Emission Summary & Dispersion Modeling Report

Cabot Canada Ltd
Sarnia Ontario

Confidential Commercially Sensitive Information

Prepared for: Cabot Canada Ltd

Attention: Shamit Nakra

Prepared by:

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Project No.: 154864
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Revision 10

Emission Summary and Dispersion Modeling Report Check-List

Company Name:	Cabot Canada Ltd
Company Address:	800 Tashmoo Avenue
Location of Facility:	Sarnia, ON

The attached Emission Summary and Dispersion Modelling Report was prepared in accordance with s.26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009 and "Air Dispersion Modelling Guideline for Ontario" dated March 2009 and the minimum required information identified in the checklist on the reverse of this sheet has been submitted.

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Emission Summary and Dispersion Modelling Checksheet

	Required Information	Submitted	Explanation / Reference
	Executive Summary		
	1.1 Overview of ESDM Report	☒ **Yes**	Executive Summary
	1.2 Emission Summary Table	☒ **Yes**	Executive Summary
1.0	**Introduction and Facility Description**		
	1.1 Purpose and Scope of the ESDM Report (when report only represents a portion of facility	☒ **Yes**	Section 1
	1.2 Description of Processes and NAICS code(s)	☒ **Yes**	Section 2
	1.3 Description of Products and Raw Materials	☒ **Yes**	Section 2
	1.4 Process Flow Diagram	☒ **Yes**	Appendix A
	1.5 Operating schedule	☒ **Yes**	Section 2
2.0	**Initial Identification of Sources and Contaminants**		
	2.1 Source and Contaminants Table	☒ **Yes**	Section 3
3.0	**Assessment of Significance of Contaminants and Sources**		
	3.1 Identification of Negligible sources and contaminants	☒ **Yes**	Section 4
	3.2 Rationale for assessment	☒ **Yes**	Section 4
4.0	**Operating Conditions, Emission Estimating and Data Quality**		
	4.1 Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	☒ **Yes**	Sections 6, 7, 8
	4.2 Explanation of Method used to calculate the emission rate for each contaminant	☒ **Yes**	Sections 6, 7, 8 Appendices G/H/I
	4.3 Sample calculation for each method	☒ **Yes**	Appendices G/H/I
	4.4 Assessment of data quality for each emission rate	☒ **Yes**	Sections 6, 7, 8
5.0	**Source Summary Table and Property Plan**		
	5.1 Source summary table	☒ **Yes**	Appendix C/D
	5.2 Site Plan (scalable)	☒ **Yes**	Appendix B
6.0	**Dispersion Modelling**		
	6.1 Dispersion Modelling Input Summary Table	☒ **Yes**	Section 10
	6.2 Land Use Zoning Designation Plan	☒ **Yes**	Appendix B
	6.1 Dispersion Modelling Input and Output Files	☒ **Yes**	Appendix J
7.0	**Emission Summary Table and Conclusions**		
	7.1 Emission Summary Table	☒ **Yes**	Section 11
	7.2 Assessment of Contaminants with no MOE POI Limits	☐ **Yes**	Not applicable
	7.3 Conclusions	☒ **Yes**	Section 12
	Appendices (Provide details such as)		
	- Supporting Assessment of Negligible Sources/Contaminants	☒ **Yes**	Appendix E
	- Source Summary Table	☒ **Yes**	Appendices C / D

Executive Summary

The Cabot Canada Ltd facility is located at 800 Tashmoo Avenue, in Sarnia, Ontario. The facility is located in an area zoned industrial and commercial. The facility produces carbon black using the furnace process. The plant operates 24 hours/day, 7 days/week and 52 weeks/year. Daily production varies depending on customer demand, but the maximum production rate is 121,395 tonnes of carbon black per year.

This ESDMR was prepared in accordance with Section 26 of O. Reg. 419/05. It was prepared using the MOE publications *"Procedure for Preparing an Emission Summary and Dispersion Modelling Report", March 2009* and *"Air Dispersion Modelling Guideline for Ontario", March 2009.*

Section 20 of O. Reg. 419/05 applies to this facility, therefore all emission rates and modelling has been completed using the Schedule 3 standards and applicable averaging times. The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with Section 11 of O. Reg. 419/05. An air quality dispersion modelling assessment was performed for this facility using the AERMOD models. Dispersion Modelling has predicted that the simultaneous and continuous occurrence of all activities described in the maximum operating scenario will be in compliance with the O. Reg. 419/05 Schedule 3 Standards and Guidelines as shown in the tables below.

