)	115-07-1		4/1/2000			1.08E+05 (ch)	3.93E+05 (ch)	9.03E+05 (ch)			
Propylene Glycol Monomethyl Ether	107-98-2		2/1/2000			2.52E+05 (ch)	9.18E+05 (ch)	2.11E+06 (ch)			
Propylene Oxide	75-56-9	4/99[7/90]	2/1/2000		4/1/1999	4.09E+00 (ca)	1.49E+01 (ca)	3.42E+01 (ca)	6.85E-01	1.71E+00	4.28E+00
Selenium And Compounds	7782-49-2		12/1/2001			3.68E+00 (ch)	1.34E+01 (ch)	3.08E+01 (ch)			
Hydrogen Selenide	7783-07-5				4/1/1999				1.10E-03	2.75E-03	6.90E-03
Selenium Sulfide	7446-34-6		12/1/2001			3.68E+00 (ch)	1.34E+01 (ch)	3.08E+01 (ch)			
Sodium Hydroxide	1310-73-2				4/1/1999				1.77E-03	4.40E-03	1.10E-02
Styrene	100-42-5		4/1/2000		4/1/1999	3.24E+04 (ch)	1.18E+05 (ch)	2.71E+05 (ch)	2.65E-02	6.61E-02	1.66E-01
Sulfuric Acid (Sulfur Trioxide)	7446-71-9		12/1/2008		4/1/1999	3.60E+01 (ch)	1.31E+02 (ch)	3.01E+02 (ch)	2.65E-02	6.61E-02	1.66E-01
Sulfuric Acid (Oleum)	8014-95-7				4/1/1999				2.65E-02	6.61E-02	1.66E-01
1,1,2,2-Tetrachloroethane	79-34-5	4/1/1999				2.66E-01 (ca)	9.68E-01 (ca)	2.22E+00 (ca)			
Thioacetamide	62-55-5	4/1/1999				8.71E-03 (ca)	3.17E-02 (ca)	7.28E-02 (ca)			
Toluene	108-88-3		4/1/2000		4/1/1999	1.08E+04 (ch)	3.93E+04 (ch)	9.03E+04 (ch)	8.17E+00	2.04E+01	5.11E+01
Toluene Diisocyantates	26471-62-5	4/1/1999	1/1/2001			1.36E+00 (ca)	4.96E+00 (ca)	1.14E+01 (ca)			
Toluene-2,4-Diisocyanate	584-84-9	4/1/1999	1/1/2001	3/30/2016	3/30/2016	1.29E-01 (8hr)	4.68E-01 (8hr)	1.07E+00 (8hr)	4.42E-04	1.10E-03	2.76E-03
Toluene-2,6-Diisocyanate	91-08-7	4/1/1999	1/1/2001	3/30/2016	3/30/2016	1.29E-01 (8hr)	4.68E-01 (8hr)	1.07E+00 (8hr)	4.42E-04	1.10E-03	2.76E-03
1,1,2-Trichloroethane (Vinyl Trichloride)	79-00-5	4/1/1999				9.32E-01 (ca)	3.40E+00 (ca)	7.79E+00 (ca)			
Trichloroethylene	79-01-6	10/1/1990	4/1/2000			7.59E+00 (ca)	2.77E+01 (ca)	6.35E+01 (ca)			
Triethylamine	121-44-8		9/3/2002		4/1/1999	7.20E+03 (ch)	2.62E+04 (ch)	6.02E+04 (ch)	6.18E-01	1.54E+00	3.86E+00
Urethane (Ethyl Carbamate)	51-79-6	4/99[7/90]				5.31E-02 (ca)	1.94E-01 (ca)	4.44E-01 (ca)			
Vanadium (Fume Or Dust)	7440-62-2				4/1/1999				6.63E-03	1.65E-02	4.14E-02
Vanadium Pentoxide	1314-62-1				4/1/1999				6.63E-03	1.65E-02	4.14E-02
Vinyl Acetate	108-05-4		12/1/2001			7.20E+03 (ch)	2.62E+04 (ch)	6.02E+04 (ch)			
Vinyl Chloride (Chloroethylene)	75-01-4	12/1/1990			4/1/1999	1.97E-01 (ca)	7.17E-01 (ca)	1.65E+00 (ca)	3.98E+01	9.91E+01	2.48E+02
Vinylidene Chloride (1,1-Dichloroethylene)	75-35-4		1/1/2001			2.52E+03 (ch)	9.18E+03 (ch)	2.11E+04 (ch)			
Xylenes (Mixed Isomers)	1330-20-7		4/1/2000		4/1/1999	2.52E+04 (ch)	9.18E+04 (ch)	2.11E+05 (ch)	4.86E+00	1.21E+01	3.04E+01
M-Xylene	108-38-3		4/1/2000		4/1/1999	2.52E+04 (ch)	9.18E+04 (ch)	2.11E+05 (ch)	4.86E+00	1.21E+01	3.04E+01
O-Xylene	95-47-6		4/1/2000		4/1/1999	2.52E+04 (ch)	9.18E+04 (ch)	2.11E+05 (ch)	4.86E+00	1.21E+01	3.04E+01
P-Xylene	106-42-3		4/1/2000		4/1/1999	2.52E+04 (ch)	9.18E+04 (ch)	2.11E+05 (ch)	4.86E+00	1.21E+01	3.04E+01

Table 2.0 – References for CP, RELs, MWAF, and Target Organs Affected by TACs

For the most recent information on Cancer Potency (CP), Reference Exposure Levels (REL), and Molecular Weight Adjustment Factors (MWAF), please refer to the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, which can be found on CARB's website at https://www.arb.ca.gov/toxics/healthval/contable.pdf.

For the most recent information on target organs affected by TACs for non-cancer chronic and acute HI calculations, please refer to the Target Organs Tables, which can be found on CARB's website at https://www.arb.ca.gov/toxics/healthval/totables.pdf.

Table 3.0 – MP Adjustment Factors

MP Adjustment Factors – Cancer	Table 3.1
MP Adjustment Factors – Chronic	Table 3.2

Table 3.1 - MP Adjustment Factors - Cancer

Toxic Air Contaminant	CAS No.	Cancer MP Ratio							
		30 Year		9 Year		5 Year		2 Year	
		Res	Work	Res	Work	Res	Work	Res	Work
Arsenic and Compounds (Inorganic)	7440-38-2	9.71	4.52	12.68	4.33	12.52	4.33	12.33	4.33
Chromium 6+	18540-299	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Barium Chromate	10294-40-3	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Calcium Chromate	13765-19-0	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Lead Chromate	7758-97-6	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Sodium Dichromate	10588-01-9	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Strontium Chromate	7789-06-2	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Chromic Trioxide (as Chromic Acid Mist)	1333-82-0	1.60	1.02	1.78	1.02	1.75	1.02	1.73	1.02
Di(2-Ethylhexyl)Phthalate (DEHP)	117-81-7	5.22	1.05	7.12	1.05	6.88	1.05	6.59	1.05
Hexachlorocyclohexanes	608-73-1	5.39	1.25	7.33	1.24	7.11	1.24	6.85	1.24
Alpha-Hexachlorocyclohexane	319-84-6	5.39	1.25	7.33	1.24	7.11	1.24	6.85	1.24
Beta-Hexachlorocyclohexane	319-85-7	5.39	1.25	7.33	1.24	7.11	1.24	6.85	1.24
Gamma-Hexachlorocyclohexane (Lindane)	58-89-9	5.39	1.25	7.33	1.24	7.11	1.24	6.85	1.24
Lead and Compounds (Inorganic)	7439-92-1	11.41	5.83	14.81	5.62	15.11	5.62	15.22	5.63
Lead and Compounds (Inorganic)	7439-92-1	11.41	5.83	14.81	5.62	15.11	5.62	15.22	5.63
Lead Acetate	301-04-2	11.41	5.83	14.81	5.62	15.11	5.62	15.22	5.63
Lead Phosphate	7446-27-7	11.41	5.83	14.81	5.62	15.12	5.62	15.22	5.62
Lead Subacetate	1335-32-6	11.41	5.83	14.81	5.62	15.11	5.62	15.22	5.62
4,4'-Methylene Dianiline (and its Dichloride)	101-77-9	7.22	2.47	9.79	2.41	9.52	2.41	9.20	2.41
PCB (Polychlorinated Biphenyls)	1336-36-3	18.94	13.12	24.80	12.57	24.55	12.57	24.25	12.57
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	32598-13-3	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	70362-50-4	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	32598-14-4	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	74472-37-0	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	31508-00-6	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	65510-44-3	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	57465-28-8	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	38380-08-4	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	69782-90-7	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	52663-72-6	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	32774-16-6	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	39635-31-9	27.57	13.12	24.80	12.57	40.63	12.57	45.53	12.57
Polychlorinated Dibenzo-p-Dioxins (PCDD)	1086	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1746-01-6	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	40321-76-4	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	39227-28-6	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	57653-85-7	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	19408-74-3	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	35822-46-9	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3268-87-9	25.72	7.58	16.00	7.27	39.91	7.27	46.38	7.27
Polychlorinated Dibenzofurans (PCDF)	1080	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
2,3,7,8-Tetrachlorodibenzofuran	5120-73-19	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27

Table 3.1 – MP Adjustment Factors – Cancer (continued)

Toxic Air Contaminant	CAS No.	Cancer MP Ratio							
		30 Year		9 Year		5 Year		2 Year	
		Res	Work	Res	Work	Res	Work	Res	Work
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	18.19	7.58	16.00	7.27	26.80	7.27	29.99	7.27
Polycyclic Aromatic Hydrocarbon (PAH)	1151	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Benz(a)Anthracene	56-55-3	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Benzo(a)Pyrene	50-32-8	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Benzo(b)Fluoranthene	205-99-2	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Benzo(j)Fluoranthene	205-82-3	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Benzo(k)Fluoranthene	207-08-9	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Chrysene	218-01-9	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenz(a,h)Acridine	226-36-8	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenz(a,h)Anthracene	53-70-3	7.99	2.48	9.64	2.42	11.40	2.42	12.04	2.42
Dibenz(a,j)Acridine	224-42-0	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenzo(a,e)Pyrene	192-65-4	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenzo(a,h)Pyrene	189-64-0	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenzo(a,i)Pyrene	189-55-9	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Dibenzo(a,l)Pyrene	191-30-0	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
7H-Dibenzo(c,g)Carbazole	194-59-2	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
7,12-Dimethylbenz(a) Anthracene	57-97-6	7.99	2.48	9.64	2.42	11.40	2.42	12.04	2.42
1,6-Dinitropyrene	42397-64-8	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
1,8-Dinitropyrene	42397-65-9	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
Indeno(1,2,3-c,d)Pyrene	193-39-5	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
3-Methylcholanthrene	56-49-5	7.99	2.48	9.64	2.42	11.40	2.42	12.04	2.42
5-Methylchrysene	3697-24-3	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
5-Nitroacenaphthene	602-87-9	7.99	2.49	9.64	2.42	11.40	2.42	12.04	2.42
6-Nitrochrysene	7496-02-8	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
2-Nitrofluorene	607-57-8	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
1-Nitropyrene	5522-43-0	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34
4-Nitropyrene	57835-92-4	23.12	6.62	28.21	6.34	33.72	6.34	35.81	6.34

Table 3.2 – MP Adjustment Factors - Chronic

Toxic Air Contaminant	CAS No.	Chronic MP Ratio	
		Residential	Worker
Arsenic and Compounds (Inorganic)	7440-38-2	88.03	28.37
Cadmium and Compounds	7440-43-9	1.98	1.20
Chromium 6+	18540-299	2.44	1.00
Barium Chromate	10294-40-3	2.44	1.00
Calcium Chromate	13765-19-0	2.44	1.00
Lead Chromate	7758-97-6	2.44	1.00
Sodium Dichromate	10588-01-9	2.44	1.00
Strontium Chromate	7789-06-2	2.44	1.00
Fluorides	1101	5.70	2.85
Hydrogen Fluoride (Hydrofluoric Acid)	7664-39-3	6.06	2.99
Mercury and Compounds (Inorganic)	7439-97-6	3.86	2.11
Mercuric Chloride	7487-94-7	3.86	2.11
3,3',4,4'-Tetrachlorobiphenyl (PCB 77)	32598-13-3	243.90	10.82
3,4,4',5-Tetrachlorobiphenyl (PCB 81)	70362-50-4	240.21	10.67
2,3,3',4,4'-Pentachlorobiphenyl (PCB 105)	32598-14-4	240.21	10.67
2,3,4,4',5-Pentachlorobiphenyl (PCB 114)	74472-37-0	240.21	10.67
2,3',4,4',5-Pentachlorobiphenyl (PCB 118)	31508-00-6	240.21	10.67
2,3',4,4',5'-Pentachlorobiphenyl (PCB 123)	65510-44-3	240.21	10.67
3,3',4,4',5-Pentachlorobiphenyl (PCB 126)	57465-28-8	243.90	10.82
2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156)	38380-08-4	240.21	10.67
2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157)	69782-90-7	240.21	10.67
2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167)	52663-72-6	240.21	10.67
3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169)	32774-16-6	240.21	10.67
2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189)	39635-31-9	240.21	10.67
Polychlorinated Dibenzo-p-Dioxins (PCDD)	1086	307.60	6.73
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	1746-01-6	307.60	6.73
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	40321-76-4	307.60	6.73
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	39227-28-6	307.60	6.73
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	57653-85-7	307.60	6.73
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	19408-74-3	307.60	6.73
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	35822-46-9	307.60	6.73
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-Dioxin	3268-87-9	302.95	6.64
Polychlorinated Dibenzofurans (PCDF)	1080	154.97	6.73
2,3,7,8-Tetrachlorodibenzofuran	5120-73-19	154.97	6.73
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	152.63	6.64
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	152.63	6.64
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	154.97	6.73
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	154.97	6.73
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	154.97	6.73
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	154.97	6.73
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	154.97	6.73
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	154.97	6.73

Table 3.2 – MP Adjustment Factors – Chronic (continued)

Toxic Air Contaminant	CAS No.	Chronic MP Ratio	
		Residential	Worker
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	39001-02-0	152.63	6.64
Selenium and Compounds	7782-49-2	195.58	23.71
Selenium Sulfide	7446-34-6	195.58	23.71

Table 4.0 - CEF

Receptor	Exposure Duration (years)	CEF Tables
Residential	2	Table 4.1 A
	5	Table 4.1 B
	9	Table 4.1 C
	30	Table 4.1 D
	70	Table 4.1 E
Worker	2	Table 4.2 A
	5	Table 4.2 B
	9	Table 4.2 C
	25	Table 4.2 D

Table 4.1 A – CEF for 2 Years **Residential**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	311.35
0 to 2	1,090	10	2	1	0.96	

Table 4.1 B – CEF for 5 Years **Residential**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	389.23
0 to 2	1,090	10	2	1	0.96	
2 to 5	631	3	3	1	0.96	

Table 4.1 C – CEF for 9 Years **Residential**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	493.08
0 to 2	1,090	10	2	1	0.96	
2 to 9	631	3	7	1	0.96	

Table 4.1 D – CEF for 30 Years **Residential**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	677.4
0 to 2	1,090	10	2	1	0.96	
2 to 16	572	3	14	1	0.96	
16 to 30	261	1	14	0.73	0.96	

Table 4.1 E – CEF for 70 Years **Residential**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Fraction of Time at Home	Exposure Frequency (350 days/year)	CEF_R
-0.25 to 0	361	10	0.25	1	0.96	766.78
0 to 2	1,090	10	2	1	0.96	
2 to 16	572	3	14	1	0.96	
16 to 70	233	1	54	0.73	0.96	

Table 4.2 A – CEF for 2 Years **Worker**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	CEF_W
16 - 41	230	1	2	0.68	4.47

Table 4.2 B – CEF for 5 Years **Worker**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	CEF_W
16 - 41	230	1	5	0.68	11.17

Table 4.2 C – CEF for 9 Years **Worker**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	CEF_W
16 - 41	230	1	9	0.68	20.1

Table 4.2 D – CEF for 25 Years **Worker**

Age	Daily Breathing Rate (L/kg-day)	Age Specific Factor	Exposure Duration (years)	Exposure Frequency (250 days/year)	CEF_W
16 - 41	230	1	25	0.68	55.86

Table 5.0 – WAF

Operating 12 Hours Per Day or Less	Table 5.1
Operating More Than 12 Hours Per Day	Table 5.2

Table 5.1 – WAF Operating 12 Hours Per Day or Less

Hours of Operation Per Day	Days of Operation Per Week						
	1	2	3	4	5	6	7
1	4.2	4.2	4.2	4.2	4.2	3.5	3.0
2	4.2	4.2	4.2	4.2	4.2	3.5	3.0
3	4.2	4.2	4.2	4.2	4.2	3.5	3.0
4	4.2	4.2	4.2	4.2	4.2	3.5	3.0
5	4.2	4.2	4.2	4.2	4.2	3.5	3.0
6	4.2	4.2	4.2	4.2	4.2	3.5	3.0
7	4.2	4.2	4.2	4.2	4.2	3.5	3.0
8	4.2	4.2	4.2	4.2	4.2	3.5	3.0
9	3.7	3.7	3.7	3.7	3.7	3.1	2.7
10	3.4	3.4	3.4	3.4	3.4	2.8	2.4
11	3.1	3.1	3.1	3.1	3.1	2.5	2.2
12	2.8	2.8	2.8	2.8	2.8	2.3	2.0

Note: The WAF value for residential/sensitive receptors is 1.0, which assumes exposure of 24 hours/day, 7 days/week

Table 5.2 – WAF Operating More Than 12 Hours Per Day

Hours of Operation Per Day	Days of Operation Per Week						
	1	2	3	4	5	6	7
13	2.6	2.6	2.6	2.6	2.6	2.2	1.8
14	2.4	2.4	2.4	2.4	2.4	2	1.7
15	2.2	2.2	2.2	2.2	2.2	1.9	1.6
16	2.1	2.1	2.1	2.1	2.1	1.8	1.5
17	2.0	2.0	2.0	2.0	2.0	1.6	1.4
18	1.9	1.9	1.9	1.9	1.9	1.6	1.3
19	1.8	1.8	1.8	1.8	1.8	1.5	1.3
20	1.7	1.7	1.7	1.7	1.7	1.4	1.2
21	1.6	1.6	1.6	1.6	1.6	1.3	1.1
22	1.5	1.5	1.5	1.5	1.5	1.3	1.1
23	1.5	1.5	1.5	1.5	1.5	1.2	1.0
24	1.4	1.4	1.4	1.4	1.4	1.2	1.0

Note: The WAF value for residential/sensitive receptors is 1.0, which assumes exposure of 24 hours/day, 7 days/week

Table 6.0 – χ/Q for General Non-Combustion Point Source Equipment

Equipment Type	Stack Height (ft)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables		Acute χ /Q Table	Source ID
		≤ 12 hr/day	> 12 hr/day		
General Non-Combustion Point Source Equipment	14 ≤ Stack Height < 25	Table 6.1 A	Table 6.1 B	Table 6.4	P1
	25 ≤ Stack Height < 50	Table 6.2 A	Table 6.2 B		P2
	Stack Height ≥ 50	Table 6.3 A	Table 6.3 B		P3

Table 6.1 A – χ/Q for General Non-Combustion Point Source Equipment

14 ft ≤ Stack Height < 25 ft* **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	44.54	8.83	4.31	2.39	0.44	0.15	0.05	0.01
BNAP	**Banning**	38.88	9.15	4.83	2.86	0.65	0.24	0.08	0.02
CELA	**Central L.A.**	39.03	8.06	3.86	2.15	0.42	0.14	0.05	0.01
ELSI	**Lake Elsinore**	31.08	6.78	3.28	1.80	0.36	0.12	0.04	0.01
FONT	**Fontana**	45.12	9.39	4.72	2.68	0.54	0.19	0.06	0.01
MSVJ	**Mission Viejo**	32.09	7.04	3.47	1.93	0.36	0.13	0.04	0.01
PERI	**Perris**	27.00	6.57	3.37	1.96	0.43	0.16	0.05	0.01
PICO	**Pico Rivera**	40.64	8.47	4.18	2.38	0.47	0.17	0.05	0.01
RDLD	**Redlands**	43.55	9.17	4.44	2.43	0.45	0.15	0.05	0.01
UPLA	**Upland**	49.43	10.09	5.11	2.93	0.58	0.20	0.07	0.02
KBUR	**Burbank Airport**	46.03	9.54	4.88	2.85	0.59	0.22	0.07	0.02
KCNO	**Chino Airport.**	35.66	8.90	4.72	2.77	0.63	0.24	0.07	0.02
KCQT	**USC/Downtown L.A.**	45.34	9.90	4.96	2.79	0.53	0.18	0.06	0.01
KFUL	**Fullerton Airport**	42.01	9.03	4.67	2.72	0.57	0.20	0.07	0.02
KHHR	**Hawthorne Airport**	50.38	11.10	5.83	3.44	0.75	0.26	0.09	0.02
KLAX	**Los Angeles Int'l Airport**	53.93	12.76	7.14	4.43	1.07	0.39	0.12	0.03
KLGB	**Long Beach Airport**	36.19	8.18	4.34	2.59	0.56	0.21	0.07	0.02
KONT	**Ontario Airport**	46.82	10.65	5.72	3.42	0.77	0.29	0.09	0.02
KPSP	**Palm Springs Airport**	30.91	6.85	3.55	2.06	0.43	0.16	0.05	0.01
KRAL	**Riverside Airport**	44.72	10.63	5.56	3.24	0.69	0.25	0.08	0.02
KSMO	**Santa Monica Airport**	55.55	11.88	6.36	3.83	0.85	0.30	0.10	0.02
KSNA	**John Wayne Int'l Airport**	46.20	10.72	5.63	3.38	0.76	0.29	0.09	0.02
KTRM	**Desert Hot Springs Airport**	33.57	8.31	4.56	2.80	0.65	0.24	0.08	0.02
KVNY	**Van Nuys Airport**	35.79	8.05	4.17	2.43	0.52	0.19	0.06	0.01

*Note: Facilities with stack heights less than 14 feet must perform Tier 3 or 4 dispersion modeling

Table 6.1 B – χ/Q for General Non-Combustion Point Source Equipment

14 ft ≤ Stack Height < 25 ft* **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	46.40	12.88	7.73	5.16	1.43	0.47	0.14	0.04
BNAP	**Banning**	49.83	15.25	9.54	6.61	2.13	0.81	0.28	0.09
CELA	**Central L.A.**	37.54	11.42	6.95	4.71	1.31	0.41	0.13	0.04
ELSI	**Lake Elsinore**	34.73	11.44	6.73	4.48	1.32	0.48	0.17	0.05
FONT	**Fontana**	49.30	14.18	8.47	5.69	1.62	0.56	0.17	0.05
MSVJ	**Mission Viejo**	36.69	10.68	6.31	4.23	1.22	0.43	0.15	0.05
PERI	**Perris**	40.07	12.51	7.21	4.74	1.38	0.54	0.19	0.06
PICO	**Pico Rivera**	42.92	12.08	6.91	4.48	1.18	0.42	0.14	0.04
RDLD	**Redlands**	46.28	13.58	9.06	6.65	2.16	0.64	0.18	0.05
UPLA	**Upland**	47.67	13.81	8.41	5.89	1.57	0.52	0.16	0.05
KBUR	**Burbank Airport**	38.66	10.82	6.30	4.14	1.14	0.46	0.17	0.05
KCNO	**Chino Airport.**	37.18	11.76	7.20	4.89	1.59	0.67	0.24	0.08
KCQT	**USC/Downtown L.A.**	46.96	14.53	9.30	6.45	1.86	0.56	0.15	0.05
KFUL	**Fullerton Airport**	37.00	10.76	6.29	4.04	1.20	0.43	0.16	0.05
KHHR	**Hawthorne Airport**	43.98	12.84	7.57	4.95	1.35	0.49	0.17	0.05
KLAX	**Los Angeles Int'l Airport**	45.53	13.60	8.38	5.68	1.76	0.71	0.25	0.08
KLGB	**Long Beach Airport**	35.40	11.99	7.60	5.32	1.71	0.64	0.22	0.07
KONT	**Ontario Airport**	47.53	14.23	8.88	6.14	2.03	0.85	0.32	0.10
KPSP	**Palm Springs Airport**	34.09	11.30	7.14	4.96	1.59	0.65	0.24	0.08
KRAL	**Riverside Airport**	43.31	14.55	9.20	6.41	2.01	0.71	0.23	0.07
KSMO	**Santa Monica Airport**	45.64	13.21	7.80	5.13	1.44	0.53	0.18	0.05
KSNA	**John Wayne Int'l Airport**	41.29	12.48	7.55	5.14	1.57	0.63	0.23	0.07
KTRM	**Desert Hot Springs Airport**	38.50	12.31	7.93	5.57	1.87	0.78	0.29	0.09
KVNY	**Van Nuys Airport**	33.39	10.25	6.07	4.05	1.24	0.49	0.17	0.05

*Note: Facilities with stack heights less than 14 feet must perform Tier 3 or 4 dispersion modeling

Table 6.2 A – χ/Q for General Non-Combustion Point Source Equipment

25 ft ≤ Stack Height < 50 ft **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	24.89	6.39	3.37	1.94	0.39	0.14	0.05	0.01
BNAP	Banning	20.18	5.81	3.49	2.22	0.57	0.22	0.07	0.02
CELA	Central L.A.	22.83	5.57	2.93	1.69	0.36	0.14	0.04	0.01
ELSI	Lake Elsinore	19.61	5.12	2.68	1.52	0.32	0.12	0.04	0.01
FONT	Fontana	26.01	6.61	3.65	2.18	0.48	0.18	0.06	0.01
MSVJ	Mission Viejo	19.35	5.15	2.79	1.62	0.33	0.12	0.04	0.01
PERI	Perris	16.03	4.71	2.65	1.61	0.39	0.15	0.05	0.01
PICO	Pico Rivera	24.22	5.95	3.23	1.92	0.42	0.16	0.05	0.01
RDLD	Redlands	24.11	6.67	3.50	1.99	0.40	0.15	0.05	0.01
UPLA	Upland	27.21	7.02	3.91	2.33	0.51	0.19	0.06	0.02
KBUR	Burbank Airport	25.74	6.55	3.73	2.30	0.54	0.21	0.07	0.02
KCNO	Chino Airport.	18.76	5.97	3.56	2.23	0.57	0.23	0.07	0.02
KCQT	USC/Downtown L.A.	24.42	7.07	3.87	2.26	0.47	0.17	0.06	0.01
KFUL	Fullerton Airport	25.29	6.32	3.58	2.18	0.50	0.19	0.06	0.02
KHHR	Hawthorne Airport	26.83	7.21	4.23	2.64	0.64	0.25	0.08	0.02
KLAX	Los Angeles Int'l Airport	28.07	8.09	5.07	3.34	0.91	0.36	0.12	0.03
KLGB	Long Beach Airport	20.16	5.61	3.32	2.09	0.51	0.20	0.07	0.02
KONT	Ontario Airport	25.71	7.23	4.32	2.74	0.69	0.27	0.09	0.02
KPSP	Palm Springs Airport	16.78	4.77	2.77	1.69	0.39	0.15	0.05	0.01
KRAL	Riverside Airport	22.53	7.15	4.19	2.58	0.61	0.23	0.08	0.02
KSMO	Santa Monica Airport	33.70	8.01	4.70	2.97	0.74	0.28	0.09	0.02
KSNA	John Wayne Int'l Airport	27.52	7.36	4.27	2.71	0.68	0.27	0.09	0.02
KTRM	Desert Hot Springs Airport	19.99	5.74	3.48	2.25	0.57	0.23	0.07	0.02
KVNY	Van Nuys Airport	21.17	5.70	3.24	1.99	0.47	0.19	0.06	0.01

