

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report Proposed Amended Rule 1401 – New Source Review of Toxic Air Contaminants and Preliminary Impact Assessment for Facilities Subject to Rule 1402 – Control of Toxic Air Contaminants from Existing Sources

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Deputy Executive Officer

Planning, Rule Development, and Area Sources
Elaine Chang, DrPH

Assistant Deputy Executive Officer

Planning, Rule Development, and Area Sources
Laki Tisopulos, Ph.D., P.E.

Planning and Rules Manager

Planning, Rule Development, and Area Sources
Susan Nakamura

Author: Cheryl Marshall – Program Supervisor

Technical Assistance: Tom Chico – Program Supervisor
Jillian Baker – Air Quality Specialist

Reviewed by: Jeri Voge – Senior Deputy District Counsel

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EXECUTIVE OFFICER:

BARRY R. WALLERSTEIN, D.Env.

TABLE OF CONTENTS

TABLE OF CONTENTS	i
LIST OF TABLES	i
LIST OF FIGURES	i
EXECUTIVE SUMMARY	
BACKGROUND	ES-1
PROPOSED AMENDMENTS TO RULE 1401	ES-
AFFECTED INDUSTRIES	ES-
IMPACT ASSESSMENT FOR PROPOSED AMENDED RULE 1401 AND SOURCES SUBJECT TO RULE 1402	ES-
CHAPTER 1: BACKGROUND	
INTRODUCTION	1-1
REGULATORY HISTORY	1-
ETHYL BENZENE	1-
AFFECTED INDUSTRIES	1-
CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1401	
OVERVIEW	2-1
PROPOSED CHANGES TO RULE 1401	2-
CHAPTER 3: IMPACT ASSESSMENT	
INTRODUCTION	3-1
IMPACTS OF PROPOSED AMENDED RULE 1401	3-
IMPACT ASSESSMENT FOR FACILITIES SUBJECT TO RULE 1402	3-
POTENTIAL COST IMPACTS	3-
POTENTIAL ENVIRONMENTAL IMPACTS	3-
DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727	3-
COMPARATIVE ANALYSIS	3-
REFERENCES	
LIST OF TABLES	
TABLE 1 – RISK VALUE	
LIST OF FIGURES	
FIGURE 1 – COMPARISON OF SCREENING VALUES	

EXECUTIVE SUMMARY

BACKGROUND

PROPOSED AMENDMENTS TO RULE 1401

AFFECTED INDUSTRIES

**IMPACT ASSESSMENT FOR PROPOSED AMENDED RULE 1401 AND
FACILITIES SUBJECT TO RULE 1402**

BACKGROUND

Rule 1401 – New Source Review for Toxic Air Contaminants (TACs) was adopted by the AQMD Governing Board in June 1990. The rule establishes cancer and non-cancer risk requirements for new, modified, or relocated sources of toxic air pollutants. It has been amended several times to add new compounds to the list of TACs as they have been identified and health risk values were finalized. Rule 1402 – Control of Toxic Air Contaminants from Existing Sources was adopted April 1994. It establishes risk requirements for existing facilities. Rule 1402 implements the state AB 2588 Air Toxics Hot Spots Program. Requirements of Rule 1402 include toxic emissions inventories, health risk assessments (HRA), public notification, and/or risk reduction for facilities that are above specified risk thresholds.

Rule 1401 requires that compounds be added to the Rule 1401 list of toxic air contaminants when the Scientific Review Panel (SRP) and the Office of Environmental Health Hazard Assessment (OEHHA) approve risk values. Rule 1402 also relies on the Rule 1401 list of toxic air contaminants. OEHHA approved a risk value for long-term (chronic) non-cancer health effects in 2000 and the compound was added to the Rule 1401 list of TACs with its chronic reference exposure limit (REL) that same year. In 2007, OEHHA approved a cancer risk value for ethyl benzene. Proposed Amended Rule 1401 would add ethyl benzene and its cancer risk value. The addition of ethyl benzene and its cancer risk value would affect sources subject to Rules 1401 and 1402.

Rule 1401(e)(3)(B) requires a report on the impacts, including socioeconomic impacts, of adding new compounds or risk values. Rule 1402 – Control of Toxic Air Contaminants from Existing Sources is not being amended, however, the list of TACs in Rule 1401 is also used for Rule 1402. Paragraph (j)(4) of Rule 1402 requires a report to the Governing Board regarding preliminary estimates of Rule 1402 impacts that are associated with the addition of new compounds or risk values.

