

Plain Language Summary

The Emission Summary and Dispersion Modeling Report (ESDM) is a detailed analysis of all the sources of emissions at the facility. The development of the ESDM includes refined emissions calculations, and computer-based dispersion modeling of those emissions. The dispersion modeling predicts the maximum ground level concentration of a given contaminant at receptors throughout the community.

The ESDM has been developed to support site-specific standard applications for benzene, benzo(a)pyrene, sulphur dioxide and total suspended particulate matter. However, in accordance with Ministry of the Environment Conservation and Parks (MECP) guidance, Algoma's ESDM assesses ALL emissions to the atmosphere from the Sault Ste. Marie facility.

What changes at the site trigger an application for site-specific standards?

There are two main changes that trigger an application for site-specific standards:

1. Changes to the site's dispersion model. The model updates include: newest model version, data reflecting more recent meteorological conditions, and changes to the land use designation from urban to rural based on Ministry of the Environment, Conservation and Parks (MECP) direction. These changes do not reflect physical changes to the site, or changes in emissions from the site; they are model changes only.
2. Incoming new air quality standard for sulphur dioxide. Existing integrated steelmaking facilities in Ontario cannot meet the incoming sulphur dioxide standard (phased in July 1, 2023). Both the federal and provincial governments have announced they will require Coke Oven Gas Desulfurization by January 1, 2026 as a means to reduce sulphur dioxide emissions from integrated iron and steelmaking facilities. Algoma will be taking an alternative approach to reduce sulphur dioxide through its transition to electric arc furnace (EAF) steelmaking, which will see the elimination of cokemaking from their operations. Therefore, Algoma is applying for a site-specific standard that includes an action plan to reduce sulphur dioxide that reflects the progressive shutdown of significant sulphur dioxide sources.

How will the site change over time?

Algoma has committed to transitioning its manufacturing process from integrated basic oxygen furnace (BOF) steelmaking to electric arc furnace (EAF) steelmaking which includes the progressive shutdown of facilities, including the elimination of cokemaking.

The transition to EAF steelmaking is characterized by Current (2022-2024), Interim (2025, 2026-2028) and Future (2029 and onwards) scenarios. These scenarios are assessed within the ESDM Report. The transition is scheduled to occur over eight years, with full independent operation of the EAF process by 2029.

How are emissions quantified?

Maximum emissions from the site are quantified using a range of approaches including:

- Data from testing completed at Algoma's site, or comparable operations;
- Emissions performance guarantees from manufacturers;
- United States Environmental Protection Agency (US EPA) emissions data for iron and steel facilities; and
- Other engineering approaches documented within MECP guidance for developing an ESDM Report.

What does dispersion modeling entail?

Dispersion modeling involves building a computer-based model of Algoma’s site that includes:

- Emissions sources, and their relevant flow rates, emission rates, and stack parameters
- Buildings and structures to assess the impact of these on the dispersion of emissions
- 5 years of local hourly meteorological data
- Surrounding land use and topography

For each compound emitted from Algoma’s operations, maximum potential concentrations are predicted at receptors placed up to 5 km away from the site.

What are the results of the analysis conducted within the ESDM?

The results of the assessment of the Current, Interim and Future scenarios are summarized in the following table, for the 4 compounds that are the focus of the site-specific standard applications. The detailed tables showing all compounds documented within the ESDM report are appended.

Contaminant	Averaging Period	MECP Point of Impingement Limit (µg/m³)	Maximum Predicted POI Concentration (µg/m³)			
			Current (2024)	Interim (2025)	Interim (2026-2028)	Future (2029-onwards)
Benzene	Annual	0.45 (2.2 current SSS)	3.98	3.98	3.21	0.11
Benzo(a)pyrene	Annual	0.00001 (0.004 current SSS)	0.0053	0.0053	0.0045	0
Sulphur Dioxide	1 hour	690 (current) 100 (as of July 2023)	597	615	494	79
Sulphur Dioxide	Annual	No current limit 10 (as of July 2023)	34	23	18	1.4
Total Suspended Particulate Matter	24 hour	120 (127 current SSS)	135	131	121	34

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Model input and output files

Emission Summary and Dispersion Modelling Report

Table E1-A: Emission Summary Table for the Current Scenario (2021-2024)

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
1,2,3-Trimethylbenzene	526-73-8	6.68E-06	AERMOD v.19191	1.02E-02	24	220	Health	B1	0.00%
1,2,4-Trimethylbenzene	95-63-6	8.10E-04	AERMOD v.19191	1.23E-01	24	220	Health	B1	0.06%
1-Butene	106-98-9	2.07E-04	AERMOD v.19191	1.32E-01	24	7000	Health	B2	0.00%
1-Hexene	592-41-6	1.34E-05	AERMOD v.19191	2.03E-02	24	850	Health	B2	0.00%
1-Pentene	109-67-1	1.80E-04	AERMOD v.19191	2.74E-01	24	2050	Health	B2	0.01%
2,2-Dimethylbutane	75-83-2	2.00E-05	AERMOD v.19191	3.05E-02	24	1750	Health	B2	0.00%
2-Methylpentane	107-83-5	1.87E-04	AERMOD v.19191	2.84E-01	24	1750	Health	B2	0.02%
3-Methylpentane	96-14-0	1.07E-04	AERMOD v.19191	1.62E-01	24	1750	Health	B2	0.01%
Aluminum (fumes or dust)	7429-90-5	1.06E-01	AERMOD v.19191	1.08E+00	24	12	Health	B2	9.00%
Aluminum Oxide	1344-28-1	0	AERMOD v.19191	0	30 min	100	Particulate	B1	0.00%
Acenaphthene	83-32-9	1.37E-04	AERMOD v.19191	3.85E-03	24	0.1	-	de minimus	3.85%
Acetylene	74-86-2	3.71E-03	AERMOD v.19191	4.32E-01	10 min	56000	Odour	B1	0.00%
Ammonia	7664-41-7	8.08E-02	AERMOD v.19191	9.17E-01	24	100	Health	B1	0.92%
Anthracene	0120-12-07	1.91E-03	AERMOD v.19191	5.37E-02	24	0.1	-	de minimus	53.70%
Antimony	7440-36-0	1.06E-04	AERMOD v.19191	1.80E-04	24	25	Health	B1	0.00%
Arsenic	7440-38-2	0	AERMOD v.19191	0	24	0.3	Health	B1	0.00%
Barium (total water soluble)	7440-39-3	2.61E-04	AERMOD v.19191	6.30E-04	24	10	Health	B1	0.01%
Benzene	71-43-2	7.10E-01	AERMOD v.19191	3.98E+00	Annual	2.2	-	SSS (current)	180.98%
Benzo(a)anthracene	56-55-3	1.51E-03	AERMOD v.19191	4.25E-02	24	0.1	-	de minimus	42.50%
Benzo(a)fluorene	238-84-6	8.10E-04	AERMOD v.19191	2.28E-02	24	0.1	-	de minimus	22.80%
Benzo(a)phenanthrene	0218-01-09	1.43E-03	AERMOD v.19191	4.04E-02	24	0.1	-	de minimus	40.40%
Benzo(a)pyrene	50-32-8	1.14E-03	AERMOD v.19191	5.34E-03	Annual	0.004	-	SSS (current)	133.50%
Benzo(b)fluorene	30777-19-6	9.11E-04	AERMOD v.19191	2.57E-02	24	0.1	-	de minimus	25.70%
Benzo(e)pyrene	192-97-2	1.31E-03	AERMOD v.19191	3.69E-02	24	0.1	-	de minimus	36.90%

