SCIENCE INTEGRITY KNOWLEDGE

CHEMICAL SCREENING OF EMISSIONS ASSOCIATED WITH ELECTRICAL GENERATION FACILITIES IN ALBERTA

FINAL REPORT

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CHEMICAL SCREENING OF EMISSIONS ASSOCIATED WITH ELECTRICAL GENERATION FACILITIES

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CHEMICAL SCREENING OF EMISSIONS ASSOCIATED WITH ELECTRICAL GENERATION FACILITIES in ALBERTA

1.0 INTRODUCTION

The objective of the assessment was to screen air emissions associated with electrical generation facilities in Alberta and identify chemicals, with information on toxicity potency, bioaccumulation and persistence potential. The assessment focused on electrical power generation facilities based on combustion of coal, natural gas and biomass. Electrical generation by wind or water were excluded from the assessment. The assessment incorporated the following lines of evidence to identify priority chemicals in air emissions:

1. Generated an inventory of chemicals and emission rates from electrical generation facilities in Alberta.
2. Conducted a toxic potency screening for each facility selected for the assessment.
3. Determine the bio-accumulation and persistence potential of chemicals emitted by electrical generation facilities.
4. Summarize the findings of human health risk assessments of historical environmental impact assessments and community based bio-monitoring that was conducted in close proximity to electrical generation.

Combined these four lines of evidence were used to provide the following:

- Chemicals of concern via inhalation (i.e., priority air toxics) will be identified based on the toxic potency screening;
- Chemicals with bio-accumulation and persistence potential will be based on the following three lines of evidence:
    - Physical and chemical screening was used to identify non-volatile (i.e., bio-accumulative and persistence) organic compounds in the emission inventory;
    - Fugacity modelling was used to show how the bio-accumulative and persistent chemicals would partition in the environment if released directly to air; and
- A summary of human health risk assessments from previous applications for electrical generation facilities in Alberta and bio-monitoring studies were also provided as part of this assessment.

The methods used for screening are primarily human health based, but some aspects are also applicable to the environment (e.g., wildlife and ecological). It was beyond the scope of the assessment to use methods with an explicit ecological or human health focus. The methods used for identifying chemicals was primarily based on human health some of the aspects would encompass ecological effects. For example, the physical and chemical screening would be applicable to human and ecological receptors. However, the toxic potency screening would be primarily focused on human health. This report makes no recommendations in terms of identifying chemicals of potential concern, but provides the information and methods that can be used to prioritize chemicals from electrical generation emissions by consideration of multiple lines of evidence.

2.0 INVENTORY OF CHEMICALS AND EMISSION RATES

The inventory of chemicals and emission rates associated with electrical generation facilities was based on data collected from publicly available information sources such as:

- Alberta Environment and Sustainable Resource Development (ESRD);
- Alberta Utilities Commission (AUC); and
- Environment Canada's National Pollutant Release Inventory (NPRI).

Emission rates from coal-fired power plants and natural gas power plants in Alberta were identified from these online sources and the chemical inventory is presented in Appendix A along with emission rates for each facility that was selected for the assessment. No publicly available information sources were identified for biomass power plants.

The chemical inventory (Appendix A) is based on the following:

- Air quality assessments, which were submitted as part environmental impact assessments (EIA), were used to generate an emission inventory. These assessments were publically available from the Alberta Environment and Sustainable Resource Development (ESRD) EIA Portal or the Alberta Utilities Commission (AUC). A high level of confidence is placed in these emission inventories since a comprehensive air quality assessment was completed with careful consideration of characterizing the emission sources on a conservative basis assuming operation under full power. Table 1 presents the 5 facilities that were included in the assessment based on air quality assessment that were publicly available from the ESRD and AUC.
- The National Pollutant Release Inventory (NPRI) was used to generate an emission inventory of older and large facilities that did not have a publicly available air quality assessment. The number of facilities listed on the NPRI is substantial and beyond the scope of the assessment to evaluate every single electrical generation source. Therefore, the assessment focused on currently operating facilities that emitted the greatest level of green-house gases emission, reported in tonnes of carbon dioxide equivalent (i.e., t CO2e) (ESRD 2014). The assessment focused on facilities that emit over one million t CO2e per year and reported emissions for the most recent monitoring period (2008 to 2011). Table 1 presents the three facilities that met these criteria.