PROPOSED AMENDMENTS TO RULE 1401

On November 14, 2007 OEHHA adopted a cancer potency value for ethyl benzene (CAS Registry Number 100-41-4) of $0.0087 \text{ (mg/kg-d)}^{-1}$. This corresponds to a screening value of 13.1 pounds per year per one in one million cancer risk at a receptor distance of 25 meters. The proposal to amend Rule 1401 would add ethyl benzene to the Rule 1401 list of TACs as a carcinogen and the cancer potency value (inhalation potency factor) would be added to the AQMD's "Risk Assessment Procedures for Rules 1401 and 212." Although ethyl benzene has both cancer and non-cancer effects, the cancer risk is far more stringent than the non-cancer risk. The addition of the cancer potency value for ethyl benzene may affect permits for new, relocated, or modified ethyl benzene-emitting equipment subject to Rule 1401. The Rule 1401 list of TACs is also used for Rule 1402, so existing facilities subject to Rule 1402 with ethyl benzene emissions may also be affected.

AFFECTED INDUSTRIES

Ethyl benzene is a colorless, flammable liquid. It is a natural constituent of crude petroleum and is found in gasoline, diesel, and other fuels and in their exhaust. In addition to fuels it is used in coatings and chemical operations. Sources of ethyl benzene emissions include petroleum storage facilities, especially gasoline storage because of the high vapor pressure of gasoline. Crude oil and diesel storage have much lower ethyl benzene emissions because of their low vapor pressure. Sources of ethyl benzene from fuel combustion include power producers, refineries, and landfills. Other sources of ethyl benzene emissions from raw materials include chemical manufacturers, asphalt manufacturers, coatings manufacturers, large furniture manufacturing operations, and large vehicle manufacturers.

IMPACT ASSESSMENT FOR PROPOSED AMENDED RULE 1401 AND FACILITIES SUBJECT TO RULE 1402

An analysis was conducted for facilities potentially impacted by the proposed addition of ethyl benzene and its cancer potency value to Rule 1401. Rule 1401 requires new, modified, and relocated equipment to have a maximum individual cancer risk (MICR) that is less than or equal to one in one million without best available control technology for toxics (T-BACT) or less than or equal to ten in one million with T-BACT. Based on permitting history, impacts for Rule 1401 will be minimal.

Rule 1402 requires public notification for existing facilities if the facility-wide cancer risk exceeds 10 in one million and risk reduction if it exceeds 25 in one million. Permitting data and annual emissions reports were used to identify facilities with ethyl benzene emissions and calculate a conservative estimate of their maximum individual cancer risk. Based on the analysis, few facilities are expected to be impacted by the addition of the ethyl benzene cancer potency value.

Although gasoline stations emit ethyl benzene, these facilities are not expected to be impacted because the increase in risk due to ethyl benzene will be more than offset by decreased benzene emissions associated with enhanced vapor recovery and new requirements for Rule 461 – Gasoline Transfer and Dispensing effective April 1, 2009.

Based on the conservative screening analysis of the other facilities identified, six facilities potentially could exceed ten in one million cancer risk at the nearest receptor which would require public notification. Additional, more detailed risk assessments will be required to determine what action may be required under Rule 1402. It is unlikely any of the six facilities will exceed the action risk level of 25 in one million cancer risk which would require risk reduction. It should be noted that any facility required to reduce risk under Rule 1402 would have the option of determining how to reduce overall facility-wide risk.