Emission Summary and Dispersion Modelling Report

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Benzo(ghi)perylene	191-24-2	6.21E-04	AERMOD v.19191	1.75E-02	24	0.1	-	de minimus	17.50%
Benzo(k)fluoranthene	0207-08-09	1.01E-03	AERMOD v.19191	2.83E-02	24	0.1	-	de minimus	28.30%
Beryllium (and its compounds)	7440-41-7	5.29E-06	AERMOD v.19191	2.00E-05	24	0.01	Health	B1	0.20%
Bismuth	7440-69-9	6.43E-04	AERMOD v.19191	1.40E-03	24	2.5	Health	B2	0.06%
Cadmium and Cadmium Compounds	7440-43-9	6.75E-04	AERMOD v.19191	1.30E-03	24	0.025	Health	B1	5.20%
Calcium Carbonate	1317-65-3	4.98E+00	AERMOD v.19191	9.39E+00	24	15	Health & Particulate	B2	62.60%
Calcium Magnesium Carbonate	69227-00-5	2.46E-01	AERMOD v.19191	4.86E-01	24	45	Health	B2	1.08%
Calcium oxide	1305-78-8	4.31E-03	AERMOD v.19191	5.52E-03	24	10	Corrosion	B1	0.06%
Calcium silicate	1344-95-2	1.73E-01	AERMOD v.19191	4.29E-01	24	120	Health	B2	0.36%
Calcium sulfate	7778-18-9	3.28E-03	AERMOD v.19191	4.28E-02	24	20	Health	B2	0.21%
Carbon monoxide	630-08-0	9.24E+01	AERMOD v.19191	4.01E+02	30 min	6000	Health	B1	6.68%
Chlorine	7782-50-5	0	AERMOD v.19191	0.00E+00	10 min	230	Health	B1	0.00%
				0.00E+00	24	10			0.00%
Chromium (and its compounds)	7440-47-3	1.63E-03	AERMOD v.19191	7.25E-03	24	0.5	Health	B1	1.45%
cis-2-Butene	590-18-1	9.35E-05	AERMOD v.19191	1.42E-01	24	2400	Health	B2	0.01%
Cobalt	7440-48-4	1.59E-04	AERMOD v.19191	3.92E-03	24	0.1	Health	B1	3.92%
Copper	7440-50-8	1.68E-03	AERMOD v.19191	1.73E-02	24	50	Health	B1	0.03%
Cyclohexane	110-82-7	7.82E-04	AERMOD v.19191	4.07E-01	24	6100	Health	B1	0.01%
Cyclopentane	287-92-3	3.34E-05	AERMOD v.19191	5.08E-02	24	1700	Health	B2	0.00%
Dioxins and Furans	NA	0	AERMOD v.19191	0	24	0.0000001	Health	B1	0.00%
Dibenz(ah)acridine	226-36-8	3.20E-05	AERMOD v.19191	9.00E-04	24	0.1	-	de minimus	0.90%
Dibenz(aj)acridine	224-42-0	7.12E-05	AERMOD v.19191	2.01E-03	24	0.1	-	de minimus	2.01%
Dibenzo(ah)anthracene	53-70-3	1.49E-04	AERMOD v.19191	4.20E-03	24	0.1	-	de minimus	4.20%
Ethane	74-84-0	8.40E-01	AERMOD v.19191	2.22E+01	24	14500	Health	B2	0.15%
Ethyl benzene	100-41-4	1.14E-03	AERMOD v.19191	8.89E-01	10 min	1000	Health	B1	0.09%

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Ethylene	74-85-1	1.14E+00	AERMOD v.19191	2.96E+01	24	40	Vegetation	B1	74.00%
Ferric oxide	1309-37-1	1.08E+00	AERMOD v.19191	9.18E+00	24	25	Soiling	B1	36.72%
Ferrous oxide	1345-28-1	1.78E-03	AERMOD v.19191	3.52E-03	24	0.1	-	de minimus	3.52%
Fluoranthene	206-44-0	4.95E-03	AERMOD v.19191	1.40E-01	24	140	Health	B2	0.10%
Fluorene	86-73-7	2.52E-03	AERMOD v.19191	7.12E-02	24	0.1	-	de minimus	71.20%
Graphite	7782-42-5	6.77E-02	AERMOD v.19191	3.29E-01	24	10	Health	B2	3.29%
Hydrochloric acid	7647-01-0	4.85E-02	AERMOD v.19191	1.33E+00	24	20	Health	B1	6.65%
Hydrogen cyanide	74-90-8	6.39E-03	AERMOD v.19191	1.80E-01	24	8	Health	de minimus	2.25%
Hydrogen sulphide	7783-06-4	1.10E+00	AERMOD v.19191	5.30E+00	10 min	13	Health & Odour	B1	40.77%
				7.83E-01	24	7			11.18%
Indeno(123-cd)pyrene	193-39-5	6.15E-04	AERMOD v.19191	1.74E-02	24	0.1	-	de minimus	17.40%
Iron (metallic)	7439-89-6	7.26E-02	AERMOD v.19191	4.56E-01	24	4	Health	B1	11.41%
Iron hydroxide	1310-14-1	4.98E-03	AERMOD v.19191	6.30E-02	24	0.1	-	de minimus	63.00%
Isobutane	75-28-5	5.31E-03	AERMOD v.19191	2.43E+00	24	3600	Health	B1	0.07%
Isopentane	78-78-4	1.49E-03	AERMOD v.19191	2.26E+00	24	35500	Health	B2	0.01%
Isopropyl alcohol	67-63-0	1.39E+00	AERMOD v.19191	2.37E+00	24	7300	Health	B1	0.03%
Lead	7439-92-1	2.50E-02	AERMOD v.19191	5.13E-02	24	0.5	Health	B1	10.26%
			AERMOD v.19191	1.67E-02	30 day	0.2	Health	B2	8.35%
Magnesium	7439-95-4	2.42E-05	AERMOD v.19191	1.80E-04	24	72	Health	B2	0.00%
Magnesium carbonate	546-93-0	6.33E-02	AERMOD v.19191	1.04E+00	24	20	Health	B2	5.20%
Magnesium oxide	1309-48-4	3.06E-01	AERMOD v.19191	5.93E-01	24	120	Particulate	B1	0.49%
Manganese	7439-96-5	1.48E-01	AERMOD v.19191	3.16E-01	24	0.4	Health	B1	79.00%
Manganese(ii)Oxide	1309-84-4	0	AERMOD v.19191	0	24	0.4	Particulate	B1	0.00%
Mercury	7439-97-6	0	AERMOD v.19191	0	24	2	Health	B1	0.00%
Methane	74-82-8	5.11E+01	AERMOD v.19191	1.39E+02	24	37330	Health	B2	0.37%
Methylcyclohexane	108-87-2	8.10E-05	AERMOD v.19191	3.98E-02	24	8050	Health	B2	0.00%

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Methylcyclopentane	96-37-7	7.34E-05	AERMOD v.19191	1.12E-01	24	3500	Health	B2	0.00%
Molybdenum	7439-98-7	1.27E-03	AERMOD v.19191	2.74E-03	24	120	Particulate	B2	0.00%
n-Butane	106-97-8	1.94E-02	AERMOD v.19191	9.30E+00	24	3600	Health	B2	0.26%
n-Heptane	142-82-5	1.07E-03	AERMOD v.19191	5.63E-01	24	11000	Health	B1	0.01%
n-Hexane	110-54-3	3.55E-03	AERMOD v.19191	1.86E+00	24	2500	Health	B1	0.07%
n-Octane	111-65-9	1.26E-04	AERMOD v.19191	1.56E+00	10 min	61800	Odour	B1	0.00%
n-Pentane	109-66-0	5.36E-03	AERMOD v.19191	2.64E+00	24	35500	Health	B1	0.01%
Naphthalene	91-20-3	1.46E-02	AERMOD v.19191	6.68E-01	24	22.5	Health	B1	2.97%
			AERMOD v.19191	5.70E+00	10 min	50	Odour		11.40%
Nickel and Nickel Compounds	7440-02-0	3.35E-04	AERMOD v.19191	3.30E-04	Annual	0.04	Health	B1	0.83%
Nitrogen oxides (expressed as NO ₂)	10102-44-0	1.79E+02	AERMOD v.19191	2.90E+02	1	400	Health	B1	72.50%
			AERMOD v.19191	1.27E+02	24	200			63.50%
Nitrous oxide	10024-97-2	5.59E+00	AERMOD v.19191	4.93E+00	24	9000	Health	B1	0.05%
Phosphorus (total)	7723-14-0	1.62E-03	AERMOD v.19191	3.27E-03	24	0.5	Health	B2	0.65%
Phosphoric Anhydride	1314-56-3	0.00E0	AERMOD v.19191	0.00E0	24	1	Health	B2	0.00%
Total Suspended Particulate Matter (< 44microns)	NA	3.12E+01	AERMOD v.19191	1.35E+02	24	127	-	SSS (current)	106.30%
Potassium	9/7/7440	5.67E-02	AERMOD v.19191	2.53E-01	24	1	Health	B2	25.30%
Potassium Chloride	7447-40-7	4.27E-02	AERMOD v.19191	8.45E-02	24	20	Health	B2	0.42%
Propane	74-98-6	9.15E-02	AERMOD v.19191	5.36E+00	24	215000	Health	B2	0.00%
Propylene	115-07-1	2.24E-01	AERMOD v.19191	5.93E+00	24	4000	Health	B1	0.15%
Pyrene	129-00-0	3.37E-03	AERMOD v.19191	9.50E-02	24	0.1	-	de minimus	95.00%
Pyrite	1309-36-0	1.08E-04	AERMOD v.19191	8.20E-04	24	120	Health & Particulate	B1	0.00%
Silicon dioxide	7631-86-9	2.14E-01	AERMOD v.19191	3.52E+00	24	5	Health	B2	70.40%
Silver	7440-22-4	1.65E-05	AERMOD v.19191	3.00E-05	24	1	Health	B1	0.00%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Sodium	740-23-5	5.88E-02	AERMOD v.19191	1.58E-01	24	10			1.58%
Strontium	7440-24-6	1.07E-03	AERMOD v.19191	1.99E-03	24	120	Particulate	B1	0.00%
Styrene	100-42-5	4.17E-04	AERMOD v.19191	1.91E-02	24	400	Health	B1	0.00%
Sulphur dioxide	9/5/7446	1.97E+02	AERMOD v.19191	5.97E+02	1	100 (July 23 standard)	Health & Vegetation	B1	597.00%
			AERMOD v.19191	3.40E+01	Annual	10 (July 23 standard)			340.00%
Titanium (and its compounds)	7440-32-6	6.24E-03	AERMOD v.19191	7.69E-02	24	120	Particulate	B1	0.06%
Titanium Dioxide	13463-67-7	1.78E-03	AERMOD v.19191	3.52E-03	24	34	Health	B1	0.01%
Toluene	108-88-3	1.27E-01	AERMOD v.19191	2.25E+01	10 min	2000	Odour	de minimus	1.13%
Total reduced sulphur (TRS)	NA	1.10E+00	AERMOD v.19191	5.31E+00	10 min	13	Health & Odour	B1	40.85%
trans-2-Butene	624-64-6	7.34E-05	AERMOD v.19191	1.12E-01	24	2400	Health	B1	0.00%
Tungsten (elemental)	7440-33-7	7.74E-04	AERMOD v.19191	1.99E-03	24	5	Health	B2	0.04%
Vanadium (fume or dust)	7440-62-2	2.51E-03	AERMOD v.19191	5.64E-02	24	2	Health	B1	2.82%
Xylene (mixed isomers)	1330-20-7	2.20E-03	AERMOD v.19191	6.79E-02	24	730	Health	B2	0.01%
Zinc	7440-66-6	1.64E-01	AERMOD v.19191	4.27E-01	24	120	Particulate	B1	0.36%