Table 6.2 B – χ/Q for General Non-Combustion Point Source Equipment

25 ft ≤ Stack Height < 50 ft **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	24.27	7.94	5.10	3.54	1.10	0.42	0.14	0.04
BNAP	**Banning**	25.48	8.21	5.60	4.12	1.61	0.75	0.30	0.10
CELA	**Central L.A.**	21.12	7.18	4.55	3.16	0.97	0.36	0.13	0.04
ELSI	**Lake Elsinore**	20.80	7.79	4.86	3.34	1.07	0.44	0.17	0.05
FONT	**Fontana**	26.78	8.65	5.59	3.93	1.30	0.53	0.19	0.06
MSVJ	**Mission Viejo**	20.45	7.18	4.57	3.07	0.97	0.40	0.16	0.05
PERI	**Perris**	24.72	8.70	5.29	3.60	1.17	0.51	0.20	0.06
PICO	**Pico Rivera**	24.92	7.76	4.84	3.29	0.99	0.40	0.15	0.04
RDLD	**Redlands**	25.51	9.22	5.62	4.25	1.54	0.52	0.19	0.06
UPLA	**Upland**	24.75	8.44	5.51	3.86	1.24	0.50	0.18	0.06
KBUR	**Burbank Airport**	20.26	6.51	4.18	2.91	0.96	0.44	0.18	0.06
KCNO	**Chino Airport.**	18.11	6.64	4.47	3.22	1.23	0.60	0.24	0.08
KCQT	**USC/Downtown L.A.**	22.29	8.08	5.67	4.13	1.34	0.49	0.16	0.05
KFUL	**Fullerton Airport**	20.52	6.87	4.41	3.00	0.93	0.41	0.16	0.05
KHHR	**Hawthorne Airport**	22.38	7.59	4.97	3.46	1.12	0.48	0.19	0.06
KLAX	**Los Angeles Int'l Airport**	22.49	7.55	5.16	3.72	1.36	0.63	0.25	0.08
KLGB	**Long Beach Airport**	19.53	6.86	4.71	3.46	1.30	0.58	0.23	0.08
KONT	**Ontario Airport**	24.86	8.20	5.54	4.02	1.54	0.75	0.31	0.10
KPSP	**Palm Springs Airport**	19.60	6.63	4.50	3.28	1.24	0.60	0.25	0.08
KRAL	**Riverside Airport**	20.00	7.83	5.48	4.04	1.50	0.65	0.25	0.08
KSMO	**Santa Monica Airport**	25.22	8.10	5.26	3.64	1.17	0.49	0.18	0.06
KSNA	**John Wayne Int'l Airport**	23.36	7.39	4.85	3.48	1.26	0.59	0.23	0.07
KTRM	**Desert Hot Springs Airport**	22.70	7.22	4.96	3.67	1.47	0.73	0.30	0.10
KVNY	**Van Nuys Airport**	17.99	6.19	4.02	2.83	1.00	0.46	0.18	0.06

Table 6.3 A – χ/Q for General Non-Combustion Point Source Equipment

Stack Height ≥ 50 ft **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.58	1.09	1.05	0.82	0.27	0.13	0.04	0.01
BNAP	**Banning**	0.04	0.17	0.52	0.72	0.40	0.20	0.07	0.02
CELA	**Central L.A.**	0.40	0.98	1.02	0.80	0.27	0.12	0.04	0.01
ELSI	**Lake Elsinore**	0.89	1.17	0.97	0.73	0.24	0.11	0.04	0.01
FONT	**Fontana**	0.31	0.74	0.97	0.90	0.36	0.17	0.06	0.01
MSVJ	**Mission Viejo**	0.31	0.83	0.92	0.75	0.25	0.11	0.04	0.01
PERI	**Perris**	0.88	0.93	0.87	0.77	0.30	0.14	0.05	0.01
PICO	**Pico Rivera**	0.29	0.76	0.94	0.84	0.32	0.15	0.05	0.01
RDLD	**Redlands**	0.89	1.19	1.11	0.86	0.29	0.13	0.05	0.01
UPLA	**Upland**	0.29	0.88	1.15	1.01	0.37	0.17	0.06	0.01
KBUR	**Burbank Airport**	0.19	0.52	0.80	0.88	0.42	0.20	0.07	0.02
KCNO	**Chino Airport.**	0.12	0.46	0.67	0.77	0.41	0.20	0.07	0.02
KCQT	**USC/Downtown L.A.**	0.35	1.01	1.11	0.93	0.33	0.15	0.05	0.01
KFUL	**Fullerton Airport**	0.17	0.67	0.99	0.94	0.37	0.17	0.06	0.01
KHHR	**Hawthorne Airport**	0.15	0.51	0.88	0.97	0.45	0.22	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	0.03	0.25	0.63	0.91	0.60	0.30	0.11	0.03
KLGB	**Long Beach Airport**	0.10	0.43	0.72	0.80	0.39	0.18	0.06	0.01
KONT	**Ontario Airport**	0.06	0.40	0.75	0.91	0.50	0.24	0.09	0.02
KPSP	**Palm Springs Airport**	0.10	0.46	0.70	0.69	0.29	0.14	0.05	0.01
KRAL	**Riverside Airport**	0.09	0.53	0.88	0.94	0.44	0.21	0.07	0.02
KSMO	**Santa Monica Airport**	0.06	0.46	0.97	1.09	0.52	0.25	0.09	0.02
KSNA	**John Wayne Int'l Airport**	0.09	0.38	0.79	0.97	0.51	0.25	0.09	0.02
KTRM	**Desert Hot Springs Airport**	0.04	0.30	0.66	0.80	0.42	0.20	0.07	0.02
KVNY	**Van Nuys Airport**	0.18	0.51	0.72	0.76	0.36	0.17	0.06	0.01

Table 6.3 B – χ/Q for General Non-Combustion Point Source Equipment

Stack Height ≥ 50 ft **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.65	1.08	1.17	1.07	0.55	0.31	0.15	0.05
BNAP	**Banning**	0.05	0.15	0.34	0.50	0.64	0.48	0.27	0.10
CELA	**Central L.A.**	0.40	1.21	1.36	1.20	0.54	0.30	0.13	0.04
ELSI	**Lake Elsinore**	1.21	1.91	1.63	1.37	0.66	0.38	0.18	0.06
FONT	**Fontana**	0.40	0.77	0.94	1.00	0.67	0.41	0.20	0.07
MSVJ	**Mission Viejo**	0.47	0.99	1.20	1.15	0.59	0.34	0.16	0.05
PERI	**Perris**	1.35	2.07	1.68	1.42	0.72	0.42	0.20	0.07
PICO	**Pico Rivera**	0.53	0.96	1.06	1.02	0.57	0.33	0.16	0.05
RDLD	**Redlands**	1.19	1.97	1.82	1.49	0.73	0.42	0.20	0.07
UPLA	**Upland**	0.34	0.76	1.07	1.13	0.68	0.40	0.19	0.07
KBUR	**Burbank Airport**	0.10	0.28	0.48	0.59	0.47	0.30	0.15	0.05
KCNO	**Chino Airport.**	0.07	0.26	0.43	0.55	0.50	0.36	0.19	0.07
KCQT	**USC/Downtown L.A.**	0.16	0.56	0.94	1.03	0.63	0.38	0.18	0.06
KFUL	**Fullerton Airport**	0.10	0.51	0.83	0.88	0.54	0.32	0.15	0.05
KHHR	**Hawthorne Airport**	0.08	0.39	0.72	0.86	0.61	0.37	0.18	0.06
KLAX	**Los Angeles Int'l Airport**	0.02	0.14	0.34	0.51	0.53	0.38	0.20	0.08
KLGB	**Long Beach Airport**	0.05	0.25	0.43	0.51	0.48	0.36	0.20	0.08
KONT	**Ontario Airport**	0.04	0.21	0.39	0.53	0.56	0.43	0.24	0.09
KPSP	**Palm Springs Airport**	0.05	0.21	0.33	0.41	0.48	0.37	0.21	0.08
KRAL	**Riverside Airport**	0.06	0.34	0.63	0.79	0.68	0.45	0.24	0.09
KSMO	**Santa Monica Airport**	0.04	0.33	0.68	0.84	0.58	0.36	0.17	0.06
KSNA	**John Wayne Int'l Airport**	0.04	0.20	0.43	0.59	0.56	0.38	0.20	0.07
KTRM	**Desert Hot Springs Airport**	0.02	0.15	0.30	0.41	0.54	0.43	0.25	0.10
KVNY	**Van Nuys Airport**	0.09	0.29	0.46	0.55	0.44	0.30	0.16	0.06

Table 6.4 – χ/Q for General Non-Combustion Point Source Equipment

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Stack Height (ft)	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
14 ≤ Stack Height < 25	676.64	261.46	200.34	165.43	66.01	22.72	8.35	2.68
25 ≤ Stack Height < 50	423.53	153.11	128.46	106.97	45.07	19.81	7.70	2.64
Stack Height ≥ 50	81.87	44.53	26.15	23.70	17.76	13.56	6.82	2.82

Table 7.0 – χ/Q for General Non-Combustion Volume Source Equipment

Equipment Type	Building Area (ft²)	Height (ft)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables		Acute χ /Q Table	Source ID
			≤ 12 hr/day	> 12 hr/day		
General Non-Combustion Volume Source Equipment	Area ≤ 3,000	≤ 20	Table 7.1 A	Table 7.1 B	Table 7.7	V1
	3,000 < Area ≤ 10,000	≤ 20	Table 7.2 A	Table 7.2 B		V2
	10,000 < Area ≤ 30,000	≤ 20	Table 7.3 A	Table 7.3 B		V3
	Area ≤ 3,000	> 20	Table 7.4 A	Table 7.4 B		V4
	3,000 < Area ≤ 10,000	> 20	Table 7.5 A	Table 7.5 B		V5
	10,000 < Area ≤ 30,000	> 20	Table 7.6 A	Table 7.6 B		V6

Table 7.1 A– χ/Q for General Non-Combustion Volume Source Equipment

Building Area ≤ 3,000 ft² **Height ≤ 20 ft** **≤ 12 hr/day**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	8.24	2.66	1.36	0.84	0.25	0.12	0.05	0.01
BNAP	Banning	12.32	4.72	2.50	1.55	0.45	0.21	0.08	0.02
CELA	Central L.A.	7.23	2.28	1.24	0.80	0.25	0.12	0.04	0.01
ELSI	Lake Elsinore	9.36	2.96	1.43	0.84	0.23	0.10	0.04	0.01
FONT	Fontana	9.56	3.60	1.93	1.20	0.35	0.16	0.06	0.01
MSVJ	Mission Viejo	8.75	2.92	1.46	0.88	0.24	0.11	0.04	0.01
PERI	Perris	11.24	3.80	1.89	1.13	0.31	0.14	0.05	0.01
PICO	Pico Rivera	8.47	3.14	1.69	1.06	0.31	0.14	0.05	0.01
RDLD	Redlands	8.78	2.90	1.48	0.91	0.27	0.13	0.05	0.01
UPLA	Upland	8.67	3.28	1.82	1.17	0.36	0.17	0.06	0.02
KBUR	Burbank Airport	12.78	4.82	2.52	1.54	0.44	0.20	0.07	0.02
KCNO	Chino Airport.	15.87	5.72	2.88	1.72	0.46	0.21	0.07	0.02
KCQT	USC/Downtown L.A.	9.73	3.38	1.76	1.09	0.32	0.15	0.06	0.01
KFUL	Fullerton Airport	9.82	3.76	2.01	1.26	0.37	0.17	0.06	0.02
KHHR	Hawthorne Airport	11.74	4.48	2.42	1.53	0.47	0.22	0.08	0.02
KLAX	Los Angeles Int'l Airport	18.91	7.29	3.86	2.39	0.71	0.33	0.13	0.03
KLGB	Long Beach Airport	13.43	5.01	2.57	1.55	0.43	0.19	0.07	0.02
KONT	Ontario Airport	17.68	6.60	3.38	2.04	0.56	0.25	0.09	0.02
KPSP	Palm Springs Airport	10.42	3.72	1.87	1.12	0.30	0.14	0.05	0.01
KRAL	Riverside Airport	12.96	4.90	2.58	1.59	0.46	0.21	0.08	0.02
KSMO	Santa Monica Airport	13.18	5.25	2.87	1.82	0.55	0.26	0.10	0.02
KSNA	John Wayne Int'l Airport	17.06	6.46	3.34	2.03	0.56	0.25	0.09	0.02
KTRM	Desert Hot Springs Airport	15.32	5.69	2.90	1.74	0.48	0.21	0.08	0.02
KVNY	Van Nuys Airport	12.43	4.56	2.32	1.40	0.38	0.17	0.06	0.01

Table 7.1 B – χ/Q for General Non-Combustion Volume Source Equipment

Building Area ≤ 3,000 ft² **Height ≤ 20 ft** **>12 hr/day**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	15.52	5.77	3.10	1.97	0.64	0.32	0.14	0.04
BNAP	**Banning**	23.69	10.16	5.74	3.75	1.28	0.67	0.29	0.09
CELA	**Central L.A.**	14.82	5.39	2.92	1.86	0.61	0.31	0.13	0.04
ELSI	**Lake Elsinore**	19.08	7.04	3.74	2.36	0.75	0.38	0.16	0.05
FONT	**Fontana**	17.82	6.95	3.79	2.43	0.79	0.40	0.17	0.05
MSVJ	**Mission Viejo**	17.82	6.61	3.52	2.22	0.70	0.36	0.15	0.05
PERI	**Perris**	20.96	7.91	4.24	2.68	0.86	0.44	0.19	0.06
PICO	**Pico Rivera**	15.66	5.95	3.21	2.04	0.65	0.33	0.14	0.04
RDLD	**Redlands**	19.15	7.15	3.84	2.44	0.79	0.40	0.17	0.05
UPLA	**Upland**	17.02	6.52	3.55	2.27	0.74	0.37	0.16	0.05
KBUR	**Burbank Airport**	17.97	7.19	3.92	2.49	0.80	0.40	0.17	0.05
KCNO	**Chino Airport.**	23.67	9.71	5.36	3.43	1.12	0.57	0.24	0.07
KCQT	**USC/Downtown L.A.**	16.69	6.32	3.41	2.17	0.70	0.35	0.15	0.05
KFUL	**Fullerton Airport**	16.91	6.53	3.53	2.24	0.72	0.36	0.15	0.05
KHHR	**Hawthorne Airport**	17.71	6.91	3.78	2.41	0.79	0.40	0.17	0.05
KLAX	**Los Angeles Int'l Airport**	22.51	9.48	5.32	3.45	1.16	0.60	0.26	0.08
KLGB	**Long Beach Airport**	18.82	7.78	4.34	2.81	0.95	0.50	0.22	0.07
KONT	**Ontario Airport**	26.62	11.37	6.41	4.18	1.42	0.74	0.32	0.10
KPSP	**Palm Springs Airport**	21.06	8.74	4.87	3.16	1.07	0.56	0.24	0.08
KRAL	**Riverside Airport**	20.88	8.52	4.73	3.06	1.03	0.54	0.23	0.08
KSMO	**Santa Monica Airport**	18.16	7.21	3.96	2.54	0.83	0.42	0.18	0.05
KSNA	**John Wayne Int'l Airport**	22.27	9.14	5.04	3.23	1.05	0.53	0.22	0.07
KTRM	**Desert Hot Springs Airport**	24.66	10.58	5.96	3.87	1.30	0.67	0.29	0.09
KVNY	**Van Nuys Airport**	17.65	7.07	3.86	2.46	0.79	0.40	0.17	0.05

Table 7.2 A – χ/Q for General Non-Combustion Volume Source Equipment

3,000 ft² < Building Area ≤ 10,000 ft² Height ≤ 20 ft ≤12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	5.55	2.14	1.17	0.75	0.24	0.12	0.04	0.01
BNAP	**Banning**	8.80	3.84	2.15	1.37	0.42	0.20	0.07	0.02
CELA	**Central L.A.**	4.84	1.87	1.09	0.72	0.24	0.11	0.04	0.01
ELSI	**Lake Elsinore**	6.31	2.34	1.21	0.74	0.21	0.10	0.04	0.01
FONT	**Fontana**	6.81	2.95	1.66	1.07	0.33	0.16	0.06	0.01
MSVJ	**Mission Viejo**	6.00	2.34	1.25	0.78	0.22	0.10	0.04	0.01
PERI	**Perris**	7.74	3.04	1.61	1.00	0.29	0.13	0.05	0.01
PICO	**Pico Rivera**	5.98	2.58	1.46	0.94	0.29	0.14	0.05	0.01
RDLD	**Redlands**	5.96	2.33	1.27	0.81	0.25	0.12	0.05	0.01
UPLA	**Upland**	6.12	2.72	1.59	1.05	0.34	0.16	0.06	0.02
KBUR	**Burbank Airport**	9.15	3.91	2.16	1.37	0.41	0.19	0.07	0.02
KCNO	**Chino Airport.**	11.20	4.59	2.45	1.51	0.43	0.20	0.07	0.02
KCQT	**USC/Downtown L.A.**	6.73	2.74	1.51	0.97	0.30	0.15	0.06	0.01
KFUL	**Fullerton Airport**	7.05	3.08	1.74	1.12	0.35	0.17	0.06	0.02
KHHR	**Hawthorne Airport**	8.32	3.67	2.10	1.37	0.44	0.22	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	13.41	5.89	3.31	2.12	0.66	0.32	0.12	0.03
KLGB	**Long Beach Airport**	9.59	4.04	2.19	1.37	0.40	0.18	0.07	0.02
KONT	**Ontario Airport**	12.60	5.31	2.88	1.80	0.52	0.24	0.09	0.02
KPSP	**Palm Springs Airport**	7.34	2.98	1.60	0.99	0.28	0.13	0.05	0.01
KRAL	**Riverside Airport**	9.24	3.98	2.21	1.41	0.43	0.20	0.08	0.02
KSMO	**Santa Monica Airport**	9.49	4.32	2.49	1.62	0.52	0.25	0.09	0.02
KSNA	**John Wayne Int'l Airport**	12.23	5.22	2.86	1.79	0.52	0.24	0.08	0.02
KTRM	**Desert Hot Springs Airport**	10.88	4.57	2.47	1.54	0.44	0.20	0.07	0.02
KVNY	**Van Nuys Airport**	8.83	3.67	1.98	1.23	0.35	0.16	0.06	0.01

Table 7.2 B – χ/Q for General Non-Combustion Volume Source Equipment

3,000 ft² < Building Area ≤ 10,000 ft²　　Height ≤ 20 ft　　>12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	11.05	4.73	2.69	1.77	0.60	0.31	0.13	0.04
BNAP	Banning	17.61	8.43	5.02	3.37	1.21	0.64	0.28	0.09
CELA	Central L.A.	10.47	4.43	2.54	1.67	0.57	0.30	0.13	0.04
ELSI	Lake Elsinore	13.58	5.76	3.24	2.11	0.71	0.37	0.16	0.05
FONT	Fontana	12.90	5.73	3.30	2.18	0.75	0.39	0.17	0.05
MSVJ	Mission Viejo	12.71	5.41	3.05	1.99	0.66	0.34	0.15	0.05
PERI	Perris	15.00	6.48	3.68	2.41	0.82	0.42	0.18	0.06
PICO	Pico Rivera	11.25	4.89	2.79	1.83	0.61	0.31	0.13	0.04
RDLD	Redlands	13.65	5.86	3.34	2.19	0.75	0.39	0.17	0.05
UPLA	Upland	12.23	5.37	3.09	2.04	0.70	0.36	0.15	0.05
KBUR	Burbank Airport	13.21	5.93	3.41	2.23	0.75	0.39	0.17	0.05
KCNO	Chino Airport.	17.46	8.02	4.67	3.08	1.06	0.55	0.24	0.07
KCQT	USC/Downtown L.A.	11.98	5.19	2.96	1.94	0.66	0.34	0.15	0.05
KFUL	Fullerton Airport	12.23	5.37	3.07	2.01	0.68	0.35	0.15	0.05
KHHR	Hawthorne Airport	12.80	5.69	3.29	2.17	0.74	0.39	0.16	0.05
KLAX	Los Angeles Int'l Airport	16.59	7.84	4.64	3.10	1.10	0.58	0.25	0.08
KLGB	Long Beach Airport	13.87	6.44	3.79	2.53	0.90	0.48	0.21	0.07
KONT	Ontario Airport	19.75	9.42	5.60	3.75	1.34	0.71	0.32	0.10
KPSP	Palm Springs Airport	15.51	7.23	4.25	2.84	1.01	0.54	0.24	0.08
KRAL	Riverside Airport	15.28	7.03	4.13	2.75	0.97	0.52	0.23	0.08
KSMO	Santa Monica Airport	13.20	5.95	3.45	2.28	0.78	0.40	0.17	0.05
KSNA	John Wayne Int'l Airport	16.46	7.56	4.39	2.90	0.99	0.51	0.22	0.07
KTRM	Desert Hot Springs Airport	18.41	8.78	5.20	3.48	1.23	0.65	0.29	0.09
KVNY	Van Nuys Airport	12.96	5.83	3.36	2.21	0.75	0.39	0.17	0.05

Table 7.3 A – χ/Q for General Non-Combustion Volume Source Equipment

10,000 ft² < Building Area ≤ 30,000 ft² **Height ≤ 20 ft** **≤12 hr/day**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	5.42	2.22	1.21	0.77	0.24	0.11	0.04	0.01
BNAP	**Banning**	7.23	3.57	2.07	1.33	0.41	0.19	0.07	0.02
CELA	**Central L.A.**	4.85	2.06	1.17	0.76	0.24	0.11	0.04	0.01
ELSI	**Lake Elsinore**	5.92	2.33	1.22	0.74	0.21	0.10	0.04	0.01
FONT	**Fontana**	6.55	2.97	1.68	1.07	0.33	0.15	0.06	0.01
MSVJ	**Mission Viejo**	5.68	2.35	1.27	0.78	0.22	0.10	0.04	0.01
PERI	**Perris**	6.95	2.94	1.59	0.99	0.28	0.13	0.05	0.01
PICO	**Pico Rivera**	6.01	2.67	1.50	0.96	0.29	0.13	0.05	0.01
RDLD	**Redlands**	5.84	2.40	1.31	0.83	0.25	0.12	0.05	0.01
UPLA	**Upland**	6.33	2.87	1.64	1.06	0.33	0.16	0.06	0.02
KBUR	**Burbank Airport**	7.89	3.72	2.11	1.35	0.40	0.19	0.07	0.02
KCNO	**Chino Airport.**	8.76	4.13	2.33	1.47	0.42	0.19	0.07	0.02
KCQT	**USC/Downtown L.A.**	6.47	2.78	1.53	0.97	0.29	0.14	0.05	0.01
KFUL	**Fullerton Airport**	6.79	3.09	1.75	1.12	0.34	0.16	0.06	0.01
KHHR	**Hawthorne Airport**	7.81	3.67	2.11	1.36	0.43	0.21	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	10.38	5.28	3.11	2.03	0.63	0.30	0.11	0.03
KLGB	**Long Beach Airport**	7.75	3.70	2.09	1.32	0.38	0.17	0.06	0.01
KONT	**Ontario Airport**	9.88	4.81	2.74	1.74	0.51	0.23	0.08	0.02
KPSP	**Palm Springs Airport**	6.22	2.82	1.55	0.97	0.28	0.13	0.04	0.01
KRAL	**Riverside Airport**	8.00	3.79	2.16	1.38	0.42	0.20	0.07	0.02
KSMO	**Santa Monica Airport**	8.65	4.22	2.46	1.60	0.50	0.24	0.09	0.02
KSNA	**John Wayne Int'l Airport**	9.81	4.78	2.73	1.74	0.51	0.23	0.08	0.02
KTRM	**Desert Hot Springs Airport**	8.40	4.10	2.33	1.47	0.43	0.20	0.07	0.02
KVNY	**Van Nuys Airport**	7.25	3.39	1.91	1.20	0.35	0.16	0.06	0.01

