MEEGAN BURNSIDE



Whitesand First Nation Cogeneration and Pellet Mill Project

Emission Summary and Dispersion Modelling Report

Sagatay Cogeneration LP

October 2014

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Emission Summary and Dispersion Modelling Report

Prepared By:

Neegan Burnside Ltd. 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4

Prepared for:

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation as agent

October 2014

File No: 300030895.0000

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Ministry Ministère of the de Environment l'Environnement



EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

Company Name:	Sagatay Cogeneration LP	
Company Address:	PO Box 68, Armstrong, Ontario, P0T 1A0	
Location of Facility:	Crown land in an unorganized territory of the	
	Thunder Bay District near Whitesand First Nation & Armstrong ON	

The attached Emission Summary and Dispersion Modeling 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 July, 2005 and "Air Dispersion Modelling Guideline for Ontario" dated July 2005 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact: Name:	Craig Toset	-
Title:	Project Manager	
Phone Number:	807-583-2177	7
Signature:	tecs	
Date:	October 22, 2014	

Technical Contact:		
Name: Representing: Phone Number: Signature:	Harvey Watson	
	R. J. Burnside & Associates Limited	
	905-821-1800 x589	
	Huwt	
Date:	October 22, 2014	

	-	Required Information	Submitte	d Explanation/Reference
	Exe	cutive Summary and Emission Summary Table	Oubmitto	
	1.1	Overview of ESDM Report	X Yes	Executive Summary
	1.2	Emission Summary Table	X Yes	Executive Summary
1.0	Inte	eduction and Excility Description		
1.0		oduction and Facility Description	X Yes	Section 1.1
	1.1	Purpose and Scope of ESDM Report (when report only represents a portion of facility)	res l	Section 1.1
- C.	1.2	Description of Processes and NAICS code(s)	X Yes	Section 1.2
	1.3	Description of Products and Raw Materials	X Yes	Section 1.3
	1.4	Process Flow Diagram	X Yes	Section 1.4 & Figure E3
	1.5	Operating Schedule	X Yes	Section 1.5
2.0	Initi	al Identification of Sources and Contaminants		
	2.1	Sources and Contaminants Identification Table	X Yes	Section 2.1 & Table E1
	1			
3.0		essment of the Significance of Contaminants and rces	X Yes	Section 3.0
	3.1	Identification of Negligible Contaminants and Sources	X Yes	Section 3.1
	3.2	Rationale for Assessment	X Yes	Section 3.2
4.0	One	rating Conditions, Emission Estimating and Data Quality		
4.0	4.1	Description of operating conditions, for each significant	X Yes	Section 4.1 & App EA
	4.1	contaminant that results in the maximum POI concentration for that contaminant		Section 4.1 & App LA
	4.2	Explanation of Method used to calculate the emission rate for each contaminant	X Yes	Section 4.2 & App EA
	4.3	Sample calculation for each method	X Yes	Section 4.3 & App EA
	4.4	Assessment of Data Quality for each emission rate	X Yes	Section 4.4 & App EA
5.0	Sou	rce Summary Table and Property Plan		
0.0	5.1		X Yes	Section 5.1 & Table E2
	5.2		X Yes	Section 5.2 & Figure E2
_	5.2	Site Flan (scalable)		Section 5.2 & Figure E2
6.0	the second second	persion Modelling		
_	6.1	Dispersion Modelling Input Summary Table	X Yes	Section 6.1 & Table E3
	6.2	Land Use Zoning Designation Plan	Yes	n/a
	6.3	Dispersion Modelling Input and Output Files	X Yes	Section 6.3 & App EC
7.0	Emission Summary Table and Conclusions			1.1.1.1.1.1.1.1
2	7.1	Emission Summary Table	X Yes	Section 7.1 & Table E4
	7.2	Assessment of Contaminants with no MOE POI Limits	🔀 Yes	Section 7.2
	7.3	Conclusions	X Yes	Section 7.3
	App	endices (Provide supporting information or details such as)		
	Supp	Supporting Calculations		Appendix EA
	Supp	Supporting Information for Assessment of Negligibility		Appendix EB
		Dispersion Modelling Printouts		Appendix EC
			Yes	
)		□ Yes	
			□ Yes	
			☐ Yes	

Record of Revisions

Revision	Date	Description
0	December 18, 2013	Draft Report Submission for Consultation
1	October 17, 2014	Application to the Ministry of the Environment and Climate Change for Renewable Energy Approval and Environmental Compliance Approval

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- B Supporting Information for Assessment of Negligibility
- C Dispersion Modelling Printouts

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Definitions

Whitesand	Whitesand First Nation
Site ¹	Armstrong, Ontario P0T 1A0
Acoustic Assessment	Procedure for assessing the noise impact of a Site on the local PORs
The ADMGO	"Air Dispersion Modelling Guideline for Ontario", PIBS: 5165e
Air Dispersion Model	Air Dispersion Model described in Appendix to Ontario Regulation 346.
Application	Application for Approval (Air & Noise) form dated November 2005 document PIBS: 4173e
This Application	This document containing all the information as required by the ESDM Procedure Document.
CAS#	Chemical Abstract Society reference number
CofA	Certificate of Approval (Air & Noise) as issued by the
	Ontario Ministry of the Environment prior to 31 October 2011.
ECA	Environmental Compliance Approval as issued by the
	Ontario Ministry of the Environment after 31 October 2011.
EC	Engineering Calculation
EF	Emission Factor
ESDM	Emissions Summary and Dispersion Model
ESDM Procedure Document	"Procedure for Preparing an Emission Summary and
	Dispersion Modelling Report" dated March 2009, PIBS: 3614e03
ESDM Report Checklist	"Emission Summary and Dispersion Modelling
	Checklist", dated November 2005, PIBS: 5357e
Information for an MGLC	"Supporting Information for a Maximum Ground Level
	Concentration Acceptability Request Supplement to
	Application for Approval", dated 18 February 2005,
	PIBS: 4872e.pdf
Insignificant	Negligible

¹ The term Site is used specifically to clearly indicate the difference between the term facility used in O.Reg. 419 and the term Site which refers to the specific address and everything inside the property boundary which is the focus of This Application. It was felt that using the term "Facility" for this specific location could lead to confusion. The term Site is consistent with the connotations in the "Environmental Compliance Approval", and includes the full extent of the "Project Location" as defined by O.Reg. 359/09.

List of MOE POI Limits	Schedule 3 of "SUMMARY of STANDARDS and GUIDELINES to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O.Reg. 419 on UPPER RISK THRESHOLDS)" Dated April 2012, PIBS: 6569e01
	And
	"Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality", 6547e.pdf dated February 2008.
MB	Mass Balance
MOE	Ontario Ministry of the Environment
NOx	Nitrogen Oxides
O.Reg. 346	Ontario Regulation 346
O.Reg. 419	Ontario Regulation 419/05
TSP	Total Suspended Particulate
PM	Particulate Matter
POI	Point of Impingement (Contaminant)
POR	Point of Reception (Noise)
Products of Combustion	Contaminants emitted as a result of burning natural gas
Significant	Non-negligible
Source ID	The alphanumeric string assigned to a discharge point otherwise known as a "source reference number" in the "Acme Example" PIBS: 5987e.pdf.
VOC	Volatile Organic Compound

Executive Summary

This Emission Summary and Dispersion Modelling ("ESDM") report was prepared to support an application for a Renewable Energy Approval ("REA") and Environmental Compliance Approval ("ECA"). The ESDM report was prepared in accordance with s.26 of Ontario Regulation 419/05 ("O.Reg. 419") and the ESDM Procedure Document to support the REA and ECA applications.

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation (Whitesand) as agent, will operate a biomass fuelled electrical power and heat 3.6 MW cogeneration plant and a solid wood fuel pellet plant located in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and is located on the traditional territory of Whitesand First Nation. The Site is located in an area previously used as an industrial site. The main processes will be electrical power generation and solid wood fuel pellet production.

The Site is subject to s.20 of O.Reg. 419 so the modelling impact of contaminant emissions has been assessed as the worst case maximum Point of Impingement ("POI") concentrations against Schedule 3 criteria using the appropriate averaging period.

The Site is expected to emit products of combustion and particulate matter ("PM").

The maximum POI concentrations were calculated based on the operating conditions where all significant sources are operating simultaneously at their individual maximum rates of production. The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with s.11 of O.Reg. 419 and the data quality assessment follows the process outlined in the requirements of the ESDM Procedure Document.

A POI concentration for each significant contaminant emitted from the Site was calculated based on the calculated emission rates and the output from the Air Dispersion Model; the results are presented in the following Emissions Summary Table in accordance with s.26 of O.Reg. 419.

The POI concentrations listed in the Emissions Summary Table were compared against the "SUMMARY of STANDARDS and GUIDELINES to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O.Reg. 419 on UPPER RISK THRESHOLDS)" dated April 2012, PIBS: 6569e01 and "Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality", PIBS: 6547e ("List of MOE POI Limits").

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Of the contaminants listed in **Table E4** that have limits in the List of Ministry POI Limits, all the predicted POI concentrations are below the corresponding limits. For example, the 24-hour POI concentration for particulate matter is 60.17 μ g/m³ at 50.1% of the guideline of 120 μ g/m³.

Table E4: Emissions Summary Table (Rev2)

Location of													
CAS#	Contaminant	Total Emission Rate (g/s)	Dispersion Model Used	Max POI Value (µg/m³)	X (m)	Y (m)	Averaging Period Modelled (h)	Averaging Period of Criterion (h)	Max POI Value Converted to Criterion Period (μg/m³)	Criteria (µg/m³)	Limiting Effect	Regulation Schedule #	Percentage of Criteria or Likelihood of adverse effect (%)
0-03-3	Pentachlorodibenzo-p-furans	7.7645E-11	AERMOD-m	1.10964E-09	354191	5572230	24	24	1.10964E-09	0		0	Neg
50-00-0	Formaldehyde	0.00414676	AERMOD-m	0.528224	354177	5572216	24	24	0.528224	65	Health	Schedule 3	0.8%
50-32-8	Benzo(a)pyrene - all sources	4.8066E-07	AERMOD-m	6.86921E-06	354191	5572230	24	24	6.86921E-06	0.005	sessment Va	Schedule 3	0.1%
50-32-8	Benzo(a)pyrene - all sources	4.8066E-07	AERMOD-m	5.81987E-07	354219	5572309	8760	8760	5.81987E-07	0.00001	Health	Schedule 3	5.8%
51-28-5	2,4-Dinitrophenol	3.3277E-08	AERMOD-m	4.7556E-07	354191	5572230	24	24	4.7556E-07	0		0	Neg
53-70-3	Dibenzo(a,h)anthracene	1.6823E-09	AERMOD-m	2.40422E-08	354191	5572230	24	24	2.40422E-08	0		0	Neg
56-23-5	Carbon tetrachloride	8.3191E-06	AERMOD-m	0.00011889	354191	5572230	24	24	0.00011889	2.4	Health	Schedule 3	0.0%
56-55-3	Benzo(a)anthracene	1.2017E-08	AERMOD-m		354191	5572230	24	24	1.7173E-07	0		0	Neg
65-85-0	Benzoic Acid	8.6889E-09	AERMOD-m	1.24174E-07	354191	5572230	24	24	1.24174E-07	700	Health	Guideline	0.0%
66-25-1	Hexanaldehyde	1.2941E-06	AERMOD-m	0.000018494	354191	5572230	24	24	0.000018494	2	JSL	JSL	0.0%
	Acetone	3.5125E-05	AERMOD-m	0.000501981	354191	5572230	24	24	0.000501981	11880	Health	Schedule 3	0.0%
67-66-3	Chloroform	5.1764E-06	AERMOD-m	7.39761E-05	354191	5572230	24	24	7.39761E-05	1	Health	Schedule 3	0.0%
71-43-2	Benzene	0.00077645			354191	5572230	24	24	0.0110964	100	sessment Va	Schedule 3	0.0%
71-43-2	Benzene	0.00077645	AERMOD-m	0.000940134	354219	5572309	8760	8760	0.000940134	0.45	Health	Schedule 3	0.2%
71-55-6	1,1,1-Trichloroethane	5.731E-06	AERMOD-m	8.19021E-05	354191	5572230	24	24	8.19021E-05	115000	Health	Schedule 3	0.0%
74-82-8	Methane	0.00388227	AERMOD-m	0.055482	354191	5572230	24	24	0.055482	0		0	Neg
74-83-9	Bromomethane	2.773E-06	AERMOD-m	0.00003963	354191	5572230	24	24	0.00003963	1350	Health	Guideline	0.0%
74-87-3	Methyl Chloride	4.252E-06	AERMOD-m	6.07661E-05	354191	5572230	24	24	6.07661E-05	320	Health	Schedule 3	0.0%
75-01-4	Vinyl chloride	3.3277E-06	AERMOD-m	4.75561E-05	354191	5572230	24	24	4.75561E-05	1	Health	Schedule 3	0.0%
75-07-0	Acetaldehyde	0.00015344	AERMOD-m	0.004058	354059	5571849	1	0.5	0.004927203	500	Health	Schedule 3	0.0%
75-07-0	Acetaldehyde	0.00015344	AERMOD-m	0.00219286	354191	5572230	24	24	0.00219286	500	Health	Schedule 3	0.0%
75-09-2	Dichloromethane	5.3612E-05	AERMOD-m	0.000766181	354191	5572230	24	24	0.000766181	220	Health	Schedule 3	0.0%
75-69-4	CFC-11	7.5797E-06	AERMOD-m	0.000108322	354191	5572230	24	24	0.000108322	6000	Health	Guideline	0.0%
78-84-2	Isobutyraldehyde	2.2184E-06	AERMOD-m	0.000031704	354191	5572230	24	24	0.000031704	56	JSL	JSL	0.0%
78-87-5	1,2-Dichloropropane	6.1007E-06	AERMOD-m	8.71861E-05	354191	5572230	24	24	8.71861E-05	2400	Odour	Guideline	0.0%
78-93-3	Methyl ethyl ketone	9.983E-07	AERMOD-m	1.42668E-05	354191	5572230	24	24	1.42668E-05	1000	Health	Schedule 3	0.0%
79-01-6	Trichloroethylene	5.5461E-06	AERMOD-m	7.92601E-05	354191	5572230	24	24	7.92601E-05	12	Health	Schedule 3	0.0%
83-32-9	PAH - Acenaphthene	1.6823E-07	AERMOD-m	2.40422E-06	354191	5572230	24	24	2.40422E-06	0		0	Neg
85-01-8	Phenanthrene	1.2941E-06	AERMOD-m	0.000018494	354191	5572230	24	24	0.000018494	0		0	Neg
86-73-7	PAH - Fluorene	6.2856E-07	AERMOD-m	8.98281E-06	354191	5572230	24	24	8.98281E-06	0		0	Neg
86-74-8	Dibenzopyrrole	3.3277E-07	AERMOD-m	4.7556E-06	354191	5572230	24	24	4.7556E-06	40	JSL	JSL	0.0%
87-86-5	Pentachlorophenol	9.4284E-09	AERMOD-m	1.34742E-07	354191	5572230	24	24	1.34742E-07	20	Health	Guideline	0.0%
88-06-2	2,4,6-trichlorophenol	4.0671E-09	AERMOD-m	5.81241E-08	354191	5572230	24	24	5.81241E-08	1.5	JSL	JSL	0.0%
88-75-5	2-Nitrophenol	4.4369E-08	AERMOD-m	6.34081E-07	354191	5572230	24	24	6.34081E-07	0		0	Neg
91-20-3	Naphthalene	1.7932E-05	AERMOD-m	0.000474246	354059	5571849	1	0.1667	0.00078318	50	Odour	Guideline	0.0%
	Naphthalene	1.7932E-05	AERMOD-m	0.000256274	354191	5572230	24	24	0.000256274	22.5	Health	Guideline	0.0%
91-57-6	2-Methyl Naphthalene	2.9579E-08	AERMOD-m	4.2272E-07	354191	5572230	24	24	4.2272E-07	10	JSL	JSL	0.0%
<u>91-58-7</u>	2-Chloronaphthalene	4.4369E-10	AERMOD-m	6.34081E-09	354191	5572230	24	24	6.34081E-09	0		0	Neg
95-47-6	o-Xylene	4.6217E-06	AERMOD-m	6.60501E-05	354191	5572230	24	24	6.60501E-05	100	JSL	JSL	0.0%
	2-Chlorophenol	4.4369E-09	AERMOD-m	6.34081E-08	354191	5572230	24	24	6.34081E-08	0.8	JSL	JSL	0.0%
	Acetophenone	5.9158E-10	AERMOD-m	1.56452E-08	354059	5571849	1	1	1.56452E-08	1167	Health	Guideline	0.0%
	p-Nitrophenol	2.0336E-08	AERMOD-m	2.9062E-07	354191	5572230	24	24	2.9062E-07	4	JSL	JSL	0.0%
100-41-4	Ethylbenzene	5.731E-06	AERMOD-m	8.19021E-05	354191	5572230	24	24	8.19021E-05	1000	Health	Schedule 3	0.0%
100-42-5	Styrene	0.00035125	AERMOD-m	0.00501981	354191	5572230	24	24	0.00501981	400	Health	Schedule 3	0.0%
100-52-7	Benzaldehyde	1.5714E-07	AERMOD-m	2.2457E-06	354191	5572230	24	24	2.2457E-06	2	JSL	JSL	0.0%
	p-Tolualdehyde	2.0336E-06	AERMOD-m	0.000029062	354191	5572230	24	24	0.000029062	0		0	Neg
107-02-8	Acrolein	0.00073948	AERMOD-m	0.019557	354059	5571849	1	1	0.019557	4.5	Health	Schedule 3	0.4%
107-02-8	Acrolein	0.00073948	AERMOD-m	0.010568	354191	5572230	24	24	0.010568	0.4	Health	Schedule 3	2.6%
107-06-2	1,2-Dichloroethane / Ethylene dichloride	5.3612E-06	AERMOD-m	7.66181E-05	354191	5572230	24	24	7.66181E-05	2	Health	Schedule 3	0.0%
108-88-3	Toluene	0.00017008	AERMOD-m	0.00243064	354191	5572230	24	24	0.00243064	2000	Odour	Guideline	0.0%
108-90-7	Chlorobenzene	6.1007E-06	AERMOD-m	0.000161342	354059	5571849	1	0.1667	0.000266444	4500	Odour	Guideline	0.0%
100 00 7	Chlorobenzene	6.1007E-06	AERMOD-m	0.000161342	354059	5571849	1	1	0.000161342	3500	Health	Guideline	0.0%

Table E4: Emissions Summary Table (Rev2)

