

Permitting Working Group Meeting

Risk Assessment Procedures for Rules 1401, 1401.1, and 212

August 13, 2026

Meeting Location: South Coast AQMD, Conference Room GB

Zoom Webinar: <https://aqmd.zoomgov.com/j/1601178091>

Webinar ID: 160 117 8091

Dial-in: (669) 254-5252

Agenda

- Background
- Updates to Risk Assessment Procedures
- Updates to HRA Tool
- Updates to Emissions Calculator Spreadsheet

Background

- Rule 1401 - New Source Review of Toxic Air Contaminants (TAC) is an umbrella rule that establishes requirements to ensure that new, modified, or relocated sources are below health risk thresholds
- Rule 1401 Table I lists the TACs which are based on those identified by the California Office of Environmental Health Hazard Assessment (OEHHA)
- OEHHA is the lead state agency for the assessment of health risks posed by environmental contaminants and develops health-protective exposure levels for use in health risk assessments
- Rule 1401 is periodically updated to reflect the new compounds identified by OEHHA

Background (continued)

- Rule 1401 was last amended on September 1, 2017
- Since then, OEHHA has periodically adopted or updated TACs, necessitating Rule 1401 Table I to be updated as well
- First working group meeting for the recent amendments to Rule 1401 was held on December 19, 2023
- Rule 1401 was recently amended on August 7, 2026
- Rule 1401 requires that procedures for determining health risks be published periodically
- South Coast AQMD's Risk Assessment Procedures for Rules 1401, 1401.1, and 212 have been updated and are applicable for permit applications deemed complete on and after August 7, 2026

Key Amendments to Rule 1401

- Add or update ten compounds into Table I
 - Upon adoption, health risks will be evaluated during the permitting process
- Align with South Coast AQMD Health Risk Assessment Procedures
 - Clarify that the 8-hour hazard index is evaluated during permitting process
 - Add a column in Table I for 8-hour reference exposure levels
- Remove Rule 1401 Table II
 - Listed compounds with proposed risk values
 - Table II is not referenced in Rule 1401 or 1402

Toxic Air Contaminants
1,4-Dichlorobenzene
1-Bromopropane
Cobalt
Hexamethylene Diisocyanate (HDI) (Monomer)
Isoprene
Parachloro-benzotrifluoride (PCBTF)*
Polymeric HDI
Tertiary Butyl Acetate (TBAC)
Trimethylbenzene
Trivalent Chromium

*Effective date December 31, 2027

Questions/Comments on Background

Updates to Risk Assessment Procedures

- Updated list of TACs to be consistent with Rule 1401 Table I
- Changed the HIC8 formula for Tier 3 HRAs to use the annual mean concentration
- Updated emission factors and speciation profiles for gasoline dispensing facilities due to the addition of isoprene to Rule 1401 Table I
- Added sensitivity analysis for HIC, HIC8, and HIA for gasoline dispensing facilities

HIC8 for Tier 3 HRA

- Previously used AERSCREEN 8-hour scaling factor
 - Differed from Tier 2 and Tier 4
- Updated to annual concentration x WAF

$$\text{MICR}_R = \text{CP} \times \text{AveConc} \times \text{CEF}_R \times \text{MP}_R \times 10^{-6} \times \text{MWAF}$$

$$\text{MICR}_W = \text{CP} \times \text{AveConc} \times \text{CEF}_W \times \text{MP}_W \times \text{WAF} \times 10^{-6} \times \text{MWAF}$$

$$\text{Total HIC}_{\text{target organ}} = \Sigma \{[\text{AveConc}_{\text{TAC}} \times \text{MP} \times \text{MWAF}] / \text{Chronic REL}_{\text{TAC}}\}_{\text{target organ}}$$

$$\text{Total HIC8}_{\text{target organ}} = \Sigma \{[\text{AveConc}_{\text{TAC}} \times \text{WAF} \times \text{MWAF}] / \text{8-Hour REL}_{\text{TAC}}\}_{\text{target organ}}$$

$$\text{Total HIA}_{\text{target organ}} = \Sigma \{[\text{PeakConc}_{\text{TAC}} \times \text{MWAF}] / \text{Acute REL}_{\text{TAC}}\}_{\text{target organ}}$$