Notes:

Category – refers to Category B1 and B2 in the Air Contaminants Benchmark (ACB) List Version 2.0, unless noted otherwise.

de minimus – POI concentration of $0.1 \mu\text{g}/\text{m}^3$ (24-hour averaging period) applied for substance without standard or guideline under O. Reg. 419/05, as per MECP's ESDM Procedure Document.

SSS – Site-specific Standard

B1 – (Benchmark 1) - Exceedance of a B1 concentration triggers specific actions under O. Reg. 419/05.

B2 – (Benchmark 2) - Exceedance of a B2 concentration triggers a toxicological assessment to determine the likelihood of adverse effect

NA - Not Applicable

Assumption: Iron Oxide (FeO) was included in modelling assessment and was determined to have similar properties as Ferric Oxide (Fe_2O_3). Therefore, the maximum POI concentrations for FeO and Fe_2O_3 have been combined and compared against the corresponding MECP POI limit for Ferric Oxide ($25 \mu\text{g}/\text{m}^3$)

Emission Summary and Dispersion Modelling Report

Table E1-B: Emission Summary Table for the Interim Scenario (2024-2025)

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m ³)	Averaging Period (hours)	MECP POI Limit (µg/m ³)	Limiting Effect	Category	Percent of MECP Limit (%)
1,2,3-Trimethylbenzene	526-73-8	6.68E-06	AERMOD v.19191	1.02E-02	24	220	Health	B1	0.00%
1,2,4-Trimethylbenzene	95-63-6	2.49E-04	AERMOD v.19191	1.23E-01	24	220	Health	B1	0.06%
1-Butene	106-98-9	2.07E-04	AERMOD v.19191	1.32E-01	24	7000	Health	B2	0.00%
1-Hexene	592-41-6	1.34E-05	AERMOD v.19191	2.03E-02	24	850	Health	B2	0.00%
1-Pentene	109-67-1	1.80E-04	AERMOD v.19191	2.74E-01	24	2050	Health	B2	0.01%
2,2-Dimethylbutane	75-83-2	2.00E-05	AERMOD v.19191	3.05E-02	24	1750	Health	B2	0.00%
2-Methylpentane	107-83-5	1.87E-04	AERMOD v.19191	2.84E-01	24	1750	Health	B2	0.02%
3-Methylpentane	96-14-0	1.07E-04	AERMOD v.19191	1.63E-01	24	1750	Health	B2	0.01%
Aluminum (fumes or dust)	7429-90-5	9.33E-02	AERMOD v.19191	1.07E+00	24	12	Health	B2	8.90%
Aluminum Oxide	1344-28-1	1.65E-02	AERMOD v.19191	8.24E-03	24	100	Particulate	B1	0.01%
Acenaphthene	83-32-9	1.37E-04	AERMOD v.19191	3.85E-03	24	0.1	-	de minimus	3.85%
Acetylene	74-86-2	3.71E-03	AERMOD v.19191	4.32E-01	10 min	56000	Odour	B1	0.00%
Ammonia	7664-41-7	8.08E-02	AERMOD v.19191	9.17E-01	24	100	Health	B1	0.92%
Anthracene	0120-12-07	1.91E-03	AERMOD v.19191	5.37E-02	24	0.1	-	de minimus	53.70%
Antimony	7440-36-0	1.06E-04	AERMOD v.19191	2.00E-05	24	25	Health	B1	0.00%
Arsenic	7440-38-2	1.10E-03	AERMOD v.19191	5.50E-04	24	0.3	Health	B1	0.18%
Barium (total water soluble)	7440-39-3	8.39E-05	AERMOD v.19191	1.90E-04	24	10	Health	B1	0.00%
Benzene	71-43-2	7.10E-01	AERMOD v.19191	3.98E+00	Annual	2.2	-	SSS (current)	180.91%
Benzo(a)anthracene	56-55-3	0.001507132	AERMOD v.19191	4.25E-02	24	0.1	-	de minimus	42.50%
Benzo(a)fluorene	238-84-6	0.000809613	AERMOD v.19191	2.28E-02	24	0.1	-	de minimus	22.80%
Benzo(a)phenanthrene	0218-01-09	0.001431964	AERMOD v.19191	4.04E-02	24	0.1	-	de minimus	40.40%
Benzo(a)pyrene	50-32-8	0.001143437	AERMOD v.19191	5.34E-03	Annual	0.004	-	SSS (current)	133.50%

Emission Summary and Dispersion Modelling Report

Benzo(b)fluorene	30777-19-6	0.000910877	AERMOD v.19191	2.57E-02	24	0.1	-	de minimus	25.70%
Benzo(e)pyrene	192-97-2	0.001308872	AERMOD v.19191	3.69E-02	24	0.1	-	de minimus	36.90%
Benzo(ghi)perylene	191-24-2	0.000620873	AERMOD v.19191	1.75E-02	24	0.1	-	de minimus	17.50%
Benzo(k)fluoranthene	0207-08-09	0.001005247	AERMOD v.19191	2.83E-02	24	0.1	-	de minimus	28.30%
Beryllium (and its compounds)	7440-41-7	7.23E-08	AERMOD v.19191	0.00E+00	24	0.01	Health	B1	0.00%
Bismuth	7440-69-9	2.99E-04	AERMOD v.19191	5.70E-04	24	2.5	Health	B2	0.02%
Cadmium and Cadmium Compounds	7440-43-9	9.94E-03	AERMOD v.19191	4.99E-03	24	0.025	Health	B1	19.96%
Calcium Carbonate	1317-65-3	1.26E+00	AERMOD v.19191	7.54E+00	24	15	Health & Particulate	B2	50.24%
Calcium Magnesium Carbonate	69227-00-5	2.47E-01	AERMOD v.19191	4.86E-01	24	45	Health & Particulate	B2	1.08%
Calcium oxide	1305-78-8	2.22E-01	AERMOD v.19191	1.07E+00	24	10	Corrosion	B1	10.70%
Calcium silicate	1344-95-2	4.34E-02	AERMOD v.19191	9.60E-02	24	120	Health	B2	0.08%
Calcium sulfate	7778-18-9	3.28E-03	AERMOD v.19191	2.23E-02	24	20	Health	B2	0.11%
Carbon monoxide	630-08-0	4.23E+02	AERMOD v.19191	1.46E+03	30 min	6000	Health	B1	24.31%
Chlorine	7782-50-5	2.75E-01	AERMOD v.19191	1.41E+00	10 min	230	Health	B1	0.61%
				1.37E-01	24	10			1.37%
Chromium (and its compounds)	7440-47-3	8.06E-03	AERMOD v.19191	7.63E-03	24	0.5	Health	B1	1.53%
cis-2-Butene	590-18-1	9.35E-05	AERMOD v.19191	1.42E-01	24	2400	Health	B2	0.01%
Cobalt	7440-48-4	6.76E-04	AERMOD v.19191	3.92E-03	24	0.1	Health	B1	3.92%
Copper	7440-50-8	5.11E-03	AERMOD v.19191	1.73E-02	24	50	Health	B1	0.03%
Cyclohexane	110-82-7	7.82E-04	AERMOD v.19191	4.07E-01	24	6100	Health	B1	0.01%
Cyclopentane	287-92-3	3.34E-05	AERMOD v.19191	5.08E-02	24	1700	Health	B2	0.00%
Dibenz(ah)acridine	226-36-8	3.20E-05	AERMOD v.19191	9.00E-04	24	0.1	-	de minimus	0.90%
Dibenz(aj)acridine	224-42-0	7.12E-05	AERMOD v.19191	2.01E-03	24	0.1	-	de minimus	2.01%
Dibenzo(ah)anthracene	53-70-3	1.49E-04	AERMOD v.19191	4.20E-03	24	0.1	-	de minimus	4.20%