CASE Contaminant Table Base (g) market (g) biological biol biological biol biological biol biological biol biological biol biol biol biol biol biol biol biol						Locat	ion of							
117.17 Text 7 Bog Zethylmev) phthabale 6.8680-00 AERNOD-m 12417-4 PS2230 24 24 12.4747-4 PS301-6 0.0 ASL ASL </th <th>CAS#</th> <th>Contaminant</th> <th>Emission</th> <th></th> <th></th> <th></th> <th></th> <th>Period</th> <th>Period of</th> <th>Value Converted to Criterion Period</th> <th></th> <th></th> <th></th> <th>Criteria or Likelihood of adverse effect</th>	CAS#	Contaminant	Emission					Period	Period of	Value Converted to Criterion Period				Criteria or Likelihood of adverse effect
120:127 Antimicanie 5 5461 E 07 AEMADDEM 7 282011 C 63 124 24 7 82001 C 66 0.2 J.SL J.SL 0.0% 123:36 Oponosidelyde 15300 C 60 AEMADDE 215366 757200 24 24 215566 3 J.SL J.SL J.SL 0.0% 127:378 Colonaldenyde 153000 J 215566 34411 572200 24 24 245566 3.4 J.SL J.SL J.SL J.SL 0.0% 129:00-0 Dyname 6.8402-07 AEMODDM 877220 24 24 2457066 0 L J.SL J.SL <t< td=""><td>108-95-2</td><td>Phenol</td><td>9.4284E-06</td><td>AERMOD-m</td><td>0.000134742</td><td>354191</td><td>5572230</td><td>24</td><td>24</td><td>0.000134742</td><td>30</td><td>Health</td><td>Schedule 3</td><td>0.0%</td></t<>	108-95-2	Phenol	9.4284E-06	AERMOD-m	0.000134742	354191	5572230	24	24	0.000134742	30	Health	Schedule 3	0.0%
1123 s8 Proportidity/ge 11277-65 AENNOD-m 0.00028277 364059 571480 1 0.1687 0.00042915 10 Cobur Guidence 0.0% 1237-85 Octonalethyde 7.0254-66 AENNOD-m 51556057 244 24 24 51559057 24 34 JSL JSL 2.0% 127-184 Indendvoethyler 7.0254-66 AERNOD-m 51590577 244 24 0.0010038 6046146 JSL 2.0% JSL 2.0% JSL 0.0% 0.0% 0.0% 0.0% JSL 2.0% JSL 2.0% JSL 0.0% <td>117-81-7</td> <td>Bis(2-ethylhexyl) phthalate</td> <td>8.6889E-09</td> <td>AERMOD-m</td> <td>1.24174E-07</td> <td>354191</td> <td>5572230</td> <td>24</td> <td>24</td> <td>1.24174E-07</td> <td>50</td> <td>Health</td> <td>Schedule 3</td> <td>0.0%</td>	117-81-7	Bis(2-ethylhexyl) phthalate	8.6889E-09	AERMOD-m	1.24174E-07	354191	5572230	24	24	1.24174E-07	50	Health	Schedule 3	0.0%
122-73-9 Crokonaleshyde 18302-60 AEMNOC m 261588-05 3.4 JSL JSL JSL 0.0% 122-83-6 Cathon Doxide 3.0.09 155.10013 95110 557220 2.4 2.4 155.10013 2100 JSL	120-12-7	Anthracene	5.5461E-07	AERMOD-m	7.92601E-06	354191	5572230	24	24	7.92601E-06	0.2	JSL	JSL	0.0%
1124:88 Gathon Doxide 36.046021 AEMNOD-m 515.10613 24100 424 44 515.00613 2100 JSL JSL JSL 2.5% 1271.06 Fitterhonouthytem 7025416 65.200 244 24 97.75116.06 300 Head Schedular 0.0% 1124.26 Derang(h_j)peymen 17.056.06 AEMNOD 2.45766-7.03 244 24 2.45766-7.02 12 JSL	123-38-6	Propionaldehyde	1.1277E-05	AERMOD-m	0.000298237	354059	5571849	1	0.1667	0.000492515	10	Odour	Guideline	0.0%
112:10-64 Terucetincoentyleme 7.0281E-06 AERMOD-m 0.00010396 3940 1572230 24 24 9.07541E-06 0.2 35L .35L .00% 112:00-05 Prevene 4.6062E-07 AERMOD-m 2.45706E-07 354191 5572230 24 24 2.45706E-07 1.2 JSL .4SL .00% 115:82:72 Beroxog(p.h)(pervene 1.6048E-30 AERMOD-m 2.557230 24 24 2.46706E-07 1.2 JSL .00% 115:82:72 Beroxog(p.h)(pervene 1.6048E-30 AERMOD-m 2.5942E-07 0 0 0 Neg 2020-64 Fluorantheme 2.8976E-07 AERMOD-m 3.54191 5572230 24 24 9.5112E-68 0 0 0 Neg 2020-66-66 Aconsphtyleme 7.025159 AERMOD-m 1.00304E-07 3.54191 5572230 24 24 9.5112E-68 0 0 0 Neg 2020-66-66 Aconsphtyleme 7.025159 AERMOD-m 1.00304E-07 3.5419 5572230 24 24 1.00204E-	123-73-9	Crotonaldehyde	1.8302E-06	AERMOD-m	2.61558E-05	354191	5572230	24	24	2.61558E-05	3.4	JSL	JSL	0.0%
112:00-0. Pyrene 6.8402E-07 AERMOD-m 9.77541E-06 3.24 2.4 </td <td>124-38-9</td> <td>Carbon Dioxide</td> <td>36.0496261</td> <td>AERMOD-m</td> <td>515.190613</td> <td>354191</td> <td>5572230</td> <td>24</td> <td>24</td> <td>515.190613</td> <td>21000</td> <td>JSL</td> <td>JSL</td> <td>2.5%</td>	124-38-9	Carbon Dioxide	36.0496261	AERMOD-m	515.190613	354191	5572230	24	24	515.190613	21000	JSL	JSL	2.5%
191-24-29 294 24 247086-07 1.2 JSL U.SL 0.0% 192-07.2 2800-20 394101 557230 24 24 6.86921-60 0 0 Neg 192-07.2 2800-20 24 24 6.86921-60 0 0 Neg 192-07.2 2800-20 24 24 2.4626.07 0 0 Neg 193-05.0 15211 AERMOD-n 2.947.07 354101 557.230 24 24 4.247.240 140 JSL 0.0 Neg 205-99.2 Berxol/Duranthene 2.657.07 AERMOD-n 4.277.260 244 4.277.40 140 JSL 0.0 Neg 207-09.0 AERMOD-n 2.057.230 24 24 4.247.20 140 4.257.20 4.24 1.277.40 1.0 0.0 Neg 216-04.0 Berxol/Duranthene 1.0351.10 AERMOD-n 1.02024-01 3.4511 SFFX00 1.000000 SFFX10 AERMOD-n	127-18-4	Tetrachloroethylene	7.0251E-06	AERMOD-m	0.000100396	354191	5572230	24	24	0.000100396	360	Health	Schedule 3	0.0%
19297-29 Benzole joyren 4.8066E-10 AERMOD-m Be8021E-09 24 24 24 24.80621E-09 0 0 Neg 193-355-116401(1.2.5-c.10)/versa 9.6132E-11 AERMOD-m 7.37384E-09 357230 24 24 24 24.824E-07 0 0 Neg 205-952 Benzole jhurorinthee 1.847E-00 AERMOD-m 24.272E-06 354110 557230 24 24 4.242E-07 0 0 Neg 205-952 Benzole jhurorinthee 2.85767 AERMOD-m 4.2272E-06 354110 557230 24 24 4.42272E-06 140 JBL ASL 0.0% 202-96-6 AERMOD-m 100396E-07 354111 557230 24 24 1.00396E-07 5 JSL 0 0 Neg 252-92-04 Chaudehydre 1.331E-08 AERMOD-m 1.00396E-07 354181 557230 24 24 1.00396E-07 0 0 Neg 500-080 Caudo monoide 0.1058213 AERMOD-m 1.9324E-18 1.00001521 1.5 S511849	129-00-0	Pyrene	6.8402E-07	AERMOD-m	9.77541E-06	354191	5572230	24	24	9.77541E-06	0.2	JSL	JSL	0.0%
193-35-Inderol(1.2.5.c)gyrene 1.6094-60 AERMOD-m 228954-67 557230 24 24 1.27394-69 0 0 Neg. 198-55.0 Pervlene 6.15321-1 AERMOD-m 22854-7 7.55419 557230 24 24 2.4724-65 1.0 JSL 0.0 Neg. 208-64.0 Pervlene AERMOD-m 2.672-60 54191 557230 24 24 2.4724-65 1.00 JSL 0.0 Neg. 207-64.8 Benzol/fluoranthene 6.55316-01 AERMOD-m 557230 24 24 2.4724.6 1.00 JSL 0.0 Neg. 216.01 Benzol/fluoranthene 6.55316-01 AERMOD-m 557230 24 24 1.002346-01 0 0 Neg. 216.01 Benzol/fluoranthene 1.019213 AERMOD-m 557230 24 24 1.002346-50 0 D Neg. 216.01 AERMOD-m 1.00245-60 557149 1 0.5 3.561181838 6000 Health Schedula 3 0.1% 1740-16 2.000005	191-24-2	Benzo(g,h,i)perylene	1.7193E-08	AERMOD-m	2.45706E-07	354191	5572230	24	24	2.45706E-07	1.2	JSL	JSL	0.0%
193-35-Inderol(1.2.5.c)gyrene 1.6094-60 AERMOD-m 228954-67 557230 24 24 1.27394-69 0 0 Neg. 198-55.0 Pervlene 6.15321-1 AERMOD-m 22854-7 7.55419 557230 24 24 2.4724-65 1.0 JSL 0.0 Neg. 208-64.0 Pervlene AERMOD-m 2.672-60 54191 557230 24 24 2.4724-65 1.00 JSL 0.0 Neg. 207-64.8 Benzol/fluoranthene 6.55316-01 AERMOD-m 557230 24 24 2.4724.6 1.00 JSL 0.0 Neg. 216.01 Benzol/fluoranthene 6.55316-01 AERMOD-m 557230 24 24 1.002346-01 0 0 Neg. 216.01 Benzol/fluoranthene 1.019213 AERMOD-m 557230 24 24 1.002346-50 0 D Neg. 216.01 AERMOD-m 1.00245-60 557149 1 0.5 3.561181838 6000 Health Schedula 3 0.1% 1740-16 2.000005														Neg
2099-2 Bernotoffuncanthene 1.9487E-08 AFHNOD-m 2.242-07 24 24 2.4227E-06 140 JSL JSL JSL 0.0 Neg 2094-40 Formation 6.8553E-09 AFMNOD-m 9.2727-26 8.44191 5572230 24 24 4.272E-06 140 JSL											-		0	0
2004-0 Fluoranthene 2.9579E-07 AEMODO-m 427226-06 344191 5572230 24 42 4.2272-06 1400 JSL 0.0% 2007-08 Beroxlphuoranthyrene 2.2455E-09 AEMODO-m 0.0001321 344191 5572230 24 24 9.5171E-08 0 0 Neg 218-019 Beroxlphuoranthyrene 1.0251E-09 AEMODO-m 1.00238E-07 2441 24 1.00398E-07 0 0 Neg 594-08-61 Lobromodherne 1.0168E-05 AEMODO-m 1.00244513 344191 557230 24 24 1.00241531 0 Neg 350-08-0 Carbon monoxide 0.1106213 AEMOD-m 1.24174E-08 344191 557230 24 24 1.24174E-00 0.00005 sesment Vs Schedule 3 0.1% 746-01-2 2.3.7 Attrachorodheraz-para- doxin AERMOD-m 1.952662-01 0 0 Neg 2567-07-1 Dichorobipheryl 1.3686-10 AERMOD-m 1.952682-06														- 0
2070-98 Berncy(h)lubranthene 6 6553:00 AERMOD-m 0.001321 35419 572230 24 24 9.51121E-08 0 0 Neg 208-96-A canapithylenenanthere 7.0251E-09 AERMOD-m 10.0096E-07 3.5 J.SL J.SL 0 Neg 252-92-0 Foldadetylenenanthere 1.0158E-05 AERMOD-m 10.0224E-05 34119 5572230 24 24 1.00224E-05 0 0 Neg 560-68-0 Carbon monoxide 1.01992103 AERMOD-m 1.2342 3419 557230 24 24 1.24174E-09 0.00005 essment Va Schedule 3 0.1% 1746-01-8 23.7.8 lettrachiorodilenzo-para-dioxin 8.6889E-11 AERMOD-m 1.521250 24 24 1.24174E-09 0.00005 essment Va Schedule 3 0.1% 23.7.8 lettrachiorodilenzo-para-dioxin 8.6889E-11 AERMOD-m 15262E-10 547230 24 24 12437E-07 0 0 Neg 23.7.8 lettrachiorodilenzo-para-dioxin <td< td=""><td>205-99-2</td><td>Benzo(b)fluoranthene</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	205-99-2	Benzo(b)fluoranthene												
208-96-8 Acemaptinylene 9.2435E-07 AERMOD-m 0.0001321 345 JSL JSL 0.0% 218-01-9 Berozolphenmithrene 7.0251E-00 AERMOD-m 1.00398E-07 24 24 1.00398E-07 0 0 Neg. 562-92-04 D-Tolualdehyde 1.3311E-06 AERMOD-m 1.0024E-05 364191 1572230 24 24 1.002924E-05 0 0 Neg. 560-04-9 Carbon monxide 0.11092193 AERMOD-m 2.93482 354059 5571494 1 0.5 3.56118833 6000 Health Schedule 3 0.0% 714-61-16 2.37.8-tetrachinocibinezo-pare- doxin 8.889E-11 AERMOD-m 1.82055-10 557230 24 24 1.42174E-09 0 0 Neg 2056-67-1 Dichorobiphenyl 1.386E-10 AERMOD-m 1.05205E-10 1557230 24 24 1.4537E-07 0 0 Neg 2056-67-1 Dichorobiphenyl 1.396E-10 AERMOD-m 1.05205E-10			2.9579E-07	AERMOD-m	4.2272E-06		5572230			4.2272E-06	-	JSL	JSL	0.0%
218-01-32 Berxologupenanthrene 7.0251E-09 AERMOD-m 100398E-07 24 24 10.0398E-07 0 0 Neg 559-0240 Carbon monoxide 1.118E-05 AERMOD-m 0.00014331 34191 5572230 24 24 0.00014331 0 0 Neg 630-08-10 Carbon monoxide 0.11925193 AERMOD-m 1.24174E-09 1 0.5 3.56181883 6000 Health Schedule 3 0.0% 1746-01-0 2.3.7.8-Herachiorodiberzo-para- doxin 8.6888E-11 AERMOD-m 1.9508E-00 354191 5572230 24 24 1.24174E-00 0.00005 essment V8 Schedule 3 0.1% 20504-71 Dichiorobiphenyi 1.38E-10 AERMOD-m 1.9508E-00 354191 5572230 24 24 1.95508E-03 0 0 Neg 20514-30 Dichiorobiphenyi 1.38E-10 AERMOD-m 1.9508E-03 354191 5572230 24 24 1.95508E-03 0 0 Neg 20514-30 Dichiorobiphenyi 1.38E-10 AERMOD-m 1.9508E-10 557230<	207-08-9	Benzo(k)fluoranthene	6.6553E-09	AERMOD-m	9.51121E-08	354191			24	9.51121E-08	0			
529-29-10 Tolusidehyde 1.311E-06 AERMOD-m 1.90224E-05 344 24 1.90224E-05 0 0 Neg. 540-498.[2:Dibrromcheme 1.0168E-05 AERMOD-m 2.933482 354059 557149 1 0.5 3.561618838 6000 Health Schedule 3 0.0% 1746-01-8 2.37. Hetrachlorodberzo-pare- douin 8.689E-11 AERMOD-m 1.9205E-10 35421 557230 24 24 1.24174E-09 0.00005 essment V8 Schedule 3 0.0% 746-01-8 2.37. Hetrachlorodberzo-pare- douin 8.689E-11 AERMOD-m 1.9505E-01 354219 557230 24 24 1.95026-08 0 Neg. 2050-67.[Dibriorobjphenyl 4.995E-11 AERMOD-m 7.3341E-10 36419 557230 24 24 1.9550E-08 0 0 Neg. 2954-69.[Dibriorobjphenyl 1.938E-10 AERMOD-m 7.3341E-10 36419 5572230 24 24 1.9550E-08 0 0 Neg. 2954-69.[Dibriorobjphenyl 1.238E-10 AERMOD-m 0.20921581 557230 24				-								JSL		
540-49.8 [].2.Dipromoetheme 10188E-05 AERMOD-m 0.00014531 354191 5572230 24 24 0.0014531 0.0 Health Schedule 3 0.1% 630-08-0 Carbon monoxide 0.11920133 AERMOD-m 2.93342 354095 5571249 1 0.5 3.5618838 6000 Health Schedule 3 0.1% 1746-016 2.3.7.8-terachionodibenzo-para- doxin 8.6889E-11 AERMOD-m 1.95026E-00 354191 5572300 24 24 1.95508E-00 0 0 Neg 20516-43 Dischionobiphenyi 1.9868E-10 AERMOD-m 1.95508E-00 34191 577230 24 24 1.73341E-10 0 0 Neg 20516-43 Dischionobiphenyi 1.388E-10 AERMOD-m 1.95508E-00 34191 577230 24 24 1.7337E-07 0 0 Neg 7439-80-5 Dischionobiphenyi 1.388E-10 AERMOD-m 1.000715816 357193 577230 24 24 1.070726816 <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>				-									-	
630-08-0 Carbon monoxide 0.1192193 AERMOD-m 2.934422 38409 587149 1 0.5 3.561181838 6000 Health Schedule 3 0.1% 1746-01-6 2.37.8+tretant/loroid/benzo-parte- doxin 8.689E-11 AERMOD-m 1.24174E-09 557230 24 24 1.24174E-09 0.00005 essment V8 Schedule 3 0.0% 1746-01-6 2.37.8-tretant/loroid/benzo-parte- doxin 8.689E-11 AERMOD-m 1.9505E-10 1567230 24 24 1.9506E-00 0 Neg 2026-67.1 <dichloroid benzo-p-dioxin<="" td=""> 1.2301E-10 AERMOD-m 1.9505E-00 35411 557230 24 24 1.9506E-00 0 Neg 20274-05 Dichloroid/benzo-p-dioxin 1.2301E-00 AERMOD-m 1.9502E-07 354191 557230 24 24 1.9503E-00 0 Neg 7439.827.1<lad< td=""> BATMOD-m 1.9502E-00 354191 557230 24 24 0.00021563 0 0 Neg 7439.827.1<lad< td=""> BATMOD-</lad<></lad<></dichloroid>														
1746-016 2.7.7.8-tetrachiorodibenzo-para- dioxin 8.689E-11 AERMOD-m 1.24174E-09 354191 5572230 24 24 1.24174E-09 0.000005 sessment Va Schedule 3 0.0% 1746-016 2.3.7.8-tetrachiorodibenzo-para- dioxin 8.689E-11 AERMOD-m 1.05205E-10 354219 557230 24 24 1.9505E-00 0 0 Neg 2051-24.3 Decachiorobiphenyl 4.9915E-11 AERMOD-m 1.9505E-00 354191 5572230 24 24 1.9505E-00 0 Neg 2261-24.3 Decachiorobiphenyl 1.388E-10 AERMOD-m 1.93508E-00 354191 5572230 24 24 1.9505E-00 0 Neg 3288-67.9 Octachiorobiphenyl 1.388E-10 AERMOD-m 1.73327E-07 344191 5572230 24 24 0.00021563 0 Neg 7439.942-1 Lead 8.738E-06 AERMOD-m 0.000128816 354191 557230 24 24 0.00021636 0.5 Health S				-									-	
1746-01-6 dioxin 0.00052-11 AERWOL-In 1.74/174-03 397420 2/4 2/4 1.74/4-104 0.00000 persimiler v3 Scheduel 3 0.0% 1746-01-6 23.7.8-fetrahlorodiberzo-para- dioxin 8.6898-11 AERMOD-m 1.05205E-10 354219 5572309 8760 8760 1.05205E-10 1E-07 Health Scheduel 3 0.1% 2050.67.1 Dichlorobiphenyl 1.388E-10 AERMOD-m 1.95508E-09 354191 5572230 24 24 1.95508E-09 0 0 Neg 29174-90-5 Dichlorobiphenyl 1.388E-10 AERMOD-m 1.145508E-09 364191 5572230 24 24 1.95508E-09 0 0 Neg 2918-87-9 Dichlorobiphenyl 1.388E-10 AERMOD-m 1.74372E-07 0 0 Neg 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00027861 354191 5572230 24 24 0.000261558 0 0 Neg 7439-92-1 Lead 8.8738E	630-08-0		0.11092193	AERMOD-m	2.933482	354059	5571849	1	0.5	3.561818838	6000	Health	Schedule 3	0.1%
1749-01-5 dixin 5.0809E-11 AEXMOUNT 1.0520E-10 57230 6700 6700 1.0520E-10 TE-07 Health Schedues 0.1% 2265-67-1 Dichlorobphenyl 4.3915E-11 AERMOD-m 7.3341E-10 364191 5572230 24 24 7.19341E-10 0 0 Neg 2267-49.0 Dichlorobphenyl 1.386E-10 AERMOD-m 7.13341E-10 5572230 24 24 1.95508E-09 0 0 Neg 3268-67-9 Octachlorobphenyl 1.326E-66 AERMOD-m 1.03508E-09 5572230 24 24 1.05508E-09 0 0 Neg 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00261558 364191 5572230 24 24 0.002212 0.4 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.0022122 34 24 0.0421616 0.5 Health Schedule 3 0.0% 7439-92-6 Marganese	1746-01-6		8.6889E-11	AERMOD-m	1.24174E-09	354191	5572230	24	24	1.24174E-09	0.000005	sessment Va	Schedule 3	0.0%
2051-24-3 Deschlorobiphenyl 4.9915E-11 AERMOD-m 7.13341E-10 5572230 24 24 7.13341E-10 0 Neg 2974-90-5 Dichlorobiphenyl 1.368E-10 AERMOD-m 1.95508E-09 354191 5572230 24 24 1.95508E-09 0 Neg 3268-87-9 Otachlorodibenzop-dioxin 1.2201E-08 AERMOD-m 1.04372E-07 354191 5572230 24 24 1.04072E-07 0 0 Neg 7439-89-6 Ircan 0.00018302 AERMOD-m 0.00216816 354191 5572230 24 24 0.00216816 0 0 Neg 7439-96-5 Marganese 0.009279 AERMOD-m 0.042272 354191 5572230 24 24 0.042272 0.4 Health Schedule 3 0.0% 7439-96-7 Mickule 6.1007E-06 AERMOD-m 9.24701E-06 354191 5572230 24 24 5.44821E-06 120 Particulate 0.0% 1.1% 744	1746-01-6		8.6889E-11	AERMOD-m	1.05205E-10	354219	5572309	8760	8760	1.05205E-10	1E-07	Health	Schedule 3	0.1%
2874-90-5 Dichlorobiphenyl 1.368E-10 AERMOD-m 1.95508E-09 244 244 1.95508E-09 0 Neg 7439-89-6 1ron 0.00018302 AERMOD-m 0.0261558 354191 5572230 24 24 1.74372E-07 0 Neg 7439-89-6 1ron 0.00018302 AERMOD-m 0.002126816 354191 5572230 24 24 0.00216816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00866E-05 354191 5572230 24 24 0.00261578 0.0 Neg 7439-97-5 Mercury 6.4704E-07 AERMOD-m 0.0042272 0.4 Health Schedule 3 0.0% 7439-97-5 Mercury 6.4704E-07 AERMOD-m 5.5421F-06 354191 5572230 24 24 5.5421F-06 1.00 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 384191	2050-67-1	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
3268-87-9 Octachlorodibenzo-p-dioxin 1.2201E-08 AERMOD-m 1.74372E-07 354191 5572230 24 24 1.74372E-07 0 0 Neg 7439-89-61 (ron 0.00018302 AERMOD-m 0.00021558 354191 5572230 24 24 0.000216816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00042272 354191 5572230 24 24 0.0002172 0.4 Health Schedule 3 0.0% 7439-96-5 Manganese 0.00022579 AERMOD-m 0.0042272 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-98-7 Molyddenum 3.8825-07 AERMOD-m 9.24701E-06 354191 557230 24 24 5.78161E-05 2 pessment Vg Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.18671E-06 354191 557230 24 24 0.044	2051-24-3	Decachlorobiphenyl	4.9915E-11	AERMOD-m	7.13341E-10	354191	5572230	24	24	7.13341E-10	0		0	Neg
7439-99-6 [ron 0.00013302 AERMOD-m 0.0021588 354191 5572230 24 24 0.00215816 0.0 0 Neg 7439-92-1 [Lead 8.8738E-06 AERMOD-m 0.000126816 354191 5572230 24 24 0.000126816 0.5 Health Schedule 3 0.0% 7439-92-1 [Lead 8.8738E-06 AERMOD-m 0.0042272 354191 5572230 24 24 0.0042272 0.4 Health Schedule 3 0.0% 7439-97.6 [Mercury 6.4704E-07 AERMOD-m 0.24701E-06 354191 5572230 24 24 9.24701E-06 120 Particulate Guideline 0.0% 7439-97.6 [Mercury 6.4704E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 [Nickel 6.1007E-06 AERMOD-m 7.38677E-06 0.041914 5572230 24 24 0.103038 8 JSL JSL 1.3% <	2974-90-5	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00126816 54111 5572230 24 24 0.000126816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 2.08806E-05 554191 5572230 24 24 0.0042272 0.4 Health Schedule 3 1.1% 7439-96-5 Marganese 0.00029579 AERMOD-m 0.0042272 354191 5572230 24 24 0.0042272 0.4 Health Schedule 3 0.0% 7439-97-6 Mercury 6.4704E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 5.54821E-06 100 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 5572230 24 24 0.103038 8 JSL JSL 1.3% 7440-02-0 Nickel 6.00720933 AERMOD-m 0.000391121 354191 5572230 24 24 0.0004914 1 Health Schedule 3 0.0% 7440-22-0<	3268-87-9	Octachlorodibenzo-p-dioxin	1.2201E-08	AERMOD-m	1.74372E-07	354191	5572230	24	24	1.74372E-07	0		0	Neg
7439-92-1 Lead 8.8738E-06 AERMOD-m 20.8806E-05 354199 5572280 720 720 20.8806E-05 0.2 Health Schedule 3 0.0% 7439-96-5 Marganese 0.0002979 AERMOD-m 0.0042272 354191 5572230 24 24 0.0042272 0.4 Health Schedule 3 1.1% 7439-98-7 Molybdenum 3.8823E-07 AERMOD-m 5.4821E-06 354191 5572230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 5.7367230 24 24 8.71861E-05 2 sessmult Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 364191 5572230 24 24 0.034914 1 Health Schedule 3 0.0% 7440-02-0 Nickel 0.00071293 AERMOD-m 0.000951121 357230 24 24 0.0049141 1 Health Schedule 3 0.4% 7440-24-5 Sodium 6.6553E-05	7439-89-6	Iron	0.00018302	AERMOD-m	0.00261558	354191	5572230	24	24	0.00261558	0		0	Neg
7439-96-5 Marganese 0.00029579 AERMOD-m 0.042272 364191 557230 24 24 0.042272 0.4 Health Schedule 3 1.1% 7439-97-6 Mercury 6.4704E-07 AERMOD-m 9.24701E-06 354191 5572230 24 24 9.24701E-06 10.5 Health Schedule 3 0.0% 7439-97-6 Mercury 3.8823E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 8.71861E-05 2 jessment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 8.71861E-05 354191 5572300 24 24 0.04 Health Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.103038 354191 557230 24 24 0.103038 8 JSL 1.3% 7440-22-4 Silver 0.00031428 AERMOD-m 0.0004911 1 Health Schedule 3 0.4% 7440-23-6 Sodium 6.6653505 AERMOD-m 0.0002642 354191 5572230	7439-92-1	Lead	8.8738E-06	AERMOD-m	0.000126816	354191	5572230	24	24	0.000126816	0.5	Health	Schedule 3	0.0%
7439-97-6 Mercury 6.4704E-07 AERMOD-m 9.24701E-06 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-98-7 Molybdenum 3.8823E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 5.54821E-06 120 Particulate Gudeline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 5572309 8760 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.013038 354191 5572309 8760 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-02-7 Polassium 0.00031428 AERMOD-m 0.0044914 1 Health Schedule 3 0.4% 7440-23-5 Sodium 6.6553E-05 AERMOD-m 0.000951121 354191 5572230 24 24 0.0002642 120 Particulate Guideline 0.0% 7440-23-6 Titanium 3.8974E-06 AERM	7439-92-1	Lead		AERMOD-m	2.08806E-05						-	Health	Schedule 3	0.0%
7439-88-7 Molybdenum 3.8823E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.8677E-06 354191 557230 24 24 8.71861E-05 2 essment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 557230 24 24 0.103038 8 JSL JSL 1.3% 7440-02-4 Silver 0.00031428 AERMOD-m 0.0049114 354191 557230 24 24 0.004951121 0 0 Neg 7440-23-5 Sodium 6.6553E-05 AERMOD-m 0.00096121 354191 557230 24 24 0.00002642 120 Particulate Guideline 0.0% 7440-32-5 Stontium 1.8487E-06 AERMOD-m 0.00002642 354191 557230 24 24 0.00002642 120 Particulate Guideline 0.0% 7440-32-6 Kar														
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7440-48-4 Cobalt 1.2017E-06 AERMOD-m 0.00017173 354191 557230 24 24 0.00017173 0.1 Health Guideline 0.0% 7440-50-8 Copper 9.0586E-06 AERMOD-m 0.000129458 354191 557230 24 24 0.000129458 50 Health Schedule 3 0.0% 7440-62-2 Vanadium 1.8117E-07 AERMOD-m 2.58916E-06 354191 557230 24 24 2.58916E-06 2 Health Schedule 3 0.0% 7440-65-5 Yttrium 5.5461E-08 AERMOD-m 7.92601E-07 354191 557230 24 24 7.92601E-07 2.4 JSL JSL 0.0%														
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7440-65-5 Yttrium 5.5461E-08 AERMOD-m 7.92601E-07 354191 5572230 24 24 7.92601E-07 2.4 JSL JSL 0.0%														
			7.7645E-05	-		354191	5572230	24	24	0.00110964	120	Particulate	Schedule 3	0.0%

Table E4: Emissions Summary Table (Rev2)

Location of													
CAS#	Contaminant	Total Emission Rate (g/s)	Dispersion Model Used	Max POI Value (µg/m³)	X (m)	Y (m)	Averaging Period Modelled (h)	Averaging Period of Criterion (h)	Max POI Value Converted to Criterion Period (μg/m³)	Criteria (µg/m³)	Limiting Effect	Regulation Schedule #	Percentage of Criteria or Likelihood of adverse effect (%)
7647-01-0	Hydrochloric acid	0.00351253	AERMOD-m	0.050198	354191	5572230	24	24	0.050198	20	Health	Schedule 3	0.3%
7723-14-0	Phosphorus, white	4.9915E-06	AERMOD-m	7.13341E-05	354191	5572230	24	24	7.13341E-05	0.35	JSL	JSL	0.0%
7782-49-2	Selenium	5.1764E-07	AERMOD-m	7.39761E-06	354191	5572230	24	24	7.39761E-06	10	Health	Guideline	0.0%
7782-50-5		0.00014605	AERMOD-m	0.00208718	354191	5572230	24	24	0.00208718	10	Health	Schedule 3	0.0%
	Nitrous Oxide	0.00240331	AERMOD-m	0.034346	354191	5572230	24	24	0.034346	9000	Health	Guideline	0.0%
	Nitrogen oxides	0.04532144	AERMOD-m	1.07637	354059	5571849	1	1	1.07637	400	Health	Schedule 3	0.3%
10102-44-0	Nitrogen oxides	0.04532144	AERMOD-m	0.58165	354191	5572230	24	24	0.58165	200	Health	Schedule 3	0.3%
10102-44-0	Nitrogen oxides (emergency generator)	0.47397001	AERMOD-m	974.74658	354173	5572112	1	0.5	1183.532311	1880	Health	NA	63.0%
	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
18259-05-7	Pentachlorobiphenyl	2.2184E-10	AERMOD-m	3.1704E-09	354191	5572230	24	24	3.1704E-09	0		0	Neg
18540-29-9	Chromium compounds - Hexavalent	6.4704E-07	AERMOD-m	9.24701E-06	354191	5572230	24	24	9.24701E-06	0.07	sessment Va	Schedule 3	0.0%
18540-29-9	Chromium compounds - Hexavalent	6.4704E-07	AERMOD-m	7.83445E-07	354219	5572309	8760	8760	7.83445E-07	0.00014	Health	Schedule 3	0.6%
26601-64-9	Hexachlorobiphenyl	1.0168E-10	AERMOD-m	1.4531E-09	354191	5572230	24	24	1.4531E-09	0		0	Neg
27323-18-8	Monochlorobiphenyl	4.0671E-11	AERMOD-m	5.81241E-10	354191	5572230	24	24	5.81241E-10	0		0	Neg
32598-13-3	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
32690-93-0	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
35065-29-3	Heptachlorobiphenyl	1.2201E-11	AERMOD-m	1.74372E-10	354191	5572230	24	24	1.74372E-10	0		0	Neg
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p- dioxin	3.6974E-10	AERMOD-m	5.28401E-09	354191	5572230	24	24	5.28401E-09	0		0	Neg
37680-69-6	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
37680-73-2	Pentachlorobiphenyl	2.2184E-10	AERMOD-m	3.1704E-09	354191	5572230	24	24	3.1704E-09	0		0	Neg
	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
39001-02-0	Octachlorodibenzofuran	1.6269E-11	AERMOD-m	2.32496E-10	354191	5572230	24	24	2.32496E-10	0		0	Neg
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p- dioxin	2.9579E-07	AERMOD-m	4.2272E-06	354191	5572230	24	24	4.2272E-06	0		0	Neg
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p- dioxin	2.773E-10	AERMOD-m	3.963E-09	354191	5572230	24	24	3.963E-09	0		0	Neg
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TEQ)	1.3865E-10	AERMOD-m	1.9815E-09	354191	5572230	24	24	1.9815E-09	0		0	Neg
55673-89-7	1,2,3,4,7,8,9- Heptachlorodibenzofuran	4.4369E-11	AERMOD-m	6.34081E-10	354191	5572230	24	24	6.34081E-10	0		0	Neg
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
67562-39-4	1,2,3,4,6,7,8- Heptachlorodibenzofuran	2.9579E-07	AERMOD-m	4.2272E-06	354191	5572230	24	24	4.2272E-06	0		0	Neg
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
PM	Total particulate matter	2.31278379	AERMOD-PM	60.16636	354183.8	5572223	24	24	60.16636	120	Particulate	Schedule 3	50.1%

1.0 Introduction and Site Description

This Emission Summary and Dispersion Modelling ("ESDM") report was prepared in accordance with s.26 of Ontario Regulation 419/05 ("O.Reg. 419"). In addition, guidance in the ministry publication "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009 ("ESDM Procedure Document") PIBS 3614e03 was followed, as appropriate.

For ease of review and to promote clarity, this ESDM report is structured to correspond to each of the items listed in the ESDM Report Checklist.

This section provides a description of the Site as required by sub-paragraph 1 of s.26 (1) of O.Reg. 419.

1.1 Purpose and Scope of the ESDM Report

This ESDM report was prepared in support of an application for Renewable Energy Approval and Environmental Compliance Approval, which will collectively constitute approval for all air emissions at the Site. The ESDM was prepared in accordance with s.26 of O.Reg. 419.

Sagatay Cogeneration LP, with its General Partner, Sagatay Cogeneration Ltd., and Whitesand First Nation (Whitesand) as agent, will operate a biomass fuelled electrical power and heat 3.6 MW cogeneration plant and a solid wood fuel pellet plant located in an unorganized territory of the Thunder Bay District near Whitesand First Nation and Armstrong, Ontario. The unorganized territory is administered by the Armstrong Local Service Board and is located on the traditional territory of Whitesand First Nation.

The Site is located in an area previously used as an industrial site.

The location of the Site is presented in **Figure E1**. The location of the discharges from each of the sources is presented in **Figure E2**. The location of each source is labelled with the Source ID.

1.2 Description of Processes and NAICS Code

Whitesand will produce electricity and residential and/or industrial grade wood fuel pellets at this Site. The main processes will be electrical power generation and solid wood fuel pellet production. Many of the activities are performed continuously at the Site but some may be intermittent. Some intermittent activities will occur during the day time shift only.

The North American Industry Classification System (NAICS) code that applies to the Site is 32199 – All Other Wood Product Manufacturing. Other NAICS codes that apply to the Site are 221119 – Other Electrical Power Generation and 221122 – Electrical Power Distribution. None of the NAICS codes are listed in Schedule 4 or Schedule 5.

1.3 Description of Products and Raw Materials

Whitesand will manufacture electricity and residential and/or industrial grade wood fuel pellets at this Site.

Biomass Handling

The received chipped biomass will be conveyed to the single outside circular arc chip storage pile via a rotating radial belt stacker. The storage pile could be bypassed and the biomass directed to the biomass storage fuel bin at the boiler/turbine plant. The stored chips will be reclaimed by a mobile front end loader into a reclaim metering bin conveyor. The chips will be forwarded on to the pelleting biomass feedstock belt dryer.

The hogged biomass delivered as boiler fuel will go through the biomass hog and screen, which will be located next to the boiler fuel biomass pile in an enclosed building.

Boiler/Turbine Plant

The biomass boiler system will start at the enclosed biomass fuel storage bin. It will continue through the heat source furnace, steam boiler system to the hot exhaust flue gas baghouse treatment system. The heat source will also be equipped with a steam boiler system complete with a boiler water supply treatment system and a condensate return system. The boiler will supply the required steam demand to the extraction condensing steam turbine. The remaining steam will exit the steam turbine to the steam surface condenser/hydronic heating glycol heat exchanger and the outside installed evaporative cooling tower. The plant will deliver heat for the pellet plant biomass feedstock drying and site building winter heating utilizing a glycol heating system.

The biomass power plant will be located inside its own heated building.

The standby diesel generator will be located beside the building to enable a controlled shut-down of the steam turbine system and continued operation of the biomass heat source/steam boiler. The emergency pellet boiler site heating system will be located inside the boiler/turbine building as well.

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Wood Pellet Plant

The pelleting feedstock reclaimed from the biomass storage pile will be fed onto the dryer feed conveyor. The biomass feedstock belt dryer will use steam from the nearby power plant to heat its required process drying air. The dryer feed conveyor will discharge to the biomass drver steam heated screen infeed box. The dried biomass feedstock will be conveyed to the outdoor biomass storage silo. The dried biomass will be discharged and fed to the fine hammer mill system equipped with the cyclone/baghouse system. The discharge biomass stream will be conveyed by a bucket elevator up to the pre-conditioner with optional steam and or water conditioning. The conditioned biomass will be dropped into the ripening bin for 30 minutes of retention. The ripening bin will discharge into two conditioners followed by the two pellet mills. The parallel lines of two pellet mills will discharge by chutes down to the counter-flow pellet cooler and the screener. The screen fines will be conveyed by an air system back to the cyclone/baghouse system located outside the pellet building near the hammer mills. The screened pellets will be collected and conveyed by a bucket elevator up for transfer to the outside located pellet storage bin or could be directly diverted passed the bin on to the pellet packaging system. The finished sealed pellet stacks will be accumulated on a roller conveyor in the building for later or immediate loading by a fork truck for shipping in a truck trailer outside.

The pellet plant will produce 8 tonnes per hour or 60,000 tonnes per year of residential and/or industrial grade fuel pellets which will be bagged for shipping from site.

Product usages and process information are provided in greater detail in **Appendix A**. Refer to **Table E1**, which tabulates the individual sources of emissions at the Site.

1.4 Process Flow Diagram

Figures 121-12538-01-8010 and **121-12538-01-8011** show the processes that have emissions that exhaust from the Site. Other processes are not described in detail because the emissions, if any, do not exhaust from the Site.

1.5 Operating Schedule

The Site will operate 24 hours a day, seven days a week, all year. Shipping and receiving will occur for 12 hours a day (7 a.m. to 7 p.m.), five days a week, all year. The modelling assumes that the Site and woodyard operates 24 and 12 hours a day respectively, seven days a week, all year.

1.6 EBR Posting Text

This report is in support of an application for Renewable Energy Approval and Environmental Compliance Approval for all air emissions from Sagatay Cogeneration LP's Site located near Armstrong, Ontario. Whitesand will produce electricity and residential and/or industrial grade wood fuel pellets at this Site.

The application includes all sources at the Site including:

- one 3.6 MW biomass fuelled boiler system;
- one 7 MMBtu/h emergency pellet boiler;
- one 500 kW standby diesel generator;
- one 150 HP emergency fire pump diesel engine;
- one dust baghouse;
- one pellet cooler cyclone;
- one fine hammermill baghouse;
- one biomass boiler baghouse;
- one pellet mill laboratory;
- one pellet storage silo;
- one dry chip storage silo;
- one indirect heat biomass belt dryer;
- one 2-cell induced draft evaporative cooling tower;
- one biomass hog and screen;
- two truck dumpers;
- two biomass piles;
- three wastewater vents; and,
- unpaved on-site roads.