Table 7.3 B – χ/Q for General Non-Combustion Volume Source Equipment

10,000 ft² < Building Area ≤ 30,000 ft²   Height ≤ 20 ft   >12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	9.91	4.50	2.61	1.73	0.59	0.31	0.13	0.04
BNAP	**Banning**	11.99	6.51	4.13	2.87	1.08	0.59	0.26	0.09
CELA	**Central L.A.**	9.77	4.36	2.52	1.66	0.57	0.29	0.13	0.04
ELSI	**Lake Elsinore**	12.01	5.40	3.11	2.05	0.70	0.36	0.16	0.05
FONT	**Fontana**	10.86	5.19	3.08	2.06	0.72	0.38	0.16	0.05
MSVJ	**Mission Viejo**	11.27	5.10	2.94	1.94	0.66	0.34	0.15	0.05
PERI	**Perris**	12.85	5.93	3.46	2.29	0.79	0.41	0.18	0.06
PICO	**Pico Rivera**	10.01	4.62	2.69	1.78	0.61	0.31	0.13	0.04
RDLD	**Redlands**	12.29	5.56	3.22	2.13	0.73	0.38	0.17	0.05
UPLA	**Upland**	10.98	5.11	2.99	1.99	0.68	0.35	0.15	0.05
KBUR	**Burbank Airport**	10.12	5.05	3.05	2.05	0.72	0.37	0.16	0.05
KCNO	**Chino Airport.**	12.37	6.40	3.95	2.70	0.98	0.52	0.23	0.07
KCQT	**USC/Downtown L.A.**	10.46	4.85	2.84	1.88	0.64	0.33	0.14	0.04
KFUL	**Fullerton Airport**	10.45	4.93	2.90	1.92	0.66	0.34	0.15	0.05
KHHR	**Hawthorne Airport**	10.68	5.16	3.07	2.05	0.72	0.37	0.16	0.05
KLAX	**Los Angeles Int'l Airport**	11.54	6.19	3.88	2.68	0.99	0.53	0.24	0.08
KLGB	**Long Beach Airport**	9.84	5.09	3.17	2.18	0.82	0.44	0.20	0.07
KONT	**Ontario Airport**	13.46	7.23	4.56	3.17	1.20	0.65	0.29	0.10
KPSP	**Palm Springs Airport**	10.70	5.62	3.52	2.43	0.91	0.49	0.22	0.07
KRAL	**Riverside Airport**	11.64	5.91	3.61	2.46	0.89	0.48	0.21	0.07
KSMO	**Santa Monica Airport**	10.88	5.34	3.20	2.14	0.75	0.39	0.17	0.05
KSNA	**John Wayne Int'l Airport**	11.92	6.17	3.79	2.58	0.92	0.48	0.21	0.07
KTRM	**Desert Hot Springs Airport**	12.09	6.57	4.18	2.92	1.11	0.60	0.27	0.09
KVNY	**Van Nuys Airport**	9.75	4.88	2.95	1.99	0.71	0.37	0.16	0.05

Table 7.4 A – χ/Q for General Non-Combustion Volume Source Equipment

Building Area ≤ 3,000 ft² **Height > 20 ft** **≤12 hr/day**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	3.41	1.60	0.95	0.64	0.22	0.11	0.04	0.01
BNAP	**Banning**	5.67	2.86	1.72	1.15	0.38	0.18	0.07	0.02
CELA	**Central L.A.**	2.92	1.43	0.89	0.62	0.22	0.11	0.04	0.01
ELSI	**Lake Elsinore**	3.83	1.70	0.96	0.62	0.19	0.09	0.04	0.01
FONT	**Fontana**	4.44	2.23	1.35	0.90	0.30	0.15	0.06	0.01
MSVJ	**Mission Viejo**	3.74	1.73	1.00	0.65	0.20	0.10	0.04	0.01
PERI	**Perris**	4.81	2.23	1.28	0.83	0.26	0.12	0.05	0.01
PICO	**Pico Rivera**	3.90	1.96	1.19	0.80	0.26	0.13	0.05	0.01
RDLD	**Redlands**	3.69	1.73	1.03	0.68	0.23	0.11	0.05	0.01
UPLA	**Upland**	4.03	2.09	1.30	0.89	0.31	0.15	0.06	0.02
KBUR	**Burbank Airport**	5.92	2.92	1.73	1.14	0.37	0.18	0.07	0.02
KCNO	**Chino Airport.**	7.07	3.36	1.94	1.26	0.39	0.18	0.07	0.02
KCQT	**USC/Downtown L.A.**	4.24	2.05	1.22	0.81	0.28	0.14	0.05	0.01
KFUL	**Fullerton Airport**	4.63	2.33	1.41	0.94	0.32	0.16	0.06	0.02
KHHR	**Hawthorne Airport**	5.40	2.77	1.70	1.15	0.40	0.20	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	8.52	4.35	2.64	1.77	0.60	0.30	0.12	0.03
KLGB	**Long Beach Airport**	6.13	2.98	1.74	1.14	0.36	0.17	0.06	0.02
KONT	**Ontario Airport**	8.04	3.91	2.29	1.49	0.47	0.22	0.08	0.02
KPSP	**Palm Springs Airport**	4.64	2.19	1.27	0.82	0.25	0.12	0.04	0.01
KRAL	**Riverside Airport**	5.94	2.96	1.77	1.18	0.39	0.19	0.07	0.02
KSMO	**Santa Monica Airport**	6.26	3.27	2.02	1.37	0.47	0.23	0.09	0.02
KSNA	**John Wayne Int'l Airport**	7.87	3.87	2.28	1.50	0.47	0.22	0.08	0.02
KTRM	**Desert Hot Springs Airport**	6.88	3.34	1.95	1.27	0.40	0.19	0.07	0.02
KVNY	**Van Nuys Airport**	5.63	2.71	1.58	1.03	0.32	0.15	0.06	0.01

Table 7.4 B – χ/Q for General Non-Combustion Volume Source Equipment

Building Area ≤ 3,000 ft² **Height > 20 ft** **>12 hr/day**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	7.21	3.60	2.21	1.51	0.55	0.29	0.13	0.04
BNAP	**Banning**	11.98	6.52	4.15	2.90	1.11	0.61	0.28	0.09
CELA	**Central L.A.**	6.76	3.38	2.08	1.43	0.53	0.28	0.12	0.04
ELSI	**Lake Elsinore**	8.84	4.37	2.65	1.80	0.65	0.35	0.15	0.05
FONT	**Fontana**	8.56	4.38	2.71	1.86	0.69	0.37	0.16	0.05
MSVJ	**Mission Viejo**	8.29	4.11	2.49	1.69	0.61	0.32	0.14	0.04
PERI	**Perris**	9.82	4.93	3.01	2.05	0.75	0.40	0.18	0.06
PICO	**Pico Rivera**	7.41	3.74	2.29	1.56	0.56	0.30	0.13	0.04
RDLD	**Redlands**	8.92	4.47	2.74	1.87	0.69	0.37	0.16	0.05
UPLA	**Upland**	8.07	4.11	2.54	1.74	0.64	0.34	0.15	0.05
KBUR	**Burbank Airport**	8.90	4.56	2.80	1.91	0.69	0.37	0.16	0.05
KCNO	**Chino Airport.**	11.78	6.17	3.83	2.64	0.97	0.52	0.23	0.07
KCQT	**USC/Downtown L.A.**	7.87	3.96	2.43	1.66	0.60	0.32	0.14	0.04
KFUL	**Fullerton Airport**	8.11	4.10	2.52	1.72	0.62	0.33	0.14	0.04
KHHR	**Hawthorne Airport**	8.48	4.35	2.70	1.85	0.68	0.36	0.16	0.05
KLAX	**Los Angeles Int'l Airport**	11.17	6.02	3.81	2.66	1.01	0.55	0.25	0.08
KLGB	**Long Beach Airport**	9.37	4.96	3.13	2.17	0.83	0.46	0.21	0.07
KONT	**Ontario Airport**	13.41	7.26	4.61	3.22	1.23	0.67	0.31	0.10
KPSP	**Palm Springs Airport**	10.47	5.56	3.50	2.44	0.93	0.51	0.23	0.08
KRAL	**Riverside Airport**	10.23	5.40	3.40	2.36	0.90	0.49	0.22	0.07
KSMO	**Santa Monica Airport**	8.80	4.56	2.83	1.95	0.72	0.38	0.17	0.05
KSNA	**John Wayne Int'l Airport**	11.14	5.82	3.61	2.48	0.91	0.48	0.21	0.07
KTRM	**Desert Hot Springs Airport**	12.60	6.80	4.30	2.99	1.13	0.61	0.28	0.09
KVNY	**Van Nuys Airport**	8.72	4.48	2.76	1.89	0.69	0.36	0.16	0.05

Table 7.5 A – χ/Q for General Non-Combustion Volume Source Equipment

3,000 ft² < Building Area ≤ 10,000 ft²   Height > 20 ft   ≤12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	3.46	1.66	0.98	0.65	0.21	0.11	0.04	0.01
BNAP	**Banning**	5.01	2.71	1.67	1.12	0.37	0.18	0.07	0.02
CELA	**Central L.A.**	3.15	1.57	0.95	0.64	0.22	0.11	0.04	0.01
ELSI	**Lake Elsinore**	3.72	1.70	0.96	0.62	0.19	0.09	0.03	0.01
FONT	**Fontana**	4.40	2.25	1.36	0.90	0.30	0.14	0.05	0.01
MSVJ	**Mission Viejo**	3.68	1.75	1.01	0.65	0.20	0.09	0.03	0.01
PERI	**Perris**	4.51	2.18	1.26	0.82	0.25	0.12	0.05	0.01
PICO	**Pico Rivera**	4.02	2.02	1.21	0.81	0.26	0.13	0.05	0.01
RDLD	**Redlands**	3.74	1.79	1.05	0.69	0.23	0.11	0.04	0.01
UPLA	**Upland**	4.25	2.19	1.34	0.90	0.30	0.15	0.06	0.01
KBUR	**Burbank Airport**	5.41	2.82	1.70	1.13	0.36	0.17	0.06	0.02
KCNO	**Chino Airport.**	5.99	3.12	1.86	1.22	0.38	0.18	0.07	0.02
KCQT	**USC/Downtown L.A.**	4.23	2.08	1.23	0.82	0.27	0.13	0.05	0.01
KFUL	**Fullerton Airport**	4.58	2.34	1.41	0.94	0.31	0.15	0.06	0.01
KHHR	**Hawthorne Airport**	5.28	2.78	1.70	1.15	0.39	0.19	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	7.17	4.01	2.50	1.70	0.57	0.28	0.11	0.03
KLGB	**Long Beach Airport**	5.32	2.79	1.68	1.10	0.35	0.16	0.06	0.01
KONT	**Ontario Airport**	6.83	3.64	2.20	1.45	0.46	0.22	0.08	0.02
KPSP	**Palm Springs Airport**	4.19	2.11	1.24	0.81	0.25	0.12	0.04	0.01
KRAL	**Riverside Airport**	5.46	2.87	1.74	1.16	0.38	0.18	0.07	0.02
KSMO	**Santa Monica Airport**	5.96	3.22	1.99	1.35	0.46	0.22	0.09	0.02
KSNA	**John Wayne Int'l Airport**	6.80	3.63	2.20	1.46	0.46	0.22	0.08	0.02
KTRM	**Desert Hot Springs Airport**	5.79	3.09	1.86	1.23	0.39	0.18	0.07	0.02
KVNY	**Van Nuys Airport**	4.95	2.56	1.53	1.00	0.31	0.15	0.05	0.01

Table 7.5 B – χ/Q for General Non-Combustion Volume Source Equipment

3,000 ft² < Building Area ≤ 10,000 ft²   Height > 20 ft   >12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	6.69	3.46	2.15	1.48	0.54	0.29	0.13	0.04
BNAP	**Banning**	8.69	5.18	3.45	2.48	1.00	0.55	0.26	0.09
CELA	**Central L.A.**	6.54	3.35	2.07	1.42	0.52	0.28	0.12	0.04
ELSI	**Lake Elsinore**	8.08	4.15	2.56	1.75	0.64	0.34	0.15	0.05
FONT	**Fontana**	7.50	4.03	2.54	1.76	0.66	0.35	0.16	0.05
MSVJ	**Mission Viejo**	7.62	3.92	2.42	1.65	0.60	0.32	0.14	0.04
PERI	**Perris**	8.72	4.57	2.84	1.96	0.73	0.39	0.17	0.06
PICO	**Pico Rivera**	6.83	3.57	2.22	1.52	0.56	0.29	0.13	0.04
RDLD	**Redlands**	8.27	4.27	2.65	1.82	0.67	0.36	0.16	0.05
UPLA	**Upland**	7.50	3.95	2.46	1.70	0.63	0.33	0.15	0.05
KBUR	**Burbank Airport**	7.19	3.97	2.53	1.76	0.66	0.35	0.16	0.05
KCNO	**Chino Airport.**	8.85	5.05	3.29	2.33	0.90	0.49	0.22	0.07
KCQT	**USC/Downtown L.A.**	7.14	3.75	2.33	1.61	0.59	0.31	0.14	0.04
KFUL	**Fullerton Airport**	7.20	3.82	2.39	1.65	0.61	0.32	0.14	0.04
KHHR	**Hawthorne Airport**	7.40	4.00	2.53	1.76	0.66	0.35	0.15	0.05
KLAX	**Los Angeles Int'l Airport**	8.27	4.88	3.23	2.31	0.91	0.50	0.23	0.08
KLGB	**Long Beach Airport**	7.02	4.03	2.65	1.89	0.75	0.42	0.19	0.07
KONT	**Ontario Airport**	9.70	5.73	3.81	2.74	1.10	0.61	0.28	0.10
KPSP	**Palm Springs Airport**	7.66	4.45	2.94	2.10	0.84	0.47	0.22	0.07
KRAL	**Riverside Airport**	8.21	4.63	3.00	2.11	0.82	0.45	0.21	0.07
KSMO	**Santa Monica Airport**	7.60	4.16	2.64	1.84	0.69	0.37	0.16	0.05
KSNA	**John Wayne Int'l Airport**	8.56	4.87	3.15	2.22	0.85	0.46	0.20	0.06
KTRM	**Desert Hot Springs Airport**	8.80	5.25	3.51	2.53	1.02	0.57	0.26	0.09
KVNY	**Van Nuys Airport**	6.92	3.83	2.45	1.71	0.65	0.35	0.16	0.05

Table 7.6 A – χ/Q for General Non-Combustion Volume Source Equipment

10,000 ft² < Building Area ≤ 30,000 ft²   Height > 20 ft   ≤12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	1.86	1.07	0.69	0.49	0.18	0.09	0.04	0.01
BNAP	**Banning**	2.88	1.77	1.18	0.84	0.31	0.16	0.06	0.02
CELA	**Central L.A.**	1.75	1.03	0.69	0.49	0.18	0.09	0.04	0.01
ELSI	**Lake Elsinore**	1.93	1.06	0.67	0.46	0.16	0.08	0.03	0.01
FONT	**Fontana**	2.48	1.46	0.96	0.68	0.25	0.13	0.05	0.01
MSVJ	**Mission Viejo**	1.99	1.11	0.71	0.49	0.17	0.08	0.03	0.01
PERI	**Perris**	2.42	1.37	0.88	0.61	0.21	0.11	0.04	0.01
PICO	**Pico Rivera**	2.26	1.32	0.87	0.61	0.22	0.11	0.04	0.01
RDLD	**Redlands**	2.01	1.15	0.74	0.52	0.19	0.10	0.04	0.01
UPLA	**Upland**	2.41	1.44	0.96	0.68	0.26	0.13	0.05	0.01
KBUR	**Burbank Airport**	3.08	1.83	1.20	0.84	0.30	0.15	0.06	0.02
KCNO	**Chino Airport.**	3.39	2.00	1.30	0.91	0.32	0.16	0.06	0.02
KCQT	**USC/Downtown L.A.**	2.31	1.34	0.87	0.61	0.23	0.12	0.05	0.01
KFUL	**Fullerton Airport**	2.58	1.52	1.00	0.71	0.26	0.13	0.05	0.01
KHHR	**Hawthorne Airport**	2.98	1.80	1.21	0.86	0.33	0.17	0.07	0.02
KLAX	**Los Angeles Int'l Airport**	4.11	2.59	1.75	1.26	0.48	0.25	0.10	0.03
KLGB	**Long Beach Airport**	3.02	1.79	1.17	0.82	0.29	0.14	0.06	0.01
KONT	**Ontario Airport**	3.91	2.35	1.54	1.08	0.38	0.19	0.07	0.02
KPSP	**Palm Springs Airport**	2.32	1.34	0.86	0.60	0.21	0.10	0.04	0.01
KRAL	**Riverside Airport**	3.08	1.85	1.22	0.86	0.32	0.16	0.06	0.02
KSMO	**Santa Monica Airport**	3.43	2.11	1.42	1.02	0.38	0.20	0.08	0.02
KSNA	**John Wayne Int'l Airport**	3.91	2.36	1.55	1.09	0.39	0.19	0.07	0.02
KTRM	**Desert Hot Springs Airport**	3.28	1.97	1.29	0.90	0.32	0.16	0.06	0.02
KVNY	**Van Nuys Airport**	2.80	1.65	1.07	0.74	0.26	0.13	0.05	0.01

Table 7.6 B – χ/Q for General Non-Combustion Volume Source Equipment

10,000 ft² < Building Area ≤ 30,000 ft² Height > 20 ft >12 hr/day

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	3.87	2.34	1.58	1.15	0.47	0.26	0.12	0.04
BNAP	Banning	5.44	3.63	2.60	1.96	0.87	0.50	0.24	0.08
CELA	Central L.A.	3.76	2.26	1.52	1.11	0.45	0.25	0.11	0.04
ELSI	Lake Elsinore	4.65	2.79	1.88	1.36	0.55	0.31	0.14	0.05
FONT	Fontana	4.44	2.74	1.88	1.38	0.57	0.32	0.15	0.05
MSVJ	Mission Viejo	4.40	2.64	1.78	1.28	0.52	0.29	0.13	0.04
PERI	Perris	5.07	3.08	2.09	1.52	0.63	0.35	0.16	0.05
PICO	Pico Rivera	3.99	2.42	1.63	1.18	0.48	0.27	0.12	0.04
RDLD	Redlands	4.77	2.88	1.95	1.42	0.58	0.33	0.15	0.05
UPLA	Upland	4.39	2.67	1.82	1.32	0.54	0.30	0.14	0.04
KBUR	Burbank Airport	4.39	2.74	1.89	1.38	0.57	0.32	0.15	0.05
KCNO	Chino Airport.	5.46	3.52	2.46	1.83	0.78	0.44	0.21	0.07
KCQT	USC/Downtown L.A.	4.17	2.53	1.72	1.25	0.51	0.28	0.13	0.04
KFUL	Fullerton Airport	4.25	2.60	1.76	1.28	0.53	0.29	0.13	0.04
KHHR	Hawthorne Airport	4.38	2.72	1.87	1.37	0.57	0.32	0.15	0.05
KLAX	Los Angeles Int'l Airport	5.11	3.38	2.40	1.81	0.79	0.45	0.21	0.07
KLGB	Long Beach Airport	4.34	2.81	1.99	1.49	0.66	0.38	0.18	0.06
KONT	Ontario Airport	6.04	4.00	2.86	2.16	0.96	0.56	0.27	0.09
KPSP	Palm Springs Airport	4.74	3.10	2.21	1.66	0.73	0.42	0.20	0.07
KRAL	Riverside Airport	4.97	3.18	2.23	1.66	0.71	0.41	0.19	0.07
KSMO	Santa Monica Airport	4.54	2.83	1.95	1.43	0.59	0.33	0.15	0.05
KSNA	John Wayne Int'l Airport	5.29	3.38	2.36	1.74	0.74	0.41	0.19	0.06
KTRM	Desert Hot Springs Airport	5.57	3.71	2.66	2.01	0.89	0.52	0.25	0.08
KVNY	Van Nuys Airport	4.22	2.65	1.83	1.34	0.56	0.32	0.15	0.05

Table 7.7 – χ/Q for General Non-Combustion Volume Source Equipment

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Stack Height (ft)	Downwind Distance (meters)							
Building Area (ft²)	**≤ 20**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
Building Area ≤ 3,000	**≤ 20**	1,033.77	414.65	218.14	135.08	44.63	23.14	10.01	3.15
3,000 < Building Area ≤ 10,000	**≤ 20**	707.38	325.92	183.90	119.58	41.96	22.20	9.76	3.12
10,000 < Building Area ≤ 30,000	**≤ 20**	488.94	273.75	169.32	114.26	39.57	20.43	8.71	2.64
Building Area ≤ 3,000	**> 20**	427.29	230.93	142.89	99.10	38.15	20.87	9.44	3.10
3,000 < Building Area ≤ 10,000	**> 20**	325.79	202.24	133.97	94.69	35.76	19.08	8.36	2.59
10,000 < Building Area ≤ 30,000	**> 20**	182.34	126.31	91.40	68.97	29.84	16.86	7.75	2.49

Table 8.0 – χ/Q for Natural Gas Boilers

Equipment Type	Equipment Rating (MMBTU/hr)	Cancer, Chronic, Chronic 8 Hr	χ /Q Tables	Acute χ /Q Table	Source ID
		≤ 12 hr/day	> 12 hr/day		
Gaseous Fuel Fired (Natural Gas) Boilers	2 < Rating ≤ 5	Table 8.1 A	Table 8.1 B	Table 8.8	B1
	5 < Rating ≤ 10	Table 8.2 A	Table 8.2 B		B2
	10 < Rating ≤ 20	Table 8.3 A	Table 8.3 B		B3
	20 < Rating ≤ 30	Table 8.4 A	Table 8.4 B		B4
	30 < Rating ≤ 50	Table 8.5 A	Table 8.5 B		B5
	50 < Rating ≤ 150	Table 8.6 A	Table 8.6 B		B6
	150 < Rating ≤ 200	Table 8.7 A	Table 8.7 B		B7

Table 8.1 A – χ/Q for Natural Gas Boilers

2 < Rating (MMBTU/hr) ≤ 5 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	13.41	4.34	2.61	1.59	0.35	0.13	0.04	0.01
BNAP	**Banning**	14.59	4.49	2.94	1.95	0.53	0.21	0.07	0.02
CELA	**Central L.A.**	14.45	3.98	2.34	1.42	0.33	0.13	0.04	0.01
ELSI	**Lake Elsinore**	8.92	3.16	1.95	1.21	0.28	0.11	0.04	0.01
FONT	**Fontana**	16.21	4.77	2.95	1.85	0.44	0.17	0.06	0.01
MSVJ	**Mission Viejo**	10.73	3.54	2.17	1.33	0.30	0.12	0.04	0.01
PERI	**Perris**	9.87	3.21	2.04	1.33	0.35	0.14	0.05	0.01
PICO	**Pico Rivera**	15.62	4.36	2.61	1.63	0.38	0.15	0.05	0.01
RDLD	**Redlands**	11.97	4.38	2.65	1.61	0.35	0.14	0.05	0.01
UPLA	**Upland**	17.23	5.03	3.13	1.97	0.46	0.18	0.06	0.02
KBUR	**Burbank Airport**	17.17	4.93	3.08	1.99	0.49	0.20	0.07	0.02
KCNO	**Chino Airport.**	12.11	4.25	2.82	1.88	0.51	0.21	0.07	0.02
KCQT	**USC/Downtown L.A.**	12.73	4.74	2.99	1.87	0.42	0.16	0.05	0.01
KFUL	**Fullerton Airport**	17.05	4.69	2.89	1.84	0.44	0.17	0.06	0.01
KHHR	**Hawthorne Airport**	18.93	5.45	3.50	2.29	0.59	0.23	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	20.56	6.23	4.23	2.91	0.83	0.33	0.11	0.03
KLGB	**Long Beach Airport**	14.51	4.30	2.77	1.82	0.46	0.19	0.06	0.02
KONT	**Ontario Airport**	17.36	5.34	3.52	2.34	0.62	0.25	0.09	0.02
KPSP	**Palm Springs Airport**	10.92	3.45	2.24	1.44	0.35	0.14	0.05	0.01
KRAL	**Riverside Airport**	14.00	5.12	3.37	2.20	0.55	0.22	0.08	0.02
KSMO	**Santa Monica Airport**	25.29	6.32	3.98	2.61	0.68	0.27	0.09	0.02
KSNA	**John Wayne Int'l Airport**	19.61	5.61	3.50	2.31	0.60	0.25	0.08	0.02
KTRM	**Desert Hot Springs Airport**	14.28	4.35	2.86	1.93	0.52	0.21	0.07	0.02
KVNY	**Van Nuys Airport**	14.28	4.29	2.66	1.71	0.43	0.17	0.06	0.01

Table 8.1 B – χ/Q for Natural Gas Boilers

2 < Rating (MMBTU/hr) ≤ 5 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	8.83	2.51	1.76	1.31	0.59	0.30	0.14	0.05
BNAP	**Banning**	16.96	5.08	3.61	2.73	1.12	0.58	0.28	0.10
CELA	**Central L.A.**	8.08	2.11	1.47	1.10	0.51	0.26	0.12	0.04
ELSI	**Lake Elsinore**	5.04	1.63	1.08	0.76	0.43	0.27	0.15	0.06
FONT	**Fontana**	12.49	3.43	2.36	1.73	0.73	0.39	0.19	0.07
MSVJ	**Mission Viejo**	5.91	1.79	1.18	0.82	0.40	0.25	0.13	0.05
PERI	**Perris**	7.68	2.30	1.57	1.16	0.55	0.32	0.17	0.06
PICO	**Pico Rivera**	11.03	2.88	1.89	1.36	0.56	0.30	0.14	0.05
RDLD	**Redlands**	6.69	2.31	1.60	1.17	0.56	0.34	0.20	0.08
UPLA	**Upland**	11.18	3.05	2.13	1.56	0.69	0.36	0.19	0.08
KBUR	**Burbank Airport**	11.76	3.25	2.13	1.49	0.53	0.28	0.14	0.05
KCNO	**Chino Airport.**	10.26	3.21	2.24	1.65	0.67	0.36	0.18	0.07
KCQT	**USC/Downtown L.A.**	7.72	2.59	1.89	1.44	0.68	0.37	0.18	0.07
KFUL	**Fullerton Airport**	9.37	2.49	1.63	1.13	0.46	0.25	0.13	0.05
KHHR	**Hawthorne Airport**	12.48	3.47	2.37	1.70	0.67	0.35	0.17	0.06
KLAX	**Los Angeles Int'l Airport**	14.98	4.44	3.15	2.33	0.89	0.44	0.21	0.08
KLGB	**Long Beach Airport**	10.44	3.03	2.15	1.64	0.72	0.38	0.20	0.08
KONT	**Ontario Airport**	15.84	4.69	3.31	2.46	0.96	0.49	0.24	0.09
KPSP	**Palm Springs Airport**	12.74	3.89	2.68	1.99	0.79	0.41	0.21	0.08
KRAL	**Riverside Airport**	9.57	3.37	2.49	1.91	0.85	0.45	0.22	0.09
KSMO	**Santa Monica Airport**	14.81	3.77	2.52	1.81	0.69	0.34	0.16	0.06
KSNA	**John Wayne Int'l Airport**	14.14	3.99	2.61	1.87	0.69	0.36	0.18	0.07
KTRM	**Desert Hot Springs Airport**	13.70	4.14	2.89	2.15	0.88	0.49	0.25	0.10
KVNY	**Van Nuys Airport**	9.82	2.82	1.84	1.32	0.52	0.28	0.14	0.06