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Dioxins and Furans	NA	1.10E-07	AERMOD v.19191	5.49E-08	24	0.0000001	Health	B1	54.90%
Ethane	74-84-0	8.46E-01	AERMOD v.19191	2.22E+01	24	14500	Health	B2	0.15%
Ethyl benzene	100-41-4	1.14E-03	AERMOD v.19191	8.89E-01	10 min	1000	Health	B1	0.09%
Ethylene	74-85-1	1.14E+00	AERMOD v.19191	2.96E+01	24	40	Vegetation	B1	74.07%
Ferric oxide	1309-37-1	9.02E-01	AERMOD v.19191	3.16E+00	24	25	Soiling	B1	12.64%
Ferrous oxide	1345-28-1	1.79E-03	AERMOD v.19191	3.52E-03	24	0.1	-	de minimus	3.52%
Fluoranthene	206-44-0	4.95E-03	AERMOD v.19191	1.40E-01	24	140	Health	B2	0.10%
Fluorene	86-73-7	5.20E-02	AERMOD v.19191	7.33E-02	24	0.1	-	de minimus	73.30%
Graphite	7782-42-5	5.58E-02	AERMOD v.19191	2.82E-01	24	10	Health	B2	2.82%
Hydrochloric acid	7647-01-0	4.85E-02	AERMOD v.19191	1.33E+00	24	20	Health	B1	6.65%
Hydrogen cyanide	74-90-8	6.39E-03	AERMOD v.19191	1.80E-01	24	8	Health	de minimus	2.25%
Hydrogen sulphide	7783-06-4	1.10E+00	AERMOD v.19191	5.30E+00	10 min	13	Health & Odour	B1	40.75%
				7.83E-01	24	7			11.18%
Indeno(123-cd)pyrene	193-39-5	6.15E-04	AERMOD v.19191	1.74E-02	24	0.1	-	de minimus	17.40%
Iron (metallic)	7439-89-6	3.03E-02	AERMOD v.19191	3.93E-01	24	4	Health	B1	9.83%
Iron hydroxide	1310-14-1	4.09E-03	AERMOD v.19191	5.47E-02	24	0.1	-	de minimus	54.70%
Isobutane	75-28-5	5.31E-03	AERMOD v.19191	2.43E+00	24	3600	Health	B1	0.07%
Isopentane	78-78-4	1.49E-03	AERMOD v.19191	2.27E+00	24	35500	Health	B2	0.01%
Isopropyl alcohol	67-63-0	1.39E+00	AERMOD v.19191	4.97E-01	24	7300	Health	B1	0.01%
Lead	7439-92-1	2.28E-02	AERMOD v.19191	1.23E-02	24	0.5	Health	B1	2.47%
			AERMOD v.19191	2.45E-03	30 day	0.2	Health	B2	1.23%
Magnesium	7439-95-4	2.42E-05	AERMOD v.19191	1.80E-04	24	72	Health	B2	0.00%
Magnesium carbonate	546-93-0	6.33E-02	AERMOD v.19191	1.03E+00	24	20	Health	B2	5.17%
Magnesium oxide	1309-48-4	1.09E-01	AERMOD v.19191	2.14E-01	24	120	Particulate	B1	0.18%
Manganese	7439-96-5	5.75E-02	AERMOD v.19191	2.63E-01	24	0.4	Health	B1	65.86%
Manganese(ii)Oxide	1309-84-4	3.30E-01	AERMOD v.19191	1.65E-01	24	0.4	Health	B1	41.18%
Mercury	7439-97-6	5.50E-06	AERMOD v.19191	1.00E-06	24	2	Health	B1	0.00%
Methane	74-82-8	5.10E+01	AERMOD v.19191	1.39E+02	24	37330	Health	B2	0.37%

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Methylcyclohexane	108-87-2	8.10E-05	AERMOD v.19191	3.97E-02	24	8050	Health	B2	0.00%
Methylcyclopentane	96-37-7	7.34E-05	AERMOD v.19191	1.12E-01	24	3500	Health	B2	0.00%
Molybdenum	7439-98-7	1.21E-03	AERMOD v.19191	2.66E-03	24	120	Particulate	B2	0.00%
n-Butane	106-97-8	1.94E-02	AERMOD v.19191	9.30E+00	24	3600	Health	B2	0.26%
n-Heptane	142-82-5	1.07E-03	AERMOD v.19191	5.62E-01	24	11000	Health	B1	0.01%
n-Hexane	110-54-3	3.55E-03	AERMOD v.19191	1.86E+00	24	2500	Health	B1	0.07%
n-Octane	111-65-9	1.26E-04	AERMOD v.19191	1.57E+00	10 min	61800	Odour	B1	0.00%
n-Pentane	109-66-0	5.36E-03	AERMOD v.19191	2.64E+00	24	35500	Health	B1	0.01%
Naphthalene	91-20-3	1.46E-02	AERMOD v.19191	6.68E-01	24	22.5	Health	B1	2.97%
			AERMOD v.19191	5.70E+00	10 min	50	Odour		11.40%
Nickel and Nickel Compounds	7440-02-0	4.42E-02	AERMOD v.19191	1.94E-03	Annual	0.04	Health	B1	4.85%
Nitrogen oxides (expressed as NO2)	10102-44-0	2.35E+02	AERMOD v.19191	3.62E+02	1	400	Health	B1	90.58%
			AERMOD v.19191	9.69E+01	24	200			48.45%
Nitrous oxide	10024-97-2	5.59E+00	AERMOD v.19191	4.95E+00	24	9000	Health	B1	0.06%
Phosphorus (total)	7723-14-0	5.69E-04	AERMOD v.19191	2.33E-03	24	0.5	Health	B2	0.47%
Phosphoric Anhydride	1314-56-3	2.04E-02	AERMOD v.19191	1.02E-02	24	1	Health	B2	1.02%
Total Suspended Particulate Matter	NA	3.03E+01	AERMOD v.19191	1.31E+02	24	127	-	SSS (current)	103.29%
Potassium	9/7/7440	1.89E-02	AERMOD v.19191	2.18E-01	24	1	Health	B2	21.82%
Potassium Chloride	7447-40-7	4.29E-02	AERMOD v.19191	8.45E-02	24	20	Health	B2	0.42%
Propane	74-98-6	9.67E-02	AERMOD v.19191	5.36E+00	24	215000	Health	B2	0.00%
Propylene	115-07-1	2.24E-01	AERMOD v.19191	5.93E+00	24	4000	Health	B1	0.15%
Pyrene	129-00-0	3.37E-03	AERMOD v.19191	9.50E-02	24	0.1	-	de minimus	95.00%
Pyrite	1309-36-0	1.08E-04	AERMOD v.19191	8.20E-04	24	120	Health & Particulate	B1	0.00%
Silicon dioxide	7631-86-9	5.29E-01	AERMOD v.19191	3.54E+00	24	5	Health	B2	70.73%
Silver	7440-22-4	5.21E-06	AERMOD v.19191	1.00E-05	24	1	Health	B1	0.00%
Sodium	740-23-5	2.30E-02	AERMOD v.19191	2.16E-02	24	10			0.22%