Emitted contaminants include products of combustion and particulate matter ("PM").

2.0 Initial Identification of Sources and Contaminants

This section provides an initial identification of all of the sources and the contaminants emitted from the Site as required by sub-paragraph 2 to 4 of s.26 (1) of O.Reg. 419.

There may be general ventilation from the Site that only discharges uncontaminated air from the workspaces or air from the workspace that may include contaminants that come from commercial office supplies, building maintenance products or supplies and activities; these types of ventilation are considered negligible and may not have been identified as sources at the Site.

It should be noted that general ventilation located in the process area that does not vent process emissions is also considered to be negligible.

2.1 Sources and Contaminants Identification Table

Table E1 tabulates all the emission sources at the Site, for example, EA-01 – Biomass boiler is identified as a source. **Table E1** provides the information required by sub-paragraphs 2 to 4 of s.26 (1) of O.Reg. 419.

The expected contaminants emitted from each source are also identified in **Table E1**; for example, the expected contaminants emitted from EA-01 – Biomass boiler are identified as combustion products. Each of the identified sources has been assigned a Source ID, for example Biomass boiler source has been identified as #8.

The location of each discharge point is presented in **Figure E2.** The discharge point is labelled with its Source ID.

3.0 Assessment of the Significance of Contaminants and Sources

This section provides an explanation for each source and contaminant identified in **Table E1**, as required by sub-paragraph 5 of s.26 (1) of O.Reg. 419.

In accordance with s.8 of O.Reg. 419, emission rate calculations, and dispersion modelling does not have to be performed for emissions from negligible sources or for the emission of negligible contaminants from significant sources.

3.1 Identification of Negligible Contaminants and Sources

Of the processes listed on **Table E1**, some of the processes have been identified as negligible. Each negligible process is identified in the table, for example, EA15 – Truck dumper (60_1) has been labelled as negligible. The remaining processes are considered significant. For example, EA-01 - Biomass boiler (8) is considered a significant process. These significant processes are included in the dispersion modelling for the Site.

Of the sources listed on **Table E1**, several emission points have been identified as negligible. Each negligible emission point is identified in the table, for example, Pellet plant lab exhaust (37) has been labelled as negligible. The remaining exhaust points are considered significant. For example, Biomass boiler (8) is considered a significant source. These sources will be included in the dispersion modelling for the Site. The emissions from many exhaust points are covered under the processes listed above. If this is the case, then the "Rate/Rational" column will indicate the process that exhausts through this point.

Of the contaminants listed on **Table E1**, several of the contaminants have been identified as negligible. Each negligible contaminant is identified in the table, for example, p-Tolualdehyde (104-87-0) has been labelled as negligible. The remaining contaminants are not listed in Table E1 but are shown on Table E4.

3.2 Rationale for Assessment

For each Process in **Table E1** that has been identified as being negligible there is an accompanying documented rationale. For example the rationale for EA15 – Truck dumper (60_1) is "Contained space; less than 5% of total property-wide emissions." The technical information required to substantiate the argument that each of the identified sources is negligible is presented in **Appendix B**.

For each Source in **Table E1** that has been identified as being negligible there is an accompanying documented rationale. For example the rationale for Pellet plant lab

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exhaust (37) is "Table B-3: Fume hoods for laboratories." The technical information required to substantiate the argument that each of the identified sources is negligible is presented in **Appendix B**.

The only contaminants that are listed as negligible are identified on **Table E4** as "Neg" when their POI concentration is less than the negligible limit from Table B-2A of the ESDM Procedure Document.

4.0 Operating Conditions, Emissions Estimating and Data Quality Emissions

This section provides a description of the operating conditions used in the calculation of the emission estimates and an assessment of the data quality of the emission estimates for each significant contaminant from the Site as required by sub-paragraphs 6 and 7 of s.26 (1) of O.Reg. 419. In accordance with s.8 of O.Reg. 419, emission rate calculations and dispersion modelling does not have to be performed for emissions from negligible sources or for the emission of negligible contaminants from negligible sources.

4.1 Description of Operating Conditions

As noted in Section 1.2, the NAICS code that applies to this facility is 221119 Other Electrical Power Generation.

Therefore, s.20 of O.Reg. 419 currently applies to the Site and the modeled impact to POI criteria can be assessed using AERMOD. As a result, all of the POI criteria have been assessed against their Schedule 3, or other, criteria as appropriate.

s.10 of O.Reg. 419 states "A scenario that assumes operating conditions for the Facility that would result, for the relevant contaminant, in the highest concentration of the contaminant at a point of impingement that the Facility is capable of." The operating condition described in this ESDM Report meets this requirement.

The averaging time for the operating condition is 24 hours. The operating condition used for this Site that results in the maximum concentration at a POI is the scenario where all significant sources are operating simultaneously at their individual maximum rates of production. The individual maximum rates of production for each significant source of emissions correspond to the maximum emission rate during any 24 hour period. The individual maximum rates of production for each significant source of emissions are explicitly described in **Appendix A**. Several contaminants (e.g., nitrogen oxides, benzo(a)pyrene) have been assessed on a one hour or an annual basis.

Backup equipment (diesel generator, pellet boiler, fire diesel pump engine) was modelled separately as they will not be running simultaneously with all other onsite sources.

The assessment of all operating conditions included transient, start-up, shut-down and continuous operation modes. Continuous operation is expected to provide the largest POI concentration estimate so that method is used as the basis of calculations in this application.

4.2 Explanation of the Method Used to Calculate Emission Rates

The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with requirements of the ESDM Procedure Document.

The emission rate for each significant contaminant emitted from a significant source was estimated and the methodology for the calculation is documented in **Table E2**. For example, the emission of Nitrogen Oxides was calculated using an emission factor (EF) technique. The information for **Table E2** can be found in either **Table E2-1** (sorted by Source ID) or **Table E2-2** (sorted by contaminant).

4.3 Sample Calculations

The technical rationale, including sample calculations, required to substantiate the emission rates presented in **Table E2** is documented in **Appendix A**.

4.4 Assessment of Data Quality

This section provides a description of the assessment of the data quality of the emission estimates for each significant contaminant from the Site, as required by sub-paragraph 7iii of s.26 (1) of O.Reg. 419.

The assessment of data quality of the emission rate estimates for each significant contaminant emitted from significant sources was performed in accordance with the requirements of sub-paragraph 7iii of s.26 (1) of O.Reg. 419. For example, the EF technique used to calculate the emissions from source #8 is based on the USEPA NOx emission factor published in AP-42. The data quality of that emission factor is "A" which is equivalent to the MOE data Quality of "Above-Average."

Therefore, the emission rate estimate is not likely to be an underestimate of the actual emission rate and use of these emission rates will result in a calculated concentration at a POI greater than the actual concentrations. This source was documented as having a Data Quality of "Above-Average", which is generally acceptable according to requirements of the ESDM Procedure Document.

For each contaminant, the emission rate was estimated and the data quality of the estimate is documented in **Table E2**. The assessment of data quality for each type of source listed in **Table E2** is documented in **Appendix A**.

5.0 Source Summary Table and Site Plan

This section provides the table required by sub-paragraph 8 and the site plan required by sub-paragraph 9 of S.26 (1) O.Reg. 419.

5.1 Source Summary Table

The emission rate estimates for each source of significant contaminants are documented in **Table E2** in accordance with the requirements of sub-paragraph 8 of s.26 (1) of O.Reg. 419.

For each source of significant contaminants the following parameters are referenced:

- contaminant name;
- Chemical Abstract Society ("CAS") reference number;
- source ID;
- source description;
- stack parameters (flow rate, exhaust temperature, diameter, height above grade, height above roof);
- location referenced to a Cartesian coordinate system presented on Figure E2;
- averaging period;
- emission estimating technique;
- estimation of data quality; and,
- percentage of overall emission.

5.2 Site Plan

The locations of the emission sources listed in **Table E2** are presented in **Figure E2**. The location of each of the sources is specified with the Source ID. The location of the property line is indicated on **Figure E2**, with the end points of each section of the property line clearly referenced to a Cartesian coordinate system.

The location of each source is referenced to this Cartesian coordinate system under a column in **Table E2**.

6.0 Dispersion Modelling

This section provides a description of how the dispersion modelling was conducted at the Site to calculate the maximum concentration at a POI, as required by subparagraphs 10 to 13 of s.26 of O.Reg. 419.

Dispersion modelling was completed in accordance with the MOE's "Air Dispersion Modelling Guideline for Ontario" PIBS 516502e ("The ADMGO"). A general description of the input data used in the dispersion model is provided below and summarized in **Table E3.**

The Site is subject to s.20 of O.Reg. 419/05. Therefore, the discharge of the Site has to meet the standards in Schedule 3 of O.Reg. 419/05 using one of the approved dispersion models listed in s.6 of O.Reg. 419/05. AERMOD has been used to demonstrate compliance.

Since the Schedule 3 standards of O.Reg. 419/05 apply, the modelled impact of contaminant emissions are assessed as 10-minute, one-hour, 24-hour, and annual maximum POI concentrations. The appropriate model to assess the maximum POI impact is the USEPA AERMOD model. The following dispersion model and pre-processors were used in the assessment:

- AERMOD dispersion model (v. AERMOD_MPI_Lakes_11353);
- AERMAP surface pre-processor (v. AERMAP_EPA_11103); and,
- BPIP building downwash pre-processor (v. 0474).

The Meteorological Regional Data set as published by the MOE for the Northern Region (Int. Falls, Forest) was used. AERMET was not used as a result.

There is no child care facility, senior's residence, health care facility, long-term care facility, or educational facility located at the Site and no other tenant at the Site. As such, same structure contamination was not considered.

6.1 Meteorology and Land Use Data

The project is located on Crown Land on which a portion of it has been withdrawn under Section 35 of the Mining Act for prospecting, staking out, sale or lease rights, to develop a cogeneration processing facility. The land was previously used as an industrial site for a forestry operation under a Land Use Permit which was forfeited to the Crown. Whitesand First Nation currently holds a Land Use Permit for the Site. The Site is shown in **Figure E1**.

The MOE has created, and periodically updates, AERMOD-ready regional meteorological datasets for use with dispersion modelling using AERMOD. Depending upon the local land use of the Site, the dataset used can be urban, crops, or forest. As the Site is situated within the geographical coverage of MOE Thunder Bay District Office and based on the land-use characteristics around the site, the "Forest" dataset (last updated using version 06341 (INTFALFR.SFC and INTFALFR.PFL)) was used. The surface data is the Upper Air Data from the Int. Falls, MN. The meteorological data covers the dates from January 1, 1996 to December 31, 2000. The hourly data includes many factors which affect the dispersion of air contaminants including wind speed, wind direction, temperature, ceiling height, and atmospheric stability.

Sub-paragraph 10 of s.26 (1) of O.Reg. 419/05 requires a description of the local land use conditions if meteorological data described in paragraph 2 of s.13 (1) of O.Reg. 419/05 was used. In this assessment, MOE's regional meteorological dataset described in paragraph 1 of s.13 (1) of O.Reg. 419/05 was used.

6.2 Coordinate System

The Universal Transverse Mercator ("UTM") coordinate system, as per Section 5.2.2 of the ADGMO, was used to specify model object sources, buildings, and receptors. All coordinates were defined in the North American Datum of 1983 ("NAD83").

All source, building, and property line coordinates are shown in **Figure EC-1** (see **Appendix C**).

6.3 Terrain

S.16 of O.Reg. 419/05 sets out when terrain must be considered. In this assessment, terrain elevation contour data was downloaded from Natural Resources Canada's Canadian Digital Elevation Data (CDED) dataset and processed using the AERMOD terrain processor AERMAP. AERMAP determines base terrain elevation using the DEM data for all sources, receptors and buildings, and provides the user with a suitable input file for use with AERMOD. All the onsite sources and buildings were assigned an elevation of 366 m as the site will be leveled off in the areas of the buildings during the construction phase.

6.4 Dispersion Modelling Input Summary Table

A description of the way in which the approved dispersion model was performed is included in **Table E3**. This table meets both the requirements of s.26 (1) 11 and Sections 8-17 of O.Reg. 419/05 and follows the format provided in the ESDM Procedure Document.

The Site was modelled as multiple points, with the release height based on the building heights and the location of stacks on those buildings. Roads were modelled as line volume sources. A summary of the AERMOD source input parameters is provided in **Table E2-1** and **E2-2**. The location of all emission points are shown in **Figure E2**. The location of the property-line in relation to the dispersion modelling sources is also presented in **Figure E2**, as well as **Figure EC-1** (see **Appendix C**).

The emission rates used in the dispersion model meet the requirements of s.11 (1) 1 of O.Reg. 419/05, which requires that the emission rate used in the dispersion model is at least as high as the maximum emission rate that the source of contaminant is reasonably capable of for the relevant contaminant. These emission rates are further described in **Appendix A**. A summary of the modelled emission rates for each point source is provided in **Tables E2-1** and **E2-2**.

6.5 Building Downwash

The Site buildings were entered into the model using the USEPA Building Profile Input Program (BPIP), and run to evaluate any building cavity downwashing that may be occurring. Cavity downwash can result in air contaminants being forced to ground level prematurely under certain meteorological conditions. The roof height of on-site buildings was modelled using the height of each individual building.

6.6 Deposition

AERMOD has the capability to account for wet and dry deposition of substances that would reduce airborne concentrations. The deposition algorithm in the AERMOD model was not used for this assessment and therefore the predicted modelled POI concentrations are considered to be conservative.

6.7 Averaging Time and Conversions

The shortest time scale that AERMOD predicts is a 1-hour average value. Schedule 3 standards of O.Reg. 419/05 are being applied to this Site. Many of these standards are based on one hour and 24 hour averaging times, which are averaging times that are easily provided by AERMOD. In cases where a standard has an averaging period of less than one hour (e.g., ten minutes/hours), a conversion to the appropriate averaging period was completed using the MOE recommended conversion factors, as documented in the ADMGO.

6.8 Area of Modelling Coverage

Receptors were chosen based on recommendations provided in Section 7.1 of the ADGMO, which is in accordance with s.14 of O.Reg. 419/05. Specifically, a nested receptor grid, centred on the centre of the bounding box that encompasses all the sources at the Site, was placed as follows:

- 20 m spacing within 200 m of the edge of the bounding box;
- 50 m spacing from 200 m to 500 m;
- 100 m spacing from 500 to 1,000 m;
- 200 m spacing from 1,000 to 2,000 m; and,
- 500 m spacing from 2,000 m to 5,000 m.

In addition to using the nested grid, receptors were placed every 10 m along the property boundary. No receptors were placed inside the Site's property line.

6.9 Dispersion Modelling Input and Output Files

The information entered into the approved dispersion model is recorded in **Appendix C**. AERMOD dispersion model data of all the contaminants is provided in electronic form on the CD in **Appendix C**. As an illustration, a copy of the contour plot and the model output file for the contaminant PM is also contained in **Appendix C**.

7.0 Emissions Summary Table and Conclusions

This section provides the table required by sub-paragraph 14 of s.26 of O.Reg. 419 and provides the interpretation of the results as required by the ESDM Procedure Document.

7.1 Emissions Summary Table

A POI concentration for each significant contaminant emitted from the Site was calculated based on the emission rates listed in **Table E2** and the output from the approved dispersion model presented in **Appendix C**. The results are presented in **Table E4.** This table follows the format provided in the ESDM Procedure Document. For each source of significant contaminants the following parameters are referenced:

- contaminant name;
- Chemical Abstract Society ("CAS") reference number;
- total Site emission rate;
- approved dispersion model used;
- max POI concentration;
- averaging period for the dispersion modelling;
- MOE POI limit;
- indication of the limiting effect;
- schedule in O.Reg. 419/05; and,
- the percentage of standard or indication of the likelihood of an adverse effect.

The POI concentrations listed in **Table E4** are the highest concentrations calculated by the model with meteorological anomalies removed from consideration. The POI concentrations listed in the Emissions Summary Table were compared against the "SUMMARY of STANDARDS and GUIDELINES to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O.Reg. 419 on UPPER RISK THRESHOLDS)" dated April 2012, PIBS: 6569e01 and "Jurisdictional Screening *Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality", PIBS: 6547e ("List of MOE POI Limits").*

Of the contaminants listed in **Table E4** that have limits in the List of Ministry POI Limits, all the predicted POI concentrations are below the corresponding limits. For example, the 24-hour POI concentration for particulate matter is 60.17 μ g/m3 at 50.1% of the guideline of 120 μ g/m3.

7.2 Assessment of Contaminants with no MOE POI Limits

Sub-paragraph 14 subsection viii of s.26 (1) O.Reg. 419 requires an indication of the likelihood, nature, and location of any adverse effect if the contaminant is not listed in any of Schedules 1, 2, and 3 (or the List of Ministry POI Limits).

The contaminants listed in **Table E4** that do not have corresponding criteria limits in the List of MOE POI Limits are considered to be *"Contaminants with No Ministry POI Limits."* All *"Contaminants with No Ministry POI Limits*" were deemed as negligible for the purpose of this report using an Emission Threshold. No further assessment has been completed for these contaminants.

7.3 Conclusions

This ESDM Report was prepared in accordance with s.26 of O.Reg. 419. In addition, guidance in the ESDM Procedure Document was followed as appropriate.

The Site is subject to s.20 of O.Reg. 419/05. Therefore, the discharge of the Site has to meet the standards in Schedule 3 of O.Reg. 419/05 using one of the approved dispersion models listed in s.6 of O.Reg. 419/05. AERMOD has been used to demonstrate compliance.

The emission rate estimates for each source of significant contaminants are documented in **Table E2**. All the emission rates listed in **Table E2** correspond to the operating scenario where all sources are operating simultaneously at their individual maximum rates of production. Therefore these emission rate estimates listed in **Table E2**, are not likely to be an underestimate of the actual emission rates.

Backup equipment was modelled separately as they will not be running simultaneously with all other onsite sources.

A POI concentration for each contaminant emitted from the Site was calculated based on the calculated emission rates and the output from the model; the results are presented in **Table E4**.

The POI concentrations listed in **Table E4** were compared against criteria listed in the publication "Summary of O.Reg. 419 Standards, Points of Impingement Guidelines and Ambient Air Quality Criteria (AAQC)" dated February 2008 and "Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality", 6547e.pdf (List of Ministry POI Limits).

Of the contaminants listed in **Table E4** that have limits in the List of Ministry POI Limits, all the predicted POI concentrations are below the corresponding limits. For example, the 24-hour POI concentration for particulate matter is 60.17 μ g/m3 at 50.1% of the guideline of 120 μ g/m3.

This ESDM Report demonstrates that the Site can operate in compliance with O.Reg. 419/05.

7.4 Limitations and Use of Report

Neegan Burnside Ltd. (Neegan Burnside) has completed this report in accordance with generally accepted standards and practices. The conclusions and recommendations in this report are professional opinions based upon our understanding of anticipated Site conditions at the time of this assessment. To the best of our knowledge, the information contained in our report is accurate however Neegan Burnside does not guarantee the accuracy and reliability of the information provided by other persons or agencies. Neegan Burnside is not responsible for environmental concerns that are not visible or otherwise disclosed to us.

This report was prepared for the exclusive use of Whitesand First Nation and the Ministry of the Environment and Climate Change. Any use or reliance on or decisions based on this report by a third party, are the responsibility of such third parties. Neegan Burnside accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Respectfully submitted,

Neegan Burnside Ltd.

Written by:

Signature

Leie-

Date October, 2014

Kristina/Zeromskiene, Ph.D. Air Emissions and Noise Scientist Neegan Burnside Ltd.

Whitesand First Nation

Emission Summary and Dispersion Modelling Report October 2014

Reviewed by:

Date October, 2014

Harvey Watson, P.Eng. Technical Group Leader, Air and Noise Neegan Burnside Ltd.

Signature

Signature

_ Date October, 2014

Chris Shilton, P.Eng., LEED [®]AP Project Manager Neegan Burnside Ltd.

Approved By:

Date October, 2014

Signature Craig Toset

Project Manager Whitesand First Nation

Tables



Whitesand Armstrong Station, Ontario

Table E1: Sources and Contaminants Identification Table (Rev2)

	Source Information		Expected Contaminants	:	Significant	l	Costing As	ssignment	t
Process ID	Unit Name	Stack IDs	Contaminants	Yes or No?	Yes or No? Rate / Rationale		Contamin ant Cost Group	Noise Cost Code	Noise Cost Group
EA-01	Biomass boiler (8)	8	PM, Nox, VOC, trace elements	Yes	3.605 E01 g/s	12	а		
EA-02	Pellet boiler (24)	24	PM, Nox, VOC, trace elements	No	standby	12	а		
EA-03	Stand by diesel generator (30)	30	NOx, PM	No	standby	1	а		
EA-04	Fire pump diesel engine (31)	31	NOx, PM	No	standby	1	а		
EA-05	Baghouse - Dust collection (38)	38	PM	Yes	1.172 E-02 g/s	5	а		
EA-06	Baghouse - Cooler (39)	39	PM	Yes	1.172 E-02 g/s	5	а		
EA-07	Baghouse - Hammer mill (40)	40	PM	Yes	2.495 E-02 g/s	5	а		
EA-08	Biomass hog and screen (70)	70	PM	Yes	9.438 E-02 g/s	12	b		
EA-09	Dry biomass storage silo (57)	57	PM	Yes	1.080 E-03 g/s	11	а		
EA-10	Biomass dryer (58)	58_1, 58_2, 58_3, 58_4	PM, VOC, formaldehyde	Yes	8.667 E-01 g/s	12	с		
EA-11	Aspen/Birch storage pile (61)	61	PM	Yes	6.410 E-02 g/s	11	b		
EA-13	Biomass fuel storage pile (63)	63	PM	Yes	3.122 E-02 g/s	11	b		
EA-14	Road dust	100_1, 100_2, 100_3, 100_4, 100_5, 100_6, 100_7, 100_8, 100_9	РМ	Yes	4.075 E-02 g/s	11	с		
EA-15	Sewage vents	101, 102, 103	Ammonia	No	Below emission threshold limit	None			

Source ID	Source Description	General Location	Contaminants	Yes or No?	Rate / Rationale	Contamin ant Cost Code	Contamin ant Cost Group	Noise Cost Code	Noise Cost Group
1	Boiler Blow Down	Boiler/turbine plant		No	No Contaminants				
2	RO system Blow Down	Boiler/turbine plant		No	No Contaminants				
3	Filter Back Wash	Boiler/turbine plant		No	No Process				
4	Soft Regen	Boiler/turbine plant		No	No Process				
5	Washup and Floor Drains	Boiler/turbine plant		No	No Process				
6	Ash transfer shed washup	Boiler/turbine plant		No	No Process				
7	Boiler Building Washrooms/showers	Boiler/turbine plant		No	No Process				
8	Boiler Flue Gas Stack	Boiler/turbine plant yard	Combustion, Nox, Nox, NOx, NOx	Yes	14,672,213 Btu/h				
9	Boiler Blow Down Vent	Boiler/turbine plant		No	No Contaminants				
10	Gland Steam Vent	Boiler/turbine plant		No	No Contaminants				
11	Boiler De-Aerator Vent	Boiler/turbine plant		No	No Process				
12	Boiler SRV Silencer Outlet 1	Boiler/turbine plant		No	No Contaminants				
13	Boiler SRV Silencer Outlet 2	Boiler/turbine plant		No	No Contaminants				
14	22 psi SRV Silencer Outlet	Boiler/turbine plant		No	No Contaminants				
15	Preheater 1 SRV 1	Boiler/turbine plant		No	No Contaminants				
18	Turbine Surface Condenser Hogging Air Ejector Vent	Boiler/turbine plant		No	No Contaminants				

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Table E1 Sources and Contaminants Identification Table (Rev2)

Boiler/turbine plant

Wood pellet plant

Boiler/turbine plant

Wood pellet plant

Yard

Yard

Yard

Yard

Yard

Yard

rard

Yard

Yard

Yard

Yard

Yard

Yard

Biomass fuel storage

Next to Biomass fuel storage

РМ

РМ

РM

Boiler/turbine plant No No Contaminants 7,000,000 Btu/h Boiler/turbine plant Combustion, formaldehyde, Nox, No Boiler/turbine plant No No Process Turbine Surface Condenser Air Ejector Vent Boiler/turbine plant B3: VP < 1kPa No Boiler Bathroom Exhaust Fan Outlet Boiler/turbine plant No No Contaminants Boiler/turbine plant No No Process Boiler/turbine plant No Exhaust through Boiler Flue Gas Stack (8) Boiler/turbine plant Combustion, formaldehyde, Nox, 1,706,000 Btu/h No Fire Pump Diesel Engine (150hp) Fire pump building Combustion, formaldehvde, Nox. 376.440 Btu/h I No Pellet Plant Washup and Floor Drains Wood pellet plant No Process No Pellet Plant Washroom, Showers and Locker room Wood pellet plant No No Process Wood pellet plant No No Contaminants No B3: QA/QC Fume Hood Wood pellet plant Pellet Plant – Dust Pick-ups and Screen Fines - Bag Hous Wood pellet plant PМ Yes See EA-05 РM See EA-06 Pellet Plant - Pellet Cooler - Cyclone Vent Wood pellet plant Yes РМ See EA-07 Pellet Plant – Fine Hammer Mill - Bag House Vent Wood pellet plant Yes Pellet Plant – Ripening Bin – Vent Wood pellet plant No Contains biomass conditioned with steam or water, no dry material Wood pellet plant No No Process Mechanical Shop Exhaust Fan Wood pellet plant No No Contaminants Wood pellet plant No No Contaminants Wood pellet plant No No Contaminants Garage Washup and Floor Drains Wood pellet plant No No Process Wood pellet plant No No Process Garage Vehicle Exhaust System Wood pellet plant No Vehicle

No

No

Yes

No

No

Yes

Yes

No

No

No

No

Yes

No

No

No

No

No

No

No

No

No

No Contaminants

Finished product, larger than 6mm No emissions, will be stored in a bunker or bin

ess than 5% overall emissions, contained space

ess than 5% overall emissions, contained space

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets' Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

Humid biomass, and 0% emissions as per 'BCMOE Pellets'

See EA-09

See EA-11

See EA-13

See EA-08

Mobile Equipment

Mobile Equipment

Mobile Equipment

Mobile Equipment

Superheater SRV 1

Superheater SRV 2

Furbine Outlet SRV 1

Turbine Outlet SRV 2

Pellet Boiler Flue Gas Outlet

Turbine Lube System Vent

Boiler/Turbine Plant Noise

Stand by Generator (500kW)

Pellet Mill Lab Exhaust Fan

Pellet Plant - Building Noise

Electrical Shop Exhaust Fan

Control Room Exhaust Fan

Garage Bathroom

Biomass Boiler Ash

Truck Dumper #1

Truck Dumper #2

Biomass Pile-Fuel

Raw Fuel Infeed

uel Stacker

Fuel Reclaim

Fuel Transfer 2

Pellet Storage Silo Vent

Dry Chip Storage Silo Vent

Biomass Pile- Aspen/Birch

Biomass Fuel Screen and Hog

Fuel Transfer conveyor 1

Fuel Re-claim Transfer

Imported Biomass Transfer Conveyor

Fuel Transfer conveyor to stacker

Mobile Equipment - Forklift - Pellet Shipping Forklift

Mobile Equipment - Front End Loader - Chip Reclaim

Mobile Equipment - Front End Loader - Biomass Receivil Yard

Mobile Equipment – Front End Loader – Biomass Fuel Re Yard

Soot Blower

Bag House

Office HVAC

Project No.: 030895

Whitesand Armstrong Station, Ontario

Table E1: Sources and Contaminants Identification Table (Rev2)

81 Disc Screen In front of boiler/turbine plant No Humid biomass, and 0% emissions as per 'BCMOE Pellets' 83 Fuel Transfer Conveyor Yard No Humid biomass, and 0% emissions as per 'BCMOE Pellets' 84 Fuel Infeed Convevor Yard No Humid biomass, and 0% emissions as per 'BCMOE Pellets' Yard Humid biomass, and 0% emissions as per 'BCMOE Pellets' 85 Chip Transfer Conveyor 1 No 86 Chip Transfer Conveyor 2 Yard No Humid biomass, and 0% emissions as per 'BCMOE Pellets' Humid biomass, and 0% emissions as per 'BCMOE Pellets' 87 Chip Transfer Conveyor 3 Yard No 89 No Humid biomass, and 0% emissions as per 'BCMOE Pellets' Chip Stacker Aspen/Birch Aspen/Birch storage pile 91 Chip Reclaim Aspen/Birch Next to Aspen/Birch storage pile No Humid biomass, and 0% emissions as per 'BCMOE Pellets' Reclaim Conveyor 1 92 No Humid biomass, and 0% emissions as per 'BCMOE Pellets' Yard Humid biomass, and 0% emissions as per 'BCMOE Pellets' 93 Reclaim Conveyor 2 Yard No 94 Reclaim Conveyor 3 Yard No Humid biomass, and 0% emissions as per 'BCMOE Pellets' 95 No Chips larger than 6mm, and 0% emissions as per 'BCMOE Pellets' Dried Chip Storage Feed Conveyors Wood pellet plant yard 96 Dried Chip Storage Discharge Conveyors Wood pellet plant vard No Chips larger than 6mm, and 0% emissions as per 'BCMOE Pellets' 97 **Baghouse Fines Conveyors** Wood pellet plant No 0% emissions as per 'BCMOE Pellets' 98 Dried Pellet Storage Feed Conveyors Wood pellet plant yard No No emissions, chips are in the bags 99 Dried Pellet Storage Discharge Conveyors Wood pellet plant yard No No emissions, chips are in the bags 100 1 PМ Yes See EA-14 Road dust РM See EA-14 100 2 Road dust Yes РМ Yes See EA-14 100 3 Road dust РM See EA-14 100 4 Road dust Yes 100 5 Road dust PM Yes See EA-14 РM See EA-14 100 6 Road dust Yes РМ 100 7 Road dust Yes See EA-14 100 8 Road dust ΡM Yes See EA-14 100 9 РМ See EA-14 Road dust Yes 58 1 Chip Drver Wood pellet plant vard Yes See EA-10 See EA-10 58 2 Chip Dryer Wood pellet plant yard Yes See EA-10 58 3 Chip Dryer Wood pellet plant yard Yes 58 4 Chip Dryer Wood pellet plant yard Yes See EA-10 Boiler/turbine plant yard PM Yes 59 1 Cooling Tower 59 2 Cooling Tower Boiler/turbine plant yard PM Yes No 101 Sewage Vent #1 Ammonia Emissions below threshold value 102 Sewage Vent #2 No Ammonia Emissions below threshold value

