

# 2022 Operating Year ESDM REPORT

## Executive Summary

ArcelorMittal Dofasco (Dofasco) operates an integrated steel mill located at 1330 Burlington Street East in Hamilton, Ontario (the Facility). The Facility takes coal, iron ore, scrap steel, and fluxes, and are permitted to produce more than 4 million tons of flat rolled and tubular steel products per year. Major customers include the automotive, construction, energy, manufacturing, pipe and tube, appliance, container, and steel distribution industries. As of current operations, the Facility includes two coke plants, three blast furnaces, a KOBM basic oxygen furnace and an electric arc furnace in the steelmaking plant, two slab casters, a hot strip rolling mill, cold mills, annealing furnaces, galvanizing lines, an electrolytic coating line and two tube mills. Approximately 5,000 people work at the Facility.

The Facility was constructed prior to November 30, 2005 and the North American Industrial Classification System (NAICS) code that best describes its primary operations is 331110 – Iron and Steel Mills and Ferro-Alloy Manufacturing. The Facility was phased-in under Schedule 4 of Ontario Regulation (O.Reg. 419/05) and must have an Emission Summary and Dispersion Modelling (ESDM) Report in place in accordance with s.26 of the regulation.

This ESDM report was completed to demonstrate ongoing compliance with the Limited Operational Flexibility (LOF) contained within the Environmental Compliance Approval (Air and Noise) that has been issued to the site (A-500-9129100303). This ESDM Report meets the requirement of O.Reg. 419/05 and has been prepared using the Ontario Ministry of Environment, Conservation and Parks (MECP) publication: “*Procedure for Preparing an Emission Summary and Dispersion Modelling Report*”, dated March 2018 (ESDM Procedure Document).

The maximum point of impingement (POI) concentrations were calculated based on the operating conditions where significant sources were operating simultaneously at their maximum rate of production for the averaging time. The exception to this is where physical or operational limitations exist, which would exclude two pieces of equipment from operating simultaneously. The maximum emission rates for each significant compound emitted from the significant sources were calculated in accordance with s.11 of O.Reg. 419/05 and the data quality assessment follows the process outlined in the ESDM Procedure Document.

A maximum POI concentration for each significant contaminant emitted from the Facility was determined based on these conservative emission rates and the US EPA AERMOD dispersion model; the results are presented in the following Emission Summary Table.

The Facility has site specific standards (SSS) for four compounds. The POI concentrations listed in the Emission Summary Table were compared against the SSS where applicable. The remaining compounds released were compared to the O.Reg. 419/05 limits that apply to the Facility, as listed in the MECP’s publication “*Air Contaminants Benchmark List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants, Version 2.0*” dated April, 2018 [List of Ministry POI Limits and Screening Levels]. This ESDM includes consideration of all action plans previously developed by the Facility for these existing site specific standards.

The assessment of the site’s compliance with the MECP’s air quality criteria yields the following:

- The majority of compounds have MECP POI limits and are predicted to be below the respective limits (including Schedule 3 standards and MECP guideline criteria).
- Four compounds (i.e., benzene, benzo(a)pyrene, total suspended particulate, manganese) are predicted to be below the Site Specific Standards approved by the MECP for the site.
- Multiple compounds have been considered negligible through dispersion modelling because they are below 1% of their MECP POI Limits, JSL values or the MECP’s *de minimus* limit. These compounds are presented as an Appendix to this ESDM Report.

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- ☐ Three compounds (sodium, dicalcium silicate, thiocyanate) do not have MECP POI limits and are predicted to be below MECP approved maximum ground level concentrations approved under ECA No. A-5009129100303 dated September 17, 2021.

Details on the significant compounds are presented in the following Emission Summary Table.

In accordance with the requirements of the Limited Operational Flexibility under the Environmental Compliance Approval issued to the site, Dofasco maintains a log that describes modifications to the Facility.