Emission Summary and Dispersion Modelling Report

Strontium	7440-24-6	1.91E-04	AERMOD v.19191	4.70E-04	24	120	Particulate	B1	0.00%
Styrene	100-42-5	4.17E-04	AERMOD v.19191	1.91E-02	24	400	Health	B1	0.00%
Sulphur dioxide	9/5/7446	2.21E+02	AERMOD v.19191	6.15E+02	1	100 (July 2023 standard)	Health & Vegetation	B1	615.12%
			AERMOD v.19191	2.28E+01	Annual	10 (July 2023 standard)			228.39%
Titanium (and its compounds)	7440-32-6	4.25E-03	AERMOD v.19191	6.42E-02	24	120	Particulate	B1	0.05%
Titanium Dioxide	13463-67-7	1.79E-03	AERMOD v.19191	3.52E-03	24	34	Health	B1	0.01%
Toluene	108-88-3	1.27E-01	AERMOD v.19191	2.25E+01	10 min	2000	Odour	de minimus	1.12%
Total reduced sulphur (TRS)	NA	1.10E+00	AERMOD v.19191	5.31E+00	10 min	13	Health Odour	B1	40.83%
trans-2-Butene	624-64-6	7.34E-05	AERMOD v.19191	1.12E-01	24	2400	Health	B1	0.00%
Tungsten (elemental)	7440-33-7	1.60E-04	AERMOD v.19191	3.50E-04	24	5	Health	B2	0.01%
Vanadium (fume or dust)	7440-62-2	2.40E-03	AERMOD v.19191	4.59E-03	24	2	Health	B1	0.23%
Xylene (mixed isomers)	1330-20-7	2.20E-03	AERMOD v.19191	6.79E-02	24	730	Health	B2	0.01%
Zinc	7440-66-6	1.19E+00	AERMOD v.19191	6.09E-01	24	120	Particulate	B1	0.51%

Notes:

Category – refers to Category B1 and B2 in the Air Contaminants Benchmark (ACB) List Version 2.0, unless noted otherwise.

de minimus – POI concentration of 0.1 µg/m³ (24-hour averaging period) applied for substance without standard or guideline under O. Reg. 419/05, as per MECP's ESDM Procedure Document.

SSS – Site-specific Standard

B1 – (Benchmark 1) - Exceedance of a B1 concentration triggers specific actions under O. Reg. 419/05.

B2 – (Benchmark 2) - Exceedance of a B2 concentration triggers a toxicological assessment to determine the likelihood of adverse effect

NA - Not Applicable

Assumption: Iron Oxide (FeO) was included in modelling assessment and was determined to have similar properties as Ferric Oxide (Fe₂O₃). Therefore, the maximum POI concentrations for FeO and Fe₂O₃ have been combined and compared against the corresponding MECP POI limit for Ferric Oxide (25 µg/m³)

Emission Summary and Dispersion Modelling Report

Table E1-C: Emission Summary Table for the Interim Scenario (2026-2028)