Emissions from Gasoline Dispensing Facilities

- Isoprene – Carcinogen added to Rule 1401 Table I
 - Emitted from gasoline storage and dispensing
- Updated TAC emission factor tables and HRA Tool
- Increase in MICR

Table VII-1. Gasoline Emission Factors (EF) for GDFs with USTs (a)(b)		Loading	Breathing	Refueling	Hose Permeation	Spillage
Uncontrolled Gasoline EF (lbs/1,000 gal) (c)		7.7	0.76	8.4	0.009	0.61
Controlled Gasoline EF (lbs/1,000 gal) (c)		0.15	0.024	0.32	0.009	0.24
Benzene	Weight Percent	0.457%	0.457%	0.457%	0.457%	0.707%
	EF (lbs/1,000 gal)	6.86E-04	1.10E-04	1.46E-03	4.11E-05	1.70E-03
Ethylbenzene	Weight Percent	0.107%	0.107%	0.107%	0.107%	1.29%
	EF (lbs/1,000 gal)	1.61E-04	2.57E-05	3.42E-04	9.63E-06	3.10E-03
Naphthalene	Weight Percent	0.000445%	0.000445%	0.000445%	0.000445%	0.174%
	EF (lbs/1,000 gal)	6.68E-07	1.07E-07	1.42E-06	4.01E-08	4.18E-04
Isoprene	Weight Percent	0.024%	0.024%	0.024%	0.024%	0.010%
	EF (lbs/1,000 gal)	3.60E-05	5.76E-06	7.68E-05	2.16E-06	2.40E-05

Non-Cancer Health Risks for Gasoline Dispensing Facilities

- Rule 1401 Thresholds
 - MICR: 10 in a million with T-BACT; 1 in a million without T-BACT
 - HIC, HIC8, and HIA: 1.0
- Risk Assessment Procedures V8.1 included a sensitivity analysis for non-cancer health risks for GDFs, which found that cancer risk was the main driver
- Updated sensitivity analysis to determine if cancer risk remains the health risk driver
- MICR will exceed 10 in a million before HIC and HIC8 reach 1.0
- HIA will not exceed 1.0 for gasoline UST, E-85, or mobile fuelers
- Additional HIA analysis not needed for gasoline ASTs that are either:
 - Located equal to or greater than 65 meters from the nearest acute receptor; OR
 - Have a tank capacity of 4,250 gallons or less and an annual throughput limit of 5 M gallons/year or less

Updates to HRA Tool

- Updated CARB/OEHHA Health table to the latest version dated October 2, 2025 (v25268)
- Changed the HIC8 formula for Tier 3 HRAs to use the annual mean concentration and not the hourly max concentration multiplied by AERSCREEN scaling factor, consistent with other HRA tiers
- Updated tables for gasoline dispensing facilities due to the addition of isoprene to Rule 1401 Table I

Updates to HRA Tool (Continued)

- Corrected the HIC worker calculation to use the multipathway (worker) noncancer scalar instead of the multipathway (residential) noncancer scalar
- Fixed bugs that prevented Tier 3 HRA risk values from updating when AERSCREEN concentrations were edited
- Users can now specify the closest downwind distance at which acute health risk must be evaluated
 - This can be different than the nearest residential, school, or worker receptor
 - Chronic health risks and cancer risk are not evaluated at this location

Questions/Comments
on
Updates to Risk Assessment Procedures
and Updates to HRA Tool

Emissions Calculator Spreadsheet - Background

TIER 1/TIER 2 SCREENING RISK ASSESSMENT DATA INPUT			
(Procedure Version 8.1 & Package N, September 1, 2017) - Risk Tool V1.1		0.00E+00	0.00E+00
		0.00E+00	0.00E+00
		2.30E-07	3.58E-05
		PASS	FAIL

Application Deemed Complete Date	11/10/22
A/N	641036
Facility Name	PR Broadstone Heritage I