Table 8.2 A – χ/Q for Natural Gas Boilers

5 < Rating (MMBTU/hr) ≤ 10 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	6.63	2.71	1.80	1.22	0.31	0.12	0.04	0.01
BNAP	Banning	11.09	3.56	2.41	1.71	0.49	0.20	0.07	0.02
CELA	Central L.A.	8.73	2.76	1.76	1.16	0.30	0.12	0.04	0.01
ELSI	Lake Elsinore	4.37	1.79	1.25	0.88	0.24	0.10	0.04	0.01
FONT	Fontana	9.95	3.25	2.17	1.50	0.39	0.16	0.06	0.01
MSVJ	Mission Viejo	5.65	2.19	1.48	1.01	0.26	0.11	0.04	0.01
PERI	Perris	6.64	2.24	1.52	1.07	0.31	0.13	0.05	0.01
PICO	Pico Rivera	9.95	3.09	1.97	1.33	0.34	0.14	0.05	0.01
RDLD	Redlands	5.59	2.64	1.79	1.22	0.31	0.12	0.05	0.01
UPLA	Upland	10.02	3.39	2.29	1.58	0.41	0.17	0.06	0.02
KBUR	Burbank Airport	11.80	3.60	2.38	1.66	0.44	0.19	0.07	0.02
KCNO	Chino Airport.	8.74	3.04	2.13	1.54	0.46	0.20	0.07	0.02
KCQT	USC/Downtown L.A.	5.69	2.76	1.95	1.38	0.36	0.14	0.05	0.01
KFUL	Fullerton Airport	11.06	3.32	2.19	1.51	0.40	0.16	0.06	0.01
KHHR	Hawthorne Airport	13.92	4.20	2.83	1.98	0.55	0.22	0.08	0.02
KLAX	Los Angeles Int'l Airport	15.95	5.01	3.50	2.55	0.78	0.32	0.11	0.03
KLGB	Long Beach Airport	10.07	3.17	2.14	1.52	0.42	0.17	0.06	0.02
KONT	Ontario Airport	11.97	3.85	2.68	1.94	0.57	0.24	0.08	0.02
KPSP	Palm Springs Airport	6.59	2.26	1.60	1.14	0.32	0.13	0.05	0.01
KRAL	Riverside Airport	8.19	3.30	2.38	1.72	0.49	0.20	0.07	0.02
KSMO	Santa Monica Airport	18.60	4.90	3.22	2.25	0.63	0.25	0.09	0.02
KSNA	John Wayne Int'l Airport	14.46	4.32	2.80	1.97	0.55	0.23	0.08	0.02
KTRM	Desert Hot Springs Airport	9.87	3.13	2.18	1.59	0.47	0.19	0.07	0.02
KVNY	Van Nuys Airport	9.66	3.08	2.04	1.42	0.39	0.16	0.06	0.01

Table 8.2 B – χ/Q for Natural Gas Boilers

5 < Rating (MMBTU/hr) ≤ 10 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	4.10	1.35	0.93	0.69	0.27	0.17	0.10	0.05
BNAP	**Banning**	11.83	3.44	2.29	1.77	0.75	0.40	0.22	0.10
CELA	**Central L.A.**	4.54	1.30	0.88	0.64	0.24	0.15	0.09	0.04
ELSI	**Lake Elsinore**	2.52	0.89	0.62	0.45	0.16	0.11	0.09	0.05
FONT	**Fontana**	7.25	2.04	1.35	1.01	0.39	0.22	0.14	0.06
MSVJ	**Mission Viejo**	2.77	0.98	0.66	0.47	0.16	0.11	0.08	0.04
PERI	**Perris**	4.69	1.42	0.94	0.70	0.27	0.16	0.11	0.05
PICO	**Pico Rivera**	6.40	1.73	1.09	0.79	0.29	0.17	0.10	0.05
RDLD	**Redlands**	3.00	1.25	0.86	0.64	0.24	0.15	0.14	0.08
UPLA	**Upland**	6.20	1.81	1.24	0.93	0.35	0.21	0.13	0.07
KBUR	**Burbank Airport**	7.55	2.12	1.36	0.99	0.32	0.17	0.10	0.04
KCNO	**Chino Airport.**	7.07	2.16	1.47	1.11	0.42	0.22	0.13	0.06
KCQT	**USC/Downtown L.A.**	3.04	1.27	0.92	0.70	0.28	0.18	0.13	0.06
KFUL	**Fullerton Airport**	5.55	1.56	1.01	0.73	0.24	0.14	0.08	0.04
KHHR	**Hawthorne Airport**	8.37	2.34	1.54	1.14	0.41	0.22	0.12	0.05
KLAX	**Los Angeles Int'l Airport**	10.74	3.18	2.18	1.66	0.62	0.30	0.16	0.07
KLGB	**Long Beach Airport**	6.51	1.85	1.22	0.95	0.38	0.20	0.13	0.07
KONT	**Ontario Airport**	10.65	3.10	2.10	1.61	0.62	0.31	0.18	0.08
KPSP	**Palm Springs Airport**	8.99	2.67	1.76	1.34	0.52	0.27	0.15	0.07
KRAL	**Riverside Airport**	5.20	1.92	1.37	1.06	0.44	0.25	0.16	0.07
KSMO	**Santa Monica Airport**	9.81	2.53	1.65	1.21	0.42	0.21	0.11	0.05
KSNA	**John Wayne Int'l Airport**	9.34	2.65	1.67	1.23	0.42	0.21	0.12	0.06
KTRM	**Desert Hot Springs Airport**	8.68	2.65	1.75	1.34	0.53	0.29	0.18	0.08
KVNY	**Van Nuys Airport**	6.11	1.78	1.13	0.83	0.28	0.15	0.09	0.05

Table 8.3 A – χ/Q for Natural Gas Boilers

10 < Rating (MMBTU/hr) ≤ 20 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	3.82	1.78	1.26	0.89	0.27	0.11	0.04	0.01
BNAP	**Banning**	8.79	2.98	2.05	1.47	0.46	0.19	0.07	0.02
CELA	**Central L.A.**	6.08	2.11	1.42	0.96	0.27	0.11	0.04	0.01
ELSI	**Lake Elsinore**	2.77	1.20	0.89	0.65	0.21	0.09	0.03	0.01
FONT	**Fontana**	7.00	2.40	1.67	1.18	0.36	0.15	0.06	0.01
MSVJ	**Mission Viejo**	3.41	1.44	1.05	0.75	0.23	0.10	0.04	0.01
PERI	**Perris**	5.10	1.76	1.22	0.88	0.28	0.12	0.05	0.01
PICO	**Pico Rivera**	7.07	2.33	1.54	1.06	0.31	0.13	0.05	0.01
RDLD	**Redlands**	3.10	1.68	1.22	0.87	0.27	0.12	0.04	0.01
UPLA	**Upland**	6.63	2.45	1.73	1.23	0.37	0.16	0.06	0.02
KBUR	**Burbank Airport**	9.04	2.88	1.95	1.38	0.41	0.18	0.07	0.02
KCNO	**Chino Airport.**	6.97	2.43	1.73	1.28	0.43	0.18	0.07	0.02
KCQT	**USC/Downtown L.A.**	3.17	1.80	1.35	0.99	0.32	0.13	0.05	0.01
KFUL	**Fullerton Airport**	8.32	2.61	1.77	1.25	0.37	0.15	0.06	0.01
KHHR	**Hawthorne Airport**	10.84	3.49	2.40	1.71	0.52	0.21	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	12.76	4.24	2.99	2.21	0.73	0.30	0.11	0.03
KLGB	**Long Beach Airport**	7.66	2.55	1.75	1.26	0.38	0.16	0.06	0.01
KONT	**Ontario Airport**	9.15	3.07	2.17	1.60	0.52	0.22	0.08	0.02
KPSP	**Palm Springs Airport**	4.62	1.69	1.23	0.91	0.29	0.12	0.04	0.01
KRAL	**Riverside Airport**	5.61	2.42	1.80	1.35	0.44	0.19	0.07	0.02
KSMO	**Santa Monica Airport**	14.80	4.12	2.74	1.94	0.59	0.24	0.09	0.02
KSNA	**John Wayne Int'l Airport**	11.57	3.61	2.37	1.68	0.52	0.22	0.08	0.02
KTRM	**Desert Hot Springs Airport**	7.55	2.50	1.75	1.31	0.43	0.18	0.07	0.02
KVNY	**Van Nuys Airport**	7.43	2.47	1.66	1.18	0.36	0.15	0.06	0.01

Table 8.3 B – χ/Q for Natural Gas Boilers

10 < Rating (MMBTU/hr) ≤ 20 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	2.30	0.87	0.62	0.46	0.18	0.10	0.07	0.04
BNAP	Banning	9.06	2.68	1.74	1.27	0.57	0.31	0.18	0.09
CELA	Central L.A.	3.07	0.97	0.67	0.48	0.18	0.10	0.07	0.04
ELSI	Lake Elsinore	1.58	0.59	0.43	0.32	0.12	0.06	0.06	0.04
FONT	Fontana	4.93	1.44	0.96	0.70	0.27	0.15	0.10	0.05
MSVJ	Mission Viejo	1.59	0.62	0.45	0.32	0.11	0.06	0.05	0.03
PERI	Perris	3.41	1.07	0.71	0.52	0.20	0.11	0.08	0.04
PICO	Pico Rivera	4.31	1.24	0.79	0.56	0.21	0.11	0.08	0.04
RDLD	Redlands	1.68	0.79	0.58	0.43	0.16	0.10	0.09	0.07
UPLA	Upland	4.03	1.27	0.88	0.65	0.25	0.14	0.09	0.06
KBUR	Burbank Airport	5.51	1.61	1.04	0.74	0.25	0.12	0.08	0.04
KCNO	Chino Airport.	5.49	1.72	1.16	0.86	0.33	0.16	0.10	0.05
KCQT	USC/Downtown L.A.	1.59	0.79	0.60	0.46	0.18	0.11	0.09	0.05
KFUL	Fullerton Airport	3.98	1.18	0.78	0.55	0.18	0.09	0.06	0.03
KHHR	Hawthorne Airport	6.28	1.84	1.23	0.88	0.32	0.16	0.10	0.04
KLAX	Los Angeles Int'l Airport	8.30	2.56	1.74	1.28	0.50	0.23	0.13	0.06
KLGB	Long Beach Airport	4.82	1.39	0.90	0.66	0.27	0.13	0.09	0.06
KONT	Ontario Airport	8.01	2.39	1.60	1.18	0.47	0.23	0.13	0.07
KPSP	Palm Springs Airport	7.10	2.14	1.38	1.01	0.40	0.20	0.12	0.06
KRAL	Riverside Airport	3.47	1.37	0.99	0.75	0.31	0.17	0.12	0.06
KSMO	Santa Monica Airport	7.41	2.01	1.31	0.94	0.33	0.15	0.09	0.04
KSNA	John Wayne Int'l Airport	7.05	2.07	1.29	0.92	0.32	0.15	0.09	0.05
KTRM	Desert Hot Springs Airport	6.41	2.04	1.33	0.97	0.39	0.20	0.14	0.07
KVNY	Van Nuys Airport	4.45	1.34	0.85	0.61	0.21	0.10	0.06	0.04

Table 8.4 A – χ/Q for Natural Gas Boilers

20 < Rating (MMBTU/hr) ≤ 30 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	1.18	0.71	0.62	0.49	0.20	0.10	0.04	0.01
BNAP	**Banning**	4.92	1.80	1.43	1.08	0.39	0.17	0.07	0.02
CELA	**Central L.A.**	2.76	1.15	0.90	0.66	0.22	0.10	0.04	0.01
ELSI	**Lake Elsinore**	1.33	0.68	0.57	0.44	0.17	0.08	0.03	0.01
FONT	**Fontana**	3.46	1.34	1.07	0.81	0.29	0.14	0.05	0.01
MSVJ	**Mission Viejo**	1.41	0.72	0.62	0.49	0.19	0.09	0.03	0.01
PERI	**Perris**	2.98	1.13	0.86	0.65	0.24	0.11	0.04	0.01
PICO	**Pico Rivera**	3.76	1.38	1.04	0.76	0.26	0.12	0.05	0.01
RDLD	**Redlands**	0.84	0.60	0.57	0.47	0.20	0.10	0.04	0.01
UPLA	**Upland**	2.67	1.16	0.98	0.76	0.29	0.14	0.05	0.01
KBUR	**Burbank Airport**	4.10	1.54	1.22	0.93	0.34	0.16	0.06	0.02
KCNO	**Chino Airport.**	4.00	1.50	1.18	0.92	0.36	0.17	0.06	0.02
KCQT	**USC/Downtown L.A.**	0.37	0.47	0.50	0.44	0.21	0.12	0.05	0.01
KFUL	**Fullerton Airport**	4.63	1.63	1.24	0.91	0.31	0.14	0.05	0.01
KHHR	**Hawthorne Airport**	6.03	2.16	1.70	1.27	0.44	0.19	0.07	0.02
KLAX	**Los Angeles Int'l Airport**	6.98	2.65	2.11	1.62	0.62	0.27	0.10	0.03
KLGB	**Long Beach Airport**	3.50	1.34	1.06	0.82	0.31	0.15	0.06	0.01
KONT	**Ontario Airport**	4.88	1.80	1.43	1.11	0.44	0.20	0.08	0.02
KPSP	**Palm Springs Airport**	2.28	0.85	0.70	0.56	0.23	0.11	0.04	0.01
KRAL	**Riverside Airport**	1.85	1.02	0.97	0.81	0.35	0.17	0.07	0.02
KSMO	**Santa Monica Airport**	9.06	2.85	2.08	1.50	0.51	0.22	0.08	0.02
KSNA	**John Wayne Int'l Airport**	7.18	2.47	1.77	1.29	0.44	0.20	0.07	0.02
KTRM	**Desert Hot Springs Airport**	4.27	1.54	1.18	0.91	0.36	0.16	0.06	0.02
KVNY	**Van Nuys Airport**	4.27	1.55	1.16	0.86	0.31	0.14	0.05	0.01

Table 8.4 B – χ/Q for Natural Gas Boilers

20 < Rating (MMBTU/hr) ≤ 30 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.98	0.33	0.27	0.22	0.10	0.06	0.04	0.03
BNAP	Banning	4.34	1.39	1.00	0.74	0.34	0.20	0.12	0.07
CELA	Central L.A.	1.22	0.49	0.39	0.29	0.12	0.06	0.04	0.03
ELSI	Lake Elsinore	0.71	0.32	0.26	0.20	0.08	0.04	0.03	0.03
FONT	Fontana	2.38	0.78	0.59	0.44	0.18	0.10	0.06	0.04
MSVJ	Mission Viejo	0.58	0.29	0.25	0.20	0.08	0.04	0.03	0.02
PERI	Perris	1.87	0.65	0.47	0.35	0.14	0.07	0.04	0.03
PICO	Pico Rivera	2.15	0.70	0.51	0.37	0.13	0.07	0.04	0.03
RDLD	Redlands	0.40	0.27	0.25	0.21	0.10	0.06	0.04	0.05
UPLA	Upland	1.57	0.59	0.48	0.37	0.16	0.09	0.06	0.04
KBUR	Burbank Airport	2.37	0.79	0.59	0.44	0.17	0.09	0.05	0.03
KCNO	Chino Airport.	3.01	1.03	0.76	0.57	0.23	0.12	0.06	0.04
KCQT	USC/Downtown L.A.	0.19	0.19	0.21	0.19	0.10	0.06	0.05	0.04
KFUL	Fullerton Airport	2.04	0.70	0.52	0.38	0.14	0.06	0.04	0.02
KHHR	Hawthorne Airport	3.25	1.05	0.80	0.59	0.23	0.12	0.06	0.03
KLAX	Los Angeles Int'l Airport	4.18	1.45	1.10	0.83	0.34	0.17	0.09	0.05
KLGB	Long Beach Airport	2.61	0.80	0.55	0.40	0.16	0.08	0.05	0.04
KONT	Ontario Airport	4.06	1.33	0.97	0.72	0.30	0.15	0.09	0.05
KPSP	Palm Springs Airport	4.28	1.36	0.92	0.67	0.27	0.14	0.08	0.05
KRAL	Riverside Airport	1.07	0.54	0.49	0.40	0.19	0.11	0.07	0.05
KSMO	Santa Monica Airport	4.21	1.28	0.92	0.67	0.24	0.11	0.06	0.03
KSNA	John Wayne Int'l Airport	3.98	1.28	0.87	0.63	0.22	0.10	0.05	0.03
KTRM	Desert Hot Springs Airport	3.54	1.23	0.85	0.62	0.25	0.13	0.08	0.05
KVNY	Van Nuys Airport	2.36	0.79	0.55	0.40	0.15	0.07	0.04	0.03

Table 8.5 A – χ/Q for Natural Gas Boilers

30 < Rating (MMBTU/hr) ≤ 50 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.42	0.37	0.38	0.34	0.16	0.09	0.04	0.01
BNAP	**Banning**	3.63	1.28	1.08	0.86	0.34	0.16	0.06	0.02
CELA	**Central L.A.**	1.41	0.67	0.59	0.47	0.19	0.09	0.04	0.01
ELSI	**Lake Elsinore**	0.63	0.39	0.36	0.31	0.14	0.07	0.03	0.01
FONT	**Fontana**	2.04	0.83	0.73	0.59	0.25	0.12	0.05	0.01
MSVJ	**Mission Viejo**	0.59	0.38	0.38	0.33	0.15	0.08	0.03	0.01
PERI	**Perris**	2.11	0.82	0.65	0.51	0.20	0.10	0.04	0.01
PICO	**Pico Rivera**	2.33	0.91	0.74	0.57	0.22	0.11	0.04	0.01
RDLD	**Redlands**	0.37	0.35	0.38	0.34	0.17	0.09	0.04	0.01
UPLA	**Upland**	1.18	0.60	0.60	0.52	0.24	0.13	0.05	0.01
KBUR	**Burbank Airport**	2.39	0.95	0.82	0.68	0.29	0.15	0.06	0.02
KCNO	**Chino Airport.**	3.16	1.19	0.95	0.76	0.31	0.15	0.06	0.02
KCQT	**USC/Downtown L.A.**	0.21	0.30	0.35	0.33	0.18	0.10	0.04	0.01
KFUL	**Fullerton Airport**	2.96	1.12	0.91	0.70	0.27	0.13	0.05	0.01
KHHR	**Hawthorne Airport**	4.44	1.60	1.33	1.03	0.39	0.18	0.07	0.02
KLAX	**Los Angeles Int'l Airport**	5.13	1.98	1.65	1.32	0.53	0.25	0.10	0.03
KLGB	**Long Beach Airport**	2.10	0.84	0.71	0.58	0.26	0.13	0.05	0.01
KONT	**Ontario Airport**	3.50	1.30	1.08	0.87	0.37	0.18	0.07	0.02
KPSP	**Palm Springs Airport**	1.84	0.69	0.54	0.43	0.19	0.10	0.04	0.01
KRAL	**Riverside Airport**	1.01	0.61	0.65	0.59	0.29	0.15	0.06	0.02
KSMO	**Santa Monica Airport**	6.54	2.14	1.64	1.23	0.44	0.20	0.08	0.02
KSNA	**John Wayne Int'l Airport**	5.49	1.92	1.43	1.07	0.39	0.18	0.07	0.02
KTRM	**Desert Hot Springs Airport**	2.88	1.06	0.85	0.69	0.29	0.14	0.06	0.02
KVNY	**Van Nuys Airport**	3.09	1.15	0.89	0.69	0.27	0.13	0.05	0.01

Table 8.5 B – χ/Q for Natural Gas Boilers

30 < Rating (MMBTU/hr) ≤ 50 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.48	0.19	0.16	0.14	0.08	0.05	0.03	0.02
BNAP	**Banning**	2.98	0.92	0.69	0.53	0.23	0.14	0.09	0.06
CELA	**Central L.A.**	0.59	0.27	0.24	0.20	0.09	0.05	0.03	0.02
ELSI	**Lake Elsinore**	0.31	0.17	0.15	0.13	0.06	0.04	0.02	0.02
FONT	**Fontana**	1.38	0.48	0.39	0.31	0.13	0.07	0.04	0.03
MSVJ	**Mission Viejo**	0.24	0.15	0.15	0.13	0.06	0.04	0.02	0.01
PERI	**Perris**	1.26	0.45	0.34	0.26	0.11	0.06	0.03	0.02
PICO	**Pico Rivera**	1.21	0.43	0.34	0.26	0.10	0.05	0.03	0.02
RDLD	**Redlands**	0.17	0.15	0.16	0.14	0.08	0.05	0.03	0.03
UPLA	**Upland**	0.69	0.30	0.28	0.24	0.12	0.07	0.04	0.03
KBUR	**Burbank Airport**	1.41	0.48	0.38	0.31	0.13	0.07	0.04	0.02
KCNO	**Chino Airport.**	2.30	0.80	0.60	0.46	0.19	0.10	0.05	0.03
KCQT	**USC/Downtown L.A.**	0.13	0.12	0.14	0.14	0.08	0.05	0.03	0.02
KFUL	**Fullerton Airport**	1.24	0.46	0.37	0.29	0.11	0.05	0.03	0.02
KHHR	**Hawthorne Airport**	2.25	0.75	0.60	0.47	0.19	0.10	0.05	0.03
KLAX	**Los Angeles Int'l Airport**	2.90	1.05	0.82	0.65	0.27	0.14	0.07	0.04
KLGB	**Long Beach Airport**	1.81	0.57	0.40	0.30	0.11	0.06	0.03	0.03
KONT	**Ontario Airport**	2.81	0.94	0.70	0.54	0.22	0.11	0.06	0.04
KPSP	**Palm Springs Airport**	3.20	1.04	0.72	0.53	0.21	0.11	0.06	0.04
KRAL	**Riverside Airport**	0.61	0.32	0.32	0.29	0.15	0.08	0.05	0.03
KSMO	**Santa Monica Airport**	2.88	0.92	0.70	0.52	0.19	0.09	0.04	0.02
KSNA	**John Wayne Int'l Airport**	2.82	0.94	0.67	0.49	0.18	0.08	0.04	0.02
KTRM	**Desert Hot Springs Airport**	2.66	0.95	0.66	0.48	0.19	0.10	0.06	0.04
KVNY	**Van Nuys Airport**	1.60	0.55	0.41	0.31	0.12	0.06	0.03	0.02

Table 8.6 A – χ/Q for Natural Gas Boilers

50 < Rating (MMBTU/hr) ≤ 150 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.06	0.15	0.19	0.20	0.13	0.08	0.04	0.01
BNAP	**Banning**	0.00	0.02	0.09	0.17	0.20	0.13	0.06	0.02
CELA	**Central L.A.**	0.04	0.13	0.18	0.21	0.14	0.08	0.03	0.01
ELSI	**Lake Elsinore**	0.08	0.14	0.16	0.16	0.10	0.06	0.03	0.01
FONT	**Fontana**	0.03	0.09	0.16	0.20	0.17	0.10	0.05	0.01
MSVJ	**Mission Viejo**	0.03	0.10	0.15	0.17	0.12	0.07	0.03	0.01
PERI	**Perris**	0.08	0.11	0.14	0.16	0.13	0.08	0.04	0.01
PICO	**Pico Rivera**	0.03	0.11	0.17	0.21	0.15	0.09	0.04	0.01
RDLD	**Redlands**	0.07	0.14	0.19	0.20	0.14	0.08	0.04	0.01
UPLA	**Upland**	0.03	0.10	0.18	0.23	0.18	0.11	0.05	0.01
KBUR	**Burbank Airport**	0.03	0.09	0.14	0.19	0.19	0.12	0.06	0.02
KCNO	**Chino Airport.**	0.02	0.06	0.10	0.15	0.18	0.12	0.05	0.02
KCQT	**USC/Downtown L.A.**	0.05	0.14	0.19	0.20	0.15	0.09	0.04	0.01
KFUL	**Fullerton Airport**	0.03	0.10	0.17	0.21	0.17	0.10	0.05	0.01
KHHR	**Hawthorne Airport**	0.02	0.08	0.17	0.25	0.24	0.15	0.06	0.02
KLAX	**Los Angeles Int'l Airport**	0.01	0.04	0.12	0.21	0.28	0.19	0.09	0.03
KLGB	**Long Beach Airport**	0.02	0.07	0.13	0.17	0.17	0.11	0.05	0.01
KONT	**Ontario Airport**	0.01	0.06	0.11	0.17	0.21	0.14	0.07	0.02
KPSP	**Palm Springs Airport**	0.02	0.06	0.11	0.14	0.13	0.08	0.04	0.01
KRAL	**Riverside Airport**	0.02	0.07	0.14	0.19	0.19	0.13	0.06	0.02
KSMO	**Santa Monica Airport**	0.01	0.08	0.18	0.26	0.25	0.16	0.07	0.02
KSNA	**John Wayne Int'l Airport**	0.02	0.07	0.14	0.20	0.22	0.14	0.06	0.02
KTRM	**Desert Hot Springs Airport**	0.01	0.05	0.09	0.14	0.16	0.11	0.05	0.01
KVNY	**Van Nuys Airport**	0.03	0.08	0.13	0.16	0.16	0.10	0.05	0.01

Table 8.6 B – χ/Q for Natural Gas Boilers

50 < Rating (MMBTU/hr) ≤ 150 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.03	0.07	0.08	0.08	0.06	0.04	0.02	0.01
BNAP	**Banning**	0.00	0.01	0.04	0.08	0.10	0.07	0.05	0.03
CELA	**Central L.A.**	0.02	0.05	0.07	0.08	0.06	0.04	0.02	0.01
ELSI	**Lake Elsinore**	0.04	0.06	0.07	0.06	0.04	0.03	0.02	0.01
FONT	**Fontana**	0.02	0.04	0.07	0.08	0.07	0.05	0.03	0.02
MSVJ	**Mission Viejo**	0.02	0.04	0.06	0.07	0.05	0.03	0.01	0.01
PERI	**Perris**	0.04	0.05	0.06	0.06	0.06	0.04	0.02	0.01
PICO	**Pico Rivera**	0.02	0.05	0.07	0.08	0.06	0.04	0.02	0.01
RDLD	**Redlands**	0.04	0.06	0.08	0.08	0.06	0.04	0.02	0.02
UPLA	**Upland**	0.02	0.05	0.07	0.09	0.08	0.05	0.03	0.02
KBUR	**Burbank Airport**	0.01	0.04	0.06	0.08	0.08	0.05	0.03	0.01
KCNO	**Chino Airport.**	0.01	0.03	0.04	0.06	0.08	0.06	0.03	0.02
KCQT	**USC/Downtown L.A.**	0.02	0.06	0.08	0.08	0.06	0.04	0.02	0.01
KFUL	**Fullerton Airport**	0.01	0.05	0.07	0.08	0.07	0.04	0.02	0.01
KHHR	**Hawthorne Airport**	0.01	0.04	0.07	0.10	0.10	0.07	0.04	0.02
KLAX	**Los Angeles Int'l Airport**	0.00	0.02	0.05	0.09	0.12	0.09	0.05	0.02
KLGB	**Long Beach Airport**	0.01	0.03	0.05	0.07	0.06	0.04	0.02	0.01
KONT	**Ontario Airport**	0.01	0.03	0.05	0.07	0.09	0.07	0.04	0.02
KPSP	**Palm Springs Airport**	0.01	0.03	0.04	0.06	0.08	0.06	0.04	0.02
KRAL	**Riverside Airport**	0.01	0.03	0.06	0.08	0.09	0.06	0.03	0.02
KSMO	**Santa Monica Airport**	0.01	0.03	0.07	0.10	0.10	0.07	0.03	0.01
KSNA	**John Wayne Int'l Airport**	0.01	0.03	0.06	0.08	0.09	0.06	0.03	0.01
KTRM	**Desert Hot Springs Airport**	0.00	0.02	0.04	0.05	0.06	0.05	0.04	0.02
KVNY	**Van Nuys Airport**	0.01	0.04	0.06	0.07	0.06	0.04	0.02	0.01