Four out of the five facilities that were available from the EIA Portal received ESRD approval and were constructed. One of the facilities (i.e., the Fording Brooks Power Project) completed and submitted an application but was withdrawn and never received approval. This facility was added to the assessment since a comprehensive air quality and human health risk assessment was completed for this project. In addition, the ENMAX Sheppard Energy Center was added to the assessment to characterize emissions from natural gas electrical generation since it is the only facility that is public available and has an air quality assessment. The remaining facilities in Table 1 are based on coal combustion. Finally, it should be noted that three of the facilities (i.e., Sheerness Generating Station, Battle River Generating Station and Sundance) were built before an EIA was required; therefore, an EIA nor air quality assessment was never completed. Table 2 presents a summary of the chemical groups that have been identified in the emission inventory for each facility included in the assessment.

Table 1 Summary Chemical and Emission Rates for each Facility

Facility Name	*Current Facility Name*	*Source of Emission Data*	*Reference*
EPCOR Genesee	Capital Power-Genesee Generating Station 1-3	ESRD EIA Portal(1)	Jacques Whitford Environmental Limited 2001
TransAlta Centennial	TransAlta Keephills 3	ESRD EIA Portal(1)	TransAlta 2001a
Fording Brooks Power Project	NeverBuilt – same name	ESRD EIA Portal(1)	Levelton Engineering Ltd. 2002
ENMAX Shepard Energy Centre	ENMAX/Capital Power Shepard Energy Centre	AUC(2)	Jacques Whitford Stantec AXYS Limited 2009
Maxim Power Corp. Milner Expansion Project	HR Milner M2	ESRD EIA Portal(1)	Maxim 2009
TransAlta Sundance	TransAlta Sundance 1-6	NPRI Database(3)	NPRI 2013
Alberta Power Sheerness	Atco Power Sheerness Generation Station	NPRI Database(3)	NPRI 2013
Alberta Power Battle River	Atco Power Battle River 3,4,5	NPRI Database(3)	NPRI 2013

Notes: Emissions data from the ESRD EIA Portal were sourced from Air Quality reports.
(1) ESRD EIA Portal weblink available at: https://external.sp.environment.gov.ab.ca/DocArc/EIA/EIA/Forms/AllItems.aspx
(2) AUC ENMAX Shepard Application available at: https://www.auc.ab.ca/eub/dds/EPS_Query/ApplicationDetails.aspx?AppNumber=1605340&ProceedingId=241
(3) NPRI Database for Facility Reported Data available at: http://ec.gc.ca/inrp-npri/donnees-data/index.cfm?lang=En

Table 2 Summary of Chemical Groups Identified for Each Facility

Chemical Group	*Facility*							
	EPCOR Genesee	*TransAlta Centennial*	*Fording Brooks Power Project*	*ENMAX Shepard Energy Centre*	*Maxim Power Corp. Milner Expansion Project*	*TransAlta Sundance*	*Alberta Power Sheerness*	*Alberta Power Battle River*
Criteria Air Contaminants	✓	✓	✓	✓	✓	✓	✓	✓
Dioxins and Furans	✓	✓	✓	✗	✓	✓	✓	✓
Hydrogen halides	✓	✓	✗	✗	✓	✓	✓	✓
Metals	✓	✓	✓	✓	✓	✓	✓	✓
Other Inorganics(1)	✗	✗	✗	✗	✗	✓	✓	✓
Organics	✓	✓	✓	✓	✓	✓	✓	✓
PAHs	✓	✓	✓	✓	✓	✗	✗	✗

Notes:
(1) Other Inorganics may include hydrochloric acid, sulphuric acid, and ammonia

3.0 TOXIC POTENCY SCREENING

A toxic potency screening was conducted in order to identify the most concerning chemicals emitted based on the degree to which the emission rate of each chemical exceeded its corresponding toxicity reference value (TRV). The toxic potency screening is based on inhalation TRVs; therefore, the screening helps prioritize potential air toxics. The toxic potency screening was completed for the chemical inventory for each facility and the detailed calculations and relative toxic potencies are presented in Appendix A.

