Michigan Air Toxics System
Initial Threshold Screening Level/Initial Risk Screening Level (ITSL/IRSL)
Toxics Screening Level Query Results

The results of your search are displayed below. Click any column heading to sort.
Click here to see descriptions of column headings.
If a number appears in the "notes" column for a given, chemical, see the definition on the bottom of this page.

It is possible to cut and paste the table below into a spreadsheet program for further manipulation.

Page **1** of **1** - **1** record(s) matched your criteria

CAS Number	Chemical Name	Notes	Status	ITSL (µg/m3)	Averaging Time	Second ITSL (µg/m3)	Second ITSL Avg Time	IRSL (µg/m3)	SRSL (µg/m3)	Carc Avg Time
7783064	hydrogen sulfide		FINAL	10	annual	100	24 hr			

Notes: For a list of notes which correspond to any numbers which may appear in the “Notes” column above, please follow this link.
http://www.michigan.gov/documents/deq/deq-aqd-itslirsl-notes_457666_7.pdf

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For issues related to ITSL/IRSL database content, contact Doreen Lehner at lehnerD@michigan.gov or (517) 284-6753.

Michigan Air Toxics System
Initial Threshold Screening Level (ITSL) / Initial Risk Screening Level (IRSL)
Toxics Screening Level Query Notes

Each note is applicable only to the chemical for which a corresponding number appears in the "Notes" column of the Toxics Screening Level Query results.

1. The ***combined*** ambient impact of all petroleum hydrocarbon materials with Note #1 cannot exceed the ITSL of 3500 µg/m^3 (8-hour average). If a chemical with this footnote has an ITSL other than 3,500 µg/m^3, the ambient impact for that chemical also cannot exceed the chemical specific ITSL.
2. The ***combined*** ambient impact of all forms of xylene with Note #2 cannot exceed the initial threshold screening level (ITSL) of 390 µg/m^3 (annual average).
3. These chemicals are very likely to meet the R 336.1103(c) definition of a carcinogen. The Air Quality Division has not evaluated the data to develop an IRSL/SRSL.
4. The ***combined*** ambient impact of all subtilisins cannot exceed the ITSL of 0.02 µg/m^3 (1-hour average).
5. The polycyclic aromatic hydrocarbons (PAHs) with this footnote are carcinogenic and have potency equivalency factors (PEFs) that quantitate their potency relative to that of benzo(a)pyrene (CAS# 50-32-8). Air emission mixtures of carcinogenic PAHs, including asphalt fumes, should be evaluated additively using these PEFs and the benzo(a)pyrene IRSL and SRSL. The ITSL for benzo(a)pyrene applies only to benzo(a)pyrene and none of the other PAHs.
6. The ITSL applies to pure tungsten carbide only. The ITSL for cemented tungsten carbide having a cobalt content >2%, based on the ITSL for cobalt, is 0.2 µg/m^3 based on an 8-hour averaging time. The IRSL for cemented tungsten carbide having a cobalt content <2% and a nickel content >0.3%, based on the IRSL for nickel, is 0.0042 µg/m^3, based on an annual averaging time.
7. Besides the assessment of mercury ambient air impacts in comparison to the ITSLs, larger individual sources of mercury emissions undergoing permit review (e.g., greater than 5 to 10 lbs/yr) may be evaluated on a case-by-case basis to address concerns for deposition and bioaccumulation, taking into account site-specific factors such as the presence of nearby recreational fisheries and realistic exposure scenarios.
8. Alternate screening levels may be determined on a case-by-case basis depending on the source of PCB emissions and which PCB isomers are being emitted following EPA's guidance as described in IRIS.
9. The ***combined*** ambient impacts of sulfuric acid, sulfur trioxide, and oleum cannot exceed the ITSLs.
10. The ***combined*** ambient impact of these glycol ethers must be evaluated together so that their hazard index does not exceed a value of one (1).[1]
11. The ***combined*** ambient impact of all petroleum hydrocarbon materials with Note #11 cannot exceed the ITSL of 50 µg/m^3 (8-hour average). If a chemical with this footnote has an ITSL other than 50 µg/m^3, the ambient impact for that chemical also cannot exceed the chemical specific ITSL.