Table 8.7 A – χ/Q for Natural Gas Boilers

150 < Rating (MMBTU/hr) ≤ 200 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.03	0.07	0.10	0.11	0.09	0.06	0.03	0.01
BNAP	Banning	0.00	0.01	0.03	0.07	0.12	0.09	0.05	0.01
CELA	Central L.A.	0.02	0.06	0.09	0.10	0.09	0.06	0.03	0.01
ELSI	Lake Elsinore	0.04	0.07	0.08	0.09	0.07	0.05	0.02	0.01
FONT	Fontana	0.01	0.04	0.07	0.10	0.11	0.08	0.04	0.01
MSVJ	Mission Viejo	0.01	0.05	0.07	0.09	0.08	0.05	0.03	0.01
PERI	Perris	0.03	0.05	0.07	0.08	0.08	0.06	0.03	0.01
PICO	Pico Rivera	0.01	0.05	0.09	0.11	0.10	0.07	0.03	0.01
RDLD	Redlands	0.03	0.06	0.09	0.11	0.09	0.06	0.03	0.01
UPLA	Upland	0.01	0.04	0.08	0.11	0.12	0.08	0.04	0.01
KBUR	Burbank Airport	0.01	0.04	0.07	0.09	0.12	0.09	0.05	0.01
KCNO	Chino Airport.	0.01	0.03	0.05	0.07	0.10	0.08	0.04	0.01
KCQT	USC/Downtown L.A.	0.02	0.07	0.10	0.11	0.10	0.07	0.03	0.01
KFUL	Fullerton Airport	0.01	0.05	0.08	0.11	0.11	0.08	0.04	0.01
KHHR	Hawthorne Airport	0.01	0.04	0.07	0.11	0.16	0.11	0.06	0.02
KLAX	Los Angeles Int'l Airport	0.00	0.02	0.05	0.09	0.17	0.14	0.07	0.02
KLGB	Long Beach Airport	0.01	0.04	0.06	0.09	0.11	0.08	0.04	0.01
KONT	Ontario Airport	0.01	0.03	0.05	0.08	0.13	0.10	0.05	0.02
KPSP	Palm Springs Airport	0.01	0.03	0.05	0.07	0.08	0.06	0.03	0.01
KRAL	Riverside Airport	0.01	0.03	0.06	0.09	0.12	0.09	0.05	0.01
KSMO	Santa Monica Airport	0.00	0.03	0.08	0.12	0.16	0.12	0.06	0.02
KSNA	John Wayne Int'l Airport	0.01	0.03	0.06	0.10	0.13	0.10	0.05	0.02
KTRM	Desert Hot Springs Airport	0.00	0.02	0.04	0.06	0.10	0.08	0.04	0.01
KVNY	Van Nuys Airport	0.01	0.04	0.07	0.08	0.10	0.08	0.04	0.01

Table 8.7 B – χ/Q for Natural Gas Boilers

150 < Rating (MMBTU/hr) ≤ 200 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.01	0.03	0.04	0.04	0.04	0.03	0.01	0.01
BNAP	Banning	0.00	0.01	0.02	0.03	0.06	0.04	0.03	0.02
CELA	Central L.A.	0.01	0.03	0.03	0.04	0.04	0.03	0.01	0.01
ELSI	Lake Elsinore	0.02	0.03	0.03	0.03	0.03	0.02	0.01	0.01
FONT	Fontana	0.01	0.02	0.03	0.04	0.05	0.03	0.02	0.01
MSVJ	Mission Viejo	0.01	0.02	0.03	0.03	0.03	0.02	0.01	0.00
PERI	Perris	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.01
PICO	Pico Rivera	0.01	0.02	0.04	0.04	0.04	0.03	0.01	0.01
RDLD	Redlands	0.02	0.03	0.04	0.04	0.04	0.03	0.02	0.01
UPLA	Upland	0.01	0.02	0.03	0.04	0.05	0.04	0.02	0.01
KBUR	Burbank Airport	0.01	0.02	0.03	0.04	0.05	0.04	0.02	0.01
KCNO	Chino Airport.	0.00	0.01	0.02	0.03	0.04	0.04	0.02	0.01
KCQT	USC/Downtown L.A.	0.01	0.03	0.04	0.05	0.04	0.03	0.02	0.01
KFUL	Fullerton Airport	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01
KHHR	Hawthorne Airport	0.00	0.02	0.03	0.04	0.06	0.05	0.03	0.01
KLAX	Los Angeles Int'l Airport	0.00	0.01	0.02	0.04	0.07	0.06	0.03	0.01
KLGB	Long Beach Airport	0.00	0.02	0.03	0.03	0.04	0.03	0.02	0.01
KONT	Ontario Airport	0.00	0.01	0.02	0.03	0.05	0.04	0.03	0.01
KPSP	Palm Springs Airport	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.01
KRAL	Riverside Airport	0.00	0.02	0.03	0.04	0.05	0.04	0.02	0.01
KSMO	Santa Monica Airport	0.00	0.02	0.03	0.05	0.06	0.05	0.03	0.01
KSNA	John Wayne Int'l Airport	0.00	0.02	0.03	0.04	0.05	0.04	0.02	0.01
KTRM	Desert Hot Springs Airport	0.00	0.01	0.02	0.03	0.04	0.03	0.02	0.01
KVNY	Van Nuys Airport	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01

Table 8.8 – χ/Q for Natural Gas Boilers

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Rating (MMBTU/hr)	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
2 < Rating ≤ 5	246.77	77.10	64.07	55.15	24.90	11.86	6.16	2.89
5 < Rating ≤ 10	176.34	52.72	41.10	35.06	15.72	6.62	3.69	2.43
10 < Rating ≤ 20	146.20	45.42	34.41	28.20	12.56	5.80	3.10	1.91
20 < Rating ≤ 30	100.89	31.91	25.44	20.43	9.54	4.48	2.52	1.25
30 < Rating ≤ 50	83.84	27.57	21.80	17.40	7.80	3.93	2.21	1.10
50 < Rating ≤ 150	7.32	3.85	4.74	4.48	3.30	2.50	1.62	0.82
150 < Rating ≤ 200	3.82	2.50	2.65	3.12	2.44	1.85	1.21	0.61

Table 9.0 – χ/Q for Natural Gas Internal Combustion Engines

Equipment Type	Equipment Rating (BHP)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables		Acute χ/Q Table	Source ID
		≤ 12 hr/day	> 12 hr/day		
Natural Gas Reciprocating Internal Combustion Engines	50 < Rating ≤ 75	Table 9.1 A	Table 9.1 B	Table 9.6	N1
	75 < Rating ≤ 150	Table 9.2 A	Table 9.2 B		N2
	150 < Rating ≤ 250	Table 9.3 A	Table 9.3 B		N3
	250 < Rating ≤ 1000	Table 9.4 A	Table 9.4 B		N4
	Rating > 1000	Table 9.5 A	Table 9.5 B		N5

Table 9.1 A – χ/Q for Natural Gas Internal Combustion Engines

50 < Rating (BHP) ≤ 75 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	32.01	7.57	3.93	2.24	0.42	0.14	0.05	0.01
BNAP	Banning	38.68	8.93	4.76	2.83	0.64	0.24	0.08	0.02
CELA	Central L.A.	32.26	7.30	3.64	2.06	0.41	0.14	0.05	0.01
ELSI	Lake Elsinore	21.77	5.76	2.98	1.69	0.34	0.12	0.04	0.01
FONT	Fontana	37.79	8.52	4.46	2.59	0.53	0.19	0.06	0.02
MSVJ	Mission Viejo	24.52	6.22	3.24	1.83	0.35	0.13	0.04	0.01
PERI	Perris	22.74	5.86	3.14	1.86	0.41	0.16	0.05	0.01
PICO	Pico Rivera	34.27	7.79	3.97	2.29	0.45	0.16	0.05	0.01
RDLD	Redlands	30.36	7.78	4.02	2.26	0.43	0.15	0.05	0.01
UPLA	Upland	40.22	9.05	4.80	2.80	0.56	0.20	0.07	0.02
KBUR	Burbank Airport	42.23	9.05	4.73	2.78	0.58	0.22	0.07	0.02
KCNO	Chino Airport.	31.86	8.21	4.49	2.68	0.61	0.23	0.07	0.02
KCQT	USC/Downtown L.A.	32.55	8.50	4.54	2.63	0.51	0.18	0.06	0.01
KFUL	Fullerton Airport	36.73	8.24	4.38	2.58	0.54	0.19	0.06	0.02
KHHR	Hawthorne Airport	48.48	10.62	5.69	3.38	0.74	0.26	0.09	0.02
KLAX	Los Angeles Int'l Airport	54.50	12.46	7.05	4.40	1.06	0.38	0.12	0.03
KLGB	Long Beach Airport	34.78	7.80	4.20	2.53	0.55	0.21	0.07	0.02
KONT	Ontario Airport	42.30	9.97	5.50	3.33	0.75	0.28	0.09	0.02
KPSP	Palm Springs Airport	26.05	6.19	3.34	1.97	0.42	0.15	0.05	0.01
KRAL	Riverside Airport	37.51	9.69	5.28	3.13	0.67	0.24	0.08	0.02
KSMO	Santa Monica Airport	53.59	11.42	6.22	3.77	0.84	0.30	0.10	0.02
KSNA	John Wayne Int'l Airport	42.99	10.05	5.34	3.23	0.71	0.27	0.09	0.02
KTRM	Desert Hot Springs Airport	30.67	7.76	4.36	2.71	0.63	0.24	0.08	0.02
KVNY	Van Nuys Airport	31.64	7.53	4.00	2.35	0.51	0.19	0.06	0.01

Table 9.1 B – χ/Q for Natural Gas Internal Combustion Engines

50 < Rating (BHP) ≤ 75 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	22.16	6.82	4.89	3.63	1.20	0.42	0.14	0.04
BNAP	Banning	43.66	12.89	8.19	5.78	1.99	0.81	0.31	0.10
CELA	Central L.A.	19.50	6.05	4.26	3.23	1.07	0.37	0.13	0.04
ELSI	Lake Elsinore	12.04	4.14	3.20	2.55	1.00	0.43	0.17	0.06
FONT	Fontana	29.32	8.35	5.59	4.07	1.40	0.56	0.20	0.07
MSVJ	Mission Viejo	15.67	4.80	3.43	2.58	0.94	0.39	0.16	0.05
PERI	Perris	17.73	5.68	3.96	2.98	1.10	0.49	0.20	0.07
PICO	Pico Rivera	24.75	7.29	4.75	3.36	1.02	0.39	0.14	0.04
RDLD	Redlands	18.17	5.69	4.08	3.59	1.65	0.60	0.19	0.07
UPLA	Upland	26.65	7.41	5.23	3.89	1.34	0.50	0.18	0.06
KBUR	Burbank Airport	28.06	7.33	4.55	3.15	0.98	0.43	0.17	0.05
KCNO	Chino Airport.	26.01	7.66	4.94	3.52	1.29	0.58	0.23	0.07
KCQT	USC/Downtown L.A.	22.13	7.25	5.46	4.24	1.49	0.53	0.17	0.06
KFUL	Fullerton Airport	21.21	5.92	3.97	2.78	0.87	0.37	0.15	0.05
KHHR	Hawthorne Airport	31.43	8.47	5.39	3.76	1.18	0.48	0.18	0.06
KLAX	Los Angeles Int'l Airport	38.21	10.48	6.77	4.74	1.57	0.66	0.25	0.08
KLGB	Long Beach Airport	23.38	7.52	5.20	3.89	1.46	0.62	0.23	0.08
KONT	Ontario Airport	37.07	10.63	6.93	4.96	1.75	0.77	0.30	0.10
KPSP	Palm Springs Airport	27.17	8.69	5.66	4.07	1.42	0.62	0.24	0.08
KRAL	Riverside Airport	26.33	8.71	6.06	4.53	1.68	0.69	0.26	0.09
KSMO	Santa Monica Airport	31.42	8.49	5.53	3.88	1.23	0.49	0.18	0.06
KSNA	John Wayne Int'l Airport	30.25	8.70	5.44	3.86	1.30	0.56	0.22	0.07
KTRM	Desert Hot Springs Airport	29.98	9.53	6.26	4.52	1.67	0.77	0.31	0.10
KVNY	Van Nuys Airport	21.17	6.18	4.01	2.88	1.03	0.45	0.18	0.06

Table 9.2 A – χ/Q for Natural Gas Internal Combustion Engines

75 < Rating (BHP) ≤ 150 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	18.85	5.64	3.29	1.98	0.40	0.14	0.05	0.01
BNAP	Banning	28.35	7.32	4.20	2.60	0.62	0.23	0.08	0.02
CELA	Central L.A.	21.69	5.72	3.17	1.86	0.39	0.13	0.04	0.01
ELSI	Lake Elsinore	12.22	3.98	2.35	1.42	0.31	0.11	0.04	0.01
FONT	Fontana	24.88	6.53	3.80	2.32	0.50	0.18	0.06	0.02
MSVJ	Mission Viejo	15.29	4.65	2.71	1.61	0.33	0.12	0.04	0.01
PERI	Perris	15.28	4.46	2.63	1.64	0.39	0.15	0.05	0.01
PICO	Pico Rivera	23.33	6.12	3.43	2.06	0.43	0.16	0.05	0.01
RDLD	Redlands	17.36	5.69	3.34	2.00	0.40	0.14	0.05	0.01
UPLA	Upland	25.63	6.85	4.07	2.50	0.53	0.19	0.06	0.02
KBUR	Burbank Airport	29.72	7.24	4.12	2.53	0.55	0.21	0.07	0.02
KCNO	Chino Airport.	22.67	6.48	3.87	2.42	0.58	0.22	0.07	0.02
KCQT	USC/Downtown L.A.	18.61	6.14	3.75	2.30	0.48	0.17	0.06	0.01
KFUL	Fullerton Airport	25.25	6.52	3.79	2.33	0.51	0.18	0.06	0.02
KHHR	Hawthorne Airport	35.00	8.65	5.00	3.10	0.71	0.25	0.08	0.02
KLAX	Los Angeles Int'l Airport	40.38	10.34	6.22	4.01	1.01	0.37	0.12	0.03
KLGB	Long Beach Airport	24.49	6.18	3.63	2.28	0.52	0.20	0.07	0.02
KONT	Ontario Airport	30.05	7.88	4.75	3.01	0.72	0.27	0.09	0.02
KPSP	Palm Springs Airport	17.02	4.67	2.82	1.76	0.40	0.15	0.05	0.01
KRAL	Riverside Airport	24.45	7.35	4.47	2.80	0.64	0.23	0.08	0.02
KSMO	Santa Monica Airport	39.13	9.30	5.44	3.42	0.80	0.29	0.10	0.02
KSNA	John Wayne Int'l Airport	31.67	8.18	4.68	2.94	0.68	0.26	0.09	0.02
KTRM	Desert Hot Springs Airport	21.60	6.03	3.70	2.40	0.59	0.23	0.08	0.02
KVNY	Van Nuys Airport	22.59	5.99	3.46	2.13	0.49	0.18	0.06	0.01

Table 9.2 B – χ/Q for Natural Gas Internal Combustion Engines

75 < Rating (BHP) ≤ 150 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	12.22	3.59	2.54	1.93	0.78	0.35	0.14	0.05
BNAP	Banning	30.57	8.89	5.80	4.17	1.61	0.73	0.31	0.11
CELA	Central L.A.	12.22	3.33	2.36	1.79	0.69	0.29	0.11	0.04
ELSI	Lake Elsinore	6.74	2.15	1.40	1.00	0.53	0.31	0.16	0.06
FONT	Fontana	18.53	5.10	3.37	2.46	0.97	0.45	0.20	0.07
MSVJ	Mission Viejo	8.68	2.56	1.68	1.22	0.51	0.28	0.14	0.05
PERI	Perris	11.26	3.42	2.24	1.64	0.70	0.36	0.17	0.06
PICO	Pico Rivera	15.68	4.33	2.78	2.01	0.74	0.34	0.15	0.05
RDLD	Redlands	9.95	3.19	2.18	1.62	0.71	0.37	0.20	0.08
UPLA	Upland	16.40	4.42	3.01	2.22	0.92	0.41	0.20	0.08
KBUR	Burbank Airport	19.32	5.12	3.18	2.21	0.75	0.36	0.16	0.05
KCNO	Chino Airport.	18.12	5.29	3.43	2.43	0.96	0.47	0.21	0.07
KCQT	USC/Downtown L.A.	11.71	3.70	2.77	2.20	0.98	0.44	0.19	0.07
KFUL	Fullerton Airport	13.94	3.75	2.43	1.71	0.62	0.30	0.13	0.05
KHHR	Hawthorne Airport	21.65	5.72	3.61	2.53	0.91	0.41	0.17	0.06
KLAX	Los Angeles Int'l Airport	27.40	7.64	4.99	3.54	1.27	0.57	0.24	0.08
KLGB	Long Beach Airport	16.09	4.91	3.36	2.52	1.06	0.51	0.22	0.08
KONT	Ontario Airport	26.10	7.49	5.00	3.62	1.37	0.65	0.28	0.10
KPSP	Palm Springs Airport	19.94	6.33	4.17	3.03	1.14	0.54	0.23	0.08
KRAL	Riverside Airport	16.52	5.34	3.72	2.81	1.19	0.56	0.24	0.09
KSMO	Santa Monica Airport	21.93	5.76	3.72	2.65	0.94	0.41	0.17	0.06
KSNA	John Wayne Int'l Airport	21.48	6.12	3.83	2.72	0.99	0.47	0.20	0.07
KTRM	Desert Hot Springs Airport	21.32	6.64	4.46	3.26	1.30	0.65	0.29	0.10
KVNY	Van Nuys Airport	14.56	4.18	2.64	1.90	0.74	0.36	0.16	0.06

Table 9.3 A – χ/Q for Natural Gas Internal Combustion Engines

150 < Rating (BHP) ≤ 250 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	8.43	3.18	2.05	1.40	0.34	0.12	0.04	0.01
BNAP	Banning	19.24	5.22	3.13	2.13	0.56	0.21	0.07	0.02
CELA	Central L.A.	11.92	3.71	2.23	1.45	0.34	0.12	0.04	0.01
ELSI	Lake Elsinore	5.37	2.04	1.35	0.95	0.25	0.10	0.04	0.01
FONT	Fontana	14.04	4.11	2.56	1.76	0.44	0.16	0.06	0.01
MSVJ	Mission Viejo	7.16	2.65	1.69	1.13	0.27	0.11	0.04	0.01
PERI	Perris	9.31	2.90	1.80	1.25	0.34	0.13	0.05	0.01
PICO	Pico Rivera	13.37	4.02	2.39	1.59	0.37	0.14	0.05	0.01
RDLD	Redlands	7.44	3.09	2.02	1.39	0.34	0.13	0.05	0.01
UPLA	Upland	13.49	4.19	2.70	1.88	0.46	0.17	0.06	0.02
KBUR	Burbank Airport	18.60	4.99	2.97	2.02	0.49	0.20	0.07	0.02
KCNO	Chino Airport.	14.96	4.39	2.72	1.89	0.52	0.20	0.07	0.02
KCQT	USC/Downtown L.A.	7.49	3.28	2.25	1.62	0.41	0.15	0.05	0.01
KFUL	Fullerton Airport	14.84	4.33	2.67	1.82	0.46	0.17	0.06	0.02
KHHR	Hawthorne Airport	23.33	6.09	3.70	2.52	0.65	0.24	0.08	0.02
KLAX	Los Angeles Int'l Airport	28.10	7.53	4.67	3.26	0.92	0.35	0.12	0.03
KLGB	Long Beach Airport	15.05	4.20	2.58	1.80	0.46	0.18	0.07	0.02
KONT	Ontario Airport	18.98	5.30	3.33	2.34	0.64	0.25	0.09	0.02
KPSP	Palm Springs Airport	9.13	2.81	1.85	1.31	0.35	0.13	0.05	0.01
KRAL	Riverside Airport	13.23	4.44	2.91	2.08	0.56	0.21	0.08	0.02
KSMO	Santa Monica Airport	25.80	6.65	4.04	2.78	0.73	0.27	0.09	0.02
KSNA	John Wayne Int'l Airport	21.15	5.89	3.47	2.38	0.62	0.24	0.08	0.02
KTRM	Desert Hot Springs Airport	7.55	2.50	1.75	1.31	0.43	0.18	0.07	0.02
KVNY	Van Nuys Airport	7.43	2.47	1.66	1.18	0.36	0.15	0.06	0.01

Table 9.3 B – χ/Q for Natural Gas Internal Combustion Engines

150 < Rating (BHP) ≤ 250 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	4.94	1.62	1.08	0.82	0.33	0.18	0.10	0.05
BNAP	Banning	19.11	5.27	3.14	2.34	1.00	0.52	0.25	0.10
CELA	Central L.A.	6.17	1.77	1.13	0.84	0.32	0.16	0.09	0.04
ELSI	Lake Elsinore	3.02	1.04	0.68	0.50	0.18	0.12	0.09	0.05
FONT	Fontana	9.83	2.71	1.67	1.23	0.47	0.25	0.14	0.06
MSVJ	Mission Viejo	3.53	1.21	0.76	0.54	0.17	0.11	0.08	0.04
PERI	Perris	6.37	1.92	1.17	0.85	0.32	0.18	0.11	0.05
PICO	Pico Rivera	8.17	2.31	1.35	0.98	0.35	0.19	0.11	0.04
RDLD	Redlands	4.02	1.49	0.99	0.74	0.29	0.16	0.13	0.08
UPLA	Upland	8.13	2.30	1.48	1.12	0.43	0.23	0.13	0.07
KBUR	Burbank Airport	11.54	3.09	1.80	1.29	0.42	0.21	0.11	0.05
KCNO	Chino Airport.	11.55	3.27	2.01	1.47	0.54	0.28	0.15	0.06
KCQT	USC/Downtown L.A.	4.01	1.54	1.08	0.86	0.37	0.21	0.13	0.06
KFUL	Fullerton Airport	7.48	2.10	1.27	0.91	0.30	0.15	0.09	0.04
KHHR	Hawthorne Airport	13.15	3.43	2.05	1.46	0.53	0.26	0.13	0.05
KLAX	Los Angeles Int'l Airport	17.84	4.86	3.01	2.20	0.81	0.39	0.18	0.07
KLGB	Long Beach Airport	9.44	2.75	1.68	1.27	0.52	0.27	0.15	0.07
KONT	Ontario Airport	16.09	4.49	2.79	2.08	0.81	0.41	0.20	0.09
KPSP	Palm Springs Airport	13.17	4.05	2.48	1.83	0.70	0.35	0.17	0.07
KRAL	Riverside Airport	8.38	2.75	1.78	1.36	0.58	0.31	0.17	0.08
KSMO	Santa Monica Airport	13.30	3.51	2.13	1.54	0.53	0.25	0.12	0.05
KSNA	John Wayne Int'l Airport	13.17	3.73	2.15	1.56	0.53	0.26	0.14	0.06
KTRM	Desert Hot Springs Airport	13.12	4.02	2.48	1.84	0.74	0.38	0.21	0.09
KVNY	Van Nuys Airport	8.45	2.45	1.43	1.03	0.36	0.19	0.10	0.05

Table 9.4 A – χ/Q for Natural Gas Internal Combustion Engines

250 < Rating (BHP) ≤ 1000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	3.68	1.73	1.25	0.87	0.26	0.11	0.04	0.01
BNAP	Banning	11.81	3.53	2.28	1.55	0.49	0.19	0.07	0.02
CELA	Central L.A.	6.24	2.20	1.47	0.99	0.28	0.11	0.04	0.01
ELSI	Lake Elsinore	2.65	1.11	0.82	0.59	0.20	0.09	0.03	0.01
FONT	Fontana	7.72	2.51	1.71	1.18	0.36	0.15	0.05	0.01
MSVJ	Mission Viejo	3.40	1.43	1.02	0.71	0.22	0.09	0.03	0.01
PERI	Perris	5.73	1.88	1.25	0.87	0.28	0.12	0.04	0.01
PICO	Pico Rivera	7.61	2.51	1.62	1.08	0.31	0.12	0.05	0.01
RDLD	Redlands	3.13	1.64	1.21	0.86	0.27	0.11	0.04	0.01
UPLA	Upland	6.86	2.49	1.77	1.23	0.38	0.15	0.06	0.02
KBUR	Burbank Airport	11.19	3.29	2.11	1.43	0.42	0.17	0.07	0.02
KCNO	Chino Airport.	9.49	2.94	1.94	1.35	0.44	0.18	0.07	0.02
KCQT	USC/Downtown L.A.	3.16	1.75	1.35	0.98	0.32	0.13	0.05	0.01
KFUL	Fullerton Airport	8.54	2.74	1.83	1.26	0.38	0.15	0.05	0.01
KHHR	Hawthorne Airport	14.22	4.11	2.69	1.84	0.56	0.21	0.08	0.02
KLAX	Los Angeles Int'l Airport	17.73	5.19	3.41	2.37	0.78	0.31	0.11	0.03
KLGB	Long Beach Airport	8.99	2.78	1.83	1.26	0.39	0.16	0.06	0.02
KONT	Ontario Airport	11.52	3.49	2.33	1.63	0.54	0.22	0.08	0.02
KPSP	Palm Springs Airport	4.96	1.69	1.22	0.88	0.29	0.12	0.04	0.01
KRAL	Riverside Airport	6.99	2.67	1.92	1.38	0.46	0.19	0.07	0.02
KSMO	Santa Monica Airport	16.42	4.59	2.96	2.02	0.62	0.24	0.09	0.02
KSNA	John Wayne Int'l Airport	13.61	4.08	2.54	1.73	0.53	0.22	0.08	0.02
KTRM	Desert Hot Springs Airport	8.16	2.61	1.77	1.26	0.43	0.18	0.07	0.02
KVNY	Van Nuys Airport	8.52	2.69	1.74	1.19	0.37	0.15	0.06	0.01