A number chemicals or chemical groups were excluded from the toxic potency screening on the basis that a surrogate was available to assess the group or the method was not applicable (e.g., greenhouse gases, radionuclides). Dioxin and furan groups were excluded from the toxic potency assessment because TRVs are not available for these compounds and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) was used as a surrogate to represent the group. Appendix B presents the dioxin and furan groups that were excluded from the toxic potency screening.

In addition, radionuclides were excluded from the toxic potency screening because alternative methods are available to screen these chemicals. Section 4.0 presents a screening level assessment for the evaluation of naturally occurring radioactive materials.

Finally, total suspended particulate (TSP), or total particulate matter (PM) or PM_{10} were excluded from the toxic potency screening because $PM_{2.5}$ was selected as the most appropriate surrogate for the chemical group.

3.1 Toxic Potency Screening Methods

Toxic potency screening is a prioritization scheme to select chemicals emitted to air that requires further scrutiny. Toxic potency screening is often restricted to the assessment of chemicals exposure via inhalation (i.e., air) and excluded from the assessment of chemical exposure via the oral pathway (i.e., soil, food and water). More comprehensive fate and transport or multiple pathway exposure assessment models are required to assess the oral pathway and are beyond the scope of this assessment. However, multiple pathway assessments have been completed for historical regulatory applications in Alberta for coal and natural gas facilities and a summary of these assessments has been described in Section 6.0.

Due to the sheer volume of chemicals emitted from power plants, it would be very time consuming and not practical to assess each and every chemical. Therefore, a scheme has been developed by to prioritize the pollutants that are predicted to cause the most significant human health effects. The toxic potency screening takes into account the relative amount of emissions and the toxicity reference values. By creating a normalized toxic potency value, a more direct comparison between chemicals is possible. For example, total US acetaldehyde emissions are more than double acrolein emissions, but acrolein is 450 times more toxic than acetaldehyde (Oommen et al. 2014). Inhalation toxic potency is performed with the following steps:

1. Each chemical emission (i.e., kg/day) is divided by the toxicity reference value (TRV). This value is called the toxic potency.
2. The toxic potency values are summed to derive the total toxic potential.
3. Each toxic potency value is divided by the total toxic potential to derive the relative potency. This represents the portion that an individual chemical contributes to the overall amount of toxic potential. In other words, the relative potency identifies which chemicals contribute most to the inhalation toxic potential.
4. The chemicals are sorted from highest to lowest relative potency and the cumulative potency is calculated to determine which chemicals contribute 99.9% to inhalation toxic potential.

Studies that have been conducted into the prioritization of air pollutants typically rank chemicals based on qualitative rather than quantitative methods (Kadlec 2008). A quantitative threshold or benchmark is not available to prioritize toxic potency. Internet searches and Web of Science searches using the following terms yielded no relevant results:

- Toxic potency screening;
- Searched within results: health risk assessment;
- Toxic air pollutants prioritization;
- Percent toxic potency; and
- Searched within results: health risk assessment.

Therefore, professional judgment is often used to select a threshold cut-off level of cumulative potency. Typically, this cut-off level will range from 95% to 99.9% of the cumulative potency. That is, any chemical with a relative potency below 0.1 to 5% is assumed to not contribute to air toxics and therefore is excluded from further assessment or consideration. For the current assessment a cut-off level of 0.1% relative potency was used.