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12. The ***combined*** ambient impact of DDT; p,p'-DDE; and DDD that have Note #12 cannot exceed the IRSL of 0.01 µg/m^3 (annual average) or SRSL of 0.1 µg/m^3 (annual average).
13. This chemical has two ITSLs with different averaging times. Ambient air impacts cannot exceed either ITSL. Both ITSLs also apply for determinations of permit to install exemptions under R 336.1290 (Rule 290).
14. The ***combined*** ambient impacts for the isomers of trimethylbenzene, or any mixture thereof, cannot exceed the screening level(s).
15. The ***combined*** impact of all butyl acetate isomers must be evaluated together such that the impacts cannot exceed 2400 µg/m^3 with an 8-hour averaging time.
16. The asbestos IRSL and SRSL are based on a conservative conversion from the EPA-IRIS unit risk factor and one-in-one million cancer risk estimate of 4 E-6 fibers/mL (or 4 fibers/m^3), to the units of µg/m^3. Less restrictive screening levels may be derived on a case-by-case basis depending on the fiber density, as discussed in the EPA-IRIS database.
17. See specific trivalent and hexavalent chromium compounds.
18. The ***combined*** ambient impact of turpentine and monoterpenes (a-pinene, b-pinene, and d-carene) listed with Note #18 cannot exceed the ITSL of 1120 µg/m^3 (8-hour averaging time).
19. If the 4,6-dimethyl-2-heptanone is present as a component of commercial or technical grade diisobutyl ketone or DIBK (CAS# 108-83-8), then the ITSL of 0.1 µg/m^3 for 4,6-dimethyl-2-heptanone does not apply. In this case, the ***combined*** impacts of the 4,6-dimethyl-2-heptanone, and DIBK cannot exceed the screening level for DIBK of 1500 µg/m^3 (8-hour average)
20. The ***combined*** ambient impact of meta-tolualdehyde (CAS No. 620-23-5) and para-tolualdehyde (CAS No. 104-87-0) cannot exceed the ITSL of 440 µg/m^3 with annual averaging time.
21. This chemical is very likely to meet the R 336.1103(c) definition of a carcinogen. The Air Quality Division has evaluated the data and determined it to be inadequate for IRSL/SRSL development. However, the ITSL provides adequate protection against potential cancer effects.
22. The ***combined*** ambient impact of butane (CAS# 106-97-8) and isobutane (CAS# 75-28-5) should be evaluated together so that the ***combined*** impact does not exceed a hazard index value of one.
23. The ***combined*** ambient impact of all propylene glycol n-butyl ethers (CAS nos. 5131-66-8, 15821-83-7, 29387-86-8, and 63716-40-5) cannot exceed the ITSL of 77 µg/m^3 (annual average).
24. The ***combined*** ambient impact of all chemicals with footnote #24 cannot exceed the ITSL of 93 µg/m^3 (annual average).
25. The ***combined*** ambient impact of all chemicals with footnote #25 cannot exceed the ITSL of 5600 µg/m^3 (annual average).
26. This toxic air contaminant (TAC) is reasonably anticipated to exist as a particle in the ambient air. A toxicological review has determined that, in lieu of setting a screening level, the primary NAAQS for particulate matter (PM2.5, PM10) are reasonable and appropriate health protective levels for the particulate. The ***combined*** ambient impact of

all particulate TAC emissions from the process must be below the applicable PM primary NAAQS (PM2.5, PM10). The PM primary NAAQS for particulate matter may be used in permit to install exemption determinations for this TAC under Rule 290(2)(a)(iii) or Rule 291.

27. The ***combined*** ambient impact of dimethyl adipate (CAS# 627-93-0), dimethyl glutarate (CAS# 1119-40-0), dimethyl succinate (CAS# 106-65-0), and the mixture of dimethyl adipate, dimethyl glutarate, and dimethyl succinate collectively known as dibasic ester (CAS# 95481-62-2) cannot exceed the ITSL of 1 µg/m³ with annual averaging time.
28. The ***combined*** ambient impact of all amorphous silica compounds with the CAS nos. 60676-86-0, 61790-53-2, 69012-64-2, 112945-52-5, and 112926-00-8 cannot exceed the ITSL of 60 µg/m³ (8-hour averaging time).
29. The ITSL for manganese is 0.3 µg/m^3 with an annual averaging time. This ITSL is most appropriately applied to PM_{10}-Mn or $PM_{2.5}$-Mn data rather than TSP-Mn data. This ITSL applies to "manganese and manganese compounds," therefore emissions of multiple forms of manganese must be accounted for additively to ensure that the combined ambient air impact does not exceed the manganese ITSL. This ITSL applies to ambient air impacts of the manganese atom, therefore the emissions and modeled impacts of various manganese compounds may be molecular weight-adjusted to the equivalent emission rate and ambient air impact of the manganese alone. Please note that potassium permanganate (CAS# 7722-64-7) also has a short-term ITSL = 0.6 µg/m^3 (8 hour averaging time).
30. The ITSL for mixed cresols (CAS# 1319-77-3) also applies to o-cresol (CAS# 95-48-7), p-cresol (CAS# 106-44-5), and m-cresol (CAS# 108-39-4).
31. Most processes that emit crystalline silica are exempt from the screening level requirement of Rule 225(1). Only sources of crystalline silica that are not exempt from the definition of a toxic air contaminant (see Rule 120(f)(XV)) need to comply with the ITSL.
32. The Chemical Abstract Service number (CAS#) has been changed to 12185-10-3. Since the original number 7723-14-0, is still used by many organizations, it is listed as the primary CAS#.
33. With regards to the health-based screening levels for tetrachlorodibenzo(p)dioxin (CAS# 1746-01-6), Rule 336.1225(6)(a) states that all polychlorinated dibenzodioxins and dibenzofurans shall be considered as one toxic air contaminant, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo(p)dioxin based on the relative potency of the isomers emitted from the emission unit or units. The current toxic equivalency factors (TEFs) for use are those recommended by the World Health Organization (WHO, 2005), as provided in: Van den Berg, M. et al., 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. Toxicological Sciences 93(2): 223-241.
34. The ***combined*** ambient impact of all selenium and inorganic selenium compounds with the CAS# 7446-08-4, 7446-34-6, 7488-56-4, 7783-00-8, 10102-18-8, and 13410-01-0 cannot exceed 2 µg/m^3 (8-hour averaging time).
35. The ***combined*** ambient impact of all barium and soluble barium compounds with the CAS# 543-80-6, 1304-28-5, 10022-31-8, 10361-37-2, 10553-31-8, 13477-00-4, 13718-50-8, 17194-00-2, and 21109-95-5 cannot exceed 5 µg/m^3 (8-hour averaging time).