PRIMARY INPUT PARAMETERS MUST BE ENTERED ON THE EMISSIONS SHEET OR ON ONE OF THE EQUIPMENT SPECIFIC SHEETS

TIER 1 SCREENING RISK ASSESSMENT REPORT				Application deemed complete date: 11/10/2022									
(Procedure Version 8.1 & Package N, September 1, 2017)													
A/N 641036, PR Broadstone Heritage I													
Equipment Type	Other	No T-BACT	<table border="1"> <thead> <tr> <th colspan="2">Tier 1 Results</th> </tr> <tr> <th>Cancer/Chronic ASI</th> <th>Acute ASI</th> </tr> </thead> <tbody> <tr> <td>6.39E+00</td> <td>2.26E-02</td> </tr> <tr> <td>FAILED</td> <td>PASSED</td> </tr> </tbody> </table>			Tier 1 Results		Cancer/Chronic ASI	Acute ASI	6.39E+00	2.26E-02	FAILED	PASSED
Tier 1 Results													
Cancer/Chronic ASI	Acute ASI												
6.39E+00	2.26E-02												
FAILED	PASSED												
Nearest Receptor Distance (actual)	38 meters	0											
Receptor Distance (Table 1 Emission look up)	25 meters	0											
		0											

APPLICATION SCREENING INDEX CALCULATION

Compound	Average Annual Emission	Max Hourly Emission	Cancer/Chronic Pollutant Screening	Acute Pollutant Screening	Cancer/Chronic Pollutant Screening	Acute Pollutant Screening

TAC Emissions Calculator V3.00	
Equipment Details	
Hours/Day	Input
Days/Week	
Weeks/Year	
Control Efficiency	
Source Type	
Source Category on HRA Tool ->	
Boiler	
Max Burner Rating	
Equipment w/ SNCR, S	
Fuel HHV	

Health Risk Assessment Tool and AERMOD-Ready Meteorological Data Files

For use in South Coast AQMD permit applications and CEQA purposes

Screening Index results

Toxic Air Contaminant (CAS No)	Date Toxicity Criteria Last Updated	Highest long term risk from	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for cancer, 8hr or chronic at 25m	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for cancer, 8hr or chronic at 50m	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for cancer, 8hr or chronic at 100m	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for acute exposure at 25m	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for acute exposure at 50m	Pollutant (Arsenic compounds (inorganic) (1016)) Screening Index for acute exposure at 100m
Arsenic compounds (inorganic) (1016)	2021-08-09	Cancer	2.48E+03	772	419	6.14E+03	2.76E+03	963
Total			2.48E+03	772	419	6.14E+03	2.76E+03	963

Previous 1 Next

Previous Risk Tool (Excel Spreadsheet)

- Equipment-Specific Emission Factors and Manual Input
- Tier 1/2/3 HRA

New Emissions Calculator Spreadsheet - Released 10/31/24

- Equipment-Specific Emission Factors and Manual Input
- New Health Risk Assessment (HRA) Tool**
 - Manual Input of Emissions or Import Spreadsheet
 - Tier 1/2/3 HRA
 - Required for applications deemed complete on and after 12/01/24

Where do I find the Emissions Calculator Spreadsheet?

Tier 1 HRA

Tier 2 HRA

Tier 3 HRA

Provide the TAC emission rates by:

☐ Manual entry

☒ Uploading Emissions Calculator spreadsheet or previously saved Tier 1 output

[Click here for the Emissions Calculator spreadsheet.](#) Enter the required information, save the Emissions Calculator spreadsheet, and upload here.

Or upload the XLSX output from a previous Tier 1 HRA

Browse...

No file selected

Tier 1 HRA

Tier 2 HRA

Tier 3 HRA

Select type of source and stack char

Select Source Type ⓘ

Crematoriums

Select Source Characteristics ⓘ

5,000 < Building Area ≤ 10,000 ft²

Hours of operation per day ⓘ

24

Days of operation per week ⓘ

7

Provide the TAC emission rates by:

☐ Manual entry

☒ Uploading Emissions Calculator spreadsheet or previously saved Tier 2 output

[Click here for the Emissions Calculator spreadsheet.](#) Enter the required information, save the Emissions Calculator spreadsheet, and upload here.

Or upload the XLSX output from a previous Tier 2 HRA

Browse...

No file selected

Tier 1 HRA

Tier 2 HRA

Tier 3 HRA

Run an air dispersion model separately (AERSCREEN) for cancer and non-cancer health risks

Note: AERSCREEN only outputs worst-case hourly concentrations separately before entering them here.

Provide the TAC concentrations by:

☐ Manual entry

☒ Uploading Emissions Calculator spreadsheet with Tier 3 concentrations, or previously saved Tier 3 output

☐ Uploading Emissions Calculator spreadsheet for scaling with AERSCREEN output

[Click here for the Tier 3 concentrations spreadsheet.](#) Enter concentrations in to the worksheet titled "Concentrations for Tier 3". Replicate the TACs for each receptor, save and upload here.