3.2 Toxicity Reference Values

Toxicity reference values (TRVs) are required for the toxic potency screening and were derived for acute and chronic inhalation exposures. Appendix C presents a detailed summary of the TRVs derived from each agency. The following regulatory authorities were searched for acute inhalation toxicity reference TRVs:

- American Conference of governmental Industrial Hygienists (ACGIH) – (Threshold Limit Values: Short-term exposure limit or Ceiling)
- Alberta Environment and Sustainable Resource Development (ESRD) – Ambient Air Quality Objectives (AAQO)
- Agency for Toxic Substances & Disease Registry (ATSDR)– Minimal Risk Levels (MRL)
- Canadian Council of Ministers of the Environment (CCME) – Canadian Ambient Air Quality Standards (CAAQS)
- California's Office of Environmental Health Hazard Assessment (OEHHA)– Reference Exposure Levels (REL)
- Texas Commission on Environmental Quality (TCEQ) – Reference Values (ReV)
- United States Environmental Protection Agency National Ambient Air Quality Standards (NAAQS)
- United States Environmental Protection Agency Integrated Risk Information System (IRIS)
- United States Environmental Protection Agency – Acute Exposure Guideline Levels (AEGL)
- World Health Organization (WHO) – Air Quality Guidelines

In addition, the following regulatory authorities were searched for chronic inhalation toxicity reference TRVs:

- American Conference of governmental Industrial Hygienists (ACGIH) – (Threshold Limit Values: Short-term exposure limit or Ceiling)

- Alberta Environment and Sustainable Resource Development (ESRD) – Ambient Air Quality Objectives (AAQO) (non carcinogens)
- Agency for Toxic Substances & Disease Registry (ATSDR) – Minimal Risk Levels (MRLs) (non carcinogens)
- Health Canada – Toxicity Reference Values (TRVs) (carcinogens and non carcinogens)
- California's Office of Environmental Health Hazard Assessment (OEHHA) – Reference Exposure Levels (REL) (non carcinogens)
- California's Office of Environmental Health Hazard Assessment (OEHHA) – Cancer Potency Values (carcinogens)
- National Institute of Public Health and the Environment (RIVM) – Maximum Permissible Risk Levels (carcinogens and non carcinogens)
- Texas Commission on Environmental Quality (TCEQ) – Reference Values (ReV) and inhalation Unit Risk Factors (URF) (carcinogens and non-carcinogens)
- United States Environmental Protection Agency National Ambient Air Quality Standards (NAAQS)
- United States Environmental Protection Agency Integrated Risk Information System (IRIS) (carcinogens and non carcinogens)
- United States Environmental Protection Agency Provisional Peer Reviewed Toxicity Values (PPRTV) (carcinogens and non carcinogens)
- World Health Organization (WHO) non-carcinogens and carcinogens

The toxic potency screening selected TRVs based on the following priority of selection:

1. ESRD AAQO were selected first as these objectives are specific to the province of Alberta and represent objectives for the protection of air quality (e.g., plants, odours) not just human health;
2. Health Canada TRVs were selected second if an ESRD AAQO was not available as these limits are specific to Canada and are Health based.
3. If an ESRD AAQO or Health Canada TRV was not available then the lowest value from the remaining agencies was selected.

Table 3 presents the acute and chronic (non-carcinogenic and carcinogenic) inhalation TRVs that were selected for the toxic potency screening.