Ammonia

No

Emissions below threshold value

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103

Sewage Vent #3

Whitesand		
Armstrong	Station,	Ontario

Table E2-1: Source Summary Table - Stack ID (Rev2)

Project No.: 030895

Source Summary Table by Stack ID

Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS		Averaging Period (h)		Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	0-03-3	Pentachlorodibenzo-p-furans	24	EF	Above-Average	7.765E-11	100.00%
								Γ	50-00-0	Formaldehyde	24	EF	Above-Average	0.0008134	19.62%
									50-32-8	Benzo(a)pyrene - all sources	24	EF	Above-Average	4.807E-07	100.00%
									51-28-5	2,4-Dinitrophenol	24	EF	Above-Average	3.328E-08	100.00%
									53-70-3	Dibenzo(a,h)anthracene	24	EF	Above-Average	1.682E-09	100.00%
									56-23-5	Carbon tetrachloride	24	EF	Above-Average	8.319E-06	100.00%
									56-55-3	Benzo(a)anthracene	24	EF	Above-Average	1.202E-08	100.00%
										Benzoic Acid	24	EF	Above-Average		
										Hexanaldehyde	24	EF	Above-Average		
										Acetone	24	EF	Above-Average		
								_		Chloroform	24	EF	Above-Average		
								_		Benzene	24	EF	Above-Average		
								_		1,1,1-Trichloroethane	24	EF	Above-Average		
								-		Methane	24	EF	Above-Average	0.0038823	100.00%
								-		Bromomethane	24 24	EF EF	Above-Average		
								-		Methyl Chloride Vinyl chloride	24	EF	Above-Average	4.252E-06 3.328E-06	
								-			24	EF	Above-Average Above-Average		
								-		Acetaldehyde Dichloromethane	24	EF	Above-Average		
								-		CFC-11	24	EF	Above-Average	7.58E-06	
								-		Isobutyraldehyde	24	EF	Above-Average	2.218E-06	
								F		1,2-Dichloropropane	24	EF	Above-Average		
								F		Methyl ethyl ketone	24	EF	Above-Average	9.983E-07	
										Trichloroethylene	24	EF	Above-Average	5.546E-06	
								-		PAH - Acenaphthene	24	EF	Above-Average	1.682E-07	
									85-01-8	Phenanthrene	24	EF	Above-Average	1.294E-06	100.00%
									86-73-7	PAH - Fluorene	24	EF	Above-Average	6.286E-07	100.00%
									86-74-8	Dibenzopyrrole	24	EF	Above-Average		
										Pentachlorophenol	24	EF	Above-Average		
										2,4,6-trichlorophenol	24	EF	Above-Average		
										2-Nitrophenol	24	EF	Above-Average		
								_		Naphthalene	24	EF	Above-Average		
								L		2-Methyl Naphthalene	24	EF	Above-Average		
								-		2-Chloronaphthalene	24 24	EF	Above-Average	4.437E-10	
								-		o-Xylene 2-Chlorophenol	24	EF	Above-Average Above-Average		
								-		Acetophenone	1	EF	Above-Average		
								-		p-Nitrophenol	24	EF	Above-Average		
								-		Ethylbenzene	24	EF	Above-Average		
								F	100-42-5		24	EF	Above-Average	0.0003513	
								F		Benzaldehyde	24	EF	Above-Average		
								F		p-Tolualdehyde	24	EF	Above-Average		
1								l F		Acrolein	24	EF	Above-Average		
1								l F	107-06-2	1,2-Dichloroethane / Ethylene dichlorid	24	EF	Above-Average	5.361E-06	100.00%
1									108-88-3	Toluene	24	EF	Above-Average	0.0001701	100.00%
										Chlorobenzene	1	EF	Above-Average	6.101E-06	
1								L	108-95-2		24	EF	Above-Average		
1								ļ		Bis(2-ethylhexyl) phthalate	24	EF	Above-Average		
1	l	1	I	I	I		I	l L	120-12-7	Anthracene	24	EF	Above-Average	5.546E-07	100.00%

	Whitesand Armstrong Station, Ontario					Sc	ource Summa	le E2-1: ary Table - Sta Rev2)	ack ID				Project N	lo.: 030895	
Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS	Contaminant Name	Averaging Period (h)		Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
									123-38-6	Propionaldehyde	0.1667	EF	Above-Average	1.128E-05	100.00%
										Crotonaldehyde	24	EF	Above-Average		
										Carbon Dioxide	24	EF	Above-Average		
										Tetrachloroethylene	24	EF	Above-Average		
								-	129-00-0		24	EF	Above-Average	6.84E-07	
								-		Benzo(g,h,i)perylene	24	EF	Above-Average		
										Benzo(e)pyrene	24	EF	Above-Average		
										Indeno(1,2,3-c,d)pyrene	24	EF	Above-Average		
										Perylene	24	EF EF	Above-Average		
										Benzo(b)fluoranthene Fluoranthene	24 24	EF	Above-Average Above-Average		
										Benzo(k)fluoranthene	24	EF	Above-Average		
								-		Acenaphthylene	24	EF	Above-Average	9.243E-07	
										Benzo(a)phenanthrene	24	EF	Above-Average		
								-		o-Tolualdehyde	24	EF	Above-Average		
								-		1,2-Dibromoethene	24	EF	Above-Average		
										Carbon monoxide	0.5	EF	Above-Average	0.1109219	
								-	1746-01-6	2,3,7,8-tetrachlorodibenzo-para-dioxin	24	EF	Above-Average	8.689E-11	100.00%
									2050-67-1	Dichlorobiphenyl	24	EF	Above-Average	1.368E-10	100.00%
									2051-24-3	Decachlorobiphenyl	24	EF	Above-Average	4.991E-11	100.00%
										Dichlorobiphenyl	24	EF	Above-Average	1.368E-10	
										Octachlorodibenzo-p-dioxin	24	EF	Above-Average	1.22E-08	
								-	7439-89-6		24	EF	Above-Average	0.000183	
									7439-92-1		24	EF	Above-Average		
									7439-96-5	Manganese	24 24	EF EF	Above-Average	0.0002958 6.47E-07	
										Molybdenum	24	EF	Above-Average Above-Average		
								-	7440-02-0		24	EF	Above-Average		
								-		Potassium	24	EF	Above-Average	0.0072099	
									7440-22-4		24	EF	Above-Average	0.0003143	
								-	7440-23-5		24	EF	Above-Average		
								-	7440-24-6		24	EF	Above-Average	1.849E-06	
								· · · · · ·	7440-31-5		24	EF	Above-Average	4.252E-06	100.00%
								-	7440-32-6	Titanium	24	EF	Above-Average	3.697E-06	100.00%
									7440-36-0	Antimony	24	EF	Above-Average	1.46E-06	100.00%
									7440-38-2		24	EF	Above-Average	4.067E-06	
										Barium - total water soluble	24	EF	Above-Average		
										Beryllium (And its compounds)	24	EF	Above-Average	2.034E-07	
									7440-43-9		24	EF	Above-Average		
										Chromium (metalic, II, III)	24	EF	Above-Average	3.882E-06	
									7440-48-4		24	EF	Above-Average		
									7440-50-8		24 24	EF EF	Above-Average	9.059E-06	
									7440-62-2 7440-65-5		24	EF	Above-Average Above-Average	1.812E-07 5.546E-08	
									7440-65-5		24	EF	Above-Average		
										Hydrochloric acid	24	EF	Above-Average	0.0035125	
										Phosphorus, white	24	EF	Above-Average		
									7782-49-2		24	EF	Above-Average	5.176E-07	
									7782-50-5		24	EF	Above-Average		
										Nitrous Oxide	24	EF	Above-Average	0.0024033	
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	Whitesand Armstrong Station, Ontario					So	ource Summa	le E2-1: ary Table - Sta Rev2)	ack ID				Project N	lo.: 030895	
Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS	Contaminant Name	Averaging Period (h)	Estimatio n Method	Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
									10102-44-0	Nitrogen oxides	24	EF	Above-Average	0.0406714	89.74%
									13029-08-8	Dichlorobiphenyl	24	EF	Above-Average	1.368E-10	100.00%
									15862-07-4	Trichlorobiphenyl	24	EF	Above-Average	4.807E-10	100.00%
									15968-05-5	Tetrachlorobiphenyl	24	EF	Above-Average	4.622E-10	100.00%
									18259-05-7	Pentachlorobiphenyl	24	EF	Above-Average		
									18540-29-9	Chromium compounds - Hexavalent	24	EF	Above-Average		
									26601-64-9	Hexachlorobiphenyl	24	EF	Above-Average		
									27323-18-8	Monochlorobiphenyl	24	EF	Above-Average	4.067E-11	100.00%
									32598-13-3	Tetrachlorobiphenyl	24	EF	Above-Average		
										Tetrachlorobiphenyl	24	EF	Above-Average		
										Dichlorobiphenyl	24	EF	Above-Average		
										Heptachlorobiphenyl	24	EF	Above-Average		
										1,2,3,4,6,7,8-Heptachlorodibenzo-p-di	24	EF	Above-Average		
										Trichlorobiphenyl	24	EF	Above-Average		
										Pentachlorobiphenyl	24	EF	Above-Average		
										Trichlorobiphenyl	24	EF	Above-Average		
										Octachlorodibenzofuran	24	EF	Above-Average		
										1,2,3,4,7,8-Hexachlorodibenzo-p-dioxi	24	EF	Above-Average		
										1,2,3,7,8-Pentachlorodibenzo-p-dioxin	24	EF	Above-Average		
										2,3,7,8-Tetrachlorodibenzofuran (TEQ	24	EF	Above-Average		
										1,2,3,4,7,8,9-Heptachlorodibenzofurar	24	EF	Above-Average		
										1,2,3,6,7,8-Hexachlorodibenzofuran	24	EF	Above-Average		
										2,3,4,6,7,8-Hexachlorodibenzofuran	24	EF	Above-Average		
										1,2,3,4,6,7,8-Heptachlorodibenzofurar	24	EF	Above-Average		100.00%
										1,2,3,4,7,8-Hexachlorodibenzofuran	24	EF	Above-Average		100.00%
										1,2,3,7,8,9-Hexachlorodibenzofuran	24	EF	Above-Average		
										Total particulate matter	24	EF	Above-Average	0.31268	13.52%
24	Pellet Boiler Flue Gas Outlet	0.13875255	433.15	0.254	7.62	0	354205.561	5572154.82		Pentachlorodibenzo-p-furans	24	EF	Marginal	0	0.00%
										Formaldehyde	24	EF	Marginal	0	0.00%
								-		Benzo(a)pyrene - all sources	24	EF	Marginal	0	0.00%
										2,4-Dinitrophenol	24	EF	Marginal	0	0.00%
								-		Dibenzo(a,h)anthracene	24 24	EF EF	Marginal	0	0.00%
								-		Carbon tetrachloride	24	EF	Marginal Marginal	0	0.00%
										Benzo(a)anthracene	24	EF	Marginal	0	0.00%
										Benzoic Acid Hexanaldehyde	24	EF	Marginal	0	
										Acetone	24	EF	Marginal	0	0.00%
								-		Chloroform	24	EF	Marginal	0	
								-		Benzene	24	EF	Marginal	0	0.00%
								-		1,1,1-Trichloroethane	24	EF	Marginal	0	
								-		Methane	24	EF	Marginal	0	0.00%
										Bromomethane	24	EF	Marginal	0	
										Methyl Chloride	24	EF	Marginal	0	
										Vinyl chloride	24	EF	Marginal	0	
										Acetaldehyde	24	EF	Marginal	0	
										Dichloromethane	24	EF	Marginal	0	
										CFC-11	24	EF	Marginal	0	
										Isobutyraldehyde	24	EF	Marginal	0	
										1,2-Dichloropropane	24	EF	Marginal	0	
										Methyl ethyl ketone	24	EF	Marginal	0	
	I	I	I	l	l l		I	I L	10-30-0		27		marginal	. 0	0.0076

_	Whitesand Armstrong Station, Ontario					Sc	ource Summa	le E2-1: ary Table - St Rev2)	ack ID				Project	No.: 030895	
Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS	Contaminant Name	Averaging Period (h)		Accuracy	Emission Rate (g/s)	
									79-01-6	Trichloroethylene	24	EF	Marginal	(0.00%
									83-32-9	PAH - Acenaphthene	24	EF	Marginal	0	0.00%
									85-01-8	Phenanthrene	24	EF	Marginal	0	0.0070
										PAH - Fluorene	24	EF	Marginal	C	
										Dibenzopyrrole	24	EF	Marginal	C	0.0070
										Pentachlorophenol	24	EF	Marginal	0	
										2,4,6-trichlorophenol	24	EF	Marginal	0	0.0070
										2-Nitrophenol	24	EF	Marginal	0	
										Naphthalene	24 24	EF EF	Marginal	0	
										2-Methyl Naphthalene 2-Chloronaphthalene	24	EF	Marginal Marginal		
										o-Xylene	24	EF	Marginal		
										2-Chlorophenol	24	EF	Marginal	-	0.00%
										Acetophenone	1	EF	Marginal		
										p-Nitrophenol	24	EF	Marginal	0	
										Ethylbenzene	24	EF	Marginal	0	
										Styrene	24	EF	Marginal	0	0.00%
										Benzaldehyde	24	EF	Marginal	0	0.00%
									104-87-0	p-Tolualdehyde	24	EF	Marginal	0	0.00%
										Acrolein	24	EF	Marginal	C	
										1,2-Dichloroethane / Ethylene dichlori	24	EF	Marginal	C	
										Toluene	24	EF	Marginal	0	
										Chlorobenzene	1	EF	Marginal	0	
									108-95-2		24	EF	Marginal	0	
										Bis(2-ethylhexyl) phthalate	24	EF	Marginal	0	
										Anthracene	24 0.1667	EF EF	Marginal	0	0.0070
										Propionaldehyde Crotonaldehyde	24	EF	Marginal Marginal		
										Carbon Dioxide	24	EF	Marginal		
										Tetrachloroethylene	24	EF	Marginal		
									129-00-0		24	EF	Marginal	-	0.00%
										Benzo(g,h,i)perylene	24	EF	Marginal	0	
		1								Benzo(e)pyrene	24	EF	Marginal	0	
		1								Indeno(1,2,3-c,d)pyrene	24	EF	Marginal	Ċ	
										Perylene	24	EF	Marginal	0	0.00%
									205-99-2	Benzo(b)fluoranthene	24	EF	Marginal	C	0.00%
		1								Fluoranthene	24	EF	Marginal	0	
										Benzo(k)fluoranthene	24	EF	Marginal	0	
		1								Acenaphthylene	24	EF	Marginal	0	
										Benzo(a)phenanthrene	24	EF	Marginal	0	
										o-Tolualdehyde	24	EF	Marginal	C	
										1,2-Dibromoethene	24	EF	Marginal	0	0.0070
										Carbon monoxide	0.5	EF	Marginal	0	
		1								2,3,7,8-tetrachlorodibenzo-para-dioxir	24	EF	Marginal	0	
		1								Dichlorobiphenyl	24	EF	Marginal	0	
		1								Decachlorobiphenyl Dichlorobiphenyl	24 24	EF EF	Marginal Marginal		
		1								Octachlorodibenzo-p-dioxin	24	EF	Marginal	-	0.00%
		1							7439-89-6		24	EF	Marginal		
		1											0	,	
									7439-92-1		24	EF	Marginal	()

	Whitesand Armstrong Station, Ontario					Sc	urce Summa	le E2-1: ary Table - Sta Rev2)	ack ID				Project	No.: 030895	
Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS	Contaminant Name	Averaging Period (h)		Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
									7439-96-5	Manganese	24	EF	Marginal	0	0.00%
									7439-97-6		24	EF	Marginal	0	
										Molybdenum	24	EF	Marginal	0	0.0070
									7440-02-0		24	EF	Marginal	0	
								-	7440-09-7		24	EF	Marginal	0	
								-	7440-22-4		24	EF	Marginal	0	
									7440-23-5		24	EF	Marginal	0	0.0070
									7440-24-6		24	EF	Marginal	0	
									7440-31-5 7440-32-6		24 24	EF	Marginal	0	0.0070
									7440-32-6		24	EF	Marginal Marginal	0	
									7440-38-0		24	EF	Marginal	0	
								-		Barium - total water soluble	24	EF	Marginal	0	
										Beryllium (And its compounds)	24	EF	Marginal	0	
								-	7440-43-9		24	EF	Marginal	0	
								-		Chromium (metalic, II, III)	24	EF	Marginal	0	
									7440-48-4		24	EF	Marginal	0	
								-	7440-50-8	Copper	24	EF	Marginal	0	0.00%
								-	7440-62-2	Vanadium	24	EF	Marginal	0	0.00%
									7440-65-5	Yttrium	24	EF	Marginal	0	0.00%
									7440-66-6		24	EF	Marginal	0	
										Hydrochloric acid	24	EF	Marginal	0	0.0070
										Phosphorus, white	24	EF	Marginal	0	
								-	7782-49-2		24	EF	Marginal	0	0.0070
									7782-50-5		24	EF	Marginal	0	
										Nitrous Oxide	24	EF	Marginal	0	0.0070
										Nitrogen oxides	24 24	EF	Marginal	0	
										Dichlorobiphenyl Trichlorobiphenyl	24	EF	Marginal Marginal	0	
								-		Tetrachlorobiphenyl	24	EF	Marginal	0	
										Pentachlorobiphenyl	24	EF	Marginal	0	
										Chromium compounds - Hexavalent	24	EF	Marginal	0	
								-		Hexachlorobiphenyl	24	EF	Marginal	0	
								-		Monochlorobiphenyl	24	EF	Marginal	0	
										Tetrachlorobiphenyl	24	EF	Marginal	0	
								-		Tetrachlorobiphenyl	24	EF	Marginal	0	0.00%
									33146-45-1	Dichlorobiphenyl	24	EF	Marginal	0	0.00%
									35065-29-3	Heptachlorobiphenyl	24	EF	Marginal	0	0.0070
									35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p-di	24	EF	Marginal	0	
										Trichlorobiphenyl	24	EF	Marginal	0	0.0070
										Pentachlorobiphenyl	24	EF	Marginal	0	
										Trichlorobiphenyl	24	EF	Marginal	0	
										Octachlorodibenzofuran	24	EF	Marginal	0	0.0070
										1,2,3,4,7,8-Hexachlorodibenzo-p-dioxi	24	EF	Marginal	0	
										1,2,3,7,8-Pentachlorodibenzo-p-dioxin	24	EF	Marginal	0	
										2,3,7,8-Tetrachlorodibenzofuran (TEQ	24 24	EF	Marginal	0	0.0070
										1,2,3,4,7,8,9-Heptachlorodibenzofuran	24	EF	Marginal	0	
										1,2,3,6,7,8-Hexachlorodibenzofuran	24	EF	Marginal	0	
										2,3,4,6,7,8-Hexachlorodibenzofuran 1,2,3,4,6,7,8-Heptachlorodibenzofurar	24	EF	Marginal Marginal	0	
1	l	1		I	I I		l	I L	01002-09-4	1,2,3,4,0,7,0-neptachiorouben2010fal	24		warginai	0	0.00%

	Whitesand Armstrong Station, Ontario					Sc	ource Summa	le E2-1: ary Table - Sta Rev2)	ick ID				Project	No.: 030895	
Source ID	Description	Volumetric Emission Rate (m ³ /s)	Emission Temperatur e (K)	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	CAS	Contaminant Name	Averaging Period (h)	Estimatio n Method	Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
									70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	24	EF	Marginal	0	0.0070
										1,2,3,7,8,9-Hexachlorodibenzofuran	24	EF	Marginal	0	0.0070
										Total particulate matter	24	EF	Marginal	0	0.0070
30	Stand by Generator (500kW)	0.17602622	393.15	0.1016	8.2296	8.2296	354217.192	5572144.96		Nitrogen oxides	24	EF	Marginal	0	0.0070
										Total particulate matter	24	EF	Marginal	0	0.0070
31	Fire Pump Diesel Engine (150hp)	0.03884133	393.15	0.1016	8.2296	8.2296	354387.921	5571951		Nitrogen oxides	24	EF	Marginal	0	0.0070
										Total particulate matter	24	EF	Marginal	0	0.00%
38	Pellet Plant – Dust Pick-ups and Scre			1.2192	14.0208	14.0208		5572191.11	PM	Total particulate matter	24	EF	Marginal	0.0117178	
39	Pellet Plant – Pellet Cooler - Cyclone			1.2192	14.0208	14.0208		5572222.11	PM		24	EF	Marginal	0.0117178	
40	Pellet Plant – Fine Hammer Mill - Bag			0.6096	14.0208	14.0208		5572200.45		Total particulate matter	24	EF	Marginal	0.0249476	
57	Dry Chip Storage Silo Vent	0.00943895	294.15	0.1524	23.8252	0.9144		5572212.94		Total particulate matter	24	EF	Marginal	0.00108	
61	Biomass Pile- Aspen/Birch	0.00047195	293.15	40	1	1		5572147.58		Total particulate matter	24	EF	Marginal	0.8666667	
63	Biomass Pile-Fuel	0.00047195	293.15	50	1	1		5572053.07	PM		24	EF	Marginal	0.0641014	
70	Biomass Fuel Screen and Hog	4.7194745	294.15	1.37571988	9.7536	-4.064	354352.75	5572024.54		Total particulate matter	24	EF	Marginal	0.0641014	
100_1	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0028096	
100_2	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0014672	
100_3	Road dust	0.00047195	293.15	1	1	1	1	1	PM		24	EF	Marginal	0.0028096	
100_4	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0030905	
100_5	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0112695	
100_6	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0039022	
100_7	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0019355	
100_8	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0031842	
100_9	Road dust	0.00047195	293.15	1	1	1	1	1		Total particulate matter	24	EF	Marginal	0.0007492	
58_1	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354259.648	5572190.6		Formaldehyde	24	EF	Marginal	0.0008333	
										Total particulate matter	24	EF	Marginal	0.2166667	9.37%
58_2	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354254.712	5572185		Formaldehyde	24	EF	Marginal	0.0008333	
										Total particulate matter	24	EF	Marginal	0.2166667	9.37%
58_3	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354249.731	5572179.35		Formaldehyde	24	EF	Marginal	0.0008333	
										Total particulate matter	24	EF	Marginal	0.2166667	9.37%
58_4	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354244.704	5572173.81		Formaldehyde	24	EF	Marginal	0.0008333	
										Total particulate matter	24	EF	Marginal	0.2166667	9.37%
59_1	Cooling Tower		322.038889	3.048	6.7056	6.7056		5572135.54		Total particulate matter	24	EF	Average	0.0136275	
59_2	Cooling Tower	43.8911129	322.038889	3.048	6.7056	6.7056	354189.2	5572133.78	PM	Total particulate matter	24	EF	Average	0.0136275	0.59%

Whitesand Armstrong Station, Ontario

Table E2-2: Source Summary Table - Contaminant (Rev2)

Project No.: 030895

Source Summary Table by Contaminant

CAS	Contaminant Name	Averaging Period (h)	Source ID	Description	Volumetric Emission Rate (m3/s)	Temperatur	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	Estimatio n Method	Accuracy	Emission Rate (g/s)	
0-03-3	Pentachlorodibenzo-p-furans	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	7.765E-11	
50-00-0	Formaldehyde	24	58_1	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354259.648	5572190.6	EF	Marginal	0.0008333	3 20.10%
			58_2	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354254.712	5572185	EF	Marginal	0.0008333	3 20.10%
			58_3	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354249.731	5572179.35	EF	Marginal	0.0008333	
			58_4	Chip Dryer	17.4998114	402.594444	2.1336	7.0104	7.0104	354244.704	5572173.81	EF	Marginal	0.0008333	3 20.10%
	Benzo(a)pyrene - all sources	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	4.807E-07	
	2,4-Dinitrophenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	3.328E-08	
	Dibenzo(a,h)anthracene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Benzo(a)anthracene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Benzoic Acid	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	8.689E-09	
	Hexanaldehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.294E-06	
67-64-1		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Chloroform	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
71-43-2		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	0.0007765	
	1,1,1-Trichloroethane	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
74-82-8		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Methyl Chloride	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	4.252E-06	
	Vinyl chloride	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Acetaldehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Dichloromethane	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.361E-05	
75-69-4		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	7.58E-06	
	Isobutyraldehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	2.218E-06	
	1,2-Dichloropropane	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	6.101E-06	
	Methyl ethyl ketone	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	9.983E-07	
	Trichloroethylene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.546E-06	
	PAH - Acenaphthene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.682E-07	
	Phenanthrene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.294E-06	
	PAH - Fluorene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Dibenzopyrrole	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average		
	2,4,6-trichlorophenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.067E-09	
88-75-5	2-Nitrophenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Naphthalene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
91-57-6	2-Methyl Naphthalene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	2.958E-08	
	2-Chloronaphthalene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.437E-10	
	o-Xylene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	4.622E-06	
95-57-8	2-Chlorophenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	4.437E-09	
	Acetophenone	1	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	5.916E-10	
100-02-7	p-Nitrophenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Ethylbenzene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	5.731E-06	
100-42-5	Styrene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	0.0003513	3 100.00%
100-52-7	Benzaldehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		7 100.00%
	p-Tolualdehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
107-02-8		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	0.0007395	
	1,2-Dichloroethane / Ethylene dich		8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
108-88-3	Toluene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	0.0001701	
	Chlorobenzene	1	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	6.101E-06	
108-95-2	Phenol	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	9.428E-06	6 100.00%
117-81-7	Bis(2-ethylhexyl) phthalate	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	8.689E-09	0 100.00%
	Anthracene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		

White: Armst	sand trong Station, Ontario				Source Summar	ble E2-2: y Table - Cor (Rev2)	ntaminant						Project I	No.: 030895	
CAS	Contaminant Name	Averaging Period (h)	Source ID	Description	Volumetric Emission Rate (m3/s)	Temperatur	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	Estimatio n Method	Accuracy	Emission Rate (g/s)	Percent of total Emission (%)
123-38-6	Propionaldehyde	0.1667	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	1.128E-05	5 100.00%
123-73-9	Crotonaldehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	1.83E-06	6 100.00%
124-38-9	Carbon Dioxide	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	36.049626	6 100.00%
127-18-4	Tetrachloroethylene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	7.025E-06	6 100.00%
129-00-0	Pyrene	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	6.84E-07	
191-24-2	Benzo(g,h,i)perylene	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
192-97-2	Benzo(e)pyrene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	4.807E-10	100.00%
193-39-5	Indeno(1,2,3-c,d)pyrene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	1.608E-08	
198-55-0		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	9.613E-11	
	Benzo(b)fluoranthene	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	Fluoranthene	24	-	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	2.958E-07	
	Benzo(k)fluoranthene	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
208-96-8	Acenaphthylene	24	-	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	Benzo(a)phenanthrene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	o-Tolualdehyde	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	1.331E-06	
	1,2-Dibromoethene	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	Carbon monoxide	0.5		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	2,3,7,8-tetrachlorodibenzo-para-di	i 24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	8.689E-11	1 100.00%
	Dichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.368E-10	100.00%
	Decachlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.991E-11	
	Dichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average		100.00%
3268-87-9	Octachlorodibenzo-p-dioxin	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	1.22E-08	3 100.00%
7439-92-1		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	8.874E-06	
7439-96-5	Manganese	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	0.0002958	3 100.00%
7439-97-6		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	6.47E-07	
	Molybdenum	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	3.882E-07	
7440-02-0		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	6.101E-06	
7440-09-7		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	0.0072099	100.00%
7440-22-4		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	0.0003143	
7440-23-5		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	6.655E-05	
7440-24-6		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
7440-31-5		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	4.252E-06	
7440-32-6		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
7440-36-0		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
7440-38-2		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.067E-06	6 100.00%
	Barium - total water soluble	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	3.143E-05	
	Beryllium (And its compounds)	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	2.034E-07	
7440-43-9		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average		
	Chromium (metalic, II, III)	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average		
7440-48-4		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
7440-50-8		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	9.059E-06	
7440-62-2		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15		Above-Average		
7440-65-5		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	5.546E-08	
7440-66-6		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
	Hydrochloric acid	24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	0.0035125	5 100.009
	Phosphorus, white	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average		
7782-49-2		24		Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	5.176E-07	
7782-50-5		24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406			EF	Above-Average	0.000146	
	Nitrous Oxide	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406		5572113.15	EF	Above-Average	0.0024033	3 100.00%
10102 44 0	Nitrogen oxides	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	0.0406714	89.74%