Or upload the XLSX output from a previous Tier 3 HRA

Browse...

Select file to upload

Emissions Calculator Spreadsheet Overview

TAC Emissions Calculator V3.00

Equipment Details		Input	Units
Hours/Day			hrs/day
Days/Week			days/wk
Weeks/Year			wks/yr
Control Efficiency			value between 0-1

Source Type

Source Category on HRA Tool ->

Refresh

Source Type

Source Category on HRA Tool ->

Boiler

Crematories

Diesel ICE

Diesel Pressure Washer

Diesel Reciprocating Internal Combustion Engines

Ethanol 85 Underground Storage Tanks

Compound*	CAS #	EF (*) (lbs/mmcf)	R1 (lbs/hr)	R2 (lbs/hr)	R1 (lbs/yr)	R2 (lbs/yr)	Toxic NSR Entry	
							R1 (Uncontrolled) (E-06 lbs/hr)	R2 (Controlled) (E-06 lbs/hr)
Acetaldehyde	75070	0.0015	0.000375	0.0003375	1.092	0.9828	375	337.5
Arsenic	7440-38-2	0.00058	0.000145	0.0001305	0.42224	0.380016	145	130.5
Benzene	71432	0.00072	0.00018	0.000162	0.52416	0.471744	180	162
Beryllium	7440-41-7	0.00002	0.000005	0.0000045	0.01456	0.013104	5	4.5
Cadmium	7440-43-9	0.00016	0.00004	0.000036	0.11648	0.104832	40	36
Chromium, hexavalent (&	18540-29-9	0.00019	4.75E-05	4.275E-05	0.13832	0.124488	47.5	42.75

- Light yellow boxes identifying which fields need to be filled in
- Maintained and updated equipment emission factors
- Recognizable layout from previous spreadsheet

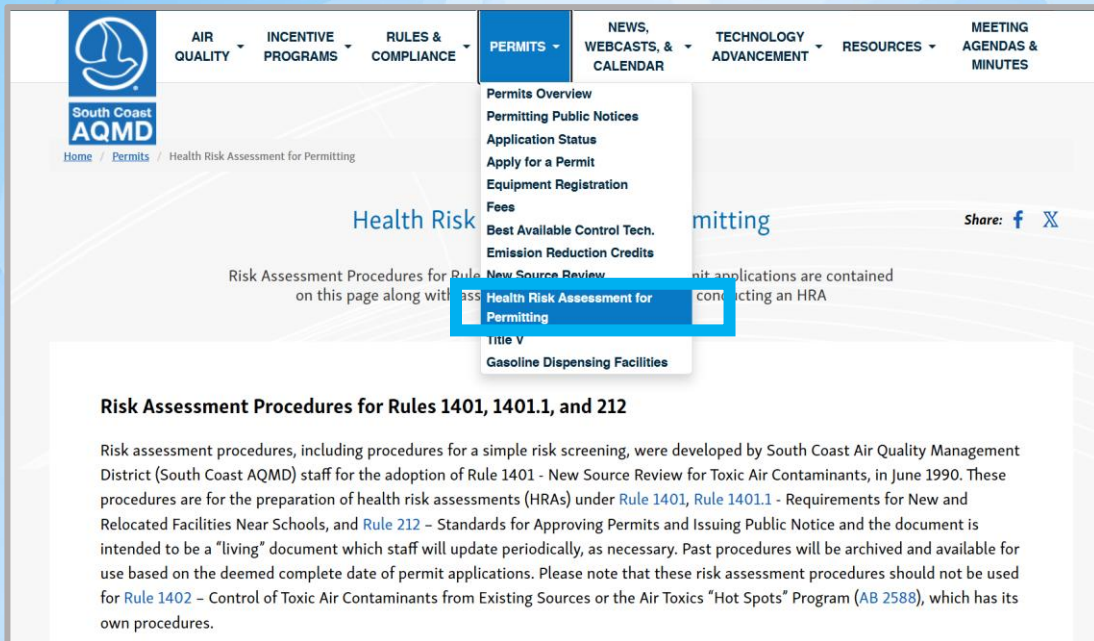
Updates Since July 2025

- Addition of 4 TACs to a Total of 319 Values on “TACList” Excel Worksheet
 - Hexamethylene Diisocyanate Isocyanurate Trimer (3779633)
 - Hexamethylene Diisocyanate Homopolymer (28182812)
 - Hexane, 1,6-Diisocyanato-, Homopolymer, Polyethylene-Polypropylene Glycol Monobutyl Ether-Blocked (125252473)
 - Aliphatic Polyisocyanate (160994683)
- “Other” Module now allows the entering of up to 100 TACs.
- Fixed issue where certain TACs were being auto-converted by Excel to “Date” format.