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Emission Summary Table

Contaminant	CAS No.	Averaging Period [hours]	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [ $\mu\text{g}/\text{m}^3$ ] <sup>(1)</sup>	MECP POI Limit [ $\mu\text{g}/\text{m}^3$ ]	Category	Percentage of MECP Limit [%]
			2022 Actual		2022 Actual			
MINERAL SPIRITS	64475-85-0	24	1.76E+00	AERMOD	1.86E+01	1,750	B2	1%
Titanium dioxide	13463-67-7	24	1.06E-01	AERMOD	3.72E-01	34	B1	1%
Thallium	7440-28-0	24	1.90E-03	AERMOD	6.20E-03	0.5	B2	1%
Vanadium	7440-62-2	24	5.30E-03	AERMOD	2.59E-02	2	B1	1%
Triethanolamine	102-71-6	24	7.20E-03	AERMOD	3.66E-01	27	B2	1%
Butyl Cellosolve	111-76-2	10 min	1.53E-02	AERMOD	1.15E+01	500	B1	2%
Cellosolve Solvent	NA	24	8.88E-06	AERMOD	2.10E-03	0.1	de minimus	2%
Tin	7440-31-5	24	8.40E-03	AERMOD	2.44E-01	10	B1	2%
Beryllium	7440-41-7	24	1.07E-04	AERMOD	2.44E-04	0.01	B1	2%
Boric acid	10043-35-3	24	1.86E-02	AERMOD	9.52E-01	33	B1	3%
Calcium	7440-70-2	24	1.97E-04	AERMOD	3.00E-03	0.1	de minimus	3%
Hydrogen cyanide	74-90-8	24	1.94E-02	AERMOD	2.40E-01	8	B1	3%
Naphthalene	91-20-3	10 min	1.10E-01	AERMOD	2.34E+00	50	B1	5%
Chromium (VI)	18540-29-9	24	2.98E-04	AERMOD	3.60E-03	0.07	DAV	5%
Magnesium oxide	1309-48-4	24	1.57E+00	AERMOD	6.34E+00	120	B1	5%
Vinyl Toluene	25013-15-4	24	2.30E-01	AERMOD	6.58E+01	1,210	B2	5%
Aluminum oxide	1344-28-1	24	1.09E+00	AERMOD	6.58E+00	120	B1	5%
Nickel	7440-02-0	Annual	4.10E-03	AERMOD	2.40E-03	0.04	B1	6%
Sodium sulfate	7757-82-6	24	1.86E-02	AERMOD	9.52E-01	15	B2	6%
Ethylene	74-85-1	24	6.28E-01	AERMOD	2.58E+00	40	B1	6%
PSA	98-67-9	24	1.54E-04	AERMOD	7.10E-03	0.10	de minimus	7%
Zinc	7440-66-6	24	1.37E+00	AERMOD	9.59E+00	120	B1	8%
Phenol	108-95-2	24	9.89E-02	AERMOD	2.51E+00	30	B1	8%
Sodium hydroxide	1310-73-2	24	3.69E-02	AERMOD	9.15E-01	10	B1	9%
Potassium	7440-09-7	24	6.76E-02	AERMOD	1.11E-01	1	B2	11%
Cadmium	7440-43-9	24	2.00E-03	AERMOD	3.00E-03	0.03	B1	12%
Lead	7439-92-1	30 day	4.37E-02	AERMOD	2.55E-02	0.2	B1	13%
Lead	7439-92-1	24	4.37E-02	AERMOD	6.60E-02	0.5	B1	13%
Naphthalene	91-20-3	24	1.10E-01	AERMOD	3.28E+00	23	B1	15%
1,3,5-Hexahydro-S-Triazine	121-82-4	24	7.20E-03	AERMOD	3.66E-01	3	B2	15%
Calcium oxide	1305-78-8	24	2.18E-01	AERMOD	1.47E+00	10	B1	15%
Calcium hydroxide	1305-62-0	24	3.30E-01	AERMOD	2.15E+00	14	B1	16%
Hydroquinone	123-31-9	24	5.50E-03	AERMOD	1.80E+00	10	B2	18%
Silicon Dioxide	14808-60-7	24	3.99E-01	AERMOD	1.00E+00	5	B1	20%
Chromium (VI)	18540-29-9	Annual	2.98E-04	AERMOD	3.17E-04	0.0014	AAV	23%
Phosphorus Pentoxide	1314-56-3	24	6.01E-02	AERMOD	2.44E-01	1	B2	24%
Hydrochloric Acid	7647-01-0	24	9.49E-01	AERMOD	5.54E+00	20	B1	28%
Chromium (TOTAL)	7440-47-3	24	1.61E-02	AERMOD	1.59E-01	0.5	B1	32%