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
1,2,3-Trimethylbenzene	526-73-8	6.68E-06	AERMOD v.19191	1.02E-02	24	220	Health	B1	0.00%
1,2,4-Trimethylbenzene	95-63-6	2.49E-04	AERMOD v.19191	1.23E-01	24	220	Health	B1	0.06%
1-Butene	106-98-9	1.74E-04	AERMOD v.19191	1.32E-01	24	7000	Health	B2	0.00%
1-Hexene	592-41-6	1.34E-05	AERMOD v.19191	2.03E-02	24	850	Health	B2	0.00%
1-Pentene	109-67-1	1.80E-04	AERMOD v.19191	2.74E-01	24	2050	Health	B2	0.01%
2,2-Dimethylbutane	75-83-2	2.00E-05	AERMOD v.19191	3.05E-02	24	1750	Health	B2	0.00%
2-Methylpentane	107-83-5	1.87E-04	AERMOD v.19191	2.84E-01	24	1750	Health	B2	0.02%
3-Methylpentane	96-14-0	1.07E-04	AERMOD v.19191	1.62E-01	24	1750	Health	B2	0.01%
Aluminum (fumes or dust)	7429-90-5	9.19E-02	AERMOD v.19191	1.06E+00	24	12	Health	B2	8.85%
Aluminum Oxide	1344-28-1	1.65E-02	AERMOD v.19191	8.24E-03	24	100	Particulate	B1	0.01%
Acenaphthene	83-32-9	9.88E-05	AERMOD v.19191	3.41E-03	24	0.1	-	de minimus	3.41%
Acetylene	74-86-2	2.67E-03	AERMOD v.19191	4.21E-01	10 min	56000	Odour	B1	0.00%
Ammonia	7664-41-7	7.32E-02	AERMOD v.19191	8.29E-01	24	100	Health	B1	0.83%
Anthracene	0120-12-07	1.38E-03	AERMOD v.19191	4.76E-02	24	0.1	-	de minimus	47.60%
Antimony	7440-36-0	4.68E-07	AERMOD v.19191	2.00E-05	24	25	Health	B1	0.00%
Arsenic	7440-38-2	1.10E-03	AERMOD v.19191	5.50E-04	24	0.3		B1	0.18%
Barium (total water soluble)	7440-39-3	7.89E-05	AERMOD v.19191	1.90E-04	24	10	Health	B1	0.00%
Benzene	71-43-2	5.44E-01	AERMOD v.19191	3.21E+00	Annual	2.2	-	SSS (current)	145.91%
Benzo(a)anthracene	56-55-3	1.09E-03	AERMOD v.19191	3.76E-02	24	0.1	-	de minimus	37.60%
Benzo(a)fluorene	238-84-6	5.85E-04	AERMOD v.19191	2.02E-02	24	0.1	-	de minimus	20.20%
Benzo(a)phenanthrene	0218-01-09	1.03E-03	AERMOD v.19191	3.58E-02	24	0.1	-	de minimus	35.80%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Benzo(a)pyrene	50-32-8	8.26E-04	AERMOD v.19191	4.49E-03	Annual	0.004	-	SSS (current)	112.25%
Benzo(b)fluorene	30777-19-6	6.58E-04	AERMOD v.19191	2.28E-02	24	0.1	-	de minimus	22.80%
Benzo(e)pyrene	192-97-2	9.46E-04	AERMOD v.19191	3.27E-02	24	0.1	-	de minimus	32.70%
Benzo(ghi)perylene	191-24-2	4.49E-04	AERMOD v.19191	1.55E-02	24	0.1	-	de minimus	15.50%
Benzo(k)fluoranthene	0207-08-09	7.26E-04	AERMOD v.19191	2.51E-02	24	0.1	-	de minimus	25.10%
Beryllium (and its compounds)	7440-41-7	0.00E+00	AERMOD v.19191	0.00E+00	24	0.01	Health	B1	0.00%
Bismuth	7440-69-9	2.70E-04	AERMOD v.19191	5.60E-04	24	2.5	Health	B2	0.02%
Cadmium and Cadmium Compounds	7440-43-9	9.94E-03	AERMOD v.19191	4.99E-03	24	0.025	Health	B1	19.96%
Calcium Carbonate	1317-65-3	1.24E+00	AERMOD v.19191	7.44E+00	24	15	Health & Particulate	B2	49.62%
Calcium Magnesium Carbonate	69227-00-5	2.47E-01	AERMOD v.19191	4.86E-01	24	45	Health & Particulate	B2	1.08%
Calcium oxide	1305-78-8	2.23E-01	AERMOD v.19191	1.07E+00	24	10	Corrosion	B1	10.74%
Calcium silicate	1344-95-2	4.26E-02	AERMOD v.19191	9.56E-02	24	120	Health	B2	0.08%
Calcium sulfate	7778-18-9	3.28E-03	AERMOD v.19191	2.23E-02	24	20	Health	B2	0.11%
Carbon monoxide	630-08-0	4.15E+02	AERMOD v.19191	1.44E+03	30 min	6000	Health	B1	24.03%
Chlorine	7782-50-5	2.75E-01	AERMOD v.19191	1.41E+00	10 min	230	Health	B1	0.61%
				1.37E-01	24	10			1.37%
Chromium (and its compounds)	7440-47-3	8.03E-03	AERMOD v.19191	7.53E-03	24	0.5	Health	B1	1.51%
cis-2-Butene	590-18-1	9.35E-05	AERMOD v.19191	1.42E-01	24	2400	Health	B2	0.01%
Cobalt	7440-48-4	6.64E-04	AERMOD v.19191	3.92E-03	24	0.1	Health	B1	3.92%
Copper	7440-50-8	5.11E-03	AERMOD v.19191	1.73E-02	24	50	Health	B1	0.03%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Cyclohexane	110-82-7	7.82E-04	AERMOD v.19191	4.07E-01	24	6100	Health	B1	0.01%
Cyclopentane	287-92-3	3.34E-05	AERMOD v.19191	5.08E-02	24	1700	Health	B2	0.00%
Dibenz(ah)acridine	226-36-8	2.31E-05	AERMOD v.19191	8.00E-04	24	0.1	-	de minimus	0.80%
Dibenz(aj)acridine	224-42-0	5.15E-05	AERMOD v.19191	1.78E-03	24	0.1	-	de minimus	1.78%
Dibenzo(ah)anthracene	53-70-3	1.08E-04	AERMOD v.19191	3.72E-03	24	0.1	-	de minimus	3.72%
Dioxins and Furans	NA	1.10E-07	AERMOD v.19191	5.49E-08	24	0.0000001	Health	B1	54.90%
Ethane	74-84-0	5.97E-01	AERMOD v.19191	2.04E+01	24	14500	Health	B2	0.14%
Ethyl benzene	100-41-4	9.24E-04	AERMOD v.19191	8.84E-01	10 min	1000	Health	B1	0.09%
Ethylene	74-85-1	8.02E-01	AERMOD v.19191	2.72E+01	24	40	Vegetation	B1	68.00%
Ferric oxide	1309-37-1	5.06E-01	AERMOD v.19191	3.16E+00	24	25	Soiling	B1	12.63%
Ferrous oxide	1345-28-1	1.79E-03	AERMOD v.19191	3.52E-03	24	0.1	-	de minimus	3.52%
Fluoranthene	206-44-0	3.58E-03	AERMOD v.19191	1.24E-01	24	140	Health	B2	0.09%
Fluorene	86-73-7	5.13E-02	AERMOD v.19191	6.52E-02	24	0.1	-	de minimus	65.15%
Graphite	7782-42-5	4.08E-02	AERMOD v.19191	2.82E-01	24	10	Health	B2	2.82%
Hydrochloric acid	7647-01-0	4.85E-02	AERMOD v.19191	1.33E+00	24	20	Health	B1	6.65%
Hydrogen cyanide	74-90-8	4.62E-03	AERMOD v.19191	1.60E-01	24	8	Health	de minimus	2.00%
Hydrogen sulphide	7783-06-4	5.20E-01	AERMOD v.19191	5.17E+00	10 min	13	Health & Odour	B1	39.80%
				6.92E-01	24	7			9.89%
Indeno(123-cd)pyrene	193-39-5	4.45E-04	AERMOD v.19191	1.54E-02	24	0.1	-	de minimus	15.40%
Iron (metallic)	7439-89-6	2.54E-02	AERMOD v.19191	3.71E-01	24	4	Health	B1	9.28%
Iron hydroxide	1310-14-1	4.09E-03	AERMOD v.19191	5.47E-02	24	0.1	-	de minimus	54.70%
Isobutane	75-28-5	5.31E-03	AERMOD v.19191	2.43E+00	24	3600	Health	B1	0.07%
Isopentane	78-78-4	1.49E-03	AERMOD v.19191	2.26E+00	24	35500	Health	B2	0.01%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Isopropyl alcohol	67-63-0	1.39E+00	AERMOD v.19191	1.15E+00	24	7300	Health	B1	0.02%
Lead	7439-92-1	2.28E-02	AERMOD v.19191	1.23E-02	24	0.5	Health	B1	2.47%
			AERMOD v.19191	2.41E-03	30 day	0.2	Health	B2	1.21%
Magnesium	7439-95-4	0.00E+00	AERMOD v.19191	0.00E+00	24	72	Health	B2	0.00%
Magnesium carbonate	546-93-0	6.09E-02	AERMOD v.19191	1.02E+00	24	20	Health	B2	5.11%
Magnesium oxide	1309-48-4	1.05E-01	AERMOD v.19191	2.13E-01	24	120	Particulate	B1	0.18%
Manganese	7439-96-5	5.74E-02	AERMOD v.19191	2.63E-01	24	0.4	Health	B1	65.65%
Manganese(ii)Oxide	1309-84-4	2.90E-01	AERMOD v.19191	1.45E-01	24	0.4	Health	B1	36.15%
Mercury	7439-97-6	5.50E-06	AERMOD v.19191	0.00E+00	24	2	Health	3	0.00%
Methane	74-82-8	3.88E+01	AERMOD v.19191	1.29E+02	24	37330	Health	B2	0.34%
Methylcyclohexane	108-87-2	8.10E-05	AERMOD v.19191	3.97E-02	24	8050	Health	B2	0.00%
Methylcyclopentane	96-37-7	7.34E-05	AERMOD v.19191	1.12E-01	24	3500	Health	B2	0.00%
Molybdenum	7439-98-7	1.21E-03	AERMOD v.19191	2.66E-03	24	120	Particulate	B2	0.00%
n-Butane	106-97-8	1.94E-02	AERMOD v.19191	9.30E+00	24	3600	Health	B2	0.26%
n-Heptane	142-82-5	1.07E-03	AERMOD v.19191	5.62E-01	24	11000	Health	B1	0.01%
n-Hexane	110-54-3	3.55E-03	AERMOD v.19191	1.86E+00	24	2500	Health	B1	0.07%
n-Octane	111-65-9	1.26E-04	AERMOD v.19191	1.56E+00	10 min	61800	Odour	B1	0.00%
n-Pentane	109-66-0	5.36E-03	AERMOD v.19191	2.64E+00	24	35500	Health	B1	0.01%
			AERMOD v.19191	4.80E-01	24	22.5	Health	B1	2.13%
Naphthalene	91-20-3	1.13E-02	AERMOD v.19191	4.07E+00	10 min	50	Odour	B1	8.13%
			AERMOD v.19191	1.94E-03	Annual	0.04	Health	B1	4.85%
Nickel and Nickel Compounds	7440-02-0	4.42E-02	AERMOD v.19191	1.94E-03	Annual	0.04	Health	B1	4.85%
Nitrogen oxides (expressed as NO2)	10102-44-0	2.27E+02	AERMOD v.19191	3.45E+02	1	400	Health	B1	86.21%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m ³)	Averaging Period (hours)	MECP POI Limit (µg/m ³)	Limiting Effect	Category	Percent of MECP Limit (%)
			AERMOD v.19191	9.46E+01	24	200			47.32%
Nitrous oxide	10024-97-2	5.23E+00	AERMOD v.19191	4.83E+00	24	9000	Health	B1	0.05%
Phosphorus (total)	7723-14-0	3.94E-04	AERMOD v.19191	2.32E-03	24	0.5	Health	B2	0.46%
Phosphoric Anhydride	1314-56-3	2.04E-02	AERMOD v.19191	1.02E-02	24	1	Health	B2	1.02%
Total Suspended Particulate Matter	NA	2.75E+01	AERMOD v.19191	1.21E+02	24	127	-	SSS (current)	95.51%
Potassium	9/7/7440	1.86E-02	AERMOD v.19191	2.17E-01	24	1	Health	B2	21.70%
Potassium Chloride	7447-40-7	4.29E-02	AERMOD v.19191	6.93E-02	24	20	Health	B2	0.35%
Propane	74-98-6	7.21E-02	AERMOD v.19191	5.20E+00	24	215000	Health	B2	0.00%
Propylene	115-07-1	1.57E-01	AERMOD v.19191	5.16E+00	24	4000	Health	B1	0.13%
Pyrene	129-00-0	2.43E-03	AERMOD v.19191	8.41E-02	24	0.1	-	de minimus	84.10%
Pyrite	1309-36-0	0.00E+00	AERMOD v.19191	0.00E+00	24	120	Health & Particulate	B1	0.00%
Silicon dioxide	7631-86-9	5.23E-01	AERMOD v.19191	3.51E+00	24	5	Health	B2	70.11%
Silver	7440-22-4	2.45E-06	AERMOD v.19191	1.00E-05	24	1	Health	B1	0.00%
Sodium	740-23-5	2.30E-02	AERMOD v.19191	2.15E-02	24	10			0.22%
Strontium	7440-24-6	1.87E-04	AERMOD v.19191	4.60E-04	24	120	Particulate	B1	0.00%
Styrene	100-42-5	3.23E-04	AERMOD v.19191	1.37E-02	24	400	Health	B1	0.00%
Sulphur dioxide	9/5/7446	1.76E+02	AERMOD v.19191	4.94E+02	1	100 (July 2023 standard)	Health & Vegetation	B1	493.87%
			AERMOD v.19191	1.77E+01	Annual	10 (July 2023 standard)			176.99%
Titanium (and its compounds)	7440-32-6	4.14E-03	AERMOD v.19191	6.32E-02	24	120	Particulate	B1	0.05%
Titanium Dioxide	13463-67-7	1.79E-03	AERMOD v.19191	3.52E-03	24	34	Health	B1	0.01%
Toluene	108-88-3	9.11E-02	AERMOD v.19191	2.20E+01	10 min	2000	Odour	de minimus	1.10%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Total reduced sulphur (TRS)	NA	5.21E-01	AERMOD v.19191	5.18E+00	10 min	13	Health Odour	B1	39.86%
trans-2-Butene	624-64-6	7.34E-05	AERMOD v.19191	1.12E-01	24	2400	Health	B1	0.00%
Tungsten (elemental)	7440-33-7	1.60E-04	AERMOD v.19191	3.50E-04	24	5	Health	B2	0.01%
Vanadium (fume or dust)	7440-62-2	2.40E-03	AERMOD v.19191	4.57E-03	24	2	Health	B1	0.23%
Xylene (mixed isomers)	1330-20-7	1.68E-03	AERMOD v.19191	6.24E-02	24	730	Health	B2	0.01%
Zinc	7440-66-6	1.18E+00	AERMOD v.19191	6.09E-01	24	120	Particulate	B1	0.51%

Notes:

Category – refers to Category B1 and B2 in the Air Contaminants Benchmark (ACB) List Version 2.0, unless noted otherwise.

de minimus – POI concentration of $0.1 \mu\text{g}/\text{m}^3$ (24-hour averaging period) applied for substance without standard or guideline under O. Reg. 419/05, as per MECP's ESDM Procedure Document.