Questions/Comments
on
Updates to Emissions Calculator
Spreadsheet

Resources

- Rule 1401 Governing Board Amendment Package (August 7, 2026)
 - https://www.aqmd.gov/docs/default-source/agendas/governing-board/2026/2026-aug7-033.pdf?sfvrsn=eaca647e_6
- Permitting HRA webpage
 - <https://www.aqmd.gov/home/permits/PermittingHRA>



The screenshot shows the South Coast AQMD website. The 'PERMITS' dropdown menu is open, displaying options: Permits Overview, Permitting Public Notices, Application Status, Apply for a Permit, Equipment Registration, Fees, Best Available Control Tech., Emission Reduction Credits, New Source Review, Health Risk Assessment for Permitting (highlighted), Title V, and Gasoline Dispensing Facilities. The main content area is titled 'Health Risk Assessment for Permitting' and includes a section for 'Risk Assessment Procedures for Rules 1401, 1401.1, and 212'.

Risk Assessment Procedures for Rules 1401, 1401.1, and 212

Risk assessment procedures, including procedures for a simple risk screening, were developed by South Coast Air Quality Management District (South Coast AQMD) staff for the adoption of Rule 1401 - New Source Review for Toxic Air Contaminants, in June 1990. These procedures are for the preparation of health risk assessments (HRAs) under Rule 1401, Rule 1401.1 - Requirements for New and Relocated Facilities Near Schools, and Rule 212 - Standards for Approving Permits and Issuing Public Notice and the document is intended to be a "living" document which staff will update periodically, as necessary. Past procedures will be archived and available for use based on the deemed complete date of permit applications. Please note that these risk assessment procedures should not be used for Rule 1402 - Control of Toxic Air Contaminants from Existing Sources or the Air Toxics "Hot Spots" Program (AB 2588), which has its own procedures.

Current Risk Assessment Procedures and Corresponding Resources:

The web-based HRA Tool with associated Emissions Calculator spreadsheet replaces the various tables found in previous Attachments and the Excel-based Risk Tool. The HRA Tool relies on the equations in the Risk Assessment Procedures to calculate health risks and is required for permit applications deemed complete on and after December 1, 2024.

Risk Assessment Procedures Version 9.0

Procedures, equations, and assumptions effective on or after December 1, 2024

- [Risk Assessment Procedures - October 31, 2024 \(pdf, 1Mb\)](#)

HRA Tool

- [HRA Tool - Effective for applications deemed complete on or after December 1, 2024](#)

Staff Contacts

George Illes

Senior AQ Engineering Manager

gilles@aqmd.gov

(909) 396-3321

Brandon Hebert

Air Quality Engineer

bhebert@aqmd.gov

(909) 396-2380

Luke Lau

Air Quality Engineer

llau@aqmd.gov

(909) 396-2729

Looking Ahead: Contact & Updates



Please send questions/comments/feedback to bhebert@aqmd.gov



Stay
Informed!

Receive email updates via:

<https://www.aqmd.gov/sign-up>

Sign Up

The South Coast AQMD offers periodic newsletter updates via Email on a variety of topics . Click on the Manage Subscriptions link at the bottom of the form to update your subscriptions (unsubscribe from lists, subscribe to additional lists, or change your Email address).

If you wish to receive daily pollution forecasts or alerts for specific pollution levels in your area, sign up for [Air Alerts](#).

For printed copies of South Coast AQMD publications that mailed to you, please visit [Subscription Services](#) (charges may apply).

Enter the following information:

Email Address:

Re-Enter Email Address:

First Name (optional):

Last Name (optional):

Permit Notifications:

☒ General Permitting

General permitting announcements; permit advisories, implementation guidelines and tools; online system improvements and features; and permitting enhancement initiatives like PEP and PSTF