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Contaminant	CAS No.	Averaging Period [hours]	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [ $\mu\text{g}/\text{m}^3$ ] <sup>(1)</sup>	MECP POI Limit [ $\mu\text{g}/\text{m}^3$ ]	Category	Percentage of MECP Limit [%]
			2022 Actual		2022 Actual			
Dicalcium silicate	N/A-3	24	2.82E+00	AERMOD	1.47E+01	41	Site Specific Level	36%
Anthracene	120-12-7	24	1.50E-03	AERMOD	3.76E-02	0.10	de minimus	38%
Ferric oxide	1309-37-1	24	7.05E+00	AERMOD	9.57E+00	25	B1	38%
Ammonia	7664-41-7	24	1.91E+00	AERMOD	3.93E+01	100	B1	39%
Total Suspended Particles	N/A-1	24	5.86E+01	AERMOD	8.16E+01	177	Site Specific Standard	46%
Thiocyanate	81210-01-7	24	5.17E-02	AERMOD	2.46E+00	5	Site Specific Level	52%
Total Reduced Sulfur	N/A-2	24	1.47E+00	AERMOD	3.73E+00	7	B1	53%
Calcium carbonate	471-34-1	24	1.80E+00	AERMOD	8.29E+00	15	B2	55%
Chromium (VI)	18540-29-9	Annual	2.42E-04	AERMOD	8.02E-05	0.0001	B1	57%
DIOXIN FURAN	N/A-4	24	4.79E-08	AERMOD	6.76E-08	0.0000001	B1	68%
Total Reduced Sulfur	N/A-2	10 min	1.45E+00	AERMOD	8.93E+00	13	B1	69%
Manganese	7439-96-5	24	2.92E-01	AERMOD	1.05E+00	1.5	Site Specific Standard	70%
Nitrogen oxides	10102-44-0	1	1.97E+02	AERMOD	2.85E+02	400	B1	71%
Carbon monoxide	630-08-0	30 min	9.37E+02	AERMOD	4.24E+03	6,000	B1	71%
Benzene	71-43-2	Annual	1.31E+00	AERMOD	7.17E+00	10	Site Specific Standard	72%
Sodium	7440-23-5	24	4.40E-01	AERMOD	5.34E-01	0.7	Site Specific Level	79%
Nitrogen oxides	10102-44-0	24	1.89E+02	AERMOD	1.60E+02	200	B1	80%
Sulfur dioxide	7446-09-5	24	4.20E+02	AERMOD	2.24E+02	275	B1	81%
Sulfur dioxide	7446-09-5	1	4.82E+02	AERMOD	6.12E+02	690	B1	89%
Benzo[a]Pyrene	50-32-8	Annual	2.10E-03	AERMOD	1.06E-02	0.011	Site Specific Standard	96%

Notes:

Site specific level - reviewed and approved by the MECP in the 2018 ESDM submitted in support of ECA with LOF for the site.

(1) In accordance with MECP guidelines, 10-minute POI concentrations modelled at nearest sensitive receptor.