SSS – Site-specific Standard

B1 – (Benchmark 1) - Exceedance of a B1 concentration triggers specific actions under O. Reg. 419/05.

B2 – (Benchmark 2) - Exceedance of a B2 concentration triggers a toxicological assessment to determine the likelihood of adverse effect

NA - Not Applicable

Assumption: Iron Oxide (FeO) was included in modelling assessment and was determined to have similar properties as Ferric Oxide (Fe_2O_3). Therefore, the maximum POI concentrations for FeO and Fe_2O_3 have been combined and compared against the corresponding MECP POI limit for Ferric Oxide ($25 \mu\text{g}/\text{m}^3$)

Emission Summary and Dispersion Modelling Report

Table E1-D: Emission Summary Table for the Future Scenario (2029 onwards)

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
1,2,3-Trimethylbenzene	526-73-8	6.68E-06	AERMOD v.19191	1.02E-02	24	220	Health	B1	0.00%
1,2,4-Trimethylbenzene	95-63-6	2.49E-04	AERMOD v.19191	1.23E-01	24	220	Health	B1	0.06%
1-Butene	106-98-9	8.68E-05	AERMOD v.19191	1.32E-01	24	7000	Health	B2	0.00%
1-Hexene	592-41-6	1.34E-05	AERMOD v.19191	2.03E-02	24	850	Health	B2	0.00%
1-Pentene	109-67-1	1.80E-04	AERMOD v.19191	2.74E-01	24	2050	Health	B2	0.01%
2,2-Dimethylbutane	75-83-2	2.00E-05	AERMOD v.19191	3.05E-02	24	1750	Health	B2	0.00%
2-Methylpentane	107-83-5	1.87E-04	AERMOD v.19191	2.84E-01	24	1750	Health	B2	0.02%
3-Methylpentane	96-14-0	1.07E-04	AERMOD v.19191	1.62E-01	24	1750	Health	B2	0.01%
Aluminum (fumes or dust)	7429-90-5	8.46E-02	AERMOD v.19191	1.05E+00	24	12	Health	B2	8.75%
Aluminum Oxide	1344-28-1	1.65E-02	AERMOD v.19191	8.24E-03	24	100	Particulate	B1	0.01%
Acenaphthene	83-32-9	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Acetylene	74-86-2	0.00E+00	AERMOD v.19191	0.00E+00	10 min	56000	Odour	B1	0.00%
Ammonia	7664-41-7	0.00E+00	AERMOD v.19191	0.00E+00	24	100	Health	B1	0.00%
Anthracene	0120-12-07	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Antimony	7440-36-0	4.68E-07	AERMOD v.19191	2.00E-05	24	25	Health	B1	0.00%
Arsenic	7440-38-2	1.10E-03	AERMOD v.19191	5.50E-04	24	0.3	Health	B1	0.18%
Barium (total water soluble)	7440-39-3	7.87E-05	AERMOD v.19191	1.90E-04	24	10	Health	B1	0.00%
Benzene	71-43-2	1.64E-03	AERMOD v.19191	1.07E-01	Annual	2.2	-	SSS (current)	4.86%
Benzo(a)anthracene	56-55-3	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Benzo(a)fluorene	238-84-6	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m ³)	Averaging Period (hours)	MECP POI Limit (µg/m ³)	Limiting Effect	Category	Percent of MECP Limit (%)
Benzo(a)phenanthrene	0218-01-09	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Benzo(a)pyrene	50-32-8	0	AERMOD v.19191	0.00E+00	Annual	0.004	-	SSS (current)	0.00%
Benzo(b)fluorene	30777-19-6	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Benzo(e)pyrene	192-97-2	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Benzo(ghi)perylene	191-24-2	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Benzo(k)fluoranthene	0207-08-09	0	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Beryllium (and its compounds)	7440-41-7	0	AERMOD v.19191	0.00E+00	24	0.01	Health	B1	0.00%
Bismuth	7440-69-9	2.65E-04	AERMOD v.19191	5.60E-04	24	2.5	Health	B2	0.02%
Cadmium and Cadmium Compounds	7440-43-9	9.94E-03	AERMOD v.19191	4.94E-03	24	0.025	Health	B1	19.76%
Calcium Carbonate	1317-65-3	1.24E+00	AERMOD v.19191	7.45E+00	24	15	Health & Particulate	B2	49.64%
Calcium Magnesium Carbonate	69227-00-5	2.47E-01	AERMOD v.19191	4.86E-01	24	45	Health & Particulate	B2	1.08%
Calcium oxide	1305-78-8	2.00E-01	AERMOD v.19191	1.07E+00	24	10	Corrosion	B1	10.70%
Calcium silicate	1344-95-2	4.25E-02	AERMOD v.19191	9.56E-01	24	120	Health	B2	0.80%
Calcium sulfate	7778-18-9	3.28E-03	AERMOD v.19191	2.23E-02	24	20	Health	B2	0.11%
Carbon monoxide	630-08-0	3.95E+02	AERMOD v.19191	1.33E+03	30 min	6000	Health	B1	22.10%
Chlorine	7782-50-5	2.75E-01	AERMOD v.19191	1.41E+00	10 min	230	Health	B1	0.61%
				1.37E-01	24	10			1.37%
Chromium (and its compounds)	7440-47-3	7.94E-03	AERMOD v.19191	7.03E-03	24	0.5	Health	B1	1.41%
cis-2-Butene	590-18-1	9.35E-05	AERMOD v.19191	1.42E-01	24	2400	Health	B2	0.01%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Cobalt	7440-48-4	6.62E-04	AERMOD v.19191	3.92E-03	24	0.1	Health	B1	3.92%
Copper	7440-50-8	5.11E-03	AERMOD v.19191	1.73E-02	24	50	Health	B1	0.03%
Cyclohexane	110-82-7	7.82E-04	AERMOD v.19191	4.07E-01	24	6100	Health	B1	0.01%
Cyclopentane	287-92-3	3.34E-05	AERMOD v.19191	5.08E-02	24	1700	Health	B2	0.00%
Dibenz(ah)acridine	226-36-8	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Dibenz(aj)acridine	224-42-0	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Dibenzo(ah)anthracene	53-70-3	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Dioxins and Furans	NA	1.10E-07	AERMOD v.19191	5.49E-08	24	0.0000001	Health	B1	54.90%
Ethane	74-84-0	6.59E-03	AERMOD v.19191	7.23E-01	24	14500	Health	B2	0.00%
Ethyl benzene	100-41-4	1.98E-04	AERMOD v.19191	8.82E-01	10 min	1000	Health	B1	0.09%
Ethylene	74-85-1	0.00E+00	AERMOD v.19191	0.00E+00	24	40	Vegetation	B1	0.00%
Ferric oxide	1309-37-1	4.38E-01	AERMOD v.19191	2.30E+00	24	25	Soiling	B1	9.21%
Ferrous oxide	1345-28-1	1.79E-03	AERMOD v.19191	3.52E-03	24	0.1	-	de minimus	3.52%
Fluoranthene	206-44-0	0.00E+00	AERMOD v.19191	0.00E+00	24	140	Health	B2	0.00%
Fluorene	86-73-7	4.95E-02	AERMOD v.19191	2.47E-03	24	0.1	-	de minimus	2.47%
Graphite	7782-42-5	2.99E-02	AERMOD v.19191	1.97E-01	24	10	Health	B2	1.97%
Hydrochloric acid	7647-01-0	4.85E-02	AERMOD v.19191	1.33E+00	24	20	Health	B1	6.65%
Hydrogen cyanide	74-90-8	0.00E+00	AERMOD v.19191	0.00E+00	24	8	Health	de minimus	0.00%
Hydrogen sulphide	7783-06-4	0.00E+00	AERMOD v.19191	0.00E+00	10 min	13	Health & Odour	B1	0.00%
				0.00E+00	24	7			0.00%
Indeno(123-cd)pyrene	193-39-5	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Iron (metallic)	7439-89-6	1.43E-02	AERMOD v.19191	2.46E-01	24	4	Health	B1	6.15%
Iron hydroxide	1310-14-1	1.91E-03	AERMOD v.19191	2.66E-02	24	0.1	-	de minimus	26.63%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Isobutane	75-28-5	5.31E-03	AERMOD v.19191	2.43E+00	24	3600	Health	B1	0.07%
Isopentane	78-78-4	1.49E-03	AERMOD v.19191	2.27E+00	24	35500	Health	B2	0.01%
Isopropyl alcohol	67-63-0	1.39E+00	AERMOD v.19191	1.15E+00	24	7300	Health	B1	0.02%
Lead	7439-92-1	2.28E-02	AERMOD v.19191	1.23E-02	24	0.5	Health	B1	2.46%
			AERMOD v.19191	2.25E-03	30 day	0.2	Health	B2	1.13%
Magnesium	7439-95-4	0.00E+00	AERMOD v.19191	0.00E+00	24	72	Health	B2	0.00%
Magnesium carbonate	546-93-0	6.12E-02	AERMOD v.19191	1.02E+00	24	20	Health	B2	5.12%
Magnesium oxide	1309-48-4	1.04E-01	AERMOD v.19191	2.08E-01	24	120	Particulate	B1	0.17%
Manganese	7439-96-5	5.72E-02	AERMOD v.19191	2.62E-01	24	0.4	Health	B1	65.61%
Manganese(ii)Oxide	1309-84-4	3.30E-01	AERMOD v.19191	1.65E-01	24	0.4	Health	B1	41.25%
Mercury	7439-97-6	4.83E-06	AERMOD v.19191	1.00E-05	24	2	Health	B1	0.00%
Methane	74-82-8	7.59E+00	AERMOD v.19191	1.64E+01	24	37330	Health	B2	0.04%
Methylcyclohexane	108-87-2	8.10E-05	AERMOD v.19191	3.98E-02	24	8050	Health	B2	0.00%
Methylcyclopentane	96-37-7	7.34E-05	AERMOD v.19191	1.12E-01	24	3500	Health	B2	0.00%
Molybdenum	7439-98-7	1.21E-03	AERMOD v.19191	2.66E-03	24	120	Particulate	B2	0.00%
n-Butane	106-97-8	1.94E-02	AERMOD v.19191	9.30E+00	24	3600	Health	B2	0.26%
n-Heptane	142-82-5	1.07E-03	AERMOD v.19191	5.63E-01	24	11000	Health	B1	0.01%
n-Hexane	110-54-3	3.55E-03	AERMOD v.19191	1.86E+00	24	2500	Health	B1	0.07%
n-Octane	111-65-9	1.26E-04	AERMOD v.19191	1.56E+00	10 min	61800	Odour	B1	0.00%
n-Pentane	109-66-0	5.36E-03	AERMOD v.19191	2.64E+00	24	35500	Health	B1	0.01%
Naphthalene	91-20-3	0.00E+00	AERMOD v.19191	0.00E+00	24	22.5	Health	B1	0.00%
				0.00E+00	10 min	50	Odour		0.00%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration (µg/m ³)	Averaging Period (hours)	MECP POI Limit (µg/m ³)	Limiting Effect	Category	Percent of MECP Limit (%)
Nickel and Nickel Compounds	7440-02-0	4.42E-02	AERMOD v.19191	1.94E-03	Annual	0.04	Health	B1	4.85%
Nitrogen oxides (expressed as NO ₂)	10102-44-0	2.05E+02	AERMOD v.19191	3.17E+02	1	400	Health	B1	79.17%
			AERMOD v.19191	8.80E+01	24	200			43.99%
Nitrous oxide	10024-97-2	2.47E-01	AERMOD v.19191	3.70E-01	24	9000	Health	B1	0.00%
Phosphorus (total)	7723-14-0	3.65E-04	AERMOD v.19191	1.89E-03	24	0.5	Health	B2	0.38%
Phosphoric Anhydride	1314-56-3	2.04E-02	AERMOD v.19191	1.02E-02	24	1	Health	B2	1.02%
Total Suspended Particulate Matter	NA	1.82E+01	AERMOD v.19191	3.38E+01	24	127	-	SSS (current)	26.63%
Potassium	9/7/7440	1.75E-02	AERMOD v.19191	2.15E-01	24	1	Health	B2	21.48%
Potassium Chloride	7447-40-7	4.29E-02	AERMOD v.19191	6.88E-02	24	20	Health	B2	0.34%
Propane	74-98-6	1.33E-02	AERMOD v.19191	4.22E+00	24	215000	Health	B2	0.00%
Propylene	115-07-1	0.00E+00	AERMOD v.19191	0.00E+00	24	4000	Health	B1	0.00%
Pyrene	129-00-0	0.00E+00	AERMOD v.19191	0.00E+00	24	0.1	-	de minimus	0.00%
Pyrite	1309-36-0	0.00E+00	AERMOD v.19191	0.00E+00	24	120	Health & Particulate	B1	0.00%
Silicon dioxide	7631-86-9	5.26E-01	AERMOD v.19191	3.74E+00	24	5	Health	B2	74.81%
Silver	7440-22-4	2.04E-06	AERMOD v.19191	1.00E-05	24	1	Health	B1	0.00%
Sodium	740-23-5	2.30E-02	AERMOD v.19191	2.15E-02	24	10			0.22%
Strontium	7440-24-6	1.87E-04	AERMOD v.19191	4.60E-04	24	120	Particulate	B1	0.00%
Styrene	100-42-5	0.00E+00	AERMOD v.19191	0.00E+00	24	400	Health	B1	0.00%
Sulphur dioxide	9/5/7446	2.71E+01	AERMOD v.19191	7.93E+01	1	100 (July 2023 standard)	Health & Vegetation	B1	79.29%
			AERMOD v.19191	1.35E+00	Annual	10 (July 2023 standard)			13.50%