	Whites Armst	sand rong Station, Ontario			Sou	rce Summar	ble E2-2: y Table - Cor (Rev2)	taminant						Project N	lo.: 030895	
CAS		Contaminant Name	Averaging Period (h)	Source ID	Description	Volumetric Emission Rate (m3/s)	Temperatur	Stack Dimension s (dia. or X by Y) (m)	Emission Height above Grade (m)	Height above or below Building Roof (m)	Stack Location X	Stack Location Y	Estimatio n Method	Accuracy	Emission Rate (g/s)	
13029	9-08-8	Dichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032		1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.368E-10	
		Trichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032		1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.807E-10	
		Tetrachlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.622E-10	
		Pentachlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032		1.016	20.0406	20.0406	354205.368		EF	Above-Average	2.218E-10	
		Chromium compounds - Hexavale	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	6.47E-07	
		Hexachlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032		1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.017E-10	
		Monochlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.067E-11	
		Tetrachlorobiphenyl	24 24	8	Boiler Flue Gas Stack	15.6342032 15.6342032	394.15 394.15	1.016 1.016	20.0406	20.0406 20.0406	354205.368		EF EF	Above-Average	4.622E-10	
		Tetrachlorobiphenyl Dichlorobiphenyl	24	8	Boiler Flue Gas Stack Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406 20.0406	20.0406	354205.368 354205.368	5572113.15 5572113.15	EF	Above-Average Above-Average	4.622E-10 1.368E-10	
		Heptachlorobiphenyl	24	0 8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.22E-11	
		1,2,3,4,6,7,8-Heptachlorodibenzo-	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.010	20.0400	20.0400	354205.368		EF	Above-Average	3.697E-10	
		Trichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.807E-10	
		Pentachlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	2.218E-10	
		Trichlorobiphenyl	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	4.807E-10	
		Octachlorodibenzofuran	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	1.627E-11	
		1,2,3,4,7,8-Hexachlorodibenzo-p-o	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	2.958E-07	
		1,2,3,7,8-Pentachlorodibenzo-p-di	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	2.773E-10	100.00%
5120	7-31-9	2,3,7,8-Tetrachlorodibenzofuran (24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	1.387E-10	100.00%
55673	3-89-7	1,2,3,4,7,8,9-Heptachlorodibenzof	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368	5572113.15	EF	Above-Average	4.437E-11	100.00%
		1,2,3,6,7,8-Hexachlorodibenzofura	24	8	Boiler Flue Gas Stack	15.6342032		1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.176E-11	100.00%
6085 ⁻	1-34-5	2,3,4,6,7,8-Hexachlorodibenzofura	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.176E-11	100.00%
		1,2,3,4,6,7,8-Heptachlorodibenzof	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	2.958E-07	100.00%
		1,2,3,4,7,8-Hexachlorodibenzofura	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.176E-11	100.00%
72918		1,2,3,7,8,9-Hexachlorodibenzofura	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	5.176E-11	
	PM	Total particulate matter	24	8	Boiler Flue Gas Stack	15.6342032	394.15	1.016	20.0406	20.0406	354205.368		EF	Above-Average	0.31268	3 13.52%
				38	Pellet Plant – Dust Pick-ups and Scre		294.261111	1.2192	14.0208	14.0208	354245.334		EF	Marginal	0.0117178	
				39	Pellet Plant – Pellet Cooler - Cyclone			1.2192	14.0208	14.0208	354236.734		EF	Marginal	0.0117178	
				40	Pellet Plant – Fine Hammer Mill - Bag		294.261111	0.6096	14.0208	14.0208	354253.12	5572200.45	EF	Marginal	0.0249476	
				57 61	Dry Chip Storage Silo Vent	0.00943895		0.1524	23.8252	0.9144	354255.21 354412.619	5572212.94	EF EF	Marginal	0.00108	8 0.05% 7 37.47%
				63	Biomass Pile- Aspen/Birch Biomass Pile-Fuel	0.00047195		40 50	1	1	354412.619		EF	Marginal Marginal	0.8666667	
				70	Biomass Fuel Screen and Hog	4.7194745	293.15	1.37571988	9.7536	-4.064	354352.75		EF	Marginal	0.0641014	
				100 1	Road dust	0.00047195		1.37371900	9.7550	-4.004	1	1	EF	Marginal	0.0028096	
				100_1	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0014672	2 0.06%
				100_2	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0028096	
				100_4	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0030905	0.13%
				100 5	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0112695	
				100_6	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0039022	
				100_7	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0019355	
				100_8	Road dust	0.00047195	293.15	1	1	1	1	1	EF	Marginal	0.0031842	0.14%
				100_9	Road dust	0.00047195		1	1	1	1	1	EF	Marginal	0.0007492	
				58_1	Chip Dryer		402.594444	2.1336	7.0104	7.0104	354259.648	5572190.6	EF	Marginal	0.2166667	9.37%
				58_2	Chip Dryer		402.594444	2.1336	7.0104	7.0104	354254.712		EF	Marginal	0.2166667	9.37%
				58_3	Chip Dryer		402.594444	2.1336	7.0104	7.0104	354249.731	5572179.35	EF	Marginal	0.2166667	
				58_4	Chip Dryer		402.594444	2.1336	7.0104	7.0104	354244.704		EF	Marginal	0.2166667	9.37%
				59_1	Cooling Tower		322.038889	3.048	6.7056	6.7056	354187.23	5572135.54	EF	Average	0.0136275	
				59_2	Cooling Tower	43.8911129	322.038889	3.048	6.7056	6.7056	354189.2	5572133.78	EF	Average	0.0136275	0.59%

rmstrong Station, Ontario	Dispersion Modeling Inp (Rev2)	-
Relevant Section of the Regulation	Section Title	Description of How the Approved Dispersion Model Was Used
Section 8	Negligible sources	The sources deemed negligible are discussed in the application document in Section 3 and Appendix EB.
Section 9	Same Structure contamination	Not applicable.
Section 10	Operating Conditions	See Section 4 and Appendix EA of the Application
Section 13	Meteorological Conditions	Regional Meteorological data was used for AERMOD.
Section 14	Area of Modelling Coverage	The entire grid specified is used.
Section 15	Stack Height for Certain New Sources of Contaminant	Not applicable
Section 16	Terrain Data	Terrain elevation contour data was used downloaded from Natural Resources Canada's Canadian Digital Elevation Data (CDED) dataset.
Section 17	Averaging Periods	10 min, 0.5 hour, 1 hour, 24 hours, monthly and annual

Table E3:

Whitesand

Project No.: 030895

Table E4: Emissions Summary Table (Rev2)

					Locat	ion of							1
CAS#	Contaminant	Total Emission Rate (g/s)	Dispersion Model Used	Max POI Value (µg/m³)	X (m)	Y (m)	Averaging Period Modelled (h)	Averaging Period of Criterion (h)	Max POI Value Converted to Criterion Period (µg/m³)	Criteria (μg/m³)	Limiting Effect	Regulation Schedule #	Percentage of Criteria or Likelihood of adverse effect (%)
0-03-3	Pentachlorodibenzo-p-furans	7.7645E-11	AERMOD-m	1.10964E-09	354191	5572230	24	24	1.10964E-09	0		0	Neg
50-00-0	Formaldehyde	0.00414676	AERMOD-m	0.528224	354177	5572216	24	24	0.528224	65	Health	Schedule 3	0.8%
50-32-8	Benzo(a)pyrene - all sources	4.8066E-07	AERMOD-m	6.86921E-06	354191	5572230	24	24	6.86921E-06	0.005	sessment Va	Schedule 3	0.1%
50-32-8	Benzo(a)pyrene - all sources	4.8066E-07	AERMOD-m	5.81987E-07	354219	5572309	8760	8760	5.81987E-07	0.00001	Health	Schedule 3	5.8%
	2,4-Dinitrophenol	3.3277E-08	-	4.7556E-07	354191	5572230	24	24	4.7556E-07	0		0	Neg
	Dibenzo(a,h)anthracene	1.6823E-09		2.40422E-08	354191	5572230	24	24	2.40422E-08	0		0	Neg
	Carbon tetrachloride	8.3191E-06	AERMOD-m	0.00011889	354191	5572230	24	24	0.00011889	2.4	Health	Schedule 3	0.0%
	Benzo(a)anthracene	1.2017E-08		1.7173E-07	354191	5572230	24	24	1.7173E-07	0		0	Neg
	Benzoic Acid	8.6889E-09	-	1.24174E-07	354191	5572230	24	24	1.24174E-07	700	Health	Guideline	0.0%
	Hexanaldehyde	1.2941E-06	AERMOD-m	0.000018494	354191	5572230	24	24	0.000018494	2	JSL	JSL	0.0%
	Acetone	3.5125E-05	AERMOD-m	0.000501981	354191	5572230	24	24	0.000501981	11880	Health	Schedule 3	0.0%
	Chloroform	5.1764E-06	AERMOD-m	7.39761E-05	354191	5572230	24	24	7.39761E-05	1	Health	Schedule 3	0.0%
	Benzene	0.00077645		0.0110964	354191	5572230	24	24	0.0110964	100	sessment Va	Schedule 3	0.0%
	Benzene	0.00077645	-	0.000940134	354219	5572309	8760	8760	0.000940134	0.45	Health	Schedule 3	0.2%
	1,1,1-Trichloroethane	5.731E-06	AERMOD-m	8.19021E-05	354191	5572230	24	24	8.19021E-05	115000	Health	Schedule 3	0.0%
	Methane	0.00388227	AERMOD-m	0.055482	354191	5572230	24	24	0.055482	0		0	Neg
	Bromomethane	2.773E-06	AERMOD-m	0.00003963	354191	5572230	24	24	0.00003963	1350	Health	Guideline	0.0%
	Methyl Chloride	4.252E-06	AERMOD-m	6.07661E-05	354191	5572230	24	24	6.07661E-05	320	Health	Schedule 3	0.0%
	Vinyl chloride	3.3277E-06	AERMOD-m	4.75561E-05	354191	5572230	24	24	4.75561E-05	1	Health	Schedule 3	0.0%
	Acetaldehyde	0.00015344	AERMOD-m	0.004058	354059	5571849	1	0.5	0.004927203	500	Health	Schedule 3	0.0%
	Acetaldehyde	0.00015344	AERMOD-m	0.00219286	354191	5572230	24	24	0.00219286	500	Health	Schedule 3	0.0%
	Dichloromethane	5.3612E-05	AERMOD-m	0.000766181	354191	5572230	24	24	0.000766181	220	Health	Schedule 3	0.0%
	CFC-11	7.5797E-06	AERMOD-m	0.000108322	354191	5572230	24	24	0.000108322	6000	Health	Guideline	0.0%
	Isobutyraldehyde	2.2184E-06	AERMOD-m	0.000031704	354191	5572230	24	24	0.000031704	56	JSL	JSL	0.0%
	1,2-Dichloropropane	6.1007E-06		8.71861E-05	354191	5572230	24	24	8.71861E-05	2400	Odour	Guideline	0.0%
	Methyl ethyl ketone	9.983E-07	AERMOD-m	1.42668E-05	354191	5572230	24	24	1.42668E-05	1000	Health	Schedule 3	0.0%
	Trichloroethylene	5.5461E-06	AERMOD-m	7.92601E-05	354191	5572230	24	24	7.92601E-05	12	Health	Schedule 3	0.0%
	PAH - Acenaphthene	1.6823E-07	AERMOD-m	2.40422E-06	354191	5572230	24	24	2.40422E-06	0		0	Neg
	Phenanthrene	1.2941E-06	AERMOD-m	0.000018494	354191	5572230	24	24	0.000018494	0		0	Neg
	PAH - Fluorene	6.2856E-07	AERMOD-m	8.98281E-06	354191	5572230	24	24	8.98281E-06	0	101	0	Neg
	Dibenzopyrrole	3.3277E-07	AERMOD-m	4.7556E-06	354191	5572230	24	24	4.7556E-06	40	JSL	JSL	0.0%
	Pentachlorophenol	9.4284E-09	AERMOD-m	1.34742E-07	354191	5572230 5572230	24 24	24	1.34742E-07	20	Health	Guideline	0.0%
	2,4,6-trichlorophenol	4.0671E-09	-	5.81241E-08	354191			24	5.81241E-08	1.5	JSL	JSL 0	0.0%
	2-Nitrophenol Naphthalene	4.4369E-08 1.7932E-05	AERMOD-m AERMOD-m	6.34081E-07 0.000474246	354191 354059	5572230 5571849	24 1	24 0.1667	6.34081E-07 0.00078318	0 50	Odour	Guideline	Neg 0.0%
	Naphthalene	1.7932E-05		0.000474246	354059	5572230	24	24	0.00078318	22.5	Health	Guideline	0.0%
	2-Methyl Naphthalene	2.9579E-08		4.2272E-07	354191	5572230	24	24	4.2272E-07	10	JSL	JSL	0.0%
	2-Chloronaphthalene	4.4369E-10	AERMOD-m	6.34081E-09	354191	5572230	24 24	24	6.34081E-09	0	JOL	0	Neg
	o-Xylene	4.6217E-06	AERMOD-m	6.60501E-05	354191	5572230	24	24	6.60501E-05	100	JSL	JSL	0.0%
	2-Chlorophenol	4.4369E-09	AERMOD-m	6.34081E-08	354191	5572230	24	24	6.34081E-08	0.8	JSL	JSL	0.0%
	Acetophenone	5.9158E-10		1.56452E-08	354059	5571849	1	1	1.56452E-08	1167	Health	Guideline	0.0%
	p-Nitrophenol	2.0336E-08		2.9062E-07	354191	5572230	24	24	2.9062E-00	4	JSL	JSL	0.0%
	Ethylbenzene	5.731E-06	AERMOD-m	8.19021E-07	354191	5572230	24	24	8.19021E-05	1000	Health	Schedule 3	0.0%
100-42-5		0.00035125		0.00501981	354191	5572230	24	24	0.00501981	400	Health	Schedule 3	0.0%
	Benzaldehyde	1.5714E-07	AERMOD-m	2.2457E-06	354191	5572230	24	24	2.2457E-06	2	JSL	JSL	0.0%
	p-Tolualdehyde	2.0336E-06	AERMOD-m	0.000029062	354191	5572230	24	24	0.000029062	0		0	Neg
107-02-8		0.00073948		0.019557	354059	5571849	1	1	0.019557	4.5	Health	Schedule 3	0.4%
107-02-8		0.00073948		0.010568	354191	5572230	24	24	0.010568	0.4	Health	Schedule 3	2.6%
107-06-2	1,2-Dichloroethane / Ethylene dichloride	5.3612E-06	AERMOD-m	7.66181E-05	354191	5572230	24	24	7.66181E-05	2	Health	Schedule 3	0.0%
108-88-3		0.00017008	AERMOD-m	0.00243064	354191	5572230	24	24	0.00243064	2000	Odour	Guideline	0.0%
			-				1	0.1667	0.000266444	4500	Odour		0.0%
108-90-7	Chlorobenzene	6.1007E-06	AERMOD-m	0.000161342	354059	5571849	1	0.1007	0.000200444	4500	Ououi	Guideline	0.070

Table E4: Emissions Summary Table (Rev2)