CHAPTER 1: BACKGROUND

INTRODUCTION

REGULATORY HISTORY

ETHYL BENZENE

AFFECTED INDUSTRIES

INTRODUCTION

Rule 1401 – New Source Review for Toxic Air Contaminants establishes cancer and non-cancer risk requirements for new, relocated, or modified sources emitting toxic air contaminants listed in the rule. The current proposal would add an OEHHA approved cancer potency (CP) value for ethyl benzene to the Rule 1401 list of TACs. In addition, AQMD’s guidance document for risk assessment, “Risk Assessment Procedures for Rules 1401 and 212”, will be updated to include the new risk value. Rule 1401(e)(3)(B) requires a report on the impacts, including socioeconomic impacts, of adding new compounds or risk values. AQMD staff conducted an analysis to identify potential impacts for new and existing sources with ethyl benzene emissions. Based on the analysis, adding a cancer risk value for ethyl benzene is expected to have minimal impacts for new, modified, or relocated sources subject to Rule 1401. Rule 1402 – Control of Toxic Air Contaminants from Existing Sources uses the list of TACs in Rule 1401 and Paragraph (j)(4) of Rule 1402 requires a report to the Governing Board regarding preliminary estimates of Rule 1402 impacts that are associated with the addition of new compounds or risk values. AQMD staff’s analysis also showed that adding ethyl benzene may impact a few existing facilities under Rule 1402. Chapter 3 contains the impact analysis for both rules.

REGULATORY HISTORY

Rule 1401 – New Source Review for Toxic Air Contaminants (TACs) was adopted by the AQMD Governing Board in June 1990. The rule establishes cancer and non-cancer risk requirements for new, relocated, or modified sources of toxic air pollutants. It is amended periodically to add new compounds or new risk values to the list of TACs as they are identified and risk values are finalized or amended by the state. Ethyl benzene was added to Rule 1401 in 2000 as a TAC with chronic health impacts based on effects to the liver, kidney, and endocrine system.

Rule 1402 – Control of Toxic Air Contaminants from Existing Sources was adopted in April 1994. It establishes facility-wide risk requirements for existing facilities that emit TACs and implements the state Air Toxics “Hot Spots” program. Rule 1402 is not being amended, however the list of TACs in Rule 1401 are also used for Rule 1402. Depending on the facility and its potential toxic risk, Rule 1402 may require toxic emissions inventories, health risk assessments (HRA), public notification, and/or risk reduction as required under the AB 2588 Air Toxics “Hot Spots” Program.

ETHYL BENZENE

Ethyl benzene is a colorless, flammable liquid. It is a natural constituent of crude petroleum and is found in gasoline and diesel fuels and their exhaust. In addition, it is a component of exhaust from combustion of other fuels such as natural gas, propane, butane, and digester gas. It is also a component of some chemical and coatings operations.

Ethyl benzene was identified under section 112(b)(1) of the U.S. Clean Air Act as a Hazardous Air Pollutant in the 1990 amendment. It was recognized by the California Air Resources Board as a toxic air contaminant on April 8, 1993. OEHHA approved a chronic reference exposure limit (REL) in 2000 and ethyl benzene was added to the Rule 1401 list of TACs with a chronic REL that same year.

A study by the National Toxicology Program in 1999 was found to show clear evidence of the compound's carcinogenicity. The Scientific Review Panel reviewed this and several other studies and, because of the scientific evidence and potential for significant human exposure, a cancer potency value was developed and adopted by OEHHA on November 14, 2007. The studies are discussed in OEHHA's "Long-term Health Effects of Exposure to Ethylbenzene" (OEHHA, November 2007) and can be found at:

http://www.oehha.ca.gov/air/hot_spots/pdf/Ethylbenzene_FINAL110607.pdf.

AFFECTED INDUSTRIES

Sources of ethyl benzene emissions include petroleum storage facilities, especially gasoline storage because of the high vapor pressure of gasoline. Crude oil and diesel storage have much lower ethyl benzene emissions because of their low vapor pressure. Large sources of ethyl benzene from fuel combustion include power producers, refineries, and landfills. Other sources of ethyl benzene emissions from raw materials include chemical manufacturers, asphalt manufacturers, coatings manufacturers, large furniture manufacturing operations, and large vehicle manufacturers.

CHAPTER 2: SUMMARY OF PROPOSED AMENDED RULE 1401

OVERVIEW

PROPOSED CHANGES TO RULE 1401

OVERVIEW

The primary purpose of amending Rule 1401 is to add ethyl benzene as a carcinogen to the list of TACs in Table I of the rule. Rule 1402 is not being amended, however, the list of TACs in Rule 1401 is also used for Rule 1402 and an analysis of impacts on Rule 1402 facilities is required when a new compound is added.