Table 3 Inhalation Exposure Limits Selected for the Toxic Potency Screening

Chemical	*Acute Inhalation*		*Chronic Inhalation non-Cancer*		*Chronic Inhalation Cancer*	
	Value (µg/m³)	*Agency*	*Value (µg/m³)*	*Agency*	*Value (µg/m³)*	*Agency*
Criteria Air Contaminants						
CO	1.50E+04	ESRD 2013				
NO_2	3.00E+02	ESRD 2013	1.00E+02	ESRD 2013		
$PM_{2.5}$	2.70E+01	CCME 2012	8.80E+00	CCME 2012		
PM_{10}						
SO_2	4.50E+02	ESRD 2013	2.00E+01	ESRD 2013		
Dioxins and Furans						
2,3,7,8-TCDD			3.00E-06	US EPA 2012	2.63E-07	OEHHA 2009
2,3,7,8-TCDF					2.63E-06	OEHHA 2009
Other						
Bromine	2.18E+02	US EPA AEGL 2013				
Chlorine	1.50E+01	ATSDR 2013	1.50E-01	ATSDR 2013		
CO_2						
Cyanide			2.50E+01	RIVM 2001		
Hydrochloric Acid	7.50E+01	ESRD 2013	9.00E+00	OEHHA 2014		
NH_3	1.40E+03	ESRD 2013	7.00E+01	ATSDR 2013		
N_2O (Nitrous Oxide)						
Sulphuric Acid	1.00E+01	ESRD 2013	1.00E+00	OEHHA 2014		
Hydrogen Halides						
Hydrogen Chloride	7.50E+01	ESRD 2013	9.00E+00	OEHHA 2014		
Hydrogen Fluoride	4.90E+00	ESRD 2013	1.40E+01	OEHHA 2014		
Metals						
Aluminum			5.00E+00	US EPA PPRTV 2014		
Antimony						
Arsenic	1.00E-01	ESRD 2013	1.00E-02	ESRD 2013	1.60E-03	Health Canada 2010
Barium			1.00E+00	RIVM 2001		
Beryllium			7.00E-03	OEHHA 2014	4.00E-03	US EPA IRIS 2014
Boron	3.00E+02	ATSDR 2013				
Cadmium	3.00E-02	ATSDR 2013	5.00E-03	ATSDR 2013	1.00E-03	Health Canada 2010

Chemical	Acute Inhalation		Chronic Inhalation non-Cancer		Chronic Inhalation Cancer	
	Value (µg/m³)	Agency	Value (µg/m³)	Agency	Value (µg/m³)	Agency
Chromium (III)	1.00E+00	TCEQ 2013	1.40E-01	TCEQ 2013		
Chromium (VI)			1.00E-01	US EPA IRIS 2014	1.30E-04	Health Canada 2010
Cobalt			1.00E-01	ATSDR 2013	1.11E-03	US EPA PPRTV 2014
Copper	1.00E+02	OEHHA 2014	1.00E+00	RIVM 2001		
Iron						
Lead	1.50E+00	ESRD 2013	5.00E-01	WHO 2000	8.33E-01	OEHHA 2009
Magnesium						
Manganese	2.00E+00	ESRD 2013	2.00E-01	ESRD 2013		
Mercury	6.00E-01	OEHHA 2014	6.00E-02	Health Canada 2010		
Molybdenum			1.20E+01	RIVM 2001		
Nickel	6.00E+00	ESRD 2013	5.00E-02	ESRD 2013	7.70E-03	Health Canada 2010
Phosphorus	2.00E+01	ATSDR 2013				
Potassium						
Rubidium						
Selenium			2.00E+01	OEHHA 2014		
Silicon						
Silver			4.00E-01	ACGIH 2014		
Sodium						
Strontium						
Thallium						
Thorium						
Titanium			1.00E-01	ATSDR 2013		
Uranium			4.00E-02	ATSDR 2013		
Vanadium	0.8 (24 hr)	OEHHA 2014	1.00E-01	ATSDR 2013		
Zinc	2.50E+02	ACGIH 2014				
Zirconium						
Organics						
1,1,1-Trichloroethane	9.00E+03	US EPA IRIS 2014	1.00E+03	TCEQ 2013		
1,3-Butadiene	1.50E+01	US EPA IRIS 2014	2.00E+00	US EPA IRIS 2014	1.70E+00	Health Canada 2004
2,4-Dinitrotoluene					1.12E-01	OEHHA 2009
2-Chloroacetophenone			3.00E-02	US EPA IRIS 2014		