36. The ***combined*** ambient impact of these chlorosilanes must be evaluated together so that their hazard index (HI) does not exceed a value of one (1).[1]
37. If perfluorooctanoic sulfonic acid [PFOS] (CAS No. 1763-23-1) and perfluorooctanoic acid [PFOA] (CAS No. 335-67-1) are co-emitted, then the proposed emission rates should be evaluated together such that the impacts of PFOS and PFOA combined shall be less than or equal to 0.07 µg/m^3 with a 24-hour averaging time, for Rule 225 acceptability evaluations.
38. The ***combined*** ambient impact of magnesium (CAS No. 7439-95-4) and magnesium compounds, magnesium hydroxide, magnesium oxide, and magnesium nitrate (CAS Nos. 1309-42-8, 1309-48-4, and 10377-60-3, respectively), cannot exceed the ITSL of 100 µg/m^3 (8-hour average).
39. The ***combined*** ambient impact of ammonia (CAS No. 7664-41-7) and ammonium hydroxide (CAS No. 1336-21-6) must be evaluated together so that their hazard index does not exceed a value of one (1).[1]
40. The ***combined*** ambient impact of trimethyl borate (CAS No. 121-43-7), boron oxide (CAS No. 1303-86-2), sodium perborate (CAS No. 7632-04-4), and boric acid (CAS No.

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[1] Footnotes #10, #36, #39, #40, and #41 refer to the calculation of a hazard index (HI). For these cases only, the HI should be calculated as follows:

Hazard Index Calculation Procedure

After the appropriate ITSLs are identified (all should have the same averaging time), a Hazard Index (HI) approach is used to determine additive impacts from a group of chemicals and their Predicted Ambient Impacts (PAIs):

$$HI = \frac{PAI_1}{ITSL_1} + \frac{PAI_2}{ITSL_2} + \frac{PAI_3}{ITSL_3} + etc.$$

The acceptability of the combined impacts is demonstrated by a HI that is less than or equal to (1).

Or, for applying the Rule 227(1)(a) method:

$$HI = \frac{PER_1}{AER_1} + \frac{PER_2}{AER_2} + \frac{PER_3}{AER_3} + etc.$$

Where: PER is the proposed emission rate, and AER is the allowable emission rate as determined by Rule 227(1)(a).

The acceptability of the combined impacts is demonstrated by a HI that is less than or equal to one (1). Rule 227(1)(a) requires that the proposed emissions comply with both the pounds per hour and the screening level specific emission rates. If the TAC has two ITSLs then a separate HI calculation must be done for each screening level.

10043-35-3) should be evaluated so that the combined impact does not exceed a hazard index value of one.

41. The ***combined*** ambient impact of sodium fluoride (CAS No. 7681-49-4), potassium fluoride (CAS No. 7789-23-3), sodium aluminum fluoride (CAS No. 15096-52-3), and sodium silicofluoride (CAS No. 16893-85-9) should be evaluated so that the combined impact does not exceed a hazard index value of one.
42. The ***combined*** ambient impact of cobalt and cobalt compounds that release cobalt ions with the CAS No. 71-48-7, 136-52-7, 513-79-1, 814-89-1, 1002-88-6, 1307-96-6, 1308-06-1, 1317-42-6, 1560-69-6, 7440-48-4, 7646-79-9, 10026-24-1, 10141-05-6, 21041-93-0, and 61789-51-3 cannot exceed the ITSL of 0.2 µg/m^3 (8-hour averaging time) and the IRSL of 0.00013 µg Co/m^3 or SRSL of 0.0013 µg Co/m^3 (annual averaging time).
43. The default screening level for this chemical has been rescinded because it may not be health protective. This chemical will be evaluated on a case-by-case basis until chemical specific toxicity information is available to derive a screening level.