PROPOSED CHANGES TO RULE 1401

OEHHA approved a cancer potency value for ethyl benzene on November 14, 2007. AQMD staff is proposing to add ethyl benzene as a carcinogen to the list of TACs in Table I of Rule 1401. Table I lists toxic air contaminants for which OEHHA has approved cancer and/or non-cancer risk values and the dates on which the values were approved. Table 1 below shows the risk values and the corresponding screening value that will be added to the AQMD's "Risk Assessment Procedures for Rules 1401 and 212" upon adoption of the proposed rule amendments. The screening value is a conservative estimate of the amount of ethyl benzene emissions required to produce one in one million cancer risk. Although ethyl benzene also has a chronic risk value for long-term non-cancer health effects, the cancer risk far outweighs the chronic risk. The cancer risk results in a more stringent screening value than the previous screening value.

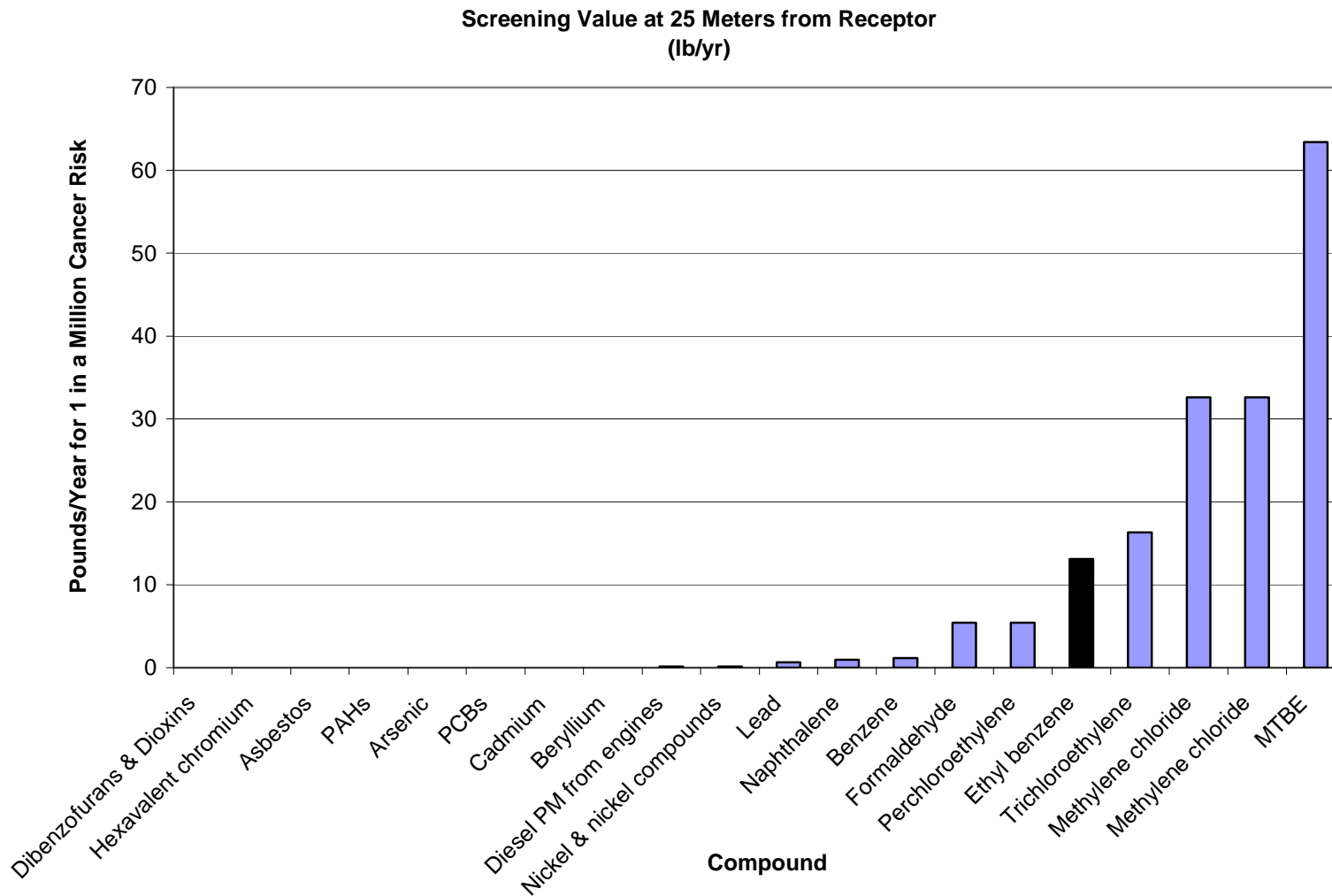
Table 1 – Risk Value

Compound	CAS	Inhalation Potency Factor (mg/kg-day) ⁻¹	Screening Value at 25 m (lb/yr per 1 x 10 ⁶ cancer risk)
Ethyl benzene	100-41-4	0.0087	13.1