Chemical	Acute Inhalation		Chronic Inhalation non-Cancer		Chronic Inhalation Cancer	
	Value (µg/m³)	Agency	Value (µg/m³)	Agency	Value (µg/m³)	Agency
Acetaldehyde	9.00E+01	ESRD 2013	3.90E+02	Health Canada 2004	1.72E+01	Health Canada 2004
Acetophenone						
Acrolein	2.50E+00	OEHHA 2014	4.00E-01	Health Canada 2004		
Benzaldehyde						
Benzene	3.00E+01	ESRD 2013	3.00E+01	ESRD 2013	3.00E+00	Health Canada 2010
Benzyl Chloride (α-chlorotoluene)	2.40E+02	OEHHA 2014	1.00E+00	US EPA PPRTV 2014	2.04E-01	OEHHA 2009
Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)					4.17E+00	OEHHA 2009
Bromoform (Tribromomethane)					9.00E+00	US EPA IRIS 2014
Carbon Disulphide	3.00E+01	ESRD 2013	1.00E+02	Health Canada 2004		
CH_4						
Chlorobenzene	4.60E+04	US EPA AEGL 2013	1.00E+01	Health Canada 2010		
Chloroform (Trichloromethane)	1.50E+02	ATSDR 2013	9.80E+01	ATSDR 2013	4.00E-01	US EPA IRIS 2014
Dichlorobenzene	3.00E+03	TCEQ 2013	9.50E+01	Health Canada 2010	9.09E-01	OEHHA 2009
Dimethyl Sulphate	4.52E+01	US EPA AEGL 2013				
Ethylbenzene	2.00E+03	ESRD 2013	1.00E+03	Health Canada 2010	4.00E+00	OEHHA 2009
Ethyl Chloride (Chloroethane, Monochloroethane)	3.96E+04	ATSDR 2013	1.00E+04	US EPA IRIS 2014		
Ethylene Dibromide (1,2-Dibromoethane)	3.53E+04	US EPA AEGL 2013	9.30E+00	Health Canada 2010	1.67E-02	Health Canada 2010
Ethylene Dichloride (1,2-Dichloroethane)	7.00E+02	WHO 2000	7.00E+00	US EPA PPRTV 2014	4.00E-01	US EPA IRIS 2014
Formaldehyde	6.50E+01	ESRD 2013	9.00E+00	OEHHA 2014	1.90E+00	Health Canada 2004
HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)			5.00E+04	US EPA IRIS 2014		
Hexachlorobenzene (Perchlorobenzene)					1.96E-02	OEHHA 2009
Hexane	7.00E+03	ESRD 2013	7.00E+02	Health Canada 2010		
Isophorone			2.00E+03	OEHHA 2014		

Chemical	Acute Inhalation		Chronic Inhalation non-Cancer		Chronic Inhalation Cancer	
	Value (µg/m³)	Agency	Value (µg/m³)	Agency	Value (µg/m³)	Agency
Isopropylbenzene (Cumene)	5.00E+02	US EPA AEGL 2013	4.00E+02	US EPA IRIS 2014		
Methyl Bromide (Bromomethane)	1.94E+02	ATSDR 2013	5.00E+00	US EPA IRIS 2014		
Methyl Chloride (Chloromethane)	1.03E+03	ATSDR 2013	9.00E+01	US EPA IRIS 2014		
Methyl Ethyl Ketone (Butanone)	5.90E+04	TCEQ 2013	5.00E+03	US EPA IRIS 2014		
Methyl Hydrazine (Monomethylhydrazine)						
Methyl Methacrylate	6.97E+04	US EPA AEGL 2013	7.00E+02	US EPA IRIS 2014		
Methyl *tert*-Butyl Ether	7.21E+03	ATSDR 2013	3.70E+01	Health Canada 2010	3.85E+01	OEHHA 2009
Methylene Chloride (Dichloromethane)	4.50E+02	WHO 2000	4.00E+02	US EPA IRIS 2014	4.35E+02	Health Canada 2010
Pentane	2.00E+05	TCEQ 2013	1.00E+03	US EPA PPRTV 2014		
Phenol	1.00E+02	ESRD 2013	2.00E+01	RIVM		
Propane	9.90E+06	US EPA AEGL 2013				
Propionaldehyde	1.10E+05	US EPA AEGL 2013	8.00E+00	US EPA IRIS 2014		
Propylene (Propene, Methylethylene)			5.00E+00	OEHHA 2014		
Propylene Oxide	4.80E+02	ESRD 2013	3.00E+01	US EPA 2014	3.00E+00	US EPA 2014
Styrene	2.15E+02	ESRD 2013	9.20E+01	Health Canada 2010		
Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	1.36E+03	ATSDR 2013	3.60E+02	Health Canada 2010	1.69E+00	OEHHA 2009
Toluene	1.88E+03	ESRD 2013	3.80E+03	Health Canada 2010		
Vinyl Acetate	2.35E+04	US EPA AEGL 2013	2.00E+02	US EPA IRIS 2014		
Xylenes	2.30E+03	ESRD 2013	1.80E+02	Health Canada 2010		
Polycyclic Aromatic Hydrocarbons						
2-Chloronaphthalene			1.00E+00	RIVM 2001		
2-Methylfluorene						
2-Methylnaphthalene						
3-Methylcholanthrene					2.00E-03	OEHHA 2009
5-Methylchrysene[(1)]					3.23E-01	Health Canada 2010
7,12-Dimethylbenz(a)anthracene					1.41E-04	OEHHA 2009