CAS# Contaminant Total Rate (git) Model Uses Maxe Poly Model Uses X (m) X (m) X (m) Averagin Model Uses Averagin Period Model Uses Averagin Period Period Settion Averagin Period Settion Averagin Settion Averag						Locat	ion of							·'
11173-17 Bis2-arbytmaying pithalala 8.8885-09 AERNOD-m 124174-677 50 Heath Scheduce 3 007 120:127-Artimizence 5.6847-07 AERNOD-m 726017-66 24 24 24 24 726017-66 23 38. 007 120:127-Artimizence 12772-63 AERNOD-m 0.00024227 344191 577230 24 <th>CAS#</th> <th>Contaminant</th> <th>Emission</th> <th></th> <th></th> <th></th> <th></th> <th>Period</th> <th>Period of</th> <th>Value Converted to Criterion Period</th> <th></th> <th></th> <th>•</th> <th>Percentage of Criteria or Likelihood of adverse effect (%)</th>	CAS#	Contaminant	Emission					Period	Period of	Value Converted to Criterion Period			•	Percentage of Criteria or Likelihood of adverse effect (%)
121:27 Antmanene 6.5611:07 R2HNOD:m 7.5201:07 5.5411 5.72320 24 24 7.82011:06 0.000 0.000 0.0000 0.0000 0.00000 0.000000 0.0000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.00000000 0.000000000 0.000000000 0.0000000000 0.000000000000 0.00000000000000 0.00000000000000000000000000000000000	108-95-2	Phenol	9.4284E-06	AERMOD-m	0.000134742	354191	5572230	24	24	0.000134742	30	Health	Schedule 3	0.0%
12338-0 Popionadetyde 11277:00 RFINOD: m 0.000298237 5871460 1 0.1667 0.00492515 10 Oxfur Guideline 0.07% 1237-30 Contonaletyde 3.6049681 AERMOD: m 51519013 584191 557220 24 24 24 51519013 21000 Vis. JSL	117-81-7	Bis(2-ethylhexyl) phthalate	8.6889E-09	AERMOD-m	1.24174E-07	354191	5572230	24	24	1.24174E-07	50	Health	Schedule 3	0.0%
1227-3-9 Colonaladatylvác 1.83/22-60 AERNOD-m 261586-05 3.4 JSL JSL <td< td=""><td>120-12-7</td><td>Anthracene</td><td>5.5461E-07</td><td>AERMOD-m</td><td>7.92601E-06</td><td>354191</td><td>5572230</td><td>24</td><td>24</td><td>7.92601E-06</td><td>0.2</td><td>JSL</td><td>JSL</td><td>0.0%</td></td<>	120-12-7	Anthracene	5.5461E-07	AERMOD-m	7.92601E-06	354191	5572230	24	24	7.92601E-06	0.2	JSL	JSL	0.0%
123-8-9 Carbon Doxide 36.0460261 AERMOO-m 65.190613 21000 JSL JSL 25% 1271-84-Tracehordenytheme 7.052160 AERMOO-m 0.0001039 3900 977641E-06 0.2 JSL JSL 0.000 1991-824 Beroz(a), Jyperme 6.8402E-07 AERMOO-m 0.75761E-06 354101 557220 24 24 24 2450766-07 12 JSL JSL 0.00 1991-824 Beroz(a), Jyperme 4800E-10 AERMOO-m 0.354101 557220 24 24 24 25.0562-07 12 JSL 0.00 Neg 1983-85 Internet(12.2-c, d)tyrene 1.06427-07 12.932411 557220 24 24 2.9427-07 0 0 0 Neg 2964-40 Filtorentheme 2.9576-07 FIRONO-m 4.9272720 24 24 4.92727-06 140 JSL 0.00 Neg	123-38-6	Propionaldehyde	1.1277E-05	AERMOD-m	0.000298237	354059	5571849	1	0.1667	0.000492515	10	Odour	Guideline	0.0%
112-11-4-7 transhorom/prime 7.0211-60 AERMOD-m 0.00103098 3940 Health Schedule 3 0.075 122-03-0 Pyrame 6.002167 AERMOD-m 2.47066-07 354101 5572230 24 24 9.075411-66 0.2 JSL JSL 0.055 192-62-2 Berox(g), hyperytene 1.05046-03 AERMOD-m 2.447066-07 354101 5572230 24 24 6.86212-69 0 0 Neg 193-62-2 Berox(g), hyperytene 1.05046-03 AERMOD-m 2.459230 24 24 2.8626-07 0 0 Neg 202-69-0 Berox(g), hyperytene 1.05046-03 354101 557220 24 24 2.8626-07 0 0 Neg 202-69-0 Berox(g), hyperytene 2.9576-07 AERMOD-m 325101 557230 24 24 0.2096-07 0 0 Neg 202-69-0 Berox(g), hyperytene 7.3516-06 AERMOD-m 1.05024-06 34101 557230 24 24 0.0001321 35. JSL JSL JSL JSL <t< td=""><td>123-73-9</td><td>Crotonaldehyde</td><td>1.8302E-06</td><td>AERMOD-m</td><td>2.61558E-05</td><td>354191</td><td>5572230</td><td>24</td><td>24</td><td>2.61558E-05</td><td>3.4</td><td>JSL</td><td>JSL</td><td>0.0%</td></t<>	123-73-9	Crotonaldehyde	1.8302E-06	AERMOD-m	2.61558E-05	354191	5572230	24	24	2.61558E-05	3.4	JSL	JSL	0.0%
112:00:0 Pyrene 0.4402E-07 AERMOD-m 9.77941E-06 34781 557220 24 24 9.77541E-06 0.2 JSL JSL 0.0% 19:24-2 Benzo(p), pyrene 4.806E-10 AERMOD-m 8.48021E-01 557220 24 24 2.4766E-07 1.2 JSL 0.0% Neg 19:38-55 Internet (1.3-c.2) (pyrene 1.6846E-68 FERMOD-m 2.3984E-08 2.47220 24 2.44 2.2664E-07 0 0 Neg 19:38-55 Internet (1.3-c.2) (pyrene 1.6846E-08 FERMOD-m 2.3974E-08 3.4111 557220 24 2.44 2.42 2.456E-07 0 0 Neg 20:39-26 Benzo(h)(noramitheme 1.655E-09 AERMOD-m 2.0112E-08 3.4111 557220 2.4 2.4 1.00226E-07 0 0 0 Neg 2.292-04 2.4 1.00236E-07 0 0 Neg 2.292-04 2.4 1.00236E-07 0 0 Neg 0 0 Neg 2.292-04 1.24 1.00236E-07 0 0 Neg	124-38-9	Carbon Dioxide	36.0496261	AERMOD-m	515.190613	354191	5572230	24	24	515.190613	21000	JSL	JSL	2.5%
19:23-2 Banzalgh,Diperylene 1.7192-508 AERNOCH 2.43706E-07 24 24 2.42 24 2.42 2.43706E-07 1.2 JSL JSL 0.10 Nsg 19:33-5 Benzolehytterne 4.6084E-10 AERNOD 8.23854E-07 557230 24 24 2.42 2.29854E-07 0 0 Nsg 19:35-50 Perylene 0.6132E-11 AERNOD 3.2484E-07 557230 24 24 2.427E-05 1.40 JSL 0.0 Nsg 20:64-02 Benzoh/Unornthene 1.6487E-03 AERNOD 3.4211 557230 24 24 4.247E-05 1.40 JSL 0.0 Nsg 20:64-02 Benzoh/Unornthene 6.6553E-03 AERNOD 1.572230 24 24 1.051216-03 AERNOD 0.0 Nsg 21:61-03 Benzoh/Unornthene 1.058E-05 AERNOD 3.57230 24 24 1.05024E-05 0 0 Nsg 21:61-03 Benzoh/Unornthene 1.058E-05 AERNOD 1.50224E-05 34111 577230 24 24	127-18-4	Tetrachloroethylene	7.0251E-06	AERMOD-m	0.000100396	354191	5572230	24	24	0.000100396	360	Health	Schedule 3	0.0%
19:23-2; Benzolfsporen 4.808E-10; AERNOD-m ABB921E-09 357/230 24 24 24 24 24 24 22858-25 Pervlene 0 0 Neg 19:33-55 Interrol (2.3-c.g)/brance 1.8471-08 AERNOD-m 23428-11 57/230 24 24 24 24/24E-07 0 0 Neg 20:59:25 Benzolfsburger 2.6978-07 AERNOD-m 2.4222-07 351911 55/2230 24 24 4.2272E-06 140 JSL JSL 0.0 Neg 20:69:62 Benzolfsburger 2.6978-07 AERNOD-m 3.51714-10 55/2230 24 24 4.0500112-0 JSL 0.0 Neg 20:69:64:56 Aernophtyne 0.0000121 35111 55/2230 24 24 1.05001531 0 0 Neg 20:69:64:56 AERNOD-m 0.000121 35111 55/2230 24 24 1.0204556 0 0 Neg 0 Neg 0 Neg 0 Neg 0 Neg 0 0 Neg <	129-00-0	Pyrene	6.8402E-07	AERMOD-m	9.77541E-06	354191	5572230	24	24	9.77541E-06	0.2	JSL	JSL	0.0%
193-9-5 Indenot(12.3-c)(pyrene 1.0684-E08 AFHNOD-m 3284191 5572230 24 24 1.3734E-607 0 0 Neg 198-56-0 Pervlers 9.412E11 AEMOD-m 7.384E-69 354191 5572230 24 24 24.4272E-06 1.00 Neg 206-440 Pervaritheme 2.6425-07 AEMOD-m 0.0 Neg 0.0 Neg 206-440 Pervaritheme 6.6555-60 AEMOD-m 0.0001212 3.54191 5572230 24 24 0.91271-608 0 Neg 206-840 Pervaritheme 7.0315E-69 AEMOD-m 0.0001212 3.54191 5572230 24 24 0.000121 3.5 J.31 J.35 J.31 J.31 J.35 J.31 J.35 J.31 J.31 J.35 J.31 J.35 J.31 J.31 J.31 J.31 J.31 J.35 J.31 J.31 J.31 J.31 J.31 J.31<	191-24-2	Benzo(g,h,i)perylene	1.7193E-08	AERMOD-m	2.45706E-07	354191	5572230	24	24	2.45706E-07	1.2	JSL	JSL	0.0%
1985-0 Perylene 9.6132E-11 AERMOD-m 137384-69 54191 557230 24 24 127384-69 0 0 Neg 2055-92 Benzolphuonnhene 2.6672E-07 AFMOD-m 4.2272-60 544191 557230 24 24 2.462E-07 0 0 Neg 206-44-0 Fluoranhene 2.6552-69 AERMOD-m 5.1212-68 544191 557230 24 24 4.2272-66 1.40 0.0 Neg 208-85 Acompthylere 9.2315-69 AEMOD-m 0.00001321 5571230 24 24 0.0001451 0 0 Neg 208-65 10.1005656 AEMOD-m 10.0224-65 557140 1 0.5 3.6118328 1 0.5 Neg 0 <														Neg
2059-92 20eracol/burcanthene 1.848/EV.08 AERMOD-m 2.242/2:07 24 24 2.428/EV.07 0 0 Neg 2064-40 Devarathene 6.6555-09 AERMOD-m 9.5172E-06 3411 5572230 24 24 9.5172E-06 140 0 Neg 207-08-9 Berozol/burcanthene 7.025E-09 AERMOD-m 100001321 35411 5572230 24 24 0.0306E-07 0 0 Neg 258-04-0 Cloudshyde 1.311E-06 AERMOD-m 10036E-07 354191 5572230 24 24 1.00224E-05 0 0 Neg 263-04-0 Cloudshyde 1.311E-06 AERMOD-m 2001451 557240 1 0.5 56178498 0 0 Neg 23.7.8-Errachiorobheno-par-dioin 6.6896E-11 AERMOD-m 1520220 24 24 1.24174E-09 0.076 0 Neg 23.7.8-Errachiorobheno-par-dioin 6.6896E-11 AERMOD-m 1552230 24 24 </td <td></td> <td>-</td> <td></td> <td>÷</td> <td>0</td>											-		÷	0
2064-40 Fluoranthene 2.9879E-07 AERMOD-m 4.2727E-06 3441 9.51121-60 3.511 0.0% 207-0-96 Becraclyfluoranthene 0.6553E-09 AERMOD-m 0.0001321 3.54 9.51121-60 3.51 JSL JSL 0.0% 218-01-96 Becraclyfluoranthrene 7.0251E-09 AERMOD-m 10.00956-07 3.411 1572230 2.4 2.4 1.003956-07 0 0 Neg 540-498 L2.0bromoethene 1.0186E-05 AERMOD-m 1.03024E-05 3.54119 1572230 2.4 2.4 1.002042E-05 0 0 Neg 37.6-breat/bloodiberzo-para- dosin 0.11092103 AERMOD-m 1.233462 354191 557230 2.4 2.4 1.24174E-08 0.00005 sesment Va Scheduel 3 0.1% 1746-01-2 2.37.8-breatrathorodiberzo-para- dosin 6.8896-11 AERMOD-m 1.95508E-00 36700 87600 1.05205E-00 1.60 0 Neg 2054-7-1 Dichirobphenyl 1.3861-10 AERMOD														
207-08-3 Deracid/Hurramhene 0 0.5 Neg 208-664 Acemaphthydene 9.2435E-07 AcRMOD-m 100001321 354111 5572230 24 24 100001321 35.1 JSL JSL 0.0 Neg 539-204 Drulaidehyde 13311E-06 AERMOD-m 10029E-07 341191 5572230 24 24 1.00290E-07 0 Neg 539-204 Orbundehyde 1.3311E-06 AERMOD-m 0.00014531 354191 5572230 24 24 0.00014531 0 0 Neg 630-80-7 Carbon monoxide 0.1192133 AERMOD-m 124174E-09 354191 5572230 24 24 1.24174E-09 0.00005 essment V Schedula 3 0.1% 1746-01-a (3.7.8-Harchkinodibenzo-para-dioxin 6.6889E-11 AERMOD-m 13520E-10 354219 557230 24 24 1.9850E-00 0 0 Neg 20514-23 Dichorbiphenyl 1.398E-10 AERMOD-m 1.354219														
208-96-8 Jocnaphilyeine 92438-07 AERMOD-m 0.0001321 3.5 JSL JSL 0.00 218-019 Berzolghennthree 7.0251E-03 AERMOD-m 1.00296E-07 24 24 1.00396E-07 0 Neg 529-204 D-Tolladlehyde 1.3311E-06 AERMOD-m 1.0029E-05 354191 5572230 24 24 1.00224E-05 0 0 Neg 630-08-0 Carbon monoxide 0.11052193 AERMOD-m 2.93482 354095 557230 24 24 1.24174E-09 0.00005 kessment Vs Schedule 3 0.1% 1746-01e 23.73-Bretrachlorodiberzo-para 8.8898E-11 AERMOD-m 1.05205E-10 354191 5572230 24 24 1.8500E-69 0 0 Neg 2050-67-1 Dichiorobipheryl 1.368E-11 AERMOD-m 1.9550E-09 364191 5572230 24 24 1.9550E-09 0 0 Neg 2050-67-1 Dichiorobipheryl 1.368E-11 AERMOD-m			2.9579E-07	AERMOD-m	4.2272E-06		5572230			4.2272E-06	-	JSL	JSL	0.0%
218-01-9 Derzocjaphenanthrene 7.0251E-09 AERWOD-m 1.00396E-07 24 24 1.00396E-07 0 0 Neg 529-204, P-Tolaidethyde 1.3311E-06 AERWOD-m 0.00014531 34191 5572230 24 24 0.00014531 0 0 Neg 630.08.0 Carbon monoxide 0.11092193 AERWOD-m 1.24174E-09 3.03482 354059 5571849 1 0.5 3.56181883 60000 Health Schedule 3 0.0% 1746-01e 2.3.7.84trachlorodiberzo-para- dioxin 8.6889E-11 AERMOD-m 1.05205E-10 364191 5572230 24 24 1.24174E-09 0.00005 essment Vs Schedule 3 0.1% 20516-43 Decachiorobiphenyl 1.398E-10 AERMOD-m 1.05205E-10 367230 24 24 1.733741E-10 0 0 Neg 20516-43 Decachiorobiphenyl 1.398E-10 AERMOD-m 1.05205E-10 367230 24 24 1.733741E-10 0 0 Neg <td>207-08-9</td> <td>Benzo(k)fluoranthene</td> <td>6.6553E-09</td> <td>AERMOD-m</td> <td>9.51121E-08</td> <td>354191</td> <td></td> <td></td> <td>24</td> <td>9.51121E-08</td> <td>0</td> <td></td> <td></td> <td></td>	207-08-9	Benzo(k)fluoranthene	6.6553E-09	AERMOD-m	9.51121E-08	354191			24	9.51121E-08	0			
529-20.4 (o-Totaldehyde 13311E-06 AERMOD-m 190224E-05 24 24 190224E-05 0 0 Neg 630-08-0 Carbon monoxide 0.1082193 AERMOD-m 2.933482 354191 5572230 24 24 0.00014531 0 Neg 630-08-0 Carbon monoxide 0.1082193 AERMOD-m 2.933482 354191 5572230 24 24 1.24174E-09 0.00006 essmmt Vg Schedula 3 0.1% 7140-16 2.3.7.8+treatentorodibenzo-para- 8.6898E-11 AERMOD-m 1.05205E-10 35421 5772309 8760 1.05205E-10 1E-07 Health Schedula 3 0.1% 2250-67.1 Dickinorbiphenyi 1.9850E-00 AERMOD-m 1.9520E-01 354191 577230 24 24 1.9520E-10 0 Neg 2012112 24 24 1.9520E-10 0 Neg 2012112 24 24 1.9520E-10 0 Neg 2012112 24 24 1.9520E-10 0 Neg				-								JSL		
540-49-81 12-Ditomostheme 101082103 AERMOD-m 2.93482 24 24 24 0.0001531 0 0 Neg 630.08-0 Carbon monxide 0.11092133 AERMOD-m 2.93482 5571349 1 0.5 55618883 6000 Health Schedule 3 0.1% 174601-6 2.3.7.84etrachlorodlbenzo-para- dloxin 8.6898E-11 AERMOD-m 1.95205E-10 354219 557230 24 24 1.24174E-09 0.00005 sessment vs Schedule 3 0.1% 2050-67:1 Dichorobiphenyl 1.986E-10 AERMOD-m 1.95208E-00 364191 557230 24 24 1.95508E-00 0 0 Neg 2061-24:3 Decachiorobiphenyl 4.991E-11 AERMOD-m 7.13341E-10 354191 557230 24 24 1.95508E-09 0 0 Neg 2064-67:9 Octachiorodiberzo-polixin 1.201E-08 AERMOD-m 1.95528E-06 54191 557230 24 24 1.040741526-07 0 0 <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>				-									-	
630-08-0 Carbon monoxide 0.1192193 JERMOD-m 2.93482 35459 571230 24 24 1.24174E-09 0.00005 Health Schedule 3 0.1% 1746-016 2.37.8-tetrandlorodibenzo-para- down 8.689E-11 AERMOD-m 1.0520E-10 354216 557230 24 24 1.24174E-09 0.000005 bessment vs Schedule 3 0.0% 1746-016 2.37.8-tetrandlorodibenzo-para- down 8.689E-11 AERMOD-m 1.0520E-10 354216 557230 24 24 1.95508E-00 0 0 Neg 2050-67-10 Dichlorobiphenyl 1.386E-10 AERMOD-m 1.95508E-00 0 0 Neg 2054-87-30 Dichlorobiphenyl 1.386E-10 AERMOD-m 1.9572820 24 24 1.745508E-00 0 Neg 2054-87-30 Dichlorobiphenyl 1.386E-10 AERMOD-m 1.00012816 545119 5572230 24 24 1.74372E-07 0 0 Neg 7439892-10 Benadmesee 0.0026														
1746-01-6 2.3,7.8.Hetrachlorodibenzo-para- dioxin 8.6889E-11 AERMOD-m 1.24174E-08 35419 557230 24 24 1.24174E-08 0.00000s essment Va Schedule 3 0.0% 1746-01-6 2.3,7.8.Hetrachlorodibenzo-para- dioxin 8.6889E-11 AERMOD-m 1.05205E-10 354219 557230 24 24 1.95508E-00 0 0 Neg 2051-24.3 Decachlorobiphenyl 1.9368E-10 AERMOD-m 1.95508E-00 354191 5572230 24 24 1.95508E-00 0 0 Neg 2051-24.3 Decachlorobiphenyl 1.9368E-10 AERMOD-m 1.95508E-00 354191 5572230 24 24 1.95508E-00 0 0 Neg 2368-87-9 Octachlorodbiphenyl 1.3686E-10 AERMOD-m 1.94508E-00 34191 5572230 24 24 1.04772E-07 0 0 Neg 247398-76 Meruny 0.000126816 354191 5572230 24 24 0.000216816 0.5 Health <td></td> <td>· · · · · · · ·</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>		· · · · · · · ·		-									-	
1749-0-15 dioxin 0.000300 cboolser-11 AERMOD-m 1.05205E-10 35/220 24 24 1.24 1.14/4-0-9 0.00000000000000000000000000000000000	630-08-0		0.11092193	AERMOD-m	2.933482	354059	5571849	1	0.5	3.561818838	6000	Health	Schedule 3	0.1%
Tr49-01-5 Biologian Beam Beam Schedule 3 0.1% 2250-67-7 Dichlorobjahenyl 1.98E-10 AERMOD-m 1.9569E-03 34191 572230 24 24 1.9569E-03 0 0 Neg 22974-20-5 Dichlorobjahenyl 4.9915E-11 AERMOD-m 7.13341E-10 354191 572230 24 24 1.95508E-09 0 0 Neg 23664-7-9 Octachirorobjahenyl 1.2621E-08 AERMOD-m 1.94572E-07 354191 572230 24 24 1.4927E-07 0 0 Neg 7439-96-1 Lead 8.8738E-68 AERMOD-m 0.00215681 34191 5572230 24 24 0.00216861 0.5 Health Schedule 3 0.0% 7439-96-5 Marganese 0.00021802 AERMOD-m 0.002272 34191 5572230 24 24 0.002272 Health Schedule 3 0.0% 7439-96-7 Mercury 6.4704E-07 AERMOD-m 2.08000E-05 524<	1746-01-6		8.6889E-11	AERMOD-m	1.24174E-09	354191	5572230	24	24	1.24174E-09	0.000005	sessment Va	Schedule 3	0.0%
2051-24-3 Decachborobjnenyl 4.9915-11 AERMOD-m 7.13341E-10 572230 24 24 7.13341E-10 0 0 Neg 3268-87-9 Octachborobjnenyl 1.3861-0 AERMOD-m 1.74372E-07 354191 577230 24 24 1.9560E-09 0 0 Neg 7439-89-6 Iron 0.00018302 AERMOD-m 1.702712816 354191 5572230 24 24 0.00212816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00212816 354191 5572230 24 24 0.0042272 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.0024272 354191 5572230 24 24 0.042272 0.4 Health Schedule 3 0.0% 7439-92-1 Motydenum 3.882470 AERMOD-m 5.72230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-92-1 Motydenum 3.882470 AERMOD-m 5.72230 24 24 </td <td>1746-01-6</td> <td></td> <td>8.6889E-11</td> <td>AERMOD-m</td> <td>1.05205E-10</td> <td>354219</td> <td>5572309</td> <td>8760</td> <td>8760</td> <td></td> <td>1E-07</td> <td>Health</td> <td>Schedule 3</td> <td>0.1%</td>	1746-01-6		8.6889E-11	AERMOD-m	1.05205E-10	354219	5572309	8760	8760		1E-07	Health	Schedule 3	0.1%
2274-90-5 Dichlorobiphenyl 1.368E-10 AERMOD-m 1.97372E-07 354191 5572230 24 24 1.95508E-09 0 0 Neg 7439-940 Incon 0.00018302 AERMOD-m 0.00261568 354191 5572230 24 24 1.04725E-07 0 0 Neg 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.000216361 354191 5572230 24 24 0.00261656 0.5 Health Schedula 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.0042272 354191 5572230 24 24 0.042272 0.4 Health Schedula 3 0.0% 7439-97.6 Mercury 6.4704E-07 AERMOD-m 9.24701E-00 354191 5572230 24 24 9.24701E-06 1.5 Health Schedula 3 0.0% 7430-97.6 Mercury 6.4704E-07 AERMOD-m 7.38677E-06 354191 5572230 24 24 5.471861E-05 2 #Sement Va Schedula 3 0.0% 7440-020 Nickel 6.1007E-	2050-67-1	Dichlorobiphenyl		AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
3288-87-9 Octachlorodibenzo-p-dioxin 1.2201E-08 AERMOD-m 1.74372E-07 354191 5572230 24 24 1.74372E-07 0 0 Neg 7439-89-61 lon 0.00018302 AERMOD-m 0.000216816 354191 5572230 24 24 0.000216816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.0042272 5572289 720 720 2.08806E-05 0.2 Health Schedule 3 0.0% 7439-96-5 Manganese 0.0002579 AERMOD-m 0.042272 544191 5572230 24 24 0.942712 0.4 Health Schedule 3 0.0% 7439-96-5 Manganese 0.0002579 AERMOD-m 5.4821E-06 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.738677E-06 384191 5572230 24 24 0.013038 8	2051-24-3	Decachlorobiphenyl	4.9915E-11	AERMOD-m	7.13341E-10	354191	5572230	24	24	7.13341E-10	0		0	Neg
7439-96-[Iron 0.0001302 AERMOD-m 0.000126816 354191 5572230 24 24 0.00261558 0 0 Neg 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.000126816 354191 5572289 720 720 2.0806E-05 0.0 Lead 0.0042272 0.4 Health Schedule 3 0.0% 7439-96-5 Manganese 0.00029579 AERMOD-m 0.0042272 354191 5572230 24 24 0.042272 0.4 Health Schedule 3 0.0% 7439-96-7 Molybdenum 3.8823E-07 AERMOD-m 0.942712 0.24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 5572230 24 24 8.71861E-05 2 essment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.034281 5572309 8760 87607 7.38677E-06	2974-90-5	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
7439-92-1 Lead 8.8738E-06 AERMOD-m 0.000128816 354191 5572230 24 24 0.000128816 0.5 Health Schedule 3 0.0% 7439-92-1 Lead 8.8738E-06 AERMOD-m 0.00029579 AERMOD-m 0.00022572 354191 5572230 24 24 0.0042272 0.04 Health Schedule 3 0.0% 7439-96-6 Mercury 6.4704E-07 AERMOD-m 9.24701E-06 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-96-76 Mercury 6.4704E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 8.7887E-06 354191 557230 24 24 0.10308 8 JSL 1.3% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.004318 557230 24 24 0.10308 8 JSL JSL JSL 3.4%	3268-87-9	Octachlorodibenzo-p-dioxin	1.2201E-08	AERMOD-m	1.74372E-07	354191	5572230	24	24	1.74372E-07	0		0	Neg
7439-92-1 Lead 8.8738E-06 AERMOD-m 2.08806E-05 354199 5572239 720 720 2.08806E-05 0.2 Health Schedule 3 0.0% 7439-96-5 Marganese 0.00029579 AERMOD-m 0.004272 354191 5572230 24 24 0.04272 0.4 Health Schedule 3 0.0% 7439-96-7 Molybdenum 3.8823E-07 AERMOD-m 9.24701E-06 354191 5572230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 5572230 24 24 8.71861E-05 2 essmitud Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354219 5572230 24 24 0.0303038 8 JSL JSL 354191 557230 24 24 0.004914 1 Health Schedule 3 0.0% 7440-02-4 Sitrontum 0.00712993 AERMOD-m 0.003414 557230 24 24	7439-89-6	Iron	0.00018302	AERMOD-m	0.00261558	354191	5572230	24	24	0.00261558	0		0	Neg
7439-96-5 Manganese 0.00029579 AERMOD-m 0.0042272 354191 5572230 24 24 0.0042272 0.4 Health Schedule 3 1.1% 7439-97-6 Mercury 6.4704E-07 AERMOD-m 9.24701E-06 354191 5572230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-97-6 Mercury 6.8704E-07 AERMOD-m 5.54821E-06 354191 5572230 24 24 8.71861E-05 2 sessment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 8.71861E-05 354191 5572230 24 24 8.71861E-05 2 sessment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.103038 354191 5572230 24 24 0.004914 1 Health Schedule 3 0.4% 7440-22-4 Stiver 0.00031428 AERMOD-m 0.000951121 354191 5572230 24 24 0.0004914 1 Health Schedule 3 0.4%	7439-92-1	Lead	8.8738E-06	AERMOD-m	0.000126816	354191	5572230	24	24	0.000126816	0.5	Health	Schedule 3	0.0%
7439-97-6 Mercury 6.4704E-07 AERMOD-m 9.24701E-06 354191 557230 24 24 9.24701E-06 0.5 Health Schedule 3 0.0% 7439-987 Molybdenum 3.8823E-07 AERMOD-m 5.74821E-06 354191 557230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354219 5572309 8760 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.103038 354191 5572309 8760 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-02-0 Nickel 0.00031428 AERMOD-m 0.000261121 354191 557230 24 24 0.00045121 0 0 Neg 7440-23-5 Schotium 6.8538-05 AERMOD-m 0.00026121 55119 557230 24 24 0.0002642 120 Particulate Schedule 3 0.0% 7440-32-6	7439-92-1	Lead		AERMOD-m	2.08806E-05							Health	Schedule 3	0.0%
7439-98-7 Molybdenum 3.8823E-07 AERMOD-m 5.54821E-06 354191 557230 24 24 5.54821E-06 120 Particulate Guideline 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 8.71861E-05 354191 5572309 8760 7.88677E-06 0.44 8.71861E-05 2 sesment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 0.103038 354191 5572309 8760 8760 7.38677E-06 0.44 0.04 0.04 0.0% 7440-02-4 Silver 0.0031428 AERMOD-m 0.0103038 354191 557230 24 24 0.0049414 1 Health Schedule 3 0.4% 7440-23-5 Sodium 6.65535-65 AERMOD-m 0.0002642 354191 557230 24 24 0.000951121 0 0 Neg 7440-31-5 Tin 4.252E-06 AERMOD-m 0.0002642 354191 557230 24 24 0.0002642 120 Particulate Guideline 0.0% 744														
7440-02-0 Nickel 6.1007E-06 AERMOD-m 8.71861E-05 354191 5572300 24 24 8.71861E-05 2 essment Va Schedule 3 0.0% 7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354191 5572300 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-02-1 Pictassium 0.00720993 AERMOD-m 0.0044914 1572230 24 24 0.103038 8 JSL JSL 1.3% 7440-23-5 Sodium 6.6553E-05 AERMOD-m 0.0049114 1572230 24 24 0.00002612 10 Particulate Guideline 0.0% 7440-31-5 Tin 4.252-06 AERMOD-m 0.0002642 354191 5572230 24 24 0.0002642 120 Particulate Guideline 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 5.28401E-05 120 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>														
7440-02-0 Nickel 6.1007E-06 AERMOD-m 7.38677E-06 354219 5572309 8760 8760 7.38677E-06 0.04 Health Schedule 3 0.0% 7440-09-7 Potassium 0.00720993 AERMOD-m 0.103038 354191 5572230 24 24 0.103038 8 JSL JSL JSL 1.3% 7440-22-4 Silver 0.00031428 AERMOD-m 0.004914 364191 5572230 24 24 0.0004911 1 Health Schedule 3 0.4% 7440-23-5 Sodium 6.6553E-05 AERMOD-m 0.0002642 354191 5572230 24 24 0.00002642 120 Particulate Guideline 0.0% 7440-31-5 Tin 4.252E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 6.07661E-05 10 Health Schedule 3 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 5.28401E-05 120 Particulate Schedule 3 0.0%														
7440-09-7 Potassium 0.00720993 AERMOD-m 0.103038 354191 5572230 24 24 0.103038 8 JSL JSL JSL 1.3% 7440-22-4 Silver 0.00031428 AERMOD-m 0.0044914 354191 5572230 24 24 0.0044914 1 Health Schedule 3 0.4% 7440-22-6 Storntum 1.8487E-06 AERMOD-m 0.0002642 354191 5572230 24 24 0.0002642 120 Particulate Guideline 0.0% 7440-31-5 Tin 4.252E-06 AERMOD-m 6.07661E-05 354191 5572230 24 24 6.07661E-05 10 Health Schedule 3 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 2.80718E-05 10 Health Schedule 3 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24														
7440-22-4 Silver 0.00031428 AERMOD-m 0.0044914 354191 557230 24 24 0.004914 1 Health Schedule 3 0.4% 7440-23-5 Sodium 6.6553E-05 AERMOD-m 0.000951121 354191 557230 24 24 0.000951121 0 0 Neg 7440-24-6 Strontium 1.8487E-06 AERMOD-m 0.0002642 354191 557230 24 24 0.0002642 120 Particulate Guideline 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 557230 24 24 2.08718E-05 120 Particulate Schedule 3 0.0% 7440-36-0 Antimony 1.4605E-06 AERMOD-m 2.08718E-05 354191 557230 24 24 2.08718E-05 0.3 Health Schedule 3 0.0% 7440-38-2 Arsenic 4.0671E-06 AERMOD-m 2.08718E-05 354191 557230 24 24 2.0004914 10 Health Guideline 0.0% 0.0% 7440-														
7440-23-5 Sodium 6.6553-05 AERMOD-m 0.000951121 354191 557230 24 24 0.000951121 0 0 Neg 7440-24-6 Strontium 1.8487E-06 AERMOD-m 0.0002642 354191 557230 24 24 0.0002642 120 Particulate Guideline 0.0% 7440-31-5 Tin 4.252E-06 AERMOD-m 6.07661E-05 354191 5572230 24 24 6.07661E-05 10 Health Schedule 3 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 5.28401E-05 120 Particulate Schedule 3 0.0% 7440-36-0 Arimony 1.4605E-06 AERMOD-m 2.08718E-05 354191 5572230 24 24 5.81241E-05 0.3 Health Schedule 3 0.0% 7440-38-2 Arsenic 4.0671E-06 AERMOD-m 0.0044914 3572230 24 24 5.81241E-05 0.3 Health Guideline 0.0% 7440-38-3 Barium - total wa														
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Tin 4.252E-06 AERMOD-m 6.07661E-05 354191 557230 24 24 6.07661E-05 10 Health Schedule 3 0.0% 7440-32-6 Titanium 3.6974E-06 AERMOD-m 5.28401E-05 354191 5572230 24 24 5.28401E-05 120 Particulate Schedule 3 0.0% 7440-36-0 Antimony 1.4605E-06 AERMOD-m 2.08718E-05 354191 5572230 24 24 5.28401E-05 25 Health Schedule 3 0.0% 7440-38-2 Arsenic 4.0671E-06 AERMOD-m 5.81241E-05 354191 5572230 24 24 5.81241E-05 0.3 Health Guideline 0.0% 7440-38-3 Barium - total water soluble 3.1428E-05 AERMOD-m 2.9062E-06 354191 5572230 24 24 2.9062E-06 0.01 Health Guideline 0.0% 7440-43-9 Cadmium 7.5797E-07 AERMOD-m 2.9062E-06 354191 5572230 24											-	Deatherstat	÷	
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7440-36-0 Antimony 1.4605E-06 AERMOD-m 2.08718E-05 354191 557230 24 24 2.08718E-05 25 Health Schedule 3 0.0% 7440-38-2 Arsenic 4.0671E-06 AERMOD-m 5.81241E-05 354191 5572230 24 24 5.81241E-05 0.3 Health Guideline 0.0% 7440-39-3 Barium - total water soluble 3.1428E-05 AERMOD-m 0.0044914 354191 5572230 24 24 2.0004914 10 Health Guideline 0.0% 7440-43-9 Berylium (And its compounds) 2.0336E-07 AERMOD-m 1.00322E-06 354191 5572230 24 24 2.0062E-06 0.01 Health Schedule 3 0.0% 7440-43-9 Cadmium 7.579FE-07 AERMOD-m 1.08322E-05 354191 5572230 24 24 2.0862E-06 0.01 Health Schedule 3 0.0% 7440-43-3 Chomium (metalic, II, III) 3.8823E-06 AERMOD-m 1.08322E-05 354191 5572230 24 24 5.54821E-05 0.5 Health											-			
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7440-66-6 Zinc 7.7645E-05 AERMOD-m 0.00110964 354191 5572230 24 24 0.00110964 120 Particulate Schedule 3 0.0%			7.7645E-05	-		354191	5572230	24	24	0.00110964	120	Particulate	Schedule 3	0.0%

Table E4: Emissions Summary Table (Rev2)

					Locat	ion of							
CAS#	Contaminant	Total Emission Rate (g/s)	Dispersion Model Used	Max POI Value (µg/m³)	X (m)	Y (m)	Averaging Period Modelled (h)	Averaging Period of Criterion (h)	Max POI Value Converted to Criterion Period (μg/m³)	Criteria (µg/m³)	Limiting Effect	Regulation Schedule #	Percentage of Criteria or Likelihood of adverse effect (%)
7647-01-0	Hydrochloric acid	0.00351253	AERMOD-m	0.050198	354191	5572230	24	24	0.050198	20	Health	Schedule 3	0.3%
7723-14-0	Phosphorus, white	4.9915E-06	AERMOD-m	7.13341E-05	354191	5572230	24	24	7.13341E-05	0.35	JSL	JSL	0.0%
7782-49-2	Selenium	5.1764E-07	AERMOD-m	7.39761E-06	354191	5572230	24	24	7.39761E-06	10	Health	Guideline	0.0%
7782-50-5		0.00014605	AERMOD-m	0.00208718	354191	5572230	24	24	0.00208718	10	Health	Schedule 3	0.0%
	Nitrous Oxide	0.00240331	AERMOD-m	0.034346	354191	5572230	24	24	0.034346	9000	Health	Guideline	0.0%
	Nitrogen oxides	0.04532144	AERMOD-m	1.07637	354059	5571849	1	1	1.07637	400	Health	Schedule 3	0.3%
10102-44-0	Nitrogen oxides	0.04532144	AERMOD-m	0.58165	354191	5572230	24	24	0.58165	200	Health	Schedule 3	0.3%
10102-44-0	Nitrogen oxides (emergency generator)	0.47397001	AERMOD-m	974.74658	354173	5572112	1	0.5	1183.532311	1880	Health	NA	63.0%
	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
18259-05-7	Pentachlorobiphenyl	2.2184E-10	AERMOD-m	3.1704E-09	354191	5572230	24	24	3.1704E-09	0		0	Neg
18540-29-9	Chromium compounds - Hexavalent	6.4704E-07	AERMOD-m	9.24701E-06	354191	5572230	24	24	9.24701E-06	0.07	sessment Va	Schedule 3	0.0%
18540-29-9	Chromium compounds - Hexavalent	6.4704E-07	AERMOD-m	7.83445E-07	354219	5572309	8760	8760	7.83445E-07	0.00014	Health	Schedule 3	0.6%
26601-64-9	Hexachlorobiphenyl	1.0168E-10	AERMOD-m	1.4531E-09	354191	5572230	24	24	1.4531E-09	0		0	Neg
27323-18-8	Monochlorobiphenyl	4.0671E-11	AERMOD-m	5.81241E-10	354191	5572230	24	24	5.81241E-10	0		0	Neg
32598-13-3	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
32690-93-0	Tetrachlorobiphenyl	4.6217E-10	AERMOD-m	6.60501E-09	354191	5572230	24	24	6.60501E-09	0		0	Neg
	Dichlorobiphenyl	1.368E-10	AERMOD-m	1.95508E-09	354191	5572230	24	24	1.95508E-09	0		0	Neg
35065-29-3	Heptachlorobiphenyl	1.2201E-11	AERMOD-m	1.74372E-10	354191	5572230	24	24	1.74372E-10	0		0	Neg
35822-46-9	1,2,3,4,6,7,8-Heptachlorodibenzo-p- dioxin	3.6974E-10	AERMOD-m	5.28401E-09	354191	5572230	24	24	5.28401E-09	0		0	Neg
	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
37680-73-2	Pentachlorobiphenyl	2.2184E-10	AERMOD-m	3.1704E-09	354191	5572230	24	24	3.1704E-09	0		0	Neg
	Trichlorobiphenyl	4.8066E-10	AERMOD-m	6.86921E-09	354191	5572230	24	24	6.86921E-09	0		0	Neg
39001-02-0	Octachlorodibenzofuran	1.6269E-11	AERMOD-m	2.32496E-10	354191	5572230	24	24	2.32496E-10	0		0	Neg
39227-28-6	1,2,3,4,7,8-Hexachlorodibenzo-p- dioxin	2.9579E-07	AERMOD-m	4.2272E-06	354191	5572230	24	24	4.2272E-06	0		0	Neg
40321-76-4	1,2,3,7,8-Pentachlorodibenzo-p- dioxin	2.773E-10	AERMOD-m	3.963E-09	354191	5572230	24	24	3.963E-09	0		0	Neg
51207-31-9	2,3,7,8-Tetrachlorodibenzofuran (TEQ)	1.3865E-10	AERMOD-m	1.9815E-09	354191	5572230	24	24	1.9815E-09	0		0	Neg
55673-89-7	1,2,3,4,7,8,9- Heptachlorodibenzofuran	4.4369E-11	AERMOD-m	6.34081E-10	354191	5572230	24	24	6.34081E-10	0		0	Neg
57117-44-9	1,2,3,6,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
60851-34-5	2,3,4,6,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
67562-39-4	1,2,3,4,6,7,8- Heptachlorodibenzofuran	2.9579E-07	AERMOD-m	4.2272E-06	354191	5572230	24	24	4.2272E-06	0		0	Neg
70648-26-9	1,2,3,4,7,8-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
72918-21-9	1,2,3,7,8,9-Hexachlorodibenzofuran	5.1764E-11	AERMOD-m	7.39761E-10	354191	5572230	24	24	7.39761E-10	0		0	Neg
PM	Total particulate matter	2.31278379	AERMOD-PM	60.16636	354183.8	5572223	24	24	60.16636	120	Particulate	Schedule 3	50.1%

Figures





FIGURE E1

WHITESAND FIRST NATION COGENERATION & PELLET MILL PROJECT ESDM REPORT

SITE LOCATION PLAN

LEGEND

350

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PROJECT LOCATION

EXISTING ELECTRICITY DISTRIBUTION LINE

CONNECTION POINT

EXISTING 10m CONTOURS INTERVAL (m asl)

GEO REFERENCE

<u>Air Photo Source:</u> Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario

0	200	400	600	800
1:10,000 August 2014 Project Number:	300030895	Metres	Projection: UTM Zone Datum: NAD83	16
Prepared by: C	. Sheppard		Verified by: C. Shilton	
NEE	GAN	BL	JRNS <mark>I</mark> DE	