The effective date for the risk value will be the date of adoption of Proposed Amended Rule 1401. Pursuant to Rule 1402 (j)(3), the effective date for use of the new cancer potency value for Rule 1402 will be 12 months after the Governing Board received and filed the notification of intent to add the risk value unless the Board approves another implementation schedule through an official Board action. The notification was accepted by the Board on November 7, 2008.

Figure 1 shows a comparison of the cancer risk screening value for ethyl benzene with other selected compounds listed in Rule 1401. Screening value represents a conservative estimate of the amount of emissions of a compound which would produce a one in one million cancer risk at 25 meters from a receptor. Therefore, compounds with low screening values are more potent carcinogens than those with higher screening values.

Figure 1 – Comparison of Screening Values



Note: Less potent compounds have higher screening values than more potent compounds.

CHAPTER 3: IMPACT ASSESSMENT

INTRODUCTION

IMPACTS OF PROPOSED AMENDMENTS TO RULE 1401

IMPACT ASSESSMENT FOR FACILITIES SUBJECT TO RULE 1402

POTENTIAL COST IMPACTS

POTENTIAL ENVIRONMENTAL IMPACTS

**DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY
CODE SECTION 40727**

COMPARATIVE ANALYSIS

INTRODUCTION

An analysis of the impacts is required when adding new compounds or health risk values to the list of TACS. Rule 1401(e)(3)(B) requires a report on the impacts, including socioeconomic impacts, to new, modified or relocated sources when adding new compounds or risk values. Rule 1401(j)(4) requires a report to the Governing Board regarding preliminary estimates of Rule 1402 impacts that are associated with the addition of new compounds or risk values. The addition of a cancer potency value to the list of toxic air contaminants in Table 1 of Rule 1401 may potentially impact some new, modified, and relocated facilities subject to Rule 1401 and existing facilities subject to Rule 1402.

IMPACTS OF PROPOSED AMENDMENTS TO RULE 1401

The proposed amendment to Rule 1401 to add ethyl benzene as a carcinogen to the list of TACs is expected to impact a few sources. Under Rule 1401, the cancer potency value for ethyl benzene will be used to calculate the maximum individual cancer risk (MICR) for new, modified, or relocated equipment requiring a permit to operate. Rule 1401 requires that all such sources have an MICR that is less than or equal to one in one million without best available control technology for toxics (T-BACT) or less than or equal to ten in one million with T-BACT. Although adding ethyl benzene to the list of TACs under Rule 1401 would impact the risk levels for new gasoline service stations, the increase in risk due to ethyl benzene will be more than offset by decreased benzene emissions associated with enhanced vapor recovery and new requirements for Rule 461 – Gasoline Transfer and Dispensing effective April 1, 2009. Benzene is the primary contributor to risk from gasoline.

The addition of ethyl benzene to Rule 1401 is not expected to impact sources of gasoline exhaust because the AQMD no longer issues permits for stationary gasoline engines. Most gasoline engines are used for passenger vehicles whose emissions are regulated under CARB rather than the AQMD. Although ethyl benzene is a constituent of diesel exhaust, the cancer risk value for diesel particulate matter from internal combustion engines encompasses all components of diesel exhaust. Therefore, diesel engine risk values would be calculated using the cancer potency value for diesel PM from internal combustion engines rather than a speciated list of compounds.

Ethyl benzene is also a component in a few coatings. Based on an AQMD permitting staff review of ethyl benzene content and allowable coatings usage, the amount of ethyl benzene is not expected to result in an MICR exceeding one in one million for new coatings permits. Because ethyl benzene is only a small component in a few coatings and coatings usage is typically limited for new sources by a permit condition to address volatile organic compound emissions, new coating sources are not expected to exceed a cancer risk of one in one million MICR. Therefore, the addition of a cancer potency value for ethyl benzene is expected to have minimal impacts for new, modified, or relocated equipment subject to Rule 1401.