Table 9.4 B – χ/Q for Natural Gas Internal Combustion Engines

250 < Rating (BHP) ≤ 1000 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	2.12	0.83	0.60	0.43	0.17	0.08	0.06	0.03
BNAP	**Banning**	11.39	3.21	1.96	1.32	0.60	0.33	0.18	0.08
CELA	**Central L.A.**	3.12	1.01	0.71	0.49	0.18	0.08	0.05	0.03
ELSI	**Lake Elsinore**	1.50	0.55	0.40	0.29	0.11	0.05	0.04	0.03
FONT	**Fontana**	5.32	1.55	1.01	0.69	0.27	0.14	0.08	0.05
MSVJ	**Mission Viejo**	1.58	0.62	0.43	0.30	0.10	0.05	0.04	0.03
PERI	**Perris**	3.77	1.17	0.74	0.51	0.19	0.10	0.06	0.03
PICO	**Pico Rivera**	4.45	1.33	0.82	0.56	0.20	0.10	0.06	0.03
RDLD	**Redlands**	1.71	0.77	0.57	0.41	0.16	0.08	0.06	0.05
UPLA	**Upland**	4.12	1.30	0.90	0.64	0.25	0.12	0.08	0.05
KBUR	**Burbank Airport**	6.72	1.89	1.15	0.77	0.26	0.12	0.07	0.03
KCNO	**Chino Airport.**	7.21	2.12	1.34	0.92	0.35	0.17	0.09	0.04
KCQT	**USC/Downtown L.A.**	1.59	0.77	0.60	0.45	0.18	0.09	0.06	0.04
KFUL	**Fullerton Airport**	4.11	1.25	0.81	0.55	0.18	0.08	0.05	0.03
KHHR	**Hawthorne Airport**	7.75	2.16	1.36	0.92	0.34	0.16	0.09	0.04
KLAX	**Los Angeles Int'l Airport**	10.99	3.14	2.00	1.37	0.52	0.25	0.12	0.06
KLGB	**Long Beach Airport**	5.56	1.63	1.00	0.68	0.27	0.13	0.08	0.05
KONT	**Ontario Airport**	9.72	2.80	1.77	1.22	0.48	0.23	0.13	0.06
KPSP	**Palm Springs Airport**	8.48	2.64	1.63	1.11	0.43	0.21	0.11	0.06
KRAL	**Riverside Airport**	4.44	1.57	1.08	0.77	0.32	0.16	0.10	0.06
KSMO	**Santa Monica Airport**	8.03	2.23	1.41	0.96	0.33	0.14	0.07	0.04
KSNA	**John Wayne Int'l Airport**	8.00	2.35	1.40	0.94	0.32	0.14	0.08	0.04
KTRM	**Desert Hot Springs Airport**	7.80	2.50	1.56	1.06	0.42	0.22	0.13	0.07
KVNY	**Van Nuys Airport**	4.92	1.48	0.90	0.61	0.21	0.09	0.05	0.03

Table 9.5 A – χ/Q for Natural Gas Internal Combustion Engines

Rating (BHP) > 1000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.21	0.22	0.23	0.21	0.12	0.07	0.03	0.01
BNAP	Banning	3.06	1.06	0.87	0.71	0.28	0.14	0.06	0.02
CELA	Central L.A.	0.64	0.34	0.33	0.28	0.13	0.07	0.03	0.01
ELSI	Lake Elsinore	0.32	0.20	0.20	0.18	0.10	0.06	0.03	0.01
FONT	Fontana	1.29	0.52	0.47	0.40	0.19	0.10	0.04	0.01
MSVJ	Mission Viejo	0.24	0.20	0.21	0.19	0.11	0.06	0.03	0.01
PERI	Perris	1.40	0.54	0.43	0.35	0.15	0.08	0.03	0.01
PICO	Pico Rivera	1.34	0.54	0.47	0.39	0.16	0.09	0.04	0.01
RDLD	Redlands	0.23	0.21	0.23	0.22	0.13	0.07	0.03	0.01
UPLA	Upland	0.65	0.35	0.36	0.33	0.18	0.10	0.04	0.01
KBUR	Burbank Airport	2.23	0.81	0.66	0.54	0.23	0.12	0.05	0.02
KCNO	Chino Airport.	2.90	1.01	0.77	0.61	0.25	0.13	0.05	0.01
KCQT	USC/Downtown L.A.	0.14	0.20	0.23	0.22	0.13	0.08	0.04	0.01
KFUL	Fullerton Airport	1.44	0.59	0.52	0.44	0.19	0.10	0.04	0.01
KHHR	Hawthorne Airport	3.55	1.25	1.04	0.84	0.33	0.15	0.06	0.02
KLAX	Los Angeles Int'l Airport	4.72	1.66	1.33	1.08	0.44	0.22	0.09	0.03
KLGB	Long Beach Airport	1.33	0.54	0.48	0.41	0.20	0.11	0.05	0.01
KONT	Ontario Airport	2.85	0.99	0.80	0.66	0.29	0.15	0.06	0.02
KPSP	Palm Springs Airport	1.59	0.57	0.43	0.34	0.14	0.08	0.03	0.01
KRAL	Riverside Airport	1.12	0.54	0.52	0.47	0.24	0.13	0.06	0.02
KSMO	Santa Monica Airport	4.06	1.36	1.10	0.88	0.34	0.16	0.07	0.02
KSNA	John Wayne Int'l Airport	3.95	1.36	1.01	0.79	0.30	0.15	0.06	0.02
KTRM	Desert Hot Springs Airport	1.68	0.63	0.52	0.44	0.21	0.11	0.05	0.01
KVNY	Van Nuys Airport	2.12	0.78	0.61	0.49	0.20	0.11	0.04	0.01

Table 9.5 B – χ/Q for Natural Gas Internal Combustion Engines

Rating (BHP) > 1000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.23	0.10	0.09	0.09	0.05	0.03	0.02	0.01
BNAP	**Banning**	2.49	0.75	0.55	0.42	0.17	0.11	0.07	0.04
CELA	**Central L.A.**	0.26	0.14	0.13	0.12	0.06	0.03	0.02	0.01
ELSI	**Lake Elsinore**	0.15	0.09	0.08	0.07	0.04	0.03	0.01	0.01
FONT	**Fontana**	0.85	0.29	0.25	0.20	0.09	0.05	0.03	0.02
MSVJ	**Mission Viejo**	0.10	0.08	0.08	0.08	0.04	0.03	0.01	0.01
PERI	**Perris**	0.81	0.29	0.22	0.18	0.07	0.04	0.02	0.01
PICO	**Pico Rivera**	0.64	0.24	0.20	0.17	0.07	0.04	0.02	0.01
RDLD	**Redlands**	0.11	0.09	0.10	0.09	0.06	0.04	0.02	0.01
UPLA	**Upland**	0.38	0.17	0.17	0.15	0.08	0.05	0.03	0.02
KBUR	**Burbank Airport**	1.12	0.39	0.30	0.24	0.10	0.06	0.03	0.01
KCNO	**Chino Airport.**	2.04	0.68	0.48	0.36	0.14	0.07	0.04	0.02
KCQT	**USC/Downtown L.A.**	0.08	0.09	0.09	0.09	0.06	0.04	0.02	0.01
KFUL	**Fullerton Airport**	0.58	0.24	0.21	0.17	0.08	0.04	0.02	0.01
KHHR	**Hawthorne Airport**	1.73	0.58	0.47	0.37	0.15	0.08	0.04	0.02
KLAX	**Los Angeles Int'l Airport**	2.62	0.88	0.66	0.52	0.21	0.11	0.05	0.02
KLGB	**Long Beach Airport**	1.25	0.39	0.27	0.20	0.08	0.04	0.02	0.01
KONT	**Ontario Airport**	2.21	0.71	0.51	0.39	0.16	0.08	0.04	0.02
KPSP	**Palm Springs Airport**	2.48	0.83	0.56	0.41	0.15	0.09	0.05	0.02
KRAL	**Riverside Airport**	0.69	0.30	0.27	0.24	0.12	0.07	0.03	0.02
KSMO	**Santa Monica Airport**	1.73	0.56	0.45	0.36	0.14	0.07	0.03	0.01
KSNA	**John Wayne Int'l Airport**	1.88	0.63	0.45	0.35	0.13	0.07	0.03	0.01
KTRM	**Desert Hot Springs Airport**	2.12	0.76	0.51	0.37	0.13	0.08	0.05	0.03
KVNY	**Van Nuys Airport**	1.04	0.37	0.27	0.21	0.09	0.05	0.02	0.01

Table 9.6 – χ/Q for Natural Gas Internal Combustion Engines

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Rating (BHP)	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
50 < Rating (BHP) ≤ 75	528.24	175.46	128.59	103.13	46.87	19.01	6.77	2.67
75 < Rating (BHP) ≤ 150	382.75	120.44	89.95	71.22	31.74	14.51	6.34	2.88
150 < Rating (BHP) ≤ 250	270.73	79.19	56.02	44.86	19.28	9.68	4.54	2.31
250 < Rating (BHP) ≤ 1000	191.90	55.66	39.93	30.37	12.85	6.98	3.48	1.58
Rating (BHP) > 1000	79.34	26.34	19.69	15.17	5.88	3.76	2.09	0.95

Table 10.0 – χ/Q for Diesel Internal Combustion Engines

Equipment Type	Equipment Rating (BHP)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables		Acute χ/Q Table	Source ID
		≤ 12 hr/day	> 12 hr/day		
Diesel Reciprocating Internal Combustion Engines	50 < Rating ≤ 175	Table 10.1 A	Table 10.1 B	Table 10.6	D1
	175 < Rating ≤ 300	Table 10.2 A	Table 10.2 B		D2
	300 < Rating ≤ 400	Table 10.3 A	Table 10.3 B		D3
	400 < Rating ≤ 600	Table 10.4 A	Table 10.4 B		D4
	600 < Rating ≤ 1150	Table 10.5 A	Table 10.5 B		D5

Table 10.1 A – χ/Q for Diesel Internal Combustion Engines

50 < Rating (BHP) ≤ 175 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	16.41	5.87	3.57	2.18	0.43	0.14	0.05	0.01
BNAP	**Banning**	27.27	7.50	4.43	2.78	0.65	0.23	0.08	0.02
CELA	**Central L.A.**	19.74	6.52	3.71	2.20	0.44	0.13	0.04	0.01
ELSI	**Lake Elsinore**	11.19	3.90	2.38	1.47	0.32	0.11	0.04	0.01
FONT	**Fontana**	22.80	6.68	4.01	2.48	0.53	0.18	0.06	0.02
MSVJ	**Mission Viejo**	14.22	4.76	2.84	1.70	0.34	0.12	0.04	0.01
PERI	**Perris**	14.34	4.49	2.70	1.71	0.40	0.15	0.05	0.01
PICO	**Pico Rivera**	21.87	6.65	3.80	2.30	0.46	0.15	0.05	0.01
RDLD	**Redlands**	14.93	5.67	3.48	2.12	0.42	0.14	0.05	0.01
UPLA	**Upland**	23.12	7.26	4.47	2.79	0.58	0.19	0.06	0.02
KBUR	**Burbank Airport**	28.28	7.43	4.32	2.68	0.57	0.21	0.07	0.02
KCNO	**Chino Airport.**	21.41	6.44	3.95	2.51	0.60	0.22	0.07	0.02
KCQT	**USC/Downtown L.A.**	16.25	5.97	3.83	2.41	0.51	0.17	0.06	0.01
KFUL	**Fullerton Airport**	23.65	6.75	4.01	2.50	0.54	0.19	0.06	0.02
KHHR	**Hawthorne Airport**	33.46	8.98	5.34	3.36	0.76	0.26	0.09	0.02
KLAX	**Los Angeles Int'l Airport**	38.90	10.54	6.49	4.23	1.07	0.38	0.13	0.03
KLGB	**Long Beach Airport**	23.01	6.23	3.74	2.38	0.54	0.20	0.07	0.02
KONT	**Ontario Airport**	28.22	7.86	4.87	3.13	0.74	0.27	0.09	0.02
KPSP	**Palm Springs Airport**	15.40	4.56	2.86	1.81	0.41	0.15	0.05	0.01
KRAL	**Riverside Airport**	22.29	7.19	4.55	2.91	0.67	0.24	0.08	0.02
KSMO	**Santa Monica Airport**	36.88	9.87	5.90	3.76	0.87	0.30	0.10	0.02
KSNA	**John Wayne Int'l Airport**	29.99	8.37	4.89	3.10	0.71	0.26	0.09	0.02
KTRM	**Desert Hot Springs Airport**	20.15	6.01	3.77	2.49	0.61	0.23	0.08	0.02
KVNY	**Van Nuys Airport**	21.16	6.06	3.58	2.23	0.50	0.19	0.06	0.01

Table 10.1 B – χ/Q for Diesel Internal Combustion Engines

50 < Rating (BHP) ≤ 175 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	10.78	3.70	2.65	2.01	0.81	0.34	0.14	0.05
BNAP	**Banning**	28.59	8.77	5.82	4.23	1.65	0.74	0.30	0.10
CELA	**Central L.A.**	11.17	3.68	2.57	1.90	0.74	0.29	0.11	0.04
ELSI	**Lake Elsinore**	6.18	2.11	1.39	0.98	0.49	0.28	0.15	0.06
FONT	**Fontana**	16.92	5.16	3.46	2.53	0.97	0.44	0.19	0.07
MSVJ	**Mission Viejo**	8.22	2.60	1.72	1.22	0.47	0.25	0.13	0.05
PERI	**Perris**	10.57	3.45	2.28	1.66	0.67	0.34	0.16	0.06
PICO	**Pico Rivera**	14.82	4.63	2.97	2.13	0.75	0.33	0.14	0.05
RDLD	**Redlands**	8.62	3.12	2.19	1.62	0.69	0.34	0.19	0.08
UPLA	**Upland**	14.72	4.59	3.18	2.34	0.94	0.40	0.19	0.08
KBUR	**Burbank Airport**	18.29	5.18	3.26	2.27	0.75	0.35	0.15	0.05
KCNO	**Chino Airport.**	17.11	5.17	3.40	2.45	0.95	0.46	0.20	0.07
KCQT	**USC/Downtown L.A.**	10.15	3.48	2.64	2.10	0.94	0.43	0.18	0.07
KFUL	**Fullerton Airport**	13.04	3.81	2.48	1.73	0.60	0.28	0.13	0.04
KHHR	**Hawthorne Airport**	20.35	5.76	3.69	2.59	0.91	0.40	0.17	0.06
KLAX	**Los Angeles Int'l Airport**	25.99	7.58	5.02	3.59	1.29	0.57	0.23	0.08
KLGB	**Long Beach Airport**	15.02	4.86	3.34	2.51	1.06	0.50	0.22	0.08
KONT	**Ontario Airport**	24.40	7.38	4.99	3.64	1.38	0.65	0.28	0.10
KPSP	**Palm Springs Airport**	18.97	6.43	4.27	3.12	1.17	0.54	0.23	0.08
KRAL	**Riverside Airport**	15.05	5.09	3.60	2.73	1.17	0.54	0.24	0.09
KSMO	**Santa Monica Airport**	20.51	5.97	3.88	2.76	0.95	0.40	0.16	0.06
KSNA	**John Wayne Int'l Airport**	20.16	6.16	3.90	2.78	0.99	0.46	0.20	0.07
KTRM	**Desert Hot Springs Airport**	20.21	6.65	4.50	3.30	1.31	0.64	0.28	0.10
KVNY	**Van Nuys Airport**	13.60	4.17	2.64	1.90	0.73	0.35	0.16	0.06

Table 10.2 A – χ/Q for Diesel Internal Combustion Engines

175 < Rating (BHP) ≤ 300 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	12.51	4.63	2.99	1.93	0.40	0.13	0.04	0.01
BNAP	**Banning**	23.00	6.47	3.95	2.57	0.63	0.23	0.08	0.02
CELA	**Central L.A.**	15.94	5.56	3.28	2.01	0.41	0.13	0.04	0.01
ELSI	**Lake Elsinore**	8.16	2.95	1.95	1.29	0.30	0.11	0.04	0.01
FONT	**Fontana**	18.26	5.49	3.47	2.25	0.50	0.18	0.06	0.02
MSVJ	**Mission Viejo**	10.62	3.78	2.38	1.52	0.32	0.11	0.04	0.01
PERI	**Perris**	11.61	3.70	2.32	1.53	0.38	0.14	0.05	0.01
PICO	**Pico Rivera**	17.51	5.55	3.32	2.09	0.43	0.15	0.05	0.01
RDLD	**Redlands**	11.11	4.32	2.82	1.82	0.38	0.13	0.05	0.01
UPLA	**Upland**	18.11	5.90	3.83	2.50	0.55	0.18	0.06	0.02
KBUR	**Burbank Airport**	23.52	6.35	3.82	2.46	0.55	0.21	0.07	0.02
KCNO	**Chino Airport.**	18.16	5.45	3.45	2.28	0.58	0.22	0.07	0.02
KCQT	**USC/Downtown L.A.**	11.38	4.57	3.15	2.11	0.48	0.16	0.06	0.01
KFUL	**Fullerton Airport**	19.07	5.69	3.52	2.28	0.52	0.18	0.06	0.02
KHHR	**Hawthorne Airport**	28.18	7.72	4.76	3.10	0.74	0.25	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	33.67	9.18	5.82	3.91	1.03	0.37	0.12	0.03
KLGB	**Long Beach Airport**	18.95	5.29	3.29	2.18	0.51	0.20	0.07	0.02
KONT	**Ontario Airport**	23.49	6.64	4.25	2.85	0.71	0.26	0.09	0.02
KPSP	**Palm Springs Airport**	12.03	3.68	2.43	1.62	0.39	0.14	0.05	0.01
KRAL	**Riverside Airport**	17.33	5.77	3.86	2.59	0.63	0.23	0.08	0.02
KSMO	**Santa Monica Airport**	31.15	8.57	5.28	3.47	0.83	0.29	0.10	0.02
KSNA	**John Wayne Int'l Airport**	25.48	7.30	4.36	2.87	0.69	0.25	0.08	0.02
KTRM	**Desert Hot Springs Airport**	16.64	5.05	3.29	2.25	0.59	0.22	0.08	0.02
KVNY	**Van Nuys Airport**	17.49	5.17	3.16	2.04	0.48	0.18	0.06	0.01

Table 10.2 B – χ/Q for Diesel Internal Combustion Engines

175 < Rating (BHP) ≤ 300 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	7.87	2.66	1.90	1.46	0.61	0.28	0.13	0.05
BNAP	**Banning**	23.57	6.99	4.55	3.35	1.37	0.65	0.28	0.10
CELA	**Central L.A.**	8.49	2.81	1.89	1.37	0.52	0.23	0.10	0.04
ELSI	**Lake Elsinore**	4.59	1.56	1.06	0.77	0.33	0.20	0.12	0.05
FONT	**Fontana**	13.38	3.98	2.64	1.95	0.76	0.36	0.17	0.07
MSVJ	**Mission Viejo**	5.82	1.90	1.24	0.87	0.31	0.18	0.10	0.05
PERI	**Perris**	8.45	2.70	1.76	1.29	0.51	0.26	0.14	0.06
PICO	**Pico Rivera**	11.55	3.56	2.24	1.63	0.58	0.27	0.13	0.05
RDLD	**Redlands**	6.23	2.23	1.57	1.17	0.48	0.25	0.17	0.09
UPLA	**Upland**	11.26	3.48	2.39	1.78	0.69	0.32	0.16	0.08
KBUR	**Burbank Airport**	14.90	4.18	2.59	1.82	0.59	0.29	0.14	0.05
KCNO	**Chino Airport.**	14.28	4.21	2.74	1.99	0.75	0.38	0.18	0.07
KCQT	**USC/Downtown L.A.**	6.56	2.35	1.75	1.38	0.63	0.32	0.16	0.07
KFUL	**Fullerton Airport**	10.14	2.97	1.88	1.32	0.44	0.22	0.11	0.04
KHHR	**Hawthorne Airport**	16.52	4.62	2.92	2.06	0.73	0.34	0.15	0.05
KLAX	**Los Angeles Int'l Airport**	21.87	6.23	4.09	2.95	1.08	0.50	0.21	0.08
KLGB	**Long Beach Airport**	12.12	3.79	2.52	1.90	0.79	0.40	0.19	0.08
KONT	**Ontario Airport**	20.11	5.91	3.95	2.91	1.12	0.54	0.25	0.09
KPSP	**Palm Springs Airport**	16.08	5.33	3.47	2.55	0.96	0.46	0.20	0.08
KRAL	**Riverside Airport**	11.37	3.80	2.64	2.01	0.87	0.43	0.21	0.08
KSMO	**Santa Monica Airport**	16.74	4.82	3.09	2.20	0.75	0.33	0.14	0.05
KSNA	**John Wayne Int'l Airport**	16.58	4.99	3.08	2.21	0.77	0.37	0.17	0.06
KTRM	**Desert Hot Springs Airport**	16.66	5.38	3.56	2.63	1.05	0.52	0.25	0.10
KVNY	**Van Nuys Airport**	10.94	3.32	2.06	1.47	0.55	0.28	0.13	0.05

Table 10.3 A – χ/Q for Diesel Internal Combustion Engines

300 < Rating (BHP) ≤ 400 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	7.52	3.35	2.18	1.51	0.36	0.12	0.04	0.01
BNAP	Banning	16.85	5.16	3.14	2.18	0.59	0.21	0.07	0.02
CELA	Central L.A.	10.49	4.09	2.47	1.63	0.37	0.11	0.04	0.01
ELSI	Lake Elsinore	4.89	1.93	1.30	0.93	0.25	0.09	0.03	0.01
FONT	Fontana	12.44	4.14	2.61	1.82	0.45	0.16	0.06	0.01
MSVJ	Mission Viejo	6.75	2.66	1.69	1.14	0.27	0.10	0.04	0.01
PERI	Perris	8.37	2.84	1.77	1.24	0.34	0.13	0.05	0.01
PICO	Pico Rivera	12.37	4.31	2.56	1.70	0.38	0.13	0.05	0.01
RDLD	Redlands	6.69	3.14	2.08	1.46	0.35	0.12	0.04	0.01
UPLA	Upland	12.13	4.46	2.89	2.03	0.49	0.16	0.06	0.02
KBUR	Burbank Airport	16.56	4.93	2.96	2.03	0.50	0.19	0.07	0.02
KCNO	Chino Airport.	13.35	4.24	2.67	1.89	0.53	0.20	0.07	0.02
KCQT	USC/Downtown L.A.	6.74	3.14	2.19	1.61	0.42	0.15	0.05	0.01
KFUL	Fullerton Airport	13.26	4.34	2.69	1.87	0.47	0.17	0.06	0.02
KHHR	Hawthorne Airport	20.29	6.11	3.78	2.62	0.68	0.24	0.08	0.02
KLAX	Los Angeles Int'l Airport	24.46	7.34	4.61	3.29	0.95	0.35	0.12	0.03
KLGB	Long Beach Airport	13.34	4.09	2.53	1.79	0.47	0.18	0.07	0.02
KONT	Ontario Airport	16.73	5.14	3.26	2.33	0.65	0.25	0.08	0.02
KPSP	Palm Springs Airport	8.06	2.69	1.78	1.29	0.35	0.13	0.05	0.01
KRAL	Riverside Airport	11.58	4.27	2.84	2.08	0.58	0.21	0.07	0.02
KSMO	Santa Monica Airport	22.99	6.88	4.21	2.93	0.77	0.27	0.09	0.02
KSNA	John Wayne Int'l Airport	18.86	5.84	3.47	2.40	0.63	0.24	0.08	0.02
KTRM	Desert Hot Springs Airport	11.91	3.89	2.49	1.83	0.53	0.20	0.07	0.02
KVNY	Van Nuys Airport	12.43	3.98	2.43	1.68	0.44	0.17	0.06	0.01

Table 10.3 B – χ/Q for Diesel Internal Combustion Engines

300 < Rating (BHP) ≤ 400 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	4.62	1.77	1.17	0.89	0.33	0.16	0.09	0.04
BNAP	Banning	17.15	5.26	3.13	2.31	1.01	0.51	0.24	0.10
CELA	Central L.A.	5.53	1.98	1.27	0.93	0.31	0.14	0.07	0.04
ELSI	Lake Elsinore	2.79	1.02	0.66	0.50	0.17	0.09	0.07	0.04
FONT	Fontana	8.94	2.82	1.72	1.27	0.47	0.23	0.12	0.06
MSVJ	Mission Viejo	3.38	1.24	0.77	0.54	0.16	0.09	0.07	0.04
PERI	Perris	5.82	1.94	1.17	0.86	0.31	0.16	0.09	0.05
PICO	Pico Rivera	7.74	2.54	1.45	1.04	0.35	0.17	0.09	0.04
RDLD	Redlands	3.73	1.54	1.02	0.77	0.28	0.14	0.11	0.07
UPLA	Upland	7.48	2.50	1.60	1.21	0.44	0.21	0.11	0.06
KBUR	Burbank Airport	10.43	3.11	1.80	1.28	0.41	0.19	0.10	0.04
KCNO	Chino Airport.	10.44	3.24	1.99	1.45	0.54	0.26	0.13	0.06
KCQT	USC/Downtown L.A.	3.74	1.52	1.06	0.84	0.34	0.17	0.11	0.06
KFUL	Fullerton Airport	6.77	2.13	1.28	0.92	0.29	0.13	0.08	0.03
KHHR	Hawthorne Airport	11.71	3.49	2.09	1.50	0.53	0.25	0.12	0.05
KLAX	Los Angeles Int'l Airport	15.80	4.78	2.95	2.17	0.81	0.37	0.17	0.07
KLGB	Long Beach Airport	8.57	2.74	1.66	1.24	0.50	0.25	0.14	0.07
KONT	Ontario Airport	14.44	4.45	2.75	2.05	0.80	0.38	0.19	0.08
KPSP	Palm Springs Airport	12.02	4.12	2.50	1.84	0.70	0.33	0.16	0.07
KRAL	Riverside Airport	7.61	2.70	1.75	1.34	0.55	0.28	0.15	0.07
KSMO	Santa Monica Airport	11.98	3.65	2.21	1.60	0.53	0.23	0.11	0.05
KSNA	John Wayne Int'l Airport	11.96	3.77	2.16	1.55	0.52	0.24	0.12	0.05
KTRM	Desert Hot Springs Airport	12.00	4.06	2.47	1.82	0.72	0.36	0.19	0.08
KVNY	Van Nuys Airport	7.70	2.45	1.42	1.02	0.35	0.17	0.09	0.04