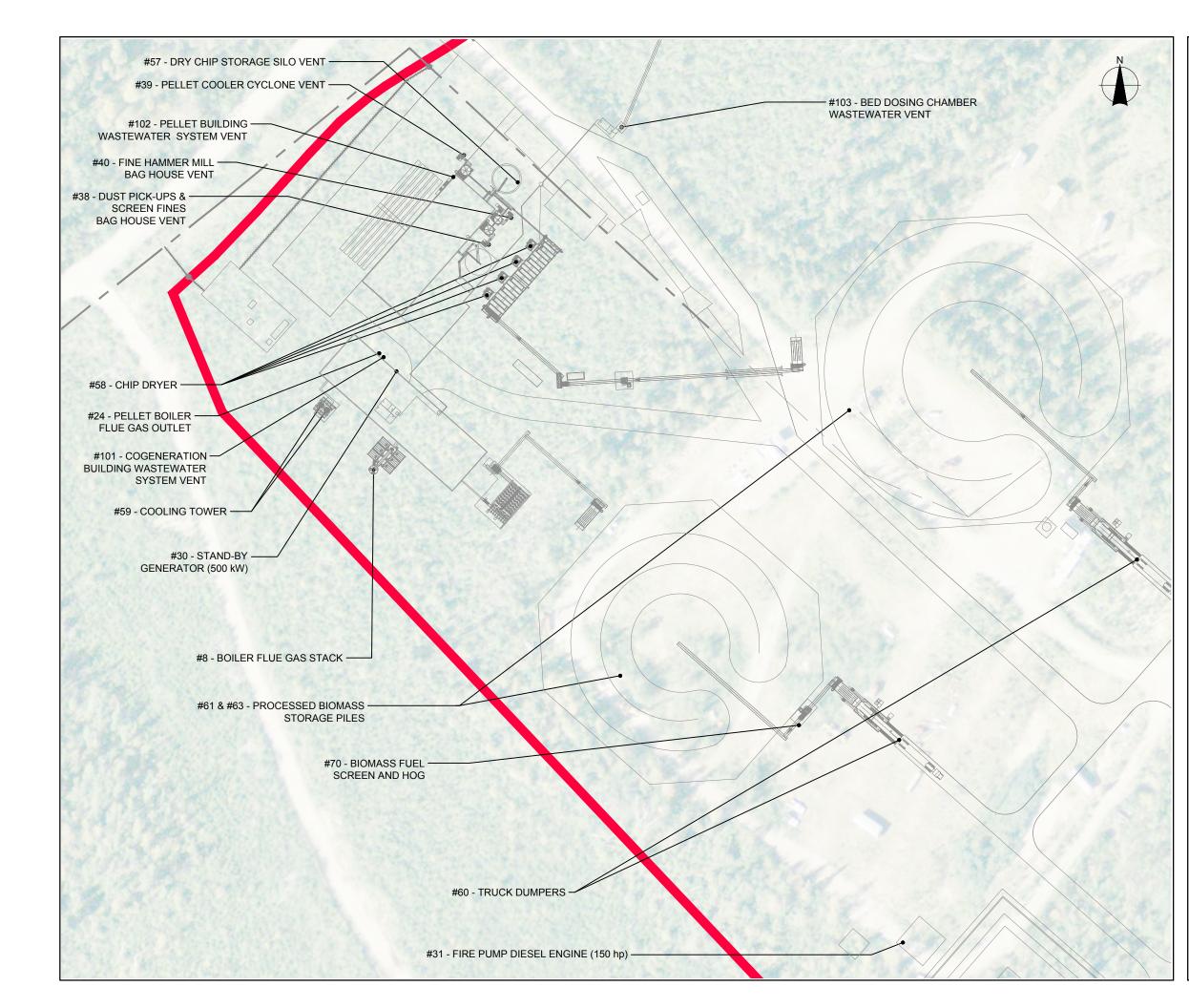


FIGURE E2

WHITESAND FIRST NATION COGENERATION & PELLET MILL PROJECT ESDM REPORT

ROOF PLAN & EMISSION POINTS

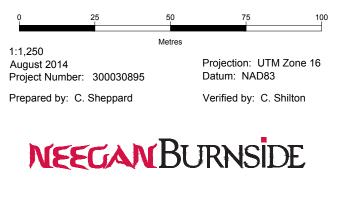
LEGEND

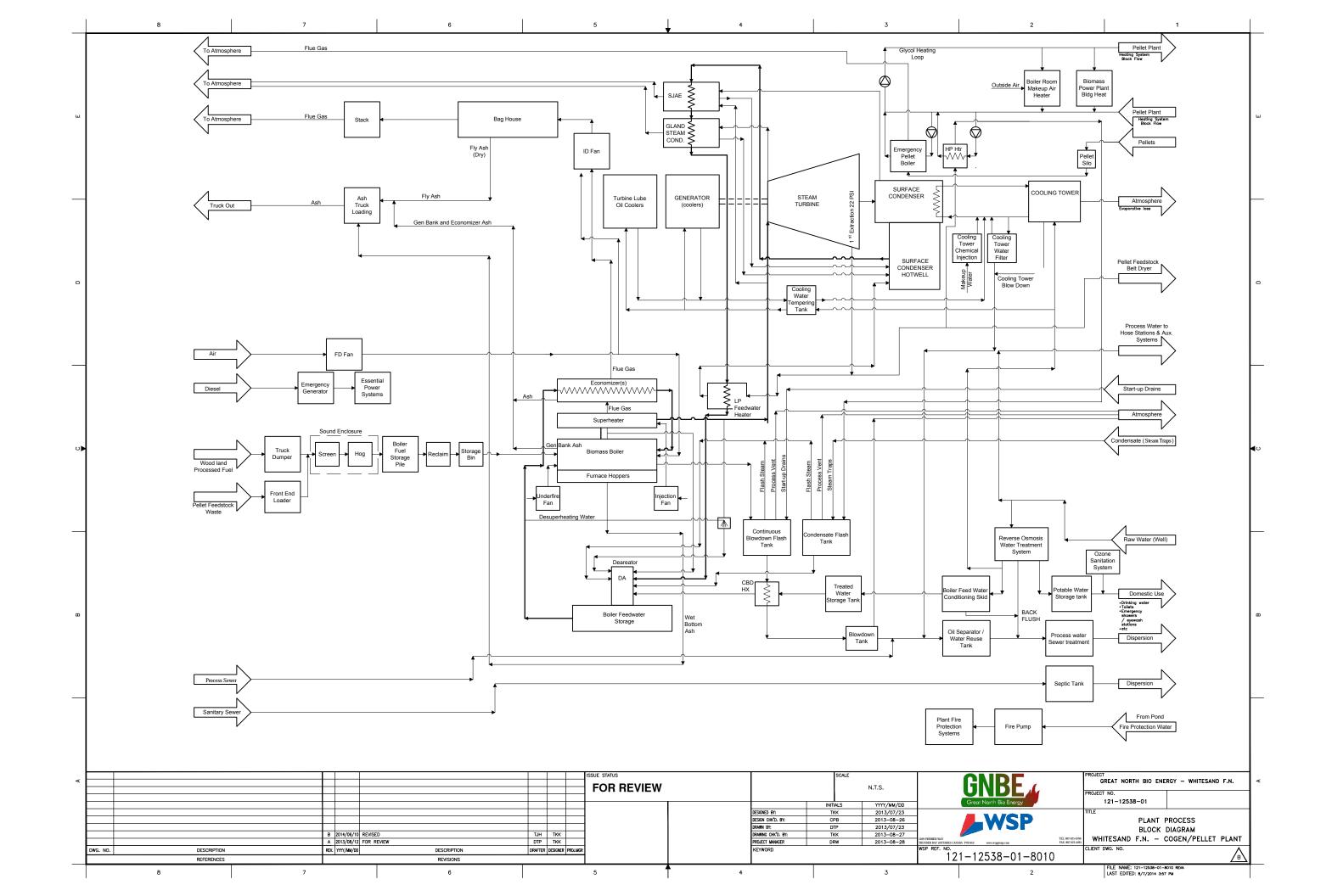
PROJECT LOCATION

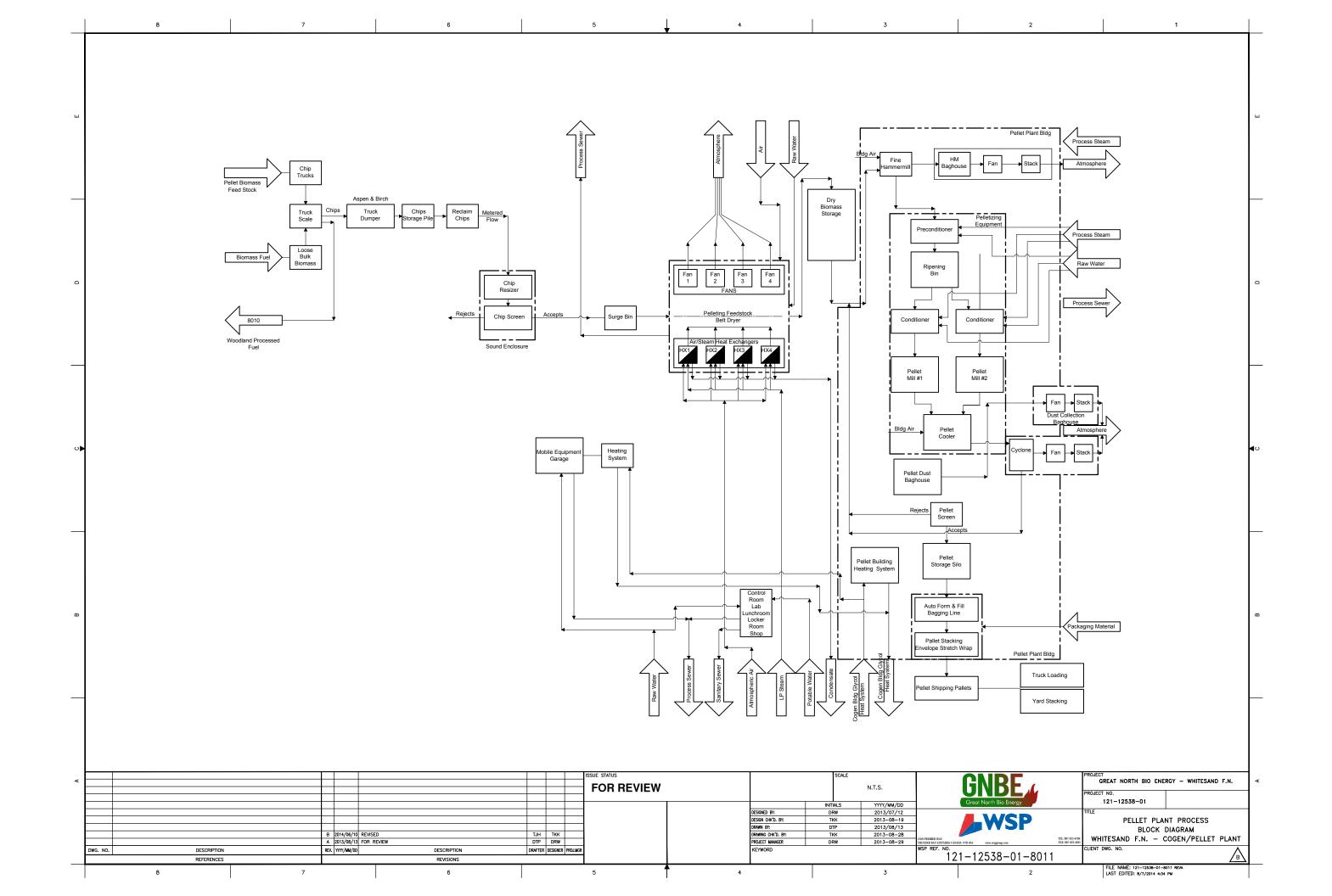
EXISTING ELECTRICITY DISTRIBUTION LINE

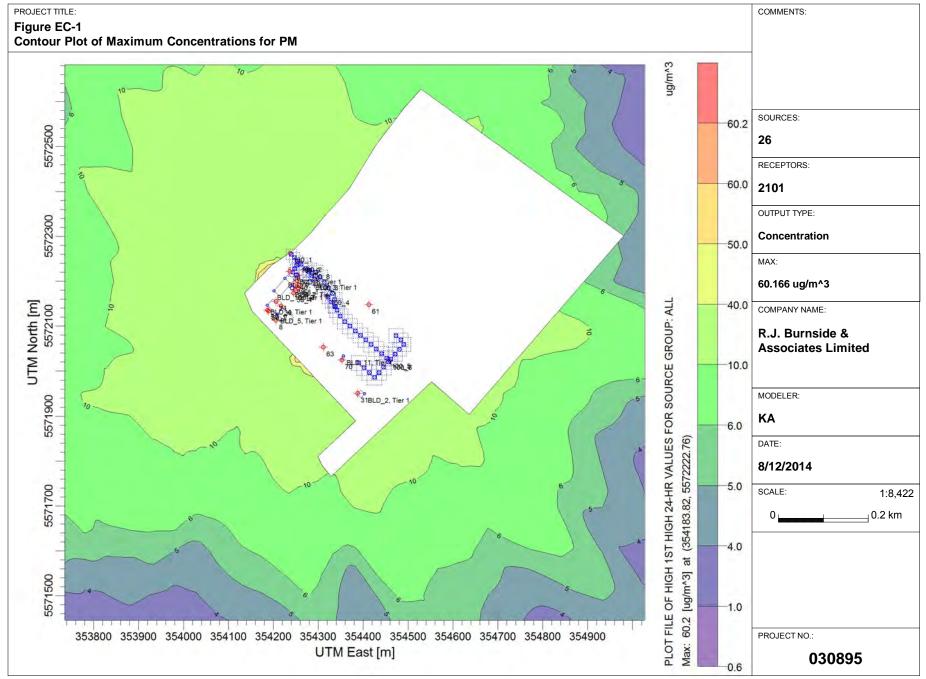
CONNECTION POINT

<u>Air Photo Source:</u> Background 2008 forest resource inventory air photo reproduced with the permission of Ministry of Natural Resources, © Queen's Printer for Ontario









AERMOD View - Lakes Environmental Software

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Supporting Calculations



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2.0	Combustion Equipment:	A1
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1.0 Usage Rates

Please see **Table E1** for maximum usage rates and list of combustion equipment corresponding to the operating conditions that would result in the maximum emission rate in accordance with s.10 and s.11 of O.Reg. 419/05.

2.0 Combustion Equipment:

There will be four pieces of combustion equipment on site:

- 3.6 MW biomass fuelled boiler;
- 7 MMBtu/h emergency pellet boiler;
- 500 KW standby diesel generator; and,
- 150 HP emergency fire pump diesel engine.

Methodology: USEPA Emission Factor ("EF")

AP-42² lists 31 contaminants as products of diesel combustion and 121 contaminants as products of wood combustion. The contaminant emission rates used for diesel combustion are Nitrogen Oxides ("NO_x"), Total Suspended Particulate Matter ("TSP") and any factor for a contaminant that is released in another process. The remaining unused factors will predict POI concentrations below their corresponding criteria since the NO_x emission factor provides the highest % of criteria per unit of combustion. All emission factors were used for wood combustion.

$$R[g/s] = \frac{X*FiringRate[Btu/h]*[1000g/kg]}{[3600s/h]*[10^6]*[2.2046226 lb/kg]}$$
Where,
R is the emissio
X is the AP42³ end
the appropriate

R is the emission rate in g/s. X is the AP42³ emission factor for the appropriate contaminant.

CAS#	Contaminant Name	X= (in lb /MMBtu)	Emission Factor Rating	Data Quality
10102-44-0	NO _x	4.41	D	Marginal
	PM10	0.31	D	Marginal

The emission factors used in this application for diesel combustion are:

The list of diesel-fired equipment can be found in **Table EA-B**.

² "<u>Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area</u> <u>Sources</u>" Table 1.4-1 from the Air CHIEF CD-ROM Version 12, June 2005.

³ "<u>Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area</u> <u>Sources</u>" Table 1.4-1 from the Air CHIEF CD-ROM Version 12, June 2005.

Data Quality: Marginal

Data quality for this calculation is best characterized by the following paragraph from s.8.3.4 of the ESDM Procedure Document titled "Marginal" or "Uncertain Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on only a small number of facilities where there is evidence of variability within the source category population (e.g., US EPA, AP-42, emission factor quality rating of D or E) and/or the emission factor rating is uncertain are considered to have uncertain data quality.

The list of wood-fired equipment can be found in Table EA-B.

Sample Calculation: Standby diesel generator

For NO_x:

From the Table above, for NO_x, X= 4.41 lb/MMBtu (Emission Factor Rating "D"). The input firing rate is 1,706,000 Btu/h.

 $R (g/s) = \frac{4.41 \text{ lb}}{10^6 \text{ Btu}} * \frac{1,706,000 \text{ Btu}}{\text{h}} * \frac{\text{kg}}{2.2046226 \text{ lb}} * \frac{1000 \text{ g}}{\text{kg}} * \frac{1 \text{ h}}{3600 \text{ s}}$ = 0.95 g/s

Emergency equipment will not run for more than 12 hours; therefore emission rate was divided by 2 and no variable emission scenario used in the modelling.

R (g/s) = 0.95 g/s/2 = 0.474g/s

Operating Condition, Individual maximum Rates of Production:

The emission rate calculations for these sources are based on the maximum input firing rate of the gas-fired unit at each point.

Neegan Burnside Ltd.

030895 ESDM Report

3.0 Equipment Emissions

3.1 General Information

3.1.1 Balance of Assumptions

In order to represent the worst case emission scenario for the Site a number of conservative assumptions were used in the assessment as listed below. All of the assumptions used throughout the Application are listed together so that it can be seen that the balance of assumptions is generally conservative.

- All the equipment is assumed to be operating 24 hours a day, 7 days a week all year.
- Particulate matter from unpaved onsite roads is included in the assessment. Dust mitigation of 95% is assumed. No adjustment for the rainfall or other precipitation is used. There will be a Best Management Plan implemented for onsite roads.
- Both biomass storage piles are considered in the modeling. A conservative assumption of up to 10 transfer points was used in emission rate calculation for each pile. Both piles were assumed to be 20 m in diameter as per model restriction. Since only part of the pile will be disturbed during each day, the disturbed surface area will be smaller than the surface area of the entire pile so the restriction of the source to 20 m in diameter is reasonable. No adjustment for the rainfall or other precipitation is used. There will be a Best Management Plan implemented for the onsite storage piles.
- The emission factor for dry product is used despite the fact that the biomass is not completely dry. This choice was made because the emission factor for the wet biomass could be an underestimate.
- Backup diesel generator and emergency diesel fire pump engine are included in the assessment. The same contaminants are emitted from both equipment with higher emissions coming from backup diesel generator; therefore emissions from diesel generator were used in the assessment. Modelling files for emergency diesel fire pump are also included on CD.
- Emergency pellet boiler is used as a backup for the main biomass boiler; therefore both boilers will never run at the same time. Emissions from the main biomass boiler were used in the assessment since both boilers will emit the same contaminants and higher emissions result from the main biomass boiler. Modelling files for an emergency pellet boiler are also included on CD. It was assumed to be operating 12 hours a day, 7 days a week, all year.
- Pellet plant mill lab exhaust is considered negligible as it will be used for quality control only.
- The ripening bin is considered insignificant, as the content of the bin will be conditioned with steam or water and is not expected to generate any particulate matter.

- Garage vehicle exhaust is negligible, as per **Table B-3** (ESDM Procedure Document Section 7.2.1).
- Dry chips conveyors and storage silo will handle finished product, which is larger than 6 mm; therefore emissions are considered negligible.
- Biomass boiler ash is considered negligible, because it will be stored in a bunker or bin.
- Truck dumpers are considered negligible, as they will be contained and minimal fugitive emissions are expected.
- All mobile equipment will be moving on the paved areas or inside the buildings only, therefore is considered negligible.
- All the outdoor biomass conveyors and stackers are considered negligible as they will handle humid biomass that is less prone to generate dust as per The BC Ministry of the Environment documentation "Emissions and Air Pollution Controls for the Biomass Pellet Manufacturing Industry" (included on CD).
- The dried pellet storage conveyors are assumed to have no emissions as produced chips will be in the bags; therefore are not included in the assessment.

3.1.2 Table EA-99: Site Emissions Summary

Table EA-99 lists all the emissions from all the sources at the Site. It also adjusts the emissions calculated on the EA-xx series of tables for the cases described below.

The value shown on **Table EA-99** is the maximum emission rate calculated on the corresponding calculation sheet for that contaminant.

Table EA-99 shows a "1" in the column for "Volatility" when a product is a liquid or a gas. This column shows a "0" when the contaminant is a solid.

Table EA-99 shows a "1" in the column for "Negligible Indicator" when a contaminant isconsidered negligible. The reasons for being considered negligible are indicated on**Table 1** and discussed in **Appendix B**.

3.2 Biomass Handling Building Exhaust

Particulate emissions from the biomass handling building exhaust was calculated based on the 20 mg/m³ emission factor provided in **Tables C-1** and **C-2** of the MOE Guide.

Methodology: Emission Factor ("EF")

 $R[g/s] = \frac{X*FlowRate[m^3/s]}{[1000mg/g]}$ Where, R is the emission rate in g/s. X is the particulate emission

Where, R is the emission rate in g/s. X is the particulate emission factor based on the MOE Guideline.

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "*Above-Average Data Quality*" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on a moderate to large number of sources where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of A or B) are anticipated to provide above-average quality of emission rate estimates.

Sample Calculation:

Biomass hog and screen baghouse:

R (g/s) = 20mg/m³ * 4.719m *
$$\left[\frac{1000mg}{1g}\right]$$

= 0.094 g/s

3.3 Baghouses

Particulate emissions from the baghouses were calculated using manufacturer's data.

Methodology: Engineering Calculation ("EC")

$$R[g/s] = \frac{X[lb/hr]*[453.59g/lb]*[1hr]}{[3600s]}$$

Where,

R is the emission rate in g/s. X is the particulate emission factor based on manufacturer's data.

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "Above-Average Data Quality" Emission Estimating Techniques states:

Engineering Calculations/Judgement: Emission rate estimates derived from fundamental scientific and engineering principles; and/or relevant empirical data can be considered above-average quality estimates if it is clear (e.g., the approach is recommended through MOE documentation)

that the estimating technique will result in relatively conservative predictions.

Sample Calculation:

Fine hammer mill dust baghouse:

 $R (g/s) = \frac{0.198 \text{ lb/hr} * 453.59 \text{ g/lb} * 1 \text{ hr}}{3600s}$ = 0.025 g/s

3.4 Dried Biomass Storage Silo

Particulate emissions from the dried biomass storage silo were calculated based on a maximum grain loading of 0.05 grains per dry standard cubic foot and a maximum air flow rate of 20 ft.³/min.

Methodology: Emission Factor ("EF")

The emission from the silo is estimated as 20 cfm times 0.05 grain/ft³.

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "Above-Average Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on a moderate to large number of sources where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of A or B) are anticipated to provide above-average quality of emission rate estimates.

Sample Calculation:

$$R (g/s) = 20cfm * 0.05gr / scf * \left[\frac{1lb}{7,000gr}\right] * \left[\frac{453.6g}{1lb}\right] * \left[\frac{1\min}{60s}\right]$$
$$= 0.00108 g/s$$

3.5 Cooling Tower

Particulate emissions from the cooling tower were calculated based on AP-42 recommendations and manufacture provided drift rate of 0.01%.

Methodology: Engineering Calculation ("EC")

$$R [g/s] = Throughput[gal/min] * \left[\frac{3.785L}{1gal}\right] * \left[\frac{1\min}{60s}\right] *$$
$$*WaterConc.[mg/L] * \left[\frac{1g}{1000mg}\right] * DriftRate[\%]$$

Where,

R is the emission rate in g/s.

X is the AP42⁴ emission factor for the appropriate contaminant.

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "Above-Average Data Quality" Emission Estimating Techniques states:

Engineering Calculations/Judgement: Emission rate estimates derived from fundamental scientific and engineering principles; and/or relevant empirical data can be considered above-average quality estimates if it is clear (e.g., the approach is recommended through MOE documentation) that the estimating technique will result in relatively conservative predictions.

Sample Calculation:

$$R (g/s) = 1,800 gal / min* \left[\frac{3.785L}{1gal} \right] * \left[\frac{1 min}{60s} \right] * 1,200 mg / L* \left[\frac{1g}{1000 mg} \right] * 0.01[\%]$$

= 0.0136 g/s

3.6 Road Dust

Particulate emissions from the onsite roads were calculated based on AP-42 methodology for unpaved roads.

⁴ "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area <u>Sources</u>" Table 1.4-1 from the Air CHIEF CD-ROM Version 12, June 2005.

Methodology: USEPA Emission Factor ("EF")

$$X [lb/VMT] = k * \left[\frac{SiltContent(\%)}{12}\right]^{a} * \left[\frac{VehicleWeight(tons)}{3}\right]^{b}$$

Where,

X is the emission factor in Ib/VMT based on AP-42 constants; VMT – vehicle mile travelled;

Constants k = 4.9 (lb/VMT), a = 0.7, b = 0.45;

$$R[g/s] = X[lb/VMT] * \left[\frac{281.9g/VKT}{llb/VMT}\right] * \text{Dist[km]} * [1 - 0.95] *$$
$$* \left[\frac{1\text{day}}{24\text{hour}}\right] * \left[\frac{1\text{hour}}{3600\text{s}}\right]$$

Where,

R is the emission rate in g/s; Dist – total distance travelled on this road segment in 1 day; Dust mitigation = 0.95%.

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "Above-Average Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on a moderate to large number of sources where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of A or B) are anticipated to provide above-average quality of emission rate estimates.

Sample Calculation: Road segment #1

$$R (g/s) = 4.9[lb/VMT] * \left[\frac{8.4(\%)}{12}\right]^{0.7} * \left[\frac{(45tons)}{3}\right]^{0.45} * \left[\frac{281.9g/VKT}{1lb/VMT}\right] *$$
$$*1.75[km] * [1 - 0.95] * \left[\frac{1day}{24hour}\right] * \left[\frac{1hour}{3600s}\right]$$
$$= 0.0037 \text{ g/s}$$

Neegan Burnside Ltd. 030895_ESDM_Report

3.7 Biomass Storage Piles

Particulate emissions from the biomass storage piles were based on emission factor provided in US EPA Memorandum on Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country (included on CD).

An emission factor for "drop" of "dry" material from one surface to another, including drop onto a pile was used for the storage piles.

Methodology: USEPA Emission Factor ("EF") R[g/s] = X[lb/bdt] * MatHandl[bdt/day] * #ofTransferPoints

Where,

R is the emission rate in g/s;

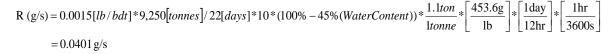
X is the emission factor in pounds per dry bone ton of material; MatHandl is the weight of the wood chips moved from the pile per day in tons; #ofTransferPoints is the number of points where biomass is moved/dropped.

Data Quality: Marginal

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.4 of the ESDM Procedure Document titled "Marginal" or "Uncertain Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on only a small number of facilities where there is evidence of variability within the source category population (e.g., US EPA, AP-42, emission factor quality rating of D or E) and/or the emission factor rating is uncertain are considered to have uncertain data quality.

Sample Calculation: Chip storage pile



3.8 Biomass Belt Dryer

Particulate emissions from the biomass belt dryer were calculated per stack using emission rate provided by the manufacturer.

Methodology: Manufacturer Emission Factors ("EF") $R [g/s] = X[mg/m^3] * FlowRate[m^3/s] * \left[\frac{1g}{1000 \text{mg}}\right]$

Where, R is the emission rate in g/s; X is the emission rate in mg/m³.

The emission factors used in this application for the dryer are:

Data Quality: Above-Average

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.2 of the ESDM Procedure Document titled "Above-Average Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on a moderate to large number of sources where the source category population is sufficiently specific to minimize variability (e.g., US EPA, AP-42, emission factor quality rating of A or B) are anticipated to provide above-average quality of emission rate estimates.

Sample Calculation:

R (g/s) = 5[mg / m³] * 17.5[m³ / s] * $\left[\frac{1g}{1,000 \text{mg}}\right]$ = 0.0875 g/s

Methodology: USEPA Emission Factors ("EF")

AP-42 lists four contaminants for conveyor dryer as a source. The contaminant emission rates used for the dryer are VOC as propane and formaldehyde.

Acrolein emissions from biomass belt dryer were not considered as it is not included as one of the contaminants emitted from the conveyor indirect-heated dryers in AP-42. It should be noted that the dryers using different technology do have emission factors for acrolein. This indicates that conveyor indirect-heated dryers are not considered as significant sources of acrolein.

The MOE produced a Technical Standard for acrolein for the Forest Products Sector and this technology was not flagged as a significant source of acrolein either.

$$R[g/s] = X[lb/ODT]*DryingRate[tonnes/h]*\left[\frac{1 \text{ton}}{2000 \text{lb}}\right]*\left[\frac{1 \text{h}}{3600 \text{s}}\right]$$

Where,

R is the emission rate in g/s;

X is the emission factor in lb per oven-dried ton of wood material out of dryer.

The emission factors used in this application for the dryer are:

CAS#	Contaminant Name	X= (in lb /ODT)	Emission Factor Rating	Data Quality	
	VOC as propane	0.51	E	Marginal	
50-00-0	Formaldehyde	0.0024	E	Marginal	

ODT - oven-dried ton of wood material out of dryer

Data Quality: Marginal

Data quality for this calculation is best characterized by the following paragraph from Section 8.3.4 of the ESDM Procedure Document titled "Marginal" or "Uncertain Data Quality" Emission Estimating Techniques states:

Emission Factors: Emission rate estimates that are developed from tests on only a small number of facilities where there is evidence of variability within the source category population (e.g., US EPA, AP-42, emission factor quality rating of D or E) and/or the emission factor rating is uncertain are considered to have uncertain data quality.