IMPACT ASSESSMENT FOR FACILITIES SUBJECT TO RULE 1402

Actions required of facilities subject to Rule 1402 depend on health risk level. Facilities are required to submit an inventory of toxic air emissions when notified by the AQMD to do so. Facilities which may exceed 10 in one million cancer risk based on a calculated priority score,

are asked to submit a health risk assessment (HRA). Facilities which exceed a cancer risk of 10 in one million, as demonstrated by a HRA, are required to do public notification. Facilities which exceed the action risk level of 25 in one million, as demonstrated by an HRA, are required to submit a risk reduction plan and, upon approval, implement the strategies to reduce risk within three years. Facilities which exceed the significant risk level of 100 in a million are required to reduce risk as soon as possible. It should be noted that any facility required to reduce risk under Rule 1402 would have the option of determining how to reduce overall facility-wide risk.

Sources of ethyl benzene emissions include gasoline stations and other permitted facilities. Ethyl benzene emissions are associated with the storage and transfer of fuels as well as the combustion of fuels. Ethyl benzene emissions also result from the use of the compound as a raw material in chemical and coatings manufacturing.

According to AQMD permitting data, there are approximately 4,600 existing gasoline service stations in the Basin which emit ethyl benzene. However, similar to new gasoline stations, they are not expected to be impacted by the current amendments because the increase in risk due to ethyl benzene will be more than offset by decreased benzene emissions associated with enhanced vapor recovery and new requirements for Rule 461– Gasoline Transfer and Dispensing which becomes effective April 1, 2009. New gasoline stations are permitted under Rule 1401 which allows a maximum cancer risk of 10 in one million with T-BACT, so all permits for new, modified, or relocated gasoline stations limit the throughput of the station such that risk does not exceed 10 in one million. In addition, AQMD staff that administers the Rule 1402/AB2588 Toxics “Hot Spots” program has recently verified that cancer risk from almost all existing service stations is also below 10 in one million. The two or three gasoline stations above 10 in one million must comply with all requirements of Rule 1402. No existing gasoline stations exceed 25 in one million cancer risk. Due to the new Rule 461 requirements, which apply to new and existing stations, there will be no impacts on service stations from the addition of a cancer risk value for ethyl benzene to Rule 1401.

AQMD staff conducted an analysis to identify permitted facilities that may be impacted by the addition of ethyl benzene and its cancer potency value to the Rule 1401 list of TACs. Data from the AQMD 2006 Annual Emissions Reporting (AER) database, permitting data, and AB2588 data were used for the preliminary analysis for Rule 1402 facilities. Approximately 300 facilities reported ethyl benzene emissions in 2006, the most recent AER data available. Based on a conservative screening analysis of the facilities identified, six facilities potentially could exceed ten in one million cancer risk at the nearest receptor. More detailed risk assessments will be required to determine what actions may be required under Rule 1402. The affected facilities include two refineries, one landfill, two coatings operations, and one coatings manufacturer.

All six facilities identified are currently in the AB2588 program. Three have approved HRAs and were not required to do public notification because their final cancer risk did not exceed 10 in one million. These three facilities, pending further analysis by AB2588 staff may be required to submit revised HRAs. The other three have not yet been required to submit HRAs. AB2588 staff will conduct further analysis and, if warranted, require submittal of an HRA. If an HRA demonstrates risk greater than 10 in one million, public notification would be required. Based on the preliminary analysis, none of the six facilities would exceed 25 in one million cancer risk

which would trigger risk reduction. It should be noted that facilities required to reduce risk under Rule 1402 have the option of determining how to reduce overall facility-wide risk.

POTENTIAL COST IMPACTS

The socioeconomic report for Proposed Amended Rules 1401 and 1402 will be available 30 days before the Public Hearing.

POTENTIAL ENVIRONMENTAL IMPACTS

Pursuant to the California Environmental Quality Act (CEQA) Guidelines and AQMD Rule 110, AQMD staff is preparing a Draft Environmental Assessment, which analyzes the potential environmental impacts from proposed amended Rule 1401 and the potential impacts for facilities subject to Rule 1402. Upon completion, the Draft EA will be released for a 30-day public review and comment period. The Draft EA will be available at AQMD headquarters by calling the AQMD Public Information Center at (909) 396-2039, or by accessing AQMD's CEQA website at <http://www.aqmd.gov/ceqa/aqmd.html>. Comments received on the Draft EA and responses to the comments will be included in the Final EA.