Chemical	Acute Inhalation		Chronic Inhalation non-Cancer		Chronic Inhalation Cancer	
	Value (µg/m³)	Agency	Value (µg/m³)	Agency	Value (µg/m³)	Agency
Acenaphthene						
Acenaphthylene						
Anthracene						
Benz(a)anthracene(1)					3.23E+00	
Benzo(a)fluorene						
Benzo(a)pyrene			3.00E-04	ESRD 2013	3.23E-01	Health Canada 2010
Benzo(b)fluoranthene(1)					3.23E+00	Health Canada 2010
Benzo(j)fluoranthene(1)					3.23E+00	Health Canada 2010
Benzo(k)fluoranthene(1)					3.23E+00	Health Canada 2010
Benzo(e)pyrene						
Benzo(g,h,i)perylene(1)					3.23E+01	Health Canada 2010
Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)						
Chrysene(1)					3.23E+01	Health Canada 2010
Dibenz(a,h)anthracene(1)					3.23E-01	Health Canada 2010
Fluoranthene					3.23E+02	Health Canada 2010
Fluorene						
Indeno(1,2,3-cd)pyrene(1)					3.23E+00	Health Canada 2010
Naphthalene	2.00E+03	ACGIH 2014	3.00E+00	US EPA IRIS 2014	2.94E-01	OEHHA 2009
Perylene (Perilene)						
Phenanthrene(1)					3.23E+02	Health Canada 2010
Pyrene						

Notes:
(1) Calculated based on Potency Equivalency Factor for carcinogenic PAHs as defined in Health Canada 2010

3.3 Toxic Potency Results

The results of the toxic potency screening are presented below for acute and chronic inhalation of chemicals associated with selected electrical generation facilities. The chronic inhalation results are separated into the assessment of non-carcinogenic and carcinogenic chemicals. Mixture toxicity was not included with the toxic potency screening as this was beyond the scope of the assessment. All detailed toxic potency screening results for each facility, averaging period (i.e., acute verses chronic) and toxic mode of action (i.e., carcinogens and non-carcinogens) are presented in Appendix A. The inhalation toxic potency screening was completed with criteria air contaminants (e.g., CO, NO_2, PM, SO_2) included and are presented in below and in Appendix A1. In addition, Appendix A2 presents the inhalation toxic potency screening without criteria air contaminants included. The inhalation toxic potency screening was presented in Appendix A2 without the criteria air contaminants because these chemicals are typically automatically screened on and usually dominate the potency. The results of the acute and chronic inhalation toxic potency presented below includes the criteria air contaminants because removing these chemicals introduces bias in the assessment and including these chemicals shows how much criteria air contaminants contribute to relative toxicity. Finally, the number of chemicals listed in the results for the inhalation toxic potency screening for each facility are inconsistent due the number of chemicals listed on the emission inventory. Typically, the number of chemicals that are required for reporting to the NPRI are less comprehensive that those reported in based on the air quality assessments.