Table 10.4 A – χ/Q for Diesel Internal Combustion Engines

400 < Rating (BHP) ≤ 600 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	4.36	2.09	1.47	1.02	0.29	0.10	0.04	0.01
BNAP	**Banning**	12.99	4.14	2.65	1.80	0.54	0.20	0.07	0.02
CELA	**Central L.A.**	7.39	3.07	1.98	1.30	0.33	0.10	0.03	0.01
ELSI	**Lake Elsinore**	3.07	1.24	0.89	0.64	0.21	0.08	0.03	0.01
FONT	**Fontana**	8.67	2.99	1.99	1.37	0.40	0.15	0.05	0.01
MSVJ	**Mission Viejo**	4.07	1.69	1.15	0.78	0.22	0.09	0.03	0.01
PERI	**Perris**	6.25	2.19	1.42	0.98	0.30	0.12	0.04	0.01
PICO	**Pico Rivera**	8.67	3.16	1.97	1.29	0.33	0.12	0.04	0.01
RDLD	**Redlands**	3.76	1.92	1.38	0.97	0.28	0.11	0.04	0.01
UPLA	**Upland**	7.92	3.12	2.16	1.50	0.42	0.15	0.05	0.01
KBUR	**Burbank Airport**	12.55	3.93	2.46	1.65	0.45	0.18	0.07	0.02
KCNO	**Chino Airport.**	10.43	3.42	2.22	1.54	0.48	0.19	0.07	0.02
KCQT	**USC/Downtown L.A.**	4.20	2.14	1.61	1.17	0.36	0.13	0.05	0.01
KFUL	**Fullerton Airport**	9.66	3.35	2.19	1.49	0.42	0.15	0.05	0.01
KHHR	**Hawthorne Airport**	15.71	4.94	3.21	2.19	0.63	0.22	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	19.21	6.00	3.91	2.73	0.88	0.33	0.11	0.03
KLGB	**Long Beach Airport**	10.06	3.25	2.10	1.44	0.42	0.17	0.06	0.02
KONT	**Ontario Airport**	12.75	4.07	2.68	1.87	0.59	0.23	0.08	0.02
KPSP	**Palm Springs Airport**	5.76	2.00	1.41	1.00	0.31	0.12	0.04	0.01
KRAL	**Riverside Airport**	8.20	3.16	2.24	1.60	0.51	0.20	0.07	0.02
KSMO	**Santa Monica Airport**	17.89	5.65	3.60	2.44	0.71	0.25	0.09	0.02
KSNA	**John Wayne Int'l Airport**	14.84	4.78	2.94	1.99	0.58	0.22	0.08	0.02
KTRM	**Desert Hot Springs Airport**	9.07	3.07	2.03	1.45	0.48	0.19	0.07	0.02
KVNY	**Van Nuys Airport**	9.46	3.16	2.00	1.35	0.40	0.16	0.06	0.01

Table 10.4 B – χ/Q for Diesel Internal Combustion Engines

400 < Rating (BHP) ≤ 600 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	2.66	1.09	0.77	0.55	0.21	0.10	0.06	0.04
BNAP	**Banning**	12.86	3.97	2.41	1.63	0.75	0.39	0.20	0.08
CELA	**Central L.A.**	3.83	1.47	0.99	0.68	0.23	0.09	0.05	0.03
ELSI	**Lake Elsinore**	1.80	0.67	0.46	0.33	0.13	0.06	0.04	0.03
FONT	**Fontana**	6.19	2.00	1.28	0.88	0.34	0.16	0.09	0.05
MSVJ	**Mission Viejo**	1.98	0.77	0.51	0.35	0.12	0.05	0.04	0.03
PERI	**Perris**	4.28	1.46	0.91	0.62	0.23	0.11	0.06	0.04
PICO	**Pico Rivera**	5.33	1.81	1.09	0.73	0.26	0.11	0.06	0.03
RDLD	**Redlands**	2.14	0.95	0.68	0.49	0.18	0.09	0.06	0.05
UPLA	**Upland**	4.85	1.71	1.16	0.82	0.31	0.14	0.08	0.05
KBUR	**Burbank Airport**	7.76	2.38	1.42	0.94	0.30	0.14	0.07	0.04
KCNO	**Chino Airport.**	8.05	2.56	1.60	1.10	0.42	0.20	0.10	0.05
KCQT	**USC/Downtown L.A.**	2.23	0.99	0.75	0.56	0.22	0.10	0.07	0.05
KFUL	**Fullerton Airport**	4.77	1.58	1.00	0.68	0.22	0.09	0.05	0.03
KHHR	**Hawthorne Airport**	8.83	2.70	1.68	1.14	0.41	0.19	0.09	0.04
KLAX	**Los Angeles Int'l Airport**	12.21	3.77	2.38	1.64	0.63	0.29	0.14	0.06
KLGB	**Long Beach Airport**	6.35	2.06	1.26	0.85	0.35	0.17	0.09	0.05
KONT	**Ontario Airport**	10.96	3.44	2.16	1.48	0.59	0.28	0.14	0.07
KPSP	**Palm Springs Airport**	9.48	3.31	2.02	1.38	0.53	0.25	0.12	0.06
KRAL	**Riverside Airport**	5.33	1.94	1.31	0.94	0.39	0.19	0.11	0.06
KSMO	**Santa Monica Airport**	8.99	2.85	1.78	1.21	0.41	0.16	0.08	0.04
KSNA	**John Wayne Int'l Airport**	9.06	2.93	1.72	1.14	0.39	0.17	0.09	0.04
KTRM	**Desert Hot Springs Airport**	8.95	3.13	1.93	1.31	0.53	0.26	0.14	0.07
KVNY	**Van Nuys Airport**	5.68	1.85	1.10	0.74	0.25	0.11	0.06	0.03

Table 10.5 A – χ/Q for Diesel Internal Combustion Engines

600 < Rating (BHP) ≤ 1150 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour
χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.69	0.41	0.37	0.31	0.15	0.08	0.03	0.01
BNAP	**Banning**	5.23	1.79	1.34	1.03	0.37	0.16	0.06	0.02
CELA	**Central L.A.**	1.98	0.82	0.67	0.51	0.18	0.08	0.03	0.01
ELSI	**Lake Elsinore**	0.77	0.39	0.33	0.28	0.12	0.06	0.03	0.01
FONT	**Fontana**	2.78	1.01	0.81	0.64	0.25	0.11	0.05	0.01
MSVJ	**Mission Viejo**	0.78	0.41	0.36	0.30	0.13	0.07	0.03	0.01
PERI	**Perris**	2.42	0.91	0.68	0.52	0.20	0.09	0.04	0.01
PICO	**Pico Rivera**	2.83	1.07	0.80	0.60	0.20	0.09	0.04	0.01
RDLD	**Redlands**	0.65	0.40	0.38	0.32	0.15	0.08	0.04	0.01
UPLA	**Upland**	1.95	0.81	0.70	0.57	0.23	0.11	0.05	0.01
KBUR	**Burbank Airport**	4.61	1.56	1.13	0.86	0.30	0.14	0.06	0.02
KCNO	**Chino Airport.**	4.53	1.57	1.12	0.86	0.32	0.15	0.06	0.02
KCQT	**USC/Downtown L.A.**	0.41	0.35	0.34	0.30	0.16	0.09	0.04	0.01
KFUL	**Fullerton Airport**	3.29	1.23	0.95	0.73	0.26	0.12	0.05	0.01
KHHR	**Hawthorne Airport**	6.20	2.12	1.62	1.24	0.43	0.18	0.07	0.02
KLAX	**Los Angeles Int'l Airport**	8.04	2.71	2.02	1.56	0.59	0.26	0.10	0.03
KLGB	**Long Beach Airport**	3.35	1.23	0.93	0.72	0.27	0.13	0.05	0.01
KONT	**Ontario Airport**	4.86	1.66	1.24	0.97	0.38	0.18	0.07	0.02
KPSP	**Palm Springs Airport**	2.35	0.86	0.61	0.46	0.19	0.09	0.04	0.01
KRAL	**Riverside Airport**	2.38	1.02	0.87	0.73	0.31	0.15	0.06	0.02
KSMO	**Santa Monica Airport**	7.32	2.43	1.79	1.35	0.46	0.19	0.08	0.02
KSNA	**John Wayne Int'l Airport**	6.44	2.22	1.53	1.14	0.39	0.18	0.07	0.02
KTRM	**Desert Hot Springs Airport**	3.17	1.17	0.88	0.70	0.29	0.14	0.06	0.02
KVNY	**Van Nuys Airport**	3.67	1.31	0.95	0.72	0.26	0.12	0.05	0.01

Table 10.5 B – χ/Q for Diesel Internal Combustion Engines

600 < Rating (BHP) ≤ 1150 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.55	0.21	0.16	0.14	0.07	0.04	0.02	0.02
BNAP	Banning	4.80	1.47	0.98	0.72	0.31	0.19	0.11	0.06
CELA	Central L.A.	0.89	0.35	0.29	0.23	0.09	0.04	0.02	0.02
ELSI	Lake Elsinore	0.39	0.18	0.15	0.12	0.06	0.03	0.02	0.01
FONT	Fontana	1.85	0.62	0.46	0.35	0.14	0.08	0.04	0.03
MSVJ	Mission Viejo	0.31	0.17	0.14	0.12	0.05	0.03	0.02	0.01
PERI	Perris	1.46	0.53	0.37	0.28	0.11	0.05	0.03	0.02
PICO	Pico Rivera	1.48	0.52	0.38	0.29	0.10	0.05	0.03	0.02
RDLD	Redlands	0.35	0.19	0.18	0.15	0.07	0.04	0.03	0.02
UPLA	Upland	1.14	0.42	0.35	0.29	0.12	0.07	0.04	0.02
KBUR	Burbank Airport	2.48	0.81	0.56	0.42	0.15	0.07	0.04	0.02
KCNO	Chino Airport.	3.30	1.10	0.74	0.54	0.21	0.11	0.05	0.03
KCQT	USC/Downtown L.A.	0.19	0.15	0.14	0.13	0.07	0.04	0.03	0.02
KFUL	Fullerton Airport	1.44	0.52	0.39	0.30	0.11	0.05	0.02	0.01
KHHR	Hawthorne Airport	3.19	1.04	0.76	0.58	0.22	0.11	0.05	0.02
KLAX	Los Angeles Int'l Airport	4.73	1.53	1.08	0.81	0.32	0.16	0.08	0.04
KLGB	Long Beach Airport	2.20	0.73	0.48	0.34	0.13	0.07	0.04	0.02
KONT	Ontario Airport	3.93	1.28	0.87	0.64	0.25	0.13	0.07	0.04
KPSP	Palm Springs Airport	3.97	1.40	0.91	0.64	0.24	0.13	0.07	0.03
KRAL	Riverside Airport	1.53	0.60	0.48	0.39	0.17	0.09	0.05	0.03
KSMO	Santa Monica Airport	3.26	1.07	0.77	0.58	0.21	0.09	0.04	0.02
KSNA	John Wayne Int'l Airport	3.31	1.13	0.74	0.54	0.18	0.09	0.04	0.02
KTRM	Desert Hot Springs Airport	3.36	1.26	0.82	0.58	0.23	0.13	0.07	0.04
KVNY	Van Nuys Airport	1.87	0.65	0.45	0.33	0.12	0.06	0.03	0.01

Table 10.6 – χ/Q for Diesel Internal Combustion Engines

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Rating (BHP)	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
50 < Rating ≤ 175	361.32	121.96	90.85	73.66	33.20	14.52	6.12	2.86
175 < Rating ≤ 300	309.73	100.99	73.33	60.55	25.94	12.36	5.45	2.67
300 < Rating ≤ 400	238.41	80.18	54.79	44.34	19.52	9.85	4.54	2.07
400 < Rating ≤ 600	198.38	67.23	46.82	35.85	15.74	8.37	3.94	1.75
600 < Rating ≤ 1150	107.85	35.73	26.27	20.43	8.51	5.36	2.83	1.25

Table 11.0 – χ/Q for Crematoriums

Equipment Type	Building Area (ft^2)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables		Acute χ/Q Table	Source ID
		≤ 12 hr/day	> 12 hr/day		
Crematoriums	5,000 < Area ≤ 10,000	Table 11.1 A	Table 11.1 B	Table 11.4	P1
	10,000 < Area ≤ 15,000	Table 11.2 A	Table 11.2 B		P2
	Area > 15,000	Table 11.3 A	Table 11.3 B		P3

Table 11.1 A – χ/Q for Crematoriums

5,000 < Building Area (ft²) ≤ 10,000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	5.19	2.52	1.65	1.11	0.28	0.11	0.04	0.01
BNAP	Banning	16.83	4.62	2.67	1.75	0.48	0.19	0.07	0.02
CELA	Central L.A.	8.00	2.76	1.70	1.10	0.28	0.11	0.04	0.01
ELSI	Lake Elsinore	3.29	1.56	1.09	0.77	0.22	0.09	0.03	0.01
FONT	Fontana	10.51	3.28	2.09	1.40	0.38	0.15	0.06	0.01
MSVJ	Mission Viejo	4.09	2.01	1.35	0.91	0.24	0.10	0.04	0.01
PERI	Perris	7.50	2.28	1.47	1.02	0.30	0.12	0.05	0.01
PICO	Pico Rivera	9.36	3.09	1.93	1.28	0.33	0.13	0.05	0.01
RDLD	Redlands	4.85	2.51	1.65	1.10	0.28	0.12	0.04	0.01
UPLA	Upland	9.11	3.33	2.17	1.47	0.39	0.16	0.06	0.02
KBUR	Burbank Airport	11.72	3.97	2.44	1.65	0.45	0.19	0.07	0.02
KCNO	Chino Airport.	13.44	3.80	2.31	1.56	0.45	0.19	0.07	0.02
KCQT	USC/Downtown L.A.	4.20	2.50	1.74	1.23	0.33	0.13	0.05	0.01
KFUL	Fullerton Airport	10.90	3.23	2.10	1.44	0.41	0.16	0.06	0.02
KHHR	Hawthorne Airport	20.21	5.26	3.11	2.05	0.54	0.21	0.08	0.02
KLAX	Los Angeles Int'l Airport	23.17	6.76	4.09	2.76	0.78	0.31	0.11	0.03
KLGB	Long Beach Airport	10.44	3.26	2.09	1.46	0.42	0.17	0.06	0.02
KONT	Ontario Airport	16.09	4.48	2.79	1.90	0.55	0.23	0.08	0.02
KPSP	Palm Springs Airport	6.54	2.21	1.48	1.03	0.30	0.12	0.04	0.01
KRAL	Riverside Airport	9.82	3.77	2.42	1.67	0.46	0.19	0.07	0.02
KSMO	Santa Monica Airport	21.67	5.38	3.30	2.24	0.63	0.25	0.09	0.02
KSNA	John Wayne Int'l Airport	19.13	4.92	2.94	1.99	0.57	0.23	0.08	0.02
KTRM	Desert Hot Springs Airport	10.73	3.11	2.05	1.48	0.46	0.19	0.07	0.02
KVNY	Van Nuys Airport	11.52	3.27	2.03	1.37	0.39	0.16	0.06	0.01

Table 11.1 B – χ/Q for Crematoriums

5,000 < Building Area (ft²) ≤ 10,000 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	2.76	1.15	0.78	0.56	0.21	0.11	0.08	0.04
BNAP	**Banning**	14.53	4.27	2.40	1.63	0.68	0.37	0.21	0.09
CELA	**Central L.A.**	3.89	1.25	0.81	0.56	0.20	0.11	0.07	0.04
ELSI	**Lake Elsinore**	1.74	0.71	0.50	0.36	0.13	0.07	0.06	0.04
FONT	**Fontana**	6.91	1.89	1.18	0.82	0.31	0.17	0.11	0.05
MSVJ	**Mission Viejo**	1.75	0.82	0.56	0.39	0.12	0.07	0.06	0.03
PERI	**Perris**	4.61	1.28	0.81	0.57	0.22	0.12	0.08	0.04
PICO	**Pico Rivera**	5.02	1.47	0.91	0.63	0.23	0.13	0.08	0.04
RDLD	**Redlands**	2.48	1.15	0.76	0.53	0.19	0.11	0.09	0.07
UPLA	**Upland**	5.32	1.67	1.09	0.77	0.29	0.15	0.10	0.06
KBUR	**Burbank Airport**	6.81	2.04	1.24	0.85	0.29	0.15	0.09	0.04
KCNO	**Chino Airport.**	9.83	2.66	1.59	1.08	0.38	0.19	0.11	0.05
KCQT	**USC/Downtown L.A.**	2.01	1.09	0.78	0.58	0.22	0.12	0.09	0.05
KFUL	**Fullerton Airport**	4.83	1.38	0.89	0.62	0.21	0.11	0.07	0.03
KHHR	**Hawthorne Airport**	10.64	2.73	1.59	1.06	0.36	0.19	0.10	0.05
KLAX	**Los Angeles Int'l Airport**	13.91	4.09	2.44	1.67	0.57	0.27	0.15	0.06
KLGB	**Long Beach Airport**	7.01	1.84	1.11	0.78	0.32	0.17	0.11	0.06
KONT	**Ontario Airport**	12.91	3.47	2.09	1.44	0.54	0.27	0.16	0.07
KPSP	**Palm Springs Airport**	10.81	2.92	1.76	1.22	0.47	0.24	0.14	0.06
KRAL	**Riverside Airport**	6.02	2.22	1.39	0.98	0.36	0.19	0.13	0.07
KSMO	**Santa Monica Airport**	10.09	2.49	1.52	1.06	0.36	0.17	0.09	0.04
KSNA	**John Wayne Int'l Airport**	10.31	2.61	1.53	1.04	0.37	0.18	0.11	0.05
KTRM	**Desert Hot Springs Airport**	9.94	2.80	1.73	1.21	0.49	0.26	0.16	0.08
KVNY	**Van Nuys Airport**	6.12	1.65	0.99	0.68	0.23	0.12	0.07	0.04

Table 11.2 A – χ/Q for Crematoriums

10,000 < Building Area (ft²) ≤ 15,000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	7.34	2.79	1.81	1.21	0.31	0.11	0.04	0.01
BNAP	Banning	19.94	4.86	2.82	1.84	0.51	0.20	0.07	0.02
CELA	Central L.A.	10.43	3.01	1.86	1.20	0.30	0.11	0.04	0.01
ELSI	Lake Elsinore	4.53	1.73	1.18	0.82	0.23	0.09	0.03	0.01
FONT	Fontana	12.50	3.61	2.26	1.51	0.40	0.16	0.06	0.01
MSVJ	Mission Viejo	6.07	2.22	1.48	0.99	0.25	0.10	0.04	0.01
PERI	Perris	8.30	2.50	1.58	1.08	0.31	0.13	0.05	0.01
PICO	Pico Rivera	11.92	3.44	2.11	1.39	0.35	0.13	0.05	0.01
RDLD	Redlands	7.22	2.74	1.80	1.21	0.31	0.12	0.04	0.01
UPLA	Upland	12.04	3.67	2.36	1.60	0.42	0.16	0.06	0.02
KBUR	Burbank Airport	16.96	4.32	2.64	1.77	0.49	0.19	0.07	0.02
KCNO	Chino Airport.	14.75	4.04	2.44	1.63	0.47	0.19	0.07	0.02
KCQT	USC/Downtown L.A.	7.22	2.82	1.93	1.35	0.37	0.14	0.05	0.01
KFUL	Fullerton Airport	12.79	3.64	2.31	1.57	0.43	0.16	0.06	0.02
KHHR	Hawthorne Airport	22.42	5.47	3.26	2.15	0.58	0.22	0.08	0.02
KLAX	Los Angeles Int'l Airport	26.64	6.87	4.16	2.82	0.82	0.32	0.11	0.03
KLGB	Long Beach Airport	13.42	3.59	2.24	1.55	0.45	0.18	0.06	0.02
KONT	Ontario Airport	17.19	4.83	2.96	2.01	0.58	0.23	0.08	0.02
KPSP	Palm Springs Airport	8.14	2.49	1.62	1.12	0.32	0.13	0.04	0.01
KRAL	Riverside Airport	14.72	4.09	2.60	1.79	0.51	0.20	0.07	0.02
KSMO	Santa Monica Airport	22.24	5.82	3.53	2.37	0.66	0.25	0.09	0.02
KSNA	John Wayne Int'l Airport	19.67	5.33	3.16	2.10	0.59	0.24	0.08	0.02
KTRM	Desert Hot Springs Airport	11.49	3.51	2.24	1.58	0.48	0.19	0.07	0.02
KVNY	Van Nuys Airport	12.48	3.59	2.20	1.48	0.41	0.16	0.06	0.01

Table 11.2 B – χ/Q for Crematoriums

10,000 < Building Area (ft²) ≤ 15,000 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	4.45	1.46	0.95	0.67	0.24	0.12	0.08	0.04
BNAP	Banning	20.31	5.25	2.99	1.99	0.77	0.39	0.21	0.09
CELA	Central L.A.	5.60	1.49	0.94	0.65	0.22	0.11	0.07	0.04
ELSI	Lake Elsinore	2.60	0.90	0.59	0.42	0.14	0.07	0.06	0.04
FONT	Fontana	8.86	2.48	1.49	1.02	0.36	0.18	0.11	0.05
MSVJ	Mission Viejo	2.88	0.99	0.65	0.44	0.14	0.07	0.06	0.03
PERI	Perris	5.50	1.63	0.99	0.69	0.25	0.12	0.08	0.04
PICO	Pico Rivera	7.17	1.96	1.16	0.78	0.27	0.13	0.08	0.04
RDLD	Redlands	4.32	1.39	0.90	0.62	0.22	0.11	0.09	0.07
UPLA	Upland	7.50	2.12	1.32	0.92	0.33	0.16	0.10	0.06
KBUR	Burbank Airport	10.27	2.55	1.50	1.01	0.34	0.16	0.09	0.04
KCNO	Chino Airport.	11.48	3.09	1.83	1.25	0.43	0.20	0.11	0.05
KCQT	USC/Downtown L.A.	4.25	1.41	0.96	0.69	0.27	0.13	0.09	0.05
KFUL	Fullerton Airport	6.30	1.74	1.08	0.74	0.24	0.11	0.07	0.03
KHHR	Hawthorne Airport	13.24	3.27	1.88	1.23	0.41	0.20	0.10	0.05
KLAX	Los Angeles Int'l Airport	17.19	4.62	2.77	1.89	0.64	0.29	0.15	0.06
KLGB	Long Beach Airport	8.19	2.51	1.51	1.04	0.39	0.18	0.11	0.06
KONT	Ontario Airport	14.46	4.24	2.56	1.77	0.63	0.29	0.16	0.07
KPSP	Palm Springs Airport	11.68	3.62	2.18	1.50	0.54	0.25	0.14	0.06
KRAL	Riverside Airport	10.24	2.72	1.68	1.17	0.44	0.22	0.13	0.07
KSMO	Santa Monica Airport	11.40	3.09	1.85	1.26	0.41	0.18	0.09	0.04
KSNA	John Wayne Int'l Airport	12.04	3.38	1.95	1.30	0.43	0.19	0.11	0.05
KTRM	Desert Hot Springs Airport	11.48	3.51	2.14	1.49	0.56	0.27	0.16	0.08
KVNY	Van Nuys Airport	7.57	2.18	1.27	0.85	0.28	0.12	0.07	0.04

Table 11.3 A – χ/Q for Crematoriums

Building Area (ft²) ≥ 15,000 **< 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([µg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	8.67	3.00	1.90	1.27	0.31	0.12	0.04	0.01
BNAP	Banning	19.23	4.94	2.87	1.88	0.52	0.20	0.07	0.02
CELA	Central L.A.	11.56	3.23	1.96	1.27	0.31	0.11	0.04	0.01
ELSI	Lake Elsinore	5.14	1.82	1.22	0.84	0.23	0.09	0.03	0.01
FONT	Fontana	13.06	3.80	2.34	1.56	0.41	0.16	0.06	0.01
MSVJ	Mission Viejo	7.37	2.36	1.54	1.03	0.26	0.10	0.04	0.01
PERI	Perris	8.53	2.58	1.62	1.11	0.32	0.13	0.05	0.01
PICO	Pico Rivera	12.97	3.63	2.20	1.44	0.36	0.14	0.05	0.01
RDLD	Redlands	8.51	2.95	1.88	1.26	0.32	0.12	0.04	0.01
UPLA	Upland	13.29	3.96	2.47	1.66	0.43	0.16	0.06	0.02
KBUR	Burbank Airport	17.29	4.64	2.74	1.84	0.50	0.19	0.07	0.02
KCNO	Chino Airport.	14.78	4.19	2.51	1.68	0.48	0.19	0.07	0.02
KCQT	USC/Downtown L.A.	8.71	3.13	2.06	1.43	0.38	0.14	0.05	0.01
KFUL	Fullerton Airport	13.56	3.85	2.41	1.63	0.44	0.17	0.06	0.02
KHHR	Hawthorne Airport	21.59	5.56	3.31	2.19	0.59	0.22	0.08	0.02
KLAX	Los Angeles Int'l Airport	24.86	6.91	4.18	2.84	0.83	0.32	0.11	0.03
KLGB	Long Beach Airport	13.82	3.82	2.34	1.60	0.46	0.18	0.06	0.02
KONT	Ontario Airport	17.30	5.06	3.05	2.07	0.59	0.23	0.08	0.02
KPSP	Palm Springs Airport	9.02	2.70	1.71	1.17	0.32	0.13	0.04	0.01
KRAL	Riverside Airport	15.20	4.34	2.72	1.86	0.52	0.20	0.07	0.02
KSMO	Santa Monica Airport	21.60	5.95	3.60	2.42	0.66	0.25	0.09	0.02
KSNA	John Wayne Int'l Airport	19.38	5.47	3.24	2.16	0.60	0.24	0.08	0.02
KTRM	Desert Hot Springs Airport	11.69	3.66	2.32	1.62	0.48	0.19	0.07	0.02
KVNY	Van Nuys Airport	12.72	3.75	2.27	1.52	0.41	0.16	0.06	0.01