Sample Calculation: VOC as propane

 $R (g/s) = 0.51[lb / ODT] * 10[tonnes / h] * \left[\frac{1 \text{ton}}{2,000 \text{lb}}\right] * \left[\frac{1,000,000\text{g}}{1 \text{tonne}}\right] * \left[\frac{1\text{h}}{3600\text{s}}\right]$ = 0.708 g/s

or 0.708/4 = 0.177 g/s per dryer exhaust

Table EA-B: Biomass Burners (Rev2)

				-	
	Eiring Ba	Source ID te (Input Rate) (BT	8 14,672,213	24 7,000,000	
		ate (Input Rate) (K	15,476,308	7,383,628	
	Thing is	Emission factor	,,,,,,	Emission rate	Emission rate
Contaminant	CAS	(lb/MMBtu)	Rating	g/s	g/s
PM	PM	20 mg/m3	D	3.13E-01	
PM	PM	0.56	С		2.47E-02
Nox	10102-44-0	0.22	A	4.07E-02	9.70E-03
SO2	7446-09-5	0.025	A	4.62E-03	1.10E-03
CO Acenaphthene	630-08-0 83-32-9	0.6 9.10E-07	A B	1.11E-01 1.68E-07	2.65E-02 4.01E-08
Acenaphthylene	208-96-8	5.00E-06	A	9.24E-07	2.21E-07
Acetaldehyde	75-07-0	8.30E-04	A	1.53E-04	3.66E-05
Acetone	67-64-1	1.90E-04	D	3.51E-05	8.38E-06
Acetophenone	98-86-2	3.20E-09	D	5.92E-10	1.41E-10
Acrolein	107-02-8	4.00E-03	С	7.39E-04	1.76E-04
Anthracene	120-12-7	3.00E-06	A	5.55E-07	1.32E-07
Benzaldehyde	100-52-7	8.50E-07	D	1.57E-07	3.75E-08
Benzene	71-43-2	4.20E-03	A B	7.76E-04 1.20E-08	1.85E-04 2.87E-09
Benzo(a)anthracene Benzo(a)pyrene	56-55-3 50-32-8	6.50E-08 2.60E-06	A	4.81E-07	1.15E-07
Benzo(b)fluoranthene	205-99-2	1.00E-00	B	1.85E-08	4.41E-09
Benzo(e)pyrene	192-97-2	2.60E-09	D	4.81E-10	1.15E-10
Benzo(g,h,i)perylene	191-24-2	9.30E-08	B	1.72E-08	4.10E-09
Benzo(j,k)fluoranthene	206-44-0	1.60E-07	D	2.96E-08	7.06E-09
Benzo(k)fluoranthene	207-08-9	3.60E-08	В	6.66E-09	1.59E-09
Benzoic acid	65-85-0	4.70E-08	D	8.69E-09	2.07E-09
bis(2-Ethylhexyl)phthalate	117-81-7	4.70E-08	D	8.69E-09	2.07E-09
Bromomethane 2-Butanone (MEK)	74-83-9 78-93-3	1.50E-05 5.40E-06	D	2.77E-06 9.98E-07	6.62E-07 2.38E-07
Z-Butanone (MEK)	86-74-8	5.40E-06	D	9.98E-07 3.33E-07	2.38E-07 7.94E-08
Carbazole Carbon tetrachloride	56-23-5	4.50E-05	D	8.32E-07	1.98E-06
Chlorine	7782-50-5	7.90E-04	D	1.46E-04	3.48E-05
Chlorobenzene	108-90-7	3.30E-05	D	6.10E-06	1.46E-06
Chloroform	67-66-3	2.80E-05	D	5.18E-06	1.23E-06
Chloromethane	74-87-3	2.30E-05	D	4.25E-06	1.01E-06
2-Chloronaphthalene	91-58-7	2.40E-09	D	4.44E-10	1.06E-10
2-Chlorophenol	95-57-8	2.40E-08	С	4.44E-09	1.06E-09
Chrysene	218-01-9 123-73-9	3.80E-08 9.90E-06	B	7.03E-09 1.83E-06	1.68E-09 4.37E-07
Crotonaldehyde Decachlorobiphenyl	2051-24-3	2.70E-10	D	4.99E-11	4.37E-07 1.19E-11
Dibenzo(a,h)anthracene	53-70-3	9.10E-09	B	1.68E-09	4.01E-10
1,2-Dibromoethene	540-49-8	5.50E-05	D	1.02E-05	2.43E-06
Dichlorobiphenyl	13029-08-8	7.40E-10	С	1.37E-10	3.26E-11
1,2-Dichloroethane	107-06-2	2.90E-05	D	5.36E-06	1.28E-06
Dichloromethane	75-09-2	2.90E-04	D	5.36E-05	1.28E-05
1,2-Dichloropropane	78-87-5	3.30E-05	D	6.10E-06	1.46E-06
2,4-Dinitrophenol	51-28-5	1.80E-07	C	3.33E-08	7.94E-09
Ethylbenzene Fluoranthene	100-41-4 206-44-0	3.10E-05 1.60E-06	DB	5.73E-06 2.96E-07	1.37E-06 7.06E-08
Fluorene	86-73-7	3.40E-06	A	6.29E-07	1.50E-08
Formaldehyde	50-00-0	4.40E-03	A	8.13E-04	1.94E-04
Heptachlorobiphenyl	35065-29-3	6.60E-11	D	1.22E-11	2.91E-12
Hexachlorobiphenyl	26601-64-9	5.50E-10	D	1.02E-10	2.43E-11
Hexanal	66-25-1	7.00E-06	D	1.29E-06	3.09E-07
Heptachlorodibenzo-p-dioxins	35822-46-9	2.00E-09	С	3.70E-10	8.82E-11
Heptachlorodibenzo-p-furans	55673-89-7	2.40E-10	C	4.44E-11	1.06E-11
Hexachlorodibenzo-p-dioxins	39227-28-6	1.60E-06	C	2.96E-07	7.06E-08
Hexachlorodibenzo-p-furans Hydrogen chloride	70648-26-9 7647-01-0	2.80E-10 1.90E-02	C C	5.18E-11 3.51E-03	1.23E-11 8.38E-04
Indeno(1,2,3,c,d)pyrene	193-39-5	8.70E-02	B	1.61E-08	3.84E-09
Isobutyraldehyde	78-84-2	1.20E-05	D	2.22E-06	5.29E-07
Methane	74-82-8	2.10E-02	C	3.88E-03	9.26E-04
2-Methylnaphthalene	91-57-6	1.60E-07	D	2.96E-08	7.06E-09
Monochlorobiphenyl	27323-18-8	2.20E-10	D	4.07E-11	9.70E-12
Naphthalene	91-20-3	9.70E-05	A	1.79E-05	4.28E-06
2-Nitrophenol	88-75-5	2.40E-07	C	4.44E-08	1.06E-08
4-Nitrophenol Octachlorodibenzo-p-dioxins	100-02-7 3268-87-9	1.10E-07 6.60E-08	C B	2.03E-08	4.85E-09
Octachlorodibenzo-p-dioxins	3208-87-9	8.80E-11	В С	1.22E-08 1.63E-11	2.91E-09 3.88E-12
Pentachlorodibenzo-p-dioxins	40321-76-4	1.50E-09	B	2.77E-10	6.62E-12
Pentachlorodibenzo-p-furans	0-03-3	4.20E-10	C	7.76E-11	1.85E-11
Pentachlorobiphenyl	18259-05-7	1.20E-09	D	2.22E-10	5.29E-11
Pentachlorophenol	87-86-5	5.10E-08	С	9.43E-09	2.25E-09
Perylene	198-55-0	5.20E-10	D	9.61E-11	2.29E-11
Phenanthrene	85-01-8	7.00E-06	В	1.29E-06	3.09E-07

Table EA-B: Biomass Burners (Rev2)

		Source ID		8	24
	11/6)	o 14,672,213	7,000,000		
		te (Input Rate) (BT ate (Input Rate) (k.			
	Firing R	Emission factor	J/n)	15,476,308 Emission rate	7,383,628 Emission rate
Contaminant	CAS	(lb/MMBtu)	Rating	g/s	g/s
Phenol	108-95-2	5.10E-05	C	9.43E-06	2.25E-06
Propanal	123-38-6	3.20E-06	D	5.92E-07	1.41E-07
Propionaldehyde	123-38-6	6.10E-05	D	1.13E-05	2.69E-06
Pyrene	129-00-0	3.70E-06	A	6.84E-07	1.63E-00
Styrene	100-42-5	1.90E-03	D	3.51E-04	8.38E-05
2,3,7,8-Tetrachlorodibenzo-p-dioxins	1746-01-6	8.60E-12	C	1.59E-12	3.79E-13
Tetrachlorodibenzo-p-dioxins	1746-01-6	4.70E-10	C	8.69E-11	2.07E-11
2,3,7,8-Tetrachlorodibenzo-p-furans	51207-31-9	9.00E-11	C	1.66E-11	3.97E-12
Tetrachlorodibenzo-p-furans	51207-31-9	7.50E-10	č	1.39E-10	3.31E-11
Tetrachlorobiphenyl	32598-13-3	2.50E-09	D	4.62E-10	1.10E-10
Tetrachloroethene	127-18-4	3.80E-05	D	7.03E-06	1.68E-06
o-Tolualdehyde	529-20-4	7.20E-06	D	1.33E-06	3.18E-07
p-Tolualdehyde	104-87-0	1.10E-05	D	2.03E-06	4.85E-07
Toluene	108-88-3	9.20E-04	C	1.70E-04	4.06E-05
Trichlorobiphenyl	37680-69-6	2.60E-09	C	4.81E-10	1.15E-10
1,1,1-Trichloroethane	71-55-6	3.10E-05	D	5.73E-06	1.37E-06
Trichloroethene	79-01-6	3.00E-05	D	5.55E-06	1.32E-06
Trichlorofluoromethane	75-69-4	4.10E-05	D	7.58E-06	1.81E-06
2,4,6-Trichlorophenol	88-06-2	2.20E-08	С	4.07E-09	9.70E-10
Vinyl Chloride	75-01-4	1.80E-05	D	3.33E-06	7.94E-07
o-Xylene	95-47-6	2.50E-05	D	4.62E-06	1.10E-06
Total organic compounds (TOC)	#N/A	0.039	D	7.21E-03	1.72E-03
Volatile organic compounds (VOC)	#N/A	0.017	D	3.14E-03	7.50E-04
Nitrous Oxide (N2O)	10024-97-2	0.013	D	2.40E-03	5.73E-04
Carbon Dioxide (CO2)	124-38-9	195	Α	3.60E+01	8.60E+00
Antimony	7440-36-0	7.90E-06	С	1.46E-06	3.48E-07
Arsenic	7440-38-2	2.20E-05	Α	4.07E-06	9.70E-07
Barium	7440-39-3	1.70E-04	С	3.14E-05	7.50E-06
Beryllium	7440-41-7	1.10E-06	В	2.03E-07	4.85E-08
Cadmium	7440-43-9	4.10E-06	Α	7.58E-07	1.81E-07
Chromium, total	7440-47-3	2.10E-05	Α	3.88E-06	9.26E-07
Chromium, hexavalent	18540-29-9	3.50E-06	С	6.47E-07	1.54E-07
Cobalt	7440-48-4	6.50E-06	С	1.20E-06	2.87E-07
Copper	7440-50-8	4.90E-05	Α	9.06E-06	2.16E-06
Iron	7439-89-6	9.90E-04	С	1.83E-04	4.37E-05
Lead	7439-92-1	4.80E-05	A	8.87E-06	2.12E-06
Manganese	7439-96-5	1.60E-03	A	2.96E-04	7.06E-05
Mercury	7439-97-6	3.50E-06	Α	6.47E-07	1.54E-07
Molybdenum	7439-98-7	2.10E-06	D	3.88E-07	9.26E-08
Nickel	7440-02-0	3.30E-05	Α	6.10E-06	1.46E-06
Phosphorus	7723-14-0	2.70E-05	D	4.99E-06	1.19E-06
Potassium	7440-09-7	3.90E-02	D	7.21E-03	1.72E-03
Selenium	7782-49-2	2.80E-06	A	5.18E-07	1.23E-07
Silver	7440-22-4	1.70E-03	D	3.14E-04	7.50E-05
Sodium	7440-23-5	3.60E-04	D	6.66E-05	1.59E-05
Strontium	7440-24-6	1.00E-05	D	1.85E-06	4.41E-07
Tin	7440-31-5	2.30E-05	D	4.25E-06	1.01E-06
Titanium	7440-32-6	2.00E-05	D	3.70E-06	8.82E-07
Vanadium	7440-62-2	9.80E-07	D	1.81E-07	4.32E-08
Yttrium	7440-65-5	3.00E-07	D	5.55E-08	1.32E-08
Zinc	7440-66-6	4.20E-04	Α	7.76E-05	1.85E-05

Whitesand Armstrong Station, Ontario

Table EA-B: Diesel Burners (Rev2)

Source ID	Firing Rate (Input Rate)	Firing Rate (Input Rate)	NO _x	Particulate Matter (Total)
Source ID	(BTU/h)	(kJ/h)	(g/s)	(g/s)
	[FR]		=[V*F]	=[V*F]
	Factor (It	/MMBtu) [X]:	4.41	0.31
F	actor (lb/hr) [F]=(X)*(5)/(2):	5.55651E-07	3.90593E-08
		CAS #:	10102-44-0	PM
Em	ission Factor	Rating (A-E):	D	D
30	1,706,000	1,799,496	0.474	0.035143559
31	376,440	397,070	0.105	0.007754655
Total E-Rate	2,082,440	2,196,566	0.5786	0.04290

Project No.: 030895

Whitesand		
Armstrong	Station,	Ontario

Table EA-C: Cooling Towers (Rev2)

Source ID	Description	Throughput (USGal/min)	Throughput (L/s)	PM10 Water Concentration (mg/L)	Drift Rate (L lost/L throughput)	Emission Rate (g/s)
59_1	Cooling Tower	1800	113.562354	1200	0.01%	0.01362748
59_2	Cooling Tower	1800	113.562354	1200	0.01%	0.01362748

Supporting Information for Assessment of Negligibility



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5.0	Identifying Significant Contaminants Using an Emission Threshold	B 4
6.0	De-minimis Calculations	B5
7.0	Operating Conditions	B6

Sources were screened for negligibility using the following screening protocols listed in the ESDM Procedure Document.

The results of the screening are discussed in greater detail in the following text.

1.0 Fugitive Dust Emissions

Fugitive emissions can potentially be generated from the truck dumpers; however it will be contained and fugitive emissions will be minimal. All biomass handling will occur inside the biomass handling building. Another potential fugitive emission source would be conveyors. All outdoor conveyors will transport humid wood which is much less susceptible to fugitive emissions than dried wood which is handled indoors. Fugitive emissions are potentially generated from shipping and delivery of raw and finished products. Fugitive emissions from all other sources described in this section are either negligible or no method of estimation is available.

2.0 Sources Listed in O. Reg 524/98 or on Table B-3

Sources listed on Table B-3 (ESDM Procedure Document Section 7.2.1):

Table B-3 of the ESDM Procedure Document lists sources that can be considered to be insignificant. Source or product that was considered negligible for any of the reasons listed is indicated with the appropriate designation in **Table E1**.

- 7. Any equipment, apparatus, mechanism or thing that is used for the ventilation of indoor air out of,
 - i. a space that is used for a purpose other than laboratory analysis, the production, processing, repair, maintenance or storage of goods or materials, or the processing, storage, transfer or disposal of waste,

In **Table EA-1**, Sources falling into this category have the text "No Process" in the column for "Rate/Rationale".

 a space that is used for laboratory analysis, the production, processing, repair, maintenance or storage of goods or materials, or the processing, storage, transfer or disposal of waste, if the equipment, apparatus, mechanism or thing does not discharge any contaminant produced by those activities, other than heat or noise, out of the space,

In **Table EA-1**, Sources falling into this category have the text "No Contaminants" in the column for "Rate/Rationale". Some sources in this category are deemed to have no

emissions because the nearby activities that cause emissions are assigned to a different nearby emission point.

8.1 Any equipment, apparatus, mechanism or thing that is used for the ventilation of emissions from a motor vehicle or locomotive that is used to transport things into, out of or within a warehouse or enclosed storage area [except coffee roasting operations 1.(3)].

In **Table EA-1**, Sources falling into this category have the text "Vehicle" in the column for "Rate/Rationale".

- 13. Any mobile equipment that is used for,
 - i. snow-making,
 - ii. the cleaning of ducts, carpets or upholstery,
 - iii. the removal of asbestos, or
 - iv. the crushing or screening of aggregate, if the mobile equipment is located below grade in a pit or quarry that is operated in accordance with a licence or permit issued under the Aggregate Resources Act.
- 20. Any equipment, apparatus, mechanism or thing that is used solely to mitigate the effects of an emergency declared to exist under the Emergency Plans Act.
- Standby power generators firing liquid or gaseous fuels that are used for standby power only with periodic testing as per the Regulation.
- Fume hoods for laboratories that are used for quality control and quality assurance purposes at industrial facilities.
 In Table EA-1, Sources falling into this category have the text "B3: QA/QC Fume Hood" in the column for "Rate/Rationale".
- Low temperature handling of compounds with a vapour pressure less than 1 kilopascal.

In **Table EA-1**, Sources falling into this category have the text "B3: VP < kPa" and "B3: standby" in the column for "Rate/Rationale".

3.0 Sources that are Insignificant Relative to Total Emissions

Sources that are insignificant relative to total emissions (ESDM Procedure Document Section 7.2.2)

As per Section 7.2.2 of the ESDM Procedure Document, it may not be necessary to consider a source of contaminant that discharges a negligible amount of the relevant

contaminant, having regard to the total amount of the contaminant that is discharged by all the sources of that contaminant to the nature of the contaminant.

Sources that, in combination, represent less than 5% of total property-wide emissions of a contaminant can, in many cases, be considered insignificant sources.

There are some exceptions to this general concept such as the situation where a relatively small amount of emissions from a source, that is emitting near a POI and/or where atmospheric dispersion is poor, can contribute the majority of the maximum POI concentration. As a result, the MOE may require, on a case-by-case basis, the inclusion of sources that would typically be considered insignificant relative to property-wide emissions of the contaminant or as a result of concerns with the nature of the contaminant.

Particulate generated by an ash dump truck was considered negligible, because it represents less than 5% of total property-wide particulate emissions. An ash dump truck drives less than 2% of the distance driven by all other trucks onsite per day. It is a dumper truck; therefore it has fewer wheels and generates less dust than all other trucks. It is correct to state that an ash dumper truck represents less than 5% of total particulate generated by truck traffic. Considering truck traffic is only a fraction of the overall particulate matter generated on site, particulate generated by an ash dump truck clearly represents less than 5% of total property-wide particulate emissions.

4.0 Generalized Guidance to identifying Insignificant or Significant Sources and Contaminants

Generalized guidance to identifying Insignificant or Significant Sources and Contaminants (ESDM Procedure Document Section 7.3):

The ministry has provided additional guidance to the Generalized Guidance in Chapter 7.3 of ESDM Procedure Document through the O.Reg. 419/05 Q&A process regarding Semi-Qualitative Assessments (Q8-7 Round 2 March 10, 2006).

In general, using this guidance, a source may be considered negligible if the emissions from one source of contaminants are similar (same contaminants and same relative proportions of contaminants) to another source of contaminants **and** one of the sources would have much higher emissions rates than the other **and** the nature of their emissions is similar (resultant dispersion impact from either source are the same) then the smaller source can be classified as insignificant provided the resultant POI impact of all the contaminants does not result in non-compliance **or** that the margin of compliance

is so slight that if the smaller source or sources were included the aggregate POI impact of all the contaminants would result in non-compliance.

Using this guidance it is possible to conclude that sources of contaminants are negligible by comparing the difference in usage rates between sources at a Site. If the usage rate of materials in the process are much less than the usage rates in other significant sources at the same Site then the lesser source may be considered negligible.

This mechanism was not used to designate any source as negligible.

5.0 Identifying Significant Contaminants Using an Emission Threshold

Identifying significant contaminants using an emission threshold (ESDM Procedure Document Section 7.1.2):

Using the Threshold Calculator provided in Chapter 7.1.2 of the ESDM Procedure Document the Emission Thresholds can be calculated.

Emissions from wastewater vents were deemed to be negligible using emission threshold calculation.

Sample Calculation: Ammonia

There are three wastewater vents on the property. The closet vent to the property line is at 56 m. To be conservative the rural dispersion factor corresponding to the distance of 40 m was used⁵.

Ammonia is the main contaminant of concern from wastewater and was used to assess negligibility based on the emission threshold. MOE POI limit for ammonia is $100 \ \mu g/m^3$ for 24 h averaging period. The dispersion factor for 24 h will be:

DispersionFactor_{24hr} = DispersionFactor_{1hr} $(1h/24h)^{0.28}$ = 8100 * (1/24)0.28 = 3,327 $\mu g / m^3 per g / s emission$)

⁵ Guideline A-10, Table B-1 Guidance for Screening-Out with Dispersion Factors.

Emission Threshold
$$(g/s) = \frac{0.5 * MOE \ POI \ Limit(\mu g / m^3)}{Dispersion \ Factor(\mu g / m^3 per g / s emission)} =$$
$$= \frac{0.5 * 100(\mu g / m^3)}{3,327(\mu g / m^3 per g / s emission)} = 0.015 \ g/s$$

To be conservative, the flow rates from process and sanitary vents were added together, since both vents are located next to each other. An emission factor of 2.28 kg/1,000 m³ influent was used as per NPRI Guidance Manual for the Wastewater Sector - Table D-2 - Plant-Wide, Air-Emission Factors for Municipal Wastewater Treatment Plants.

EmissionRate(g/s) = EmissionFactor * FlowRate

$$= 2.28(kg/1,000m^{3}influent) * (92,000L/day + 8,100L/day) * \frac{1}{1,000m^{3}}$$
$$* \frac{1m^{3}}{1,000L} * \frac{1,000g}{1kg} * \frac{1hr}{3600s} * \frac{1day}{24hr} = 0.003g/s$$

Calculated emission rate of 0.003 g/s is below 0.015 g/s threshold limit for ammonia; therefore it was deemed to be negligible.

Any other contaminants that may be emitted from these sources are expected to be a smaller fraction of their respective criteria than ammonia so ammonia would reach its limit before any other contaminant; therefore, the entire wastewater treatment process was assumed to be negligible and no further assessment was done.

Contaminants deemed negligible using this mechanism are marked as "Neg" in **Table E2**.

6.0 De-minimis Calculations

De-minimis calculations (ESDM Procedure Document Appendix B):

Appendix B of the Procedure Document, entitled *Supporting Information for the Assessment of the Significance of Contaminants and Sources* provides some direction on identifying insignificant emissions of a contaminant.

Specifically, Step 2 of **Table B-2A** entitled *Contaminants Not Listed in the MOE* Document "Summary of Point of Impingement Guidelines, and Ambient Air Quality Criteria (AAQCs)" that Can Be Deemed Insignificant in a Specific Situation indicates that if a substance is not listed in **Table B-2B** entitled *List of Contaminants Excluded from de minimus level* it can be considered insignificant if its predicted impact is below 0.1 µg/m³.

Using the de-minimus procedure included in Appendix B of the ESDM Procedure Document contaminants can be shown to be negligible.

Contaminants considered negligible because their POI concentration is less than the threshold concentration are shown on **Table E4** and are indicated by "Neg" in the column titled "Percentage of Criteria or Likelihood of Adverse Effect."

Products for which the MSDS indicates "Non-Hazardous" have been marked as "No contaminants of concern" and considered to be negligible.

This mechanism was not used to designate any source as negligible.

7.0 Operating Conditions

Operating conditions (ESDM Procedure Document Section 8.1):

As per Section 8.1 of the ESDM Procedure Document, operating conditions provide key information to the development of emission rate estimates (i.e., operating conditions provide production data that translates an emission factor into an emission rate estimate).

Subsection 10(1) of O.Reg. 419/05 states:

"1. A scenario that assumes operating conditions for the facility that would result, for the relevant contaminant, in the highest concentration of the contaminant at a point of impingement that the facility is capable of."

If a product is only found in a spill kit, it is rarely used and only for an emergency so any normal emission can be considered negligible.

In **Table EA-1**, Sources falling into this category have the text "Spill Kit" in the column for "Rate/Rationale".

This mechanism was not used to designate any source as negligible.

Dispersion Modelling Printouts



Whitesand First Nation

ECA Dispersion Modelling Printouts October 2014

Table of Contents

1.0	Nitrogen Oxides	C1
2.0	Particulate Matter	C1
3.0	Multi Contaminant Run	C1

ECA Dispersion Modelling Printouts October 2014

The emission rates organized by emission point are found in **Table E2-1**. The emission rates organized by contaminant are found in **Table E2-2**. Selected pages from the simulation output file for nitrogen oxides are shown at the end of this Appendix.

1.0 Nitrogen Oxides

The nitrogen oxides simulations are found in "030895 Whitesand ECA NOx.zip", "030895 Whitesand ECA NOx30.zip" and "030895 Whitesand ECA NOx31.zip" backup files. The simulations are for biomass boiler, standby diesel generator and fire pump diesel engine respectively and all emission points are simulated as point sources. The NO_x emissions are predicted from the maximum firing rate of each burner on Site. The first highest predicted values are reported in **Table E4**.

2.0 Particulate Matter

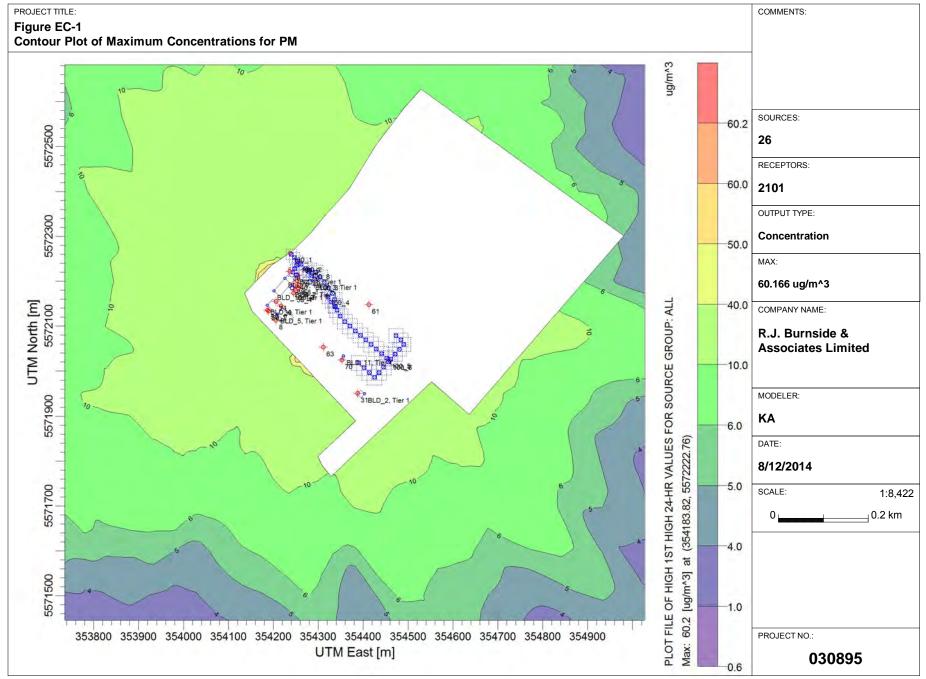
The particulate matter simulation is found in the "030895 Whitesand ECA PM.zip" backup. This simulation uses the entire site except pellet boiler, standby diesel generator and fire pump diesel engine. All emission points are simulated as point sources and roads are simulated as line volume sources. The PM emissions are predicted from the maximum firing rate of the biomass boiler. The baghouse emissions are predicted using the standard baghouse emission factors as discussed in **Appendix A**. Other particulate sources include biomass storage piles, belt dryer, storage silo, biomass handling building exhaust.

3.0 Multi Contaminant Run

The other contaminant simulations were done using Lakes' "Multi-Chemical Run..." option and are found in the "030895 Whitesand ECA Multichem.zip" backup. This simulation uses the entire site except pellet boiler, standby diesel generator, fire pump diesel engine and particulate (separate simulation) and all emission points are simulated as point sources. The various emissions are predicted from the baghouse emission factors. The first highest predicted values are reported in **Table E4.** "030895 Whitesand ECA Multichem_24.zip" backup file includes simulation for emergency pellet boiler.

```
* *
* *
** AERMOD Input Produced by:
** AERMOD View Ver. 8.5.0
** Lakes Environmental Software Inc.
** Date: 8/11/2014
** File: C:\AERMOD\Whitesand\8 Whitesand PM lastKZ\Whitesand PM.ADI
* *
* *
* *
** AERMOD Control Pathway
* *
* *
CO STARTING
  TITLEONE Whitesand - PM
  MODELOPT CONC BETA
  AVERTIME 24
  POLLUTID TSP
  RUNORNOT RUN
  ERRORFIL Whitesand_PM.err
CO FINISHED
* *
** AERMOD Source Pathway
* *
* *
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION 8
                     POINT
                             354205.368 5572113.148
                                                       366.000
** DESCRSRC Boiler Flue Gas Stack
  LOCATION 24
                    POINT
                              354205.561 5572154.823
                                                       366.000
** DESCRSRC Pellet Boiler Flue Gas Outlet
                    POINT
                              354217.192 5572144.959
  LOCATION 30
                                                       366.000
** DESCRSRC Stand by Generator (500kW)
  LOCATION 31
                     POINT
                             354387.921 5571950.996
                                                       366.000
** DESCRSRC Fire Pump Diesel Engine (150hp)
  LOCATION 38
                    POINT
                          354245.334 5572191.106
                                                       366.000
** DESCRSRC Pellet Plant - Dust Pick-ups and Screen Fines - Bag House
Vent
  LOCATION 39
                    POINT
                              354236.742 5572222.110
                                                       366.000
** DESCRSRC Pellet Plant - Pellet Cooler - Cyclone Vent
  LOCATION 40
                     POINT
                              354253.120 5572200.449
                                                       366.000
** DESCRSRC Pellet Plant - Fine Hammer Mill - Bag House Vent
  LOCATION 57
                     POINTCAP 354255.210 5572212.938
                                                       366.000
** DESCRSRC Dry Chip Storage Silo Vent
  LOCATION 61
                    POINTCAP 354412.619 5572147.580
                                                       366.000
** DESCRSRC Biomass Pile- Aspen/Birch
  LOCATION 63
                    POINTCAP 354310.997 5572053.072
                                                       366.000
```

*** AERMOD - VERSION 12060 *** *** Whitesand - PM * * * 08/11/14 * * * * * * 10:34:17 PAGE 366 **MODELOPTs: NonDFAULT CONC ELEV BETA *** THE MAXIMUM 200 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL *** INCLUDING SOURCE(S): 8 , 30 , 31 , 38 39 , 40 , 57 , 58_1 , 58_2 , 58_3 58_4 , 59_1 , 59_2 , L0000680 , L0000699 , L0000700 24 , , 61 63 , L0000678 , L0000679 L0000703 , L0000704 , L0000705 , L0000706 L0000707 , L0000708 , L0000715 , . . . ** CONC OF TSP IN MICROGRAMS/M**3 * * RANK CONC (YYMMDDHH) AT RECEPTOR (XR,YR) OF TYPE RANK CONC (YYMMDDHH) AT RECEPTOR (XR,YR) OF TYPE 1. 60.16636 (98082224) AT (354183.82, 5572222.76) DC 41. 52.13153 (98101424) AT (354183.82, 5572222.76) DC 2. 59.78304 (98022624) AT (354176.94, 5572215.74) DC 42. 52.08912 (99051424) AT (354183.82, 5572222.76) DC 3. 59.33884 (98102924) AT (354176.94, 5572215.74) DC 43. 51.98776 (99083024) AT (354190.71, 5572229.78) DC 4. 58.83725 (00071124) AT (354183.82, 5572222.76) DC 44. 51.98426 (97032424) AT (354183.82, 5572222.76) DC 5. 58.54380 (97052224) AT (354183.82, 5572222.76) DC 45. 51.98322 (99050324) AT (354190.71, 5572229.78) DC 6. 58.51524 (00081924) AT (354183.82, 5572222.76) DC 46. 51.96239 (98012224) AT (354183.82, 5572222.76) DC 7. 58.34562 (98022624) AT (354170.05, 5572208.72) DC 47. 51.95332c(99121324) AT (354190.71, 5572229.78) DC 8. 58.21602 (98081824) AT (354183.82, 5572222.76) DC 48. 51.82685 (96102024) AT (354183.82, 5572222.76) DC 9. 57.85950 (98081824) AT (354190.71, 5572229.78) DC 49. 51.80794 (00022524) AT (354176.94, 5572215.74) DC 10. 56.98299 (98012024) AT (354254.48, 5572025.81) DC 50. 51.63599 (98101124) AT (354176.94, 5572215.74) DC 11. 56.73728 (99050524) AT (354170.05, 5572208.72) DC 51. 51.41609 (00110524) AT (354190.71, 5572229.78) DC 12. 56.42690 (00081924) AT (354190.71, 5572229.78) DC 52. 51.40093 (96121124) AT (354183.82, 5572222.76) DC



AERMOD View - Lakes Environmental Software

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