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 AQMD 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

A need exists to adopt Proposed Amended Rule 1401 to accomplish the following:

- reduce emissions of air toxic contaminants;
- reduce public health exposure to toxic air contaminants, including cumulative impacts;
- meet the goals and objectives of the Board's Environmental Justice Initiatives; and
- update the list of toxic air contaminants covered by the rule consistent with those for which the Scientific Review Panel and OEHHA have finalized risk values.

Authority

The AQMD 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 44390 through 44394.

Clarity

Proposed Amended Rule 1401 is written or displayed so that its meaning can be easily understood by the persons directly affected by the rule.

Consistency

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

Non-Duplication

Proposed Amended Rule 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, AQMD.

Reference

By adopting Proposed Amended Rule 1401, the AQMD 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 (nuisance), 44390 et seq. (Risk Reduction Audits and Plans), and Federal Clean Air Act Section 112 (Hazardous Air Pollutants).

Rule Adoption Relative to Cost-effectiveness

Proposed Amended Rule 1401 is not a control measure in the 2007 Air Quality Management Plan (AQMP) and, thus, was not ranked by cost-effectiveness relative to other AQMP control measures in the 2007 AQMP. Cost-effectiveness in terms of dollars per ton of pollutant reduced is not applicable to rules regulating toxic air contaminants. Once an industry (or facility) determines its current risk associated with the emission of TACs and determines what control approaches would reduce the facility-wide risk to below the significance level provided in Rules 1401 and 1402, the cost effectiveness could be determined for that facility only, and would not be applicable to another facility or industry.

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, NOx, and their precursors. Since the proposed amended rule applies to toxic air contaminants, the incremental cost effectiveness analysis requirement does not apply.

Comparative Analysis**Health and Safety Code Section 40727.2**

Health and Safety code section 40727.2 requires a comparative analysis with rules and regulations applicable to the same source. There are currently no federal, state, and local rules that apply to ethyl benzene emissions in the AQMD.

Existing Federal Requirements

Ethylbenzene was identified under section 112(b)(1) of the U.S. Clean Air Act as a Hazardous Air Pollutant in the 1990 amendment. The Clean Air Act does not set emission limits or risk thresholds for ethyl benzene.

State Regulations

Ethyl benzene was recognized by the California Air Resources Board as a toxic air contaminant on April 8, 1993. OEHHA approved a chronic reference exposure limit in 2000 and a cancer potency value in November 2007. State regulations do not set emission limits or risk thresholds for ethyl benzene.

AQMD Rules Applying to Ethyl Benzene

The addition of ethyl benzene to Rule 1401 also affects facilities subject to Rule 1402 which relies on the same list of TACS. The difference between Rules 1401 and 1402 is that Rule 1401 applies to new, modified, or relocated equipment whereas Rule 1402 applies to existing facilities. There are no other AQMD rules that limit risk or emissions of ethyl benzene.

Proposed Amendments to Rule 1401

The proposed amendment to Rule 1401 adds ethyl benzene to the list of TACs as a carcinogen. Proposed Amended Rule 1401 sets risk thresholds for new, modified, or relocated equipment. It does not require the addition of any specific control strategy or equipment for ethyl benzene emission reduction. The Rule 1401 list of TACs is also used for Rule 1402 which sets facility-wide risk thresholds for existing facilities. If a facility is required to reduce risk, the facility may choose any strategy which reduces facility-wide risk to below 25 in one million. Therefore, the proposed addition of the cancer potency value of ethyl benzene does not duplicate any of the standards or requirements of any of the existing AQMD, state, or federal regulations.

REFERENCES

REFERENCES

“Long-term Health Effects of Exposure to Ethylbenzene”, OEHHA, November 2007, http://www.oehha.ca.gov/air/hot_spots/pdf/Ethylbenzene_FINAL110607.pdf

Risk Assessment Procedures for Rules 1401 and 212, Version 7.0, SCAQMD, July 1, 2005, <http://www.aqmd.gov/prdas/Risk%20Assessment/RiskAssessment.html#CurrentRiskAssessment>