3.3.1 Acute Inhalation

Table 4 presents the toxic potency screening for acute inhalation and presents the chemicals that contribute more than 0.1% for each facility. On an acute inhalation basis, criteria air contaminants, such as NO_2, $PM_{2.5}$ and SO_2, a few inorganics (arsenic, cadmium, hydrogen fluoride, hydrogen chloride, and nickel) and two organics (acrolein and formaldehyde) are ranked in the top 5 chemicals to contribute more than 5% of toxic potential. The most frequently reported chemicals in the top 3 are NO_2, $PM_{2.5}$ and SO_2.

It is important to remember that ranked toxicity-weighted emission inventories are only relative estimates of possible risk levels from each chemical in air and the rankings cannot be interpreted as quantitative risk estimates (Kadlec 2008). The reason for this is that the emission inventory data, although indirectly related to exposure, are not exposure estimates (i.e., predicted ground level air concentrations).

Table 4 Chemicals that Contribute More Than 0.1% to Acute Toxic Potency

Rank	*EPCOR Genesee*	*HR Milner*	*TransAlta Centennial*	*TransAlta Sundance*	*Alberta Power Sheerness*	*Alberta Power Battle River*	*Fording Coal BPP*	*ENMAX Shepard*
1	NO_2 (37.59%)	Hydrogen Fluoride (29.65%)	NO_2 (45.92%)	Hydrogen Fluoride (84.11%)	SO_2 (54.97%)	SO_2 (43.83%)	NO_2 (35.53%)	NO_2 (60.42%)
2	SO_2 (26.73%)	NO_2 (20.46%)	SO_2 (31.59%)	NO_2 (7.51%)	NO_2 (26.43%)	NO_2 (29.2%)	SO_2 (33.03%)	Formaldehyde (9.86%)
3	Hydrogen Fluoride (25.04%)	SO_2 (16.91%)	$PM_{2.5}$ (10.79%)	SO_2 (4.9%)	Hydrogen Fluoride (14.21%)	$PM_{2.5}$ (15.41%)	$PM_{2.5}$ (16.53%)	Cadmium (6.25%)
4	PM2.5 (7.31%)	Hydrogen Chloride (15.53%)	Hydrogen Fluoride (9.28%)	$PM_{2.5}$ (2.13%)	$PM_{2.5}$ (2.61%)	Hydrogen Fluoride (9.43%)	Arsenic (5.88%)	Acrolein (5.82%)
5	Chromium (III) (0.95%)	$PM_{2.5}$ (10.61%)	Hydrogen Chloride (0.9%)	Hydrogen Chloride (0.69%)	Sulphuric acid (0.88%)	Hydrogen Chloride (1.3%)	Chromium (III) (2.3%)	NH_3 (3.98%)
6	Arsenic (0.93%)	Arsenic (3.98%)	Cadmium (0.48%)	Sulphuric acid (0.27%)	Hydrogen Chloride (0.79%)	Sulphuric acid (0.76%)	Vanadium (1.83%)	Arsenic (2.86%)
7	Cadmium (0.38%)	Cadmium (1.66%)	Manganese (0.39%)	Arsenic (0.11%)			Manganese (1.27%)	CO (2.26%)
8	Manganese (0.31%)	Lead (0.27%)	Arsenic (0.39%)				Lead (0.72%)	Benzene (2.08%)
9	Hydrogen Chloride (0.18%)	Chromium (III) (0.25%)					Cadmium (0.71%)	Manganese (1.75%)
10	Nickel (0.15%)	Manganese (0.24%)					Chlorine (0.55%)	SO_2 (1.25%)
11	Acrolein (0.15%)	Acrolein (0.16%)					Phosphorus (0.45%)	Acetaldehyde (1.04%)
12							Mercury (0.43%)	Chromium (III) (0.97%)
13							Nickel (0.23%)	Nickel (0.69%)
14							Acrolein (0.22%)	Lead (0.33%)
15							Bromine (0.16%)	Vanadium (0.13%)
16							CO (0.1%)	

3.3.2 Chronic Inhalation (Non-Carcinogens)

Table 5 presents the toxic potency screening for chronic inhalation of non-carcinogens and presents the chemicals that contribute more than 0.1% for each facility. On a chronic inhalation basis, criteria air contaminants, such as NO_