Emission Summary – 10 min Average

Contaminant	CAS#	Facility Emission Rate (g/s)	MAXGLC POI Concentration (µg/m3)	MOE POI Limit (µg/m3)	Schedule	Limiting Effect	% of Criteria	Model Stage
HYDROGEN SULPHIDE[1]	7783-06-4	0.696	2.72	13	Schedule 3	odour	21%	Stage 2

Emission Summary – 1/2 hr Average

Contaminant	CAS#	Facility Emission Rate (g/s)	MAXGLC POI Concentration (µg/m3)	MOE POI Limit (µg/m3)	Schedule	Limiting Effect	% of Criteria	Model Stage
CARBON MONOXIDE[1]	630-08-0	73.05	1628.98	6000	Schedule 3	health	27%	Stage 1

Emission Summary – 1 hr Average

Contaminant	CAS#	Facility Emission Rate (g/s)	MAXGLC POI Concentration (µg/m3)	MOE POI Limit (µg/m3)	Schedule	Limiting Effect	% of Criteria	Model Stage
NITROGEN OXIDES (EXPRESSED AS NO2)	10102-44-0	21.73	267.18	400	Schedule 3	health	67%	Stage 1
SULPHUR DIOXIDE	7446-09-5	193.41	356.08	690	Schedule 3	health	52%	Stage 2

1 1st High concentration was used for 10 minute and ½ hour averaging times

Emission Summary – 24 hr Average

Contaminant	CAS#	Facility Emission Rate (g/s)	MAXGLC POI Concentration (µg/m3)	MOE POI Limit (µg/m3)	Schedule	Limiting Effect	% of Criteria	Model Stage
HYDROGEN SULPHIDE	7783-06-4	0.70	5.39	7	Schedule 3	odour	77.1%	Stage 1
SULPHUR DIOXIDE	7446-09-5	193.41	138.20	275	Schedule 3	health	50.3%	Stage 2
NITROGEN OXIDES (EXPRESSED AS NO2)	10102-44-0	21.73	74.69	200	Schedule 3	health	37.3%	Stage 1
PM - PARTICULATE MATTER	N/A - M08	2.88	20.59	120	Schedule 3	visibility	17.2%	Stage 1
HYDROGEN CYANIDE	74-90-8	0.22	1.08	8	Schedule 3	health	13.4%	Stage 1
CARBON BLACK	1333-86-4	0.21	1.34	10	Schedule 3	soiling	13.4%	Stage 2
CARBON DISULPHIDE	75-15-0	1.91	15.35	330	Guideline	odour	4.7%	Stage 1
BENZO(A)PYRENE[3]	50-32-8	5.78E-07	4.64E-05	0.0011	Guideline	health	4.2%	Stage 1
AMMONIA	7664-41-7	0.03	0.10	100	Schedule 3	health	0.1%	Stage 1
MERCURY	7439-97-6	6.41E-04	8.16E-04	2	Schedule 3	health	0.041%	Stage 1
BENZENE	71-43-2	1.11E-02	0.344	100	URT	CARC	<URT	Stage 1
CARBON DIOXIDE	124-38-9	6818.39	7973.04	21000	JSL	--	<JSL	Stage 1
CARBONYL SULPHIDE[2]	463-58-1	0.63	5.02	10.22	FL	--	<FL	Stage 1
METHANE[2]	74-82-8	2.01	3.55	6	FL	--	<FL	Stage 2

Emission Summary – Annual Average

Contaminant	CAS#	Facility Emission Rate (g/s)	MAXGLC POI Concentration (µg/m3)	MOE POI Limit (µg/m3)	Schedule	Limiting Effect	% of Criteria	Model Stage
BENZO(A)PYRENE[3]	50-32-8	5.78E-07	9.29E-06	1.00E-05	Schedule 3 2016	Health	93%	Stage 1
BENZENE	71-43-2	1.11E-02	6.87E-02	0.45	Schedule 3 2016	CARC	15%	Stage 1

2 Facility limit from CofA number: 1124-5ZYGVL issued October 18, 2005

[3] As outlined in the MOE Document Ontario Air Standards for Benzo(A)Pyrene as a Surrogate for Polycyclic Aromatic Compounds, dated June 2011, benzo(A)pyrene was modeled as a surrogate for all PAHs

Emergency equipment, including a natural gas fired emergency generator, diesel fired fire water pump, diesel effluent backup pump and a diesel backup compressor exhaust have also been modeled and compared to the MOE NOx screening level concentration. Dispersion modeling has predicted that these pieces of emergency equipment will be in compliance with the MOE POI screening level concentration as detailed in Appendix E.