Table 11.3 B – χ/Q for Crematoriums

Building Area (ft²) ≥ 15,000 **> 12 (hrs/day)**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	5.71	1.78	1.11	0.77	0.26	0.12	0.08	0.04
BNAP	Banning	20.89	5.96	3.43	2.28	0.82	0.40	0.21	0.09
CELA	Central L.A.	6.81	1.79	1.08	0.74	0.25	0.12	0.07	0.04
ELSI	Lake Elsinore	3.08	1.02	0.66	0.46	0.15	0.07	0.06	0.04
FONT	Fontana	9.69	2.91	1.72	1.17	0.39	0.18	0.11	0.05
MSVJ	Mission Viejo	3.70	1.14	0.72	0.49	0.15	0.07	0.06	0.03
PERI	Perris	5.91	1.84	1.11	0.77	0.26	0.13	0.08	0.04
PICO	Pico Rivera	8.48	2.34	1.37	0.90	0.29	0.13	0.08	0.04
RDLD	Redlands	5.36	1.68	1.03	0.71	0.24	0.12	0.09	0.07
UPLA	Upland	8.65	2.53	1.53	1.05	0.36	0.17	0.10	0.06
KBUR	Burbank Airport	11.28	3.02	1.72	1.16	0.37	0.16	0.09	0.04
KCNO	Chino Airport.	12.16	3.50	2.03	1.37	0.45	0.21	0.11	0.05
KCQT	USC/Downtown L.A.	5.75	1.82	1.16	0.83	0.30	0.14	0.09	0.05
KFUL	Fullerton Airport	7.29	2.04	1.22	0.82	0.26	0.12	0.07	0.03
KHHR	Hawthorne Airport	13.78	3.70	2.11	1.38	0.44	0.20	0.10	0.05
KLAX	Los Angeles Int'l Airport	16.98	5.02	3.02	2.07	0.68	0.30	0.15	0.06
KLGB	Long Beach Airport	8.89	2.91	1.76	1.22	0.43	0.18	0.11	0.06
KONT	Ontario Airport	15.11	4.78	2.90	2.00	0.68	0.30	0.16	0.07
KPSP	Palm Springs Airport	11.90	3.94	2.41	1.66	0.58	0.26	0.14	0.06
KRAL	Riverside Airport	11.24	3.23	1.96	1.36	0.49	0.23	0.13	0.07
KSMO	Santa Monica Airport	11.83	3.45	2.06	1.40	0.44	0.18	0.09	0.04
KSNA	John Wayne Int'l Airport	12.91	3.84	2.23	1.48	0.47	0.20	0.11	0.05
KTRM	Desert Hot Springs Airport	12.46	3.98	2.43	1.69	0.61	0.28	0.16	0.08
KVNY	Van Nuys Airport	8.48	2.54	1.47	0.97	0.30	0.13	0.07	0.04

Table 11.4 – χ/Q for Crematoriums

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Building Area (ft^2)	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
5,000 < Area ≤ 10,000	265.00	72.63	48.55	37.28	15.05	7.54	3.64	1.88
10,000 < Area ≤ 15,000	258.10	69.72	47.65	36.20	15.12	7.57	3.64	1.88
Building Area > 15,000	230.50	71.30	49.30	37.13	14.98	7.49	3.64	1.88

Table 12.0 – MICR Screening Tables for Gasoline Dispensing Facilities

Equipment Type	MICR Screening Tables		Source ID
	Residential	Worker	
Gasoline Underground Storage Tank	Table 12.1A	Table 12.1B	U
Gasoline Aboveground Storage Tank	Table 12.2A	Table 12.2B	A

Table 12.1A – Screening Tables for Gasoline Dispensing Facilities

Underground Storage Tank (UST) Residential

MICR per One Million Gallons of Gasoline

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	2.884	1.040	0.550	0.340	0.093	0.045	0.018	0.006
BNAP	**Banning**	4.208	1.703	0.940	0.603	0.186	0.093	0.039	0.013
CELA	**Central L.A.**	2.484	0.876	0.455	0.287	0.085	0.041	0.017	0.005
ELSI	**Lake Elsinore**	2.978	1.075	0.558	0.347	0.103	0.051	0.021	0.007
FONT	**Fontana**	3.306	1.254	0.677	0.423	0.124	0.060	0.025	0.007
MSVJ	**Mission Viejo**	2.721	0.981	0.515	0.319	0.094	0.047	0.018	0.006
PERI	**Perris**	3.494	1.310	0.695	0.436	0.127	0.063	0.026	0.008
PICO	**Pico Rivera**	2.629	0.956	0.509	0.316	0.091	0.044	0.018	0.005
RDLD	**Redlands**	3.562	1.325	0.691	0.418	0.113	0.055	0.024	0.007
UPLA	**Upland**	3.108	1.133	0.609	0.384	0.111	0.054	0.022	0.007
KBUR	**Burbank Airport**	3.097	1.198	0.655	0.410	0.125	0.062	0.026	0.008
KCNO	**Chino Airport.**	4.084	1.609	0.870	0.549	0.166	0.082	0.033	0.010
KCQT	**USC/Downtown L.A.**	3.382	1.244	0.656	0.407	0.110	0.052	0.021	0.007
KFUL	**Fullerton Airport**	2.726	1.027	0.553	0.348	0.104	0.052	0.021	0.007
KHHR	**Hawthorne Airport**	3.225	1.197	0.640	0.405	0.123	0.061	0.025	0.007
KLAX	**Los Angeles Int'l Airport**	4.456	1.830	1.010	0.648	0.204	0.102	0.044	0.013
KLGB	**Long Beach Airport**	3.417	1.394	0.764	0.488	0.151	0.076	0.033	0.010
KONT	**Ontario Airport**	4.834	2.006	1.111	0.710	0.222	0.112	0.047	0.015
KPSP	**Palm Springs Airport**	3.363	1.352	0.736	0.467	0.144	0.073	0.031	0.010
KRAL	**Riverside Airport**	4.141	1.678	0.922	0.588	0.177	0.088	0.038	0.013
KSMO	**Santa Monica Airport**	3.444	1.336	0.731	0.462	0.139	0.068	0.028	0.008
KSNA	**John Wayne Int'l Airport**	4.041	1.605	0.870	0.549	0.164	0.079	0.032	0.010
KTRM	**Desert Hot Springs Airport**	3.820	1.553	0.848	0.540	0.163	0.082	0.035	0.010
KVNY	**Van Nuys Airport**	2.909	1.132	0.608	0.378	0.111	0.055	0.022	0.007

Table 12.1B – Screening Tables for Gasoline Dispensing Facilities

Underground Storage Tank (UST) **Worker**

MICR per One Million Gallons of Gasoline

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	0.238	0.086	0.045	0.028	0.008	0.004	0.002	0.000
BNAP	Banning	0.347	0.140	0.078	0.050	0.015	0.008	0.003	0.001
CELA	Central L.A.	0.205	0.072	0.038	0.024	0.007	0.003	0.001	0.000
ELSI	Lake Elsinore	0.246	0.089	0.046	0.029	0.009	0.004	0.002	0.001
FONT	Fontana	0.273	0.103	0.056	0.035	0.010	0.005	0.002	0.001
MSVJ	Mission Viejo	0.224	0.081	0.042	0.026	0.008	0.004	0.002	0.000
PERI	Perris	0.288	0.108	0.057	0.036	0.010	0.005	0.002	0.001
PICO	Pico Rivera	0.217	0.079	0.042	0.026	0.007	0.004	0.001	0.000
RDLD	Redlands	0.294	0.109	0.057	0.034	0.009	0.005	0.002	0.001
UPLA	Upland	0.256	0.093	0.050	0.032	0.009	0.004	0.002	0.001
KBUR	Burbank Airport	0.255	0.099	0.054	0.034	0.010	0.005	0.002	0.001
KCNO	Chino Airport.	0.337	0.133	0.072	0.045	0.014	0.007	0.003	0.001
KCQT	USC/Downtown L.A.	0.279	0.103	0.054	0.034	0.009	0.004	0.002	0.001
KFUL	Fullerton Airport	0.225	0.085	0.046	0.029	0.009	0.004	0.002	0.001
KHHR	Hawthorne Airport	0.266	0.099	0.053	0.033	0.010	0.005	0.002	0.001
KLAX	Los Angeles Int'l Airport	0.367	0.151	0.083	0.053	0.017	0.008	0.004	0.001
KLGB	Long Beach Airport	0.282	0.115	0.063	0.040	0.012	0.006	0.003	0.001
KONT	Ontario Airport	0.399	0.165	0.092	0.059	0.018	0.009	0.004	0.001
KPSP	Palm Springs Airport	0.277	0.111	0.061	0.038	0.012	0.006	0.003	0.001
KRAL	Riverside Airport	0.341	0.138	0.076	0.049	0.015	0.007	0.003	0.001
KSMO	Santa Monica Airport	0.284	0.110	0.060	0.038	0.011	0.006	0.002	0.001
KSNA	John Wayne Int'l Airport	0.333	0.132	0.072	0.045	0.014	0.007	0.003	0.001
KTRM	Desert Hot Springs Airport	0.315	0.128	0.070	0.045	0.013	0.007	0.003	0.001
KVNY	Van Nuys Airport	0.240	0.093	0.050	0.031	0.009	0.005	0.002	0.001

Table 12.2A – Screening Tables for Gasoline Dispensing Facilities

Aboveground Storage Tank (AST) **Residential**

MICR per One Million Gallons of Gasoline

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	4.447	1.603	0.827	0.496	0.114	0.050	0.020	0.006
BNAP	**Banning**	5.469	2.176	1.185	0.748	0.210	0.101	0.042	0.013
CELA	**Central L.A.**	3.610	1.258	0.641	0.392	0.100	0.046	0.019	0.006
ELSI	**Lake Elsinore**	4.056	1.458	0.748	0.452	0.119	0.057	0.024	0.008
FONT	**Fontana**	4.812	1.787	0.940	0.569	0.145	0.067	0.027	0.008
MSVJ	**Mission Viejo**	3.600	1.276	0.650	0.395	0.108	0.052	0.021	0.007
PERI	**Perris**	4.639	1.733	0.904	0.558	0.144	0.069	0.029	0.009
PICO	**Pico Rivera**	3.720	1.342	0.699	0.421	0.106	0.049	0.019	0.006
RDLD	**Redlands**	5.809	2.218	1.154	0.685	0.132	0.062	0.026	0.008
UPLA	**Upland**	4.693	1.677	0.871	0.532	0.130	0.060	0.025	0.008
KBUR	**Burbank Airport**	3.940	1.493	0.808	0.493	0.139	0.069	0.028	0.008
KCNO	**Chino Airport.**	4.971	1.950	1.047	0.658	0.188	0.091	0.037	0.011
KCQT	**USC/Downtown L.A.**	5.393	1.959	1.002	0.604	0.133	0.058	0.024	0.007
KFUL	**Fullerton Airport**	3.614	1.336	0.699	0.429	0.118	0.058	0.024	0.007
KHHR	**Hawthorne Airport**	4.415	1.593	0.837	0.511	0.140	0.067	0.027	0.008
KLAX	**Los Angeles Int'l Airport**	5.624	2.316	1.257	0.794	0.227	0.111	0.047	0.015
KLGB	**Long Beach Airport**	4.450	1.829	0.993	0.621	0.172	0.083	0.035	0.011
KONT	**Ontario Airport**	5.990	2.494	1.370	0.862	0.249	0.121	0.051	0.017
KPSP	**Palm Springs Airport**	4.148	1.691	0.915	0.573	0.163	0.080	0.034	0.010
KRAL	**Riverside Airport**	5.770	2.318	1.244	0.776	0.202	0.096	0.041	0.013
KSMO	**Santa Monica Airport**	4.771	1.829	0.977	0.596	0.159	0.074	0.031	0.009
KSNA	**John Wayne Int'l Airport**	5.072	2.017	1.085	0.674	0.186	0.088	0.036	0.010
KTRM	**Desert Hot Springs Airport**	4.681	1.917	1.040	0.660	0.183	0.091	0.039	0.012
KVNY	**Van Nuys Airport**	3.673	1.428	0.760	0.467	0.127	0.060	0.025	0.008

Table 12.2B – Screening Tables for Gasoline Dispensing Facilities

Aboveground Storage Tank (AST) **Worker**

MICR per One Million Gallons of Gasoline

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	0.367	0.132	0.068	0.041	0.009	0.004	0.002	0.001
BNAP	**Banning**	0.451	0.179	0.098	0.062	0.017	0.008	0.003	0.001
CELA	**Central L.A.**	0.298	0.104	0.053	0.032	0.008	0.004	0.002	0.001
ELSI	**Lake Elsinore**	0.334	0.120	0.062	0.037	0.010	0.005	0.002	0.001
FONT	**Fontana**	0.397	0.147	0.077	0.047	0.012	0.005	0.002	0.001
MSVJ	**Mission Viejo**	0.297	0.105	0.054	0.033	0.009	0.004	0.002	0.001
PERI	**Perris**	0.383	0.143	0.075	0.046	0.012	0.006	0.002	0.001
PICO	**Pico Rivera**	0.307	0.111	0.058	0.035	0.009	0.004	0.002	0.001
RDLD	**Redlands**	0.479	0.183	0.095	0.056	0.011	0.005	0.002	0.001
UPLA	**Upland**	0.387	0.138	0.072	0.044	0.011	0.005	0.002	0.001
KBUR	**Burbank Airport**	0.325	0.123	0.067	0.041	0.011	0.006	0.002	0.001
KCNO	**Chino Airport.**	0.410	0.161	0.086	0.054	0.016	0.007	0.003	0.001
KCQT	**USC/Downtown L.A.**	0.445	0.162	0.083	0.050	0.011	0.005	0.002	0.001
KFUL	**Fullerton Airport**	0.298	0.110	0.058	0.035	0.010	0.005	0.002	0.001
KHHR	**Hawthorne Airport**	0.364	0.131	0.069	0.042	0.012	0.006	0.002	0.001
KLAX	**Los Angeles Int'l Airport**	0.464	0.191	0.104	0.066	0.019	0.009	0.004	0.001
KLGB	**Long Beach Airport**	0.367	0.151	0.082	0.051	0.014	0.007	0.003	0.001
KONT	**Ontario Airport**	0.494	0.206	0.113	0.071	0.021	0.010	0.004	0.001
KPSP	**Palm Springs Airport**	0.342	0.139	0.075	0.047	0.013	0.007	0.003	0.001
KRAL	**Riverside Airport**	0.476	0.191	0.103	0.064	0.017	0.008	0.003	0.001
KSMO	**Santa Monica Airport**	0.393	0.151	0.081	0.049	0.013	0.006	0.003	0.001
KSNA	**John Wayne Int'l Airport**	0.418	0.166	0.089	0.056	0.015	0.007	0.003	0.001
KTRM	**Desert Hot Springs Airport**	0.386	0.158	0.086	0.054	0.015	0.007	0.003	0.001
KVNY	**Van Nuys Airport**	0.303	0.118	0.063	0.038	0.010	0.005	0.002	0.001

Table 13.0 – χ/Q for Spray Booths

Equipment Type	Stack Height (ft)	Cancer, Chronic, Chronic 8 Hr χ/Q Tables	Acute χ /Q Table	Source ID
		≤ 12 hr/day		
Spray Booth	16 ≤ Height < 24	Table 13.1	Table 13.3	P1
	24 ≤ Height < 50	Table 13.2		P2

Table 13.1 – χ/Q for Spray Booths

16 ft ≤ Stack Height < 24 ft* **< 12 hours**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	**Location**	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
AZUS	**Azusa**	21.48	5.77	2.98	1.78	0.34	0.13	0.05	0.01
BNAP	**Banning**	25.33	6.05	3.59	2.31	0.54	0.22	0.08	0.02
CELA	**Central L.A.**	23.19	7.14	2.95	1.74	0.33	0.13	0.05	0.01
ELSI	**Lake Elsinore**	11.82	5.62	2.23	1.34	0.28	0.11	0.04	0.01
FONT	**Fontana**	23.99	6.78	3.45	2.13	0.44	0.18	0.06	0.01
MSVJ	**Mission Viejo**	14.46	7.58	2.50	1.50	0.29	0.12	0.04	0.01
PERI	**Perris**	10.89	6.11	2.36	1.48	0.35	0.15	0.05	0.01
PICO	**Pico Rivera**	16.68	9.30	3.07	1.84	0.38	0.15	0.05	0.01
RDLD	**Redlands**	20.78	5.75	3.00	1.81	0.35	0.14	0.05	0.01
UPLA	**Upland**	27.30	7.04	3.69	2.27	0.46	0.18	0.07	0.02
KBUR	**Burbank Airport**	14.62	8.84	3.44	2.14	0.49	0.21	0.07	0.02
KCNO	**Chino Airport.**	22.53	5.96	3.49	2.25	0.54	0.22	0.07	0.02
KCQT	**USC/Downtown L.A.**	23.02	6.43	3.51	2.15	0.42	0.16	0.06	0.01
KFUL	**Fullerton Airport**	15.58	9.45	3.26	2.02	0.44	0.18	0.07	0.02
KHHR	**Hawthorne Airport**	32.27	7.25	4.22	2.68	0.59	0.23	0.08	0.02
KLAX	**Los Angeles Int'l Airport**	34.88	8.37	5.14	3.37	0.83	0.34	0.12	0.03
KLGB	**Long Beach Airport**	11.54	7.02	2.98	1.90	0.47	0.20	0.07	0.02
KONT	**Ontario Airport**	27.28	7.64	4.24	2.72	0.65	0.26	0.09	0.02
KPSP	**Palm Springs Airport**	17.43	4.66	2.62	1.65	0.36	0.14	0.05	0.01
KRAL	**Riverside Airport**	25.40	6.50	3.94	2.51	0.56	0.22	0.08	0.02
KSMO	**Santa Monica Airport**	28.07	8.70	4.48	2.84	0.66	0.27	0.10	0.02
KSNA	**John Wayne Int'l Airport**	22.94	8.73	4.07	2.59	0.63	0.26	0.09	0.02
KTRM	**Desert Hot Springs Airport**	14.92	6.24	3.14	2.04	0.52	0.22	0.08	0.02
KVNY	**Van Nuys Airport**	14.36	7.45	2.98	1.87	0.43	0.18	0.06	0.01

* Note: Facilities with stack heights less than 16 feet must perform Tier 3 or Tier 4 dispersion modeling.

Table 13.2 – χ/Q for Spray Booths

24 ft ≤ Stack Height < 50 ft **< 12 hours**

Carcinogenic, Chronic and Chronic 8-Hour χ/Q Values ([μg/m³]/[ton/year])

		Downwind Distance (meters)							
Station Abbr.	Location	25	50	75	100	200	300	500	1000
AZUS	Azusa	15.68	7.28	3.08	1.96	0.49	0.18	0.05	0.01
BNAP	Banning	16.43	5.62	3.26	2.20	0.65	0.27	0.08	0.02
CELA	Central L.A.	14.10	8.60	2.75	1.77	0.45	0.17	0.05	0.01
ELSI	Lake Elsinore	10.37	8.12	2.31	1.46	0.37	0.14	0.04	0.01
FONT	Fontana	16.71	9.18	3.27	2.14	0.57	0.22	0.06	0.01
MSVJ	Mission Viejo	11.34	8.63	2.35	1.53	0.38	0.14	0.04	0.01
PERI	Perris	8.52	6.81	2.18	1.44	0.41	0.17	0.05	0.01
PICO	Pico Rivera	12.30	10.41	2.83	1.81	0.48	0.18	0.05	0.01
RDLD	Redlands	16.48	6.82	3.18	2.02	0.50	0.18	0.05	0.01
UPLA	Upland	17.77	8.64	3.53	2.31	0.62	0.23	0.07	0.02
KBUR	Burbank Airport	11.88	10.42	3.12	2.04	0.56	0.23	0.07	0.02
KCNO	Chino Airport.	15.61	5.77	3.15	2.13	0.63	0.26	0.08	0.02
KCQT	USC/Downtown L.A.	16.41	7.29	3.44	2.23	0.57	0.21	0.06	0.01
KFUL	Fullerton Airport	12.13	11.23	3.02	2.00	0.56	0.22	0.07	0.02
KHHR	Hawthorne Airport	20.76	6.85	3.96	2.65	0.78	0.31	0.09	0.02
KLAX	Los Angeles Int'l Airport	22.81	7.30	4.64	3.22	1.03	0.43	0.12	0.03
KLGB	Long Beach Airport	9.19	8.40	2.67	1.79	0.52	0.21	0.07	0.02
KONT	Ontario Airport	18.51	8.46	3.80	2.57	0.76	0.31	0.09	0.02
KPSP	Palm Springs Airport	12.03	5.40	2.39	1.59	0.44	0.17	0.05	0.01
KRAL	Riverside Airport	18.01	6.03	3.73	2.50	0.70	0.28	0.08	0.02
KSMO	Santa Monica Airport	18.31	14.28	4.13	2.79	0.84	0.33	0.10	0.02
KSNA	John Wayne Int'l Airport	15.86	12.66	3.68	2.46	0.73	0.30	0.09	0.02
KTRM	Desert Hot Springs Airport	10.55	9.40	2.82	1.94	0.60	0.25	0.08	0.02
KVNY	Van Nuys Airport	10.89	9.71	2.72	1.80	0.51	0.20	0.06	0.01

Table 13.3 – χ/Q for Spray Booths

All Operating Conditions

Acute Hazard Index
χ/Q Values ([μg/m³]/[lb/hr]))

	Downwind Distance (meters)							
Stack Height	**25**	**50**	**75**	**100**	**200**	**300**	**500**	**1000**
16 ft ≤ Stack Height < 24 ft	1280.53	498.24	275.07	213.97	72.34	39.80	19.87	7.27
24 ft ≤ Stack Height < 50 ft	782.00	503.29	213.04	181.03	106.19	55.96	20.63	7.56

Attachment J

Proposed Amended Rule 1401:

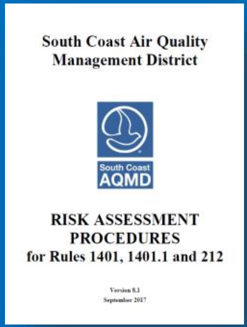
New Source Review of Toxic Air Contaminants

GOVERNING BOARD MEETING
September 1, 2017

Background

- Rule 1401 establishes cancer and non-cancer risk requirements for new, relocated, or modified permitted sources
- Rule 1401 was amended in June 2015 to use the 2015 OEHHA Guidelines which are incorporated in the SCAQMD Risk Assessment Procedures Version 8.0
  - Included provision to allow spray booths and gasoline dispensing facilities to continue using Version 7.0
  - Staff needed additional time to assess impacts

Staff Proposal



South Coast Air Quality
Management District

South Coast AQMD

RISK ASSESSMENT
PROCEDURES
for Rules 1401, 1401.1 and 212

OEHHA
SCIENCE FOR A HEALTHY CALIFORNIA

- Remove exemption in Rule 1401 for Spray Booths and Gasoline Dispensing Facilities
- Require use of most recent Risk Assessment Procedures

Revise Risk Assessment Procedures* to include

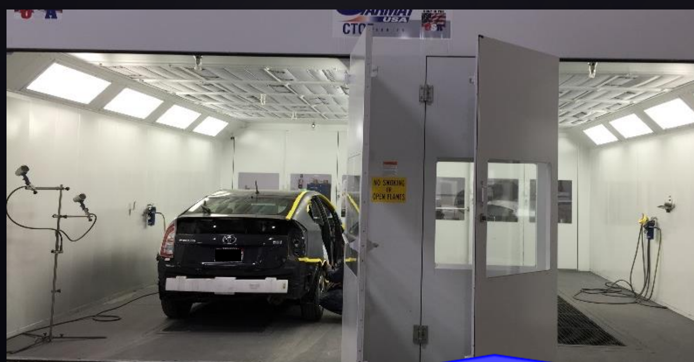
- 2015 OEHHA Guidelines for the two categories
- CARB's 2013 gasoline dispensing emission factors and speciation profiles
- Updated model and meteorological data

Update list of toxic air contaminants in Rule 1401 to be consistent with the current list used by OEHHA

* Guidelines are receive and file

Potential Permitting Impacts

SCAQMD staff evaluated spray booth and gasoline dispensing facility permits issued over five-year period* to understand potential impacts of SCAQMD Risk Assessment Guidelines Version 8.1



Spray Booths

Gasoline Dispensing Facilities

* Five year period was 2009 to 2014. For new gasoline dispensing facilities a seven year period from 2009 to 2016 was evaluated.

Analysis of Updates to Toxic Air Contaminants in PAR 1401

- Table I of Rule 1401 is being updated to reflect revisions by OEHHA
- No impacts anticipated
  - Caprolactum – Rule 1141 already controls emissions by 95%
  - Carbonyl sulfide – Already closely controlled in refineries
  - Other compounds added acute health risk values
    - Acute risk (new) << chronic / cancer risk (current)

CAS #	New Substances Added
105-60-2	caprolactum
463-58-1	carbonyl sulfide

CAS #	Added Health Risk Values
106-99-0	1,3-butadiene (acute)
101-68-8	Methylene diphenyl diisocyante (acute)
584-84-9	toluene-2,4-diisocyanate (acute)
91-08-7	toluene-2,6-diisocyanate (acute)

Key Issue

- Stakeholders requesting to continue using current procedures (Version 7.0) until CARB updates gasoline dispensing emission factors – continue exemption in R1401
  - CARB will be revising refueling emission estimates for Phase II controls with ORVR vehicles
  - CARB anticipates revisions by end of 2017
    - CARB reviewing new study (not yet published)
    - CARB committed to CAPCOA and public review
  - SCAQMD staff will work with CARB
  - After CARB completes revision, adoption Resolution commits staff to revise guidelines and return to the Governing Board as soon as practicable
    - Rule amendment not necessary

Staff Proposal for Refueling Emission Factor

- Use Version 7.0 for the refueling emission factor
- Use all other 2013 CARB emission factors – loading, breathing, etc.
- Permitting impacts of Version 8.1 are minimal (< 1 new gas station per year)

Emission Source	SCAQMD Proposed Changes
Emission Factors	
Loading	Revised, Same as CARB
Breathing	Revised, Same as CARB
Refueling	No Change (0.32 lbs/1000 gallons)
Spillage	Revised, Same as CARB
Hose Permeation	Revised, Same as CARB
2015 Speciation Profiles	Revised, Same as CARB

Recommended Actions

- Adopt the Resolution:
  - Determining that proposed amendments to Rule 1401 are exempt from CEQA; and
  - Adopting Proposed Amended Rule 1401