Emission Summary and Dispersion Modelling Report

Contaminant	CAS No.	Total Facility Emission Rate (g/s)	Air Dispersion Model Used	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period (hours)	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Category	Percent of MECP Limit (%)
Titanium (and its compounds)	7440-32-6	3.82E-03	AERMOD v.19191	6.25E-02	24	120	Particulate	B1	0.05%
Titanium Dioxide	13463-67-7	1.79E-03	AERMOD v.19191	3.52E-03	24	34	Health	B1	0.01%
Toluene	108-88-3	1.32E-03	AERMOD v.19191	5.68E+00	10 min	2000	Odour	de minimus	0.28%
Total reduced sulphur (TRS)	NA	0.00E+00	AERMOD v.19191	0.00E+00	10 min	13	Health Odour	B1	0.00%
trans-2-Butene	624-64-6	7.34E-05	AERMOD v.19191	1.12E-01	24	2400	Health	B1	0.00%
Tungsten (elemental)	7440-33-7	1.60E-04	AERMOD v.19191	3.50E-04	24	5	Health	B2	0.01%
Vanadium (fume or dust)	7440-62-2	2.32E-03	AERMOD v.19191	4.55E-03	24	2	Health	B1	0.23%
Xylene (mixed isomers)	1330-20-7	8.05E-05	AERMOD v.19191	4.30E-02	24	730	Health	B2	0.01%
Zinc	7440-66-6	1.18E+00	AERMOD v.19191	6.79E-01	24	120	Particulate	B1	0.57%

Notes:

Category – refers to Category B1 and B2 in the Air Contaminants Benchmark (ACB) List Version 2.0, unless noted otherwise.

de minimus – POI concentration of $0.1 \mu\text{g}/\text{m}^3$ (24-hour averaging period) applied for substance without standard or guideline under O. Reg. 419/05, as per MECP's ESDM Procedure Document.

SSS – Site-specific Standard

B1 – (Benchmark 1) - Exceedance of a B1 concentration triggers specific actions under O. Reg. 419/05.

B2 – (Benchmark 2) - Exceedance of a B2 concentration triggers a toxicological assessment to determine the likelihood of adverse effect

NA - Not Applicable

Assumption: Iron Oxide (FeO) was included in modelling assessment and was determined to have similar properties as Ferric Oxide (Fe_2O_3). Therefore, the maximum POI concentrations for FeO and Fe_2O_3 have been combined and compared against the corresponding MECP POI limit for Ferric Oxide ($25 \mu\text{g}/\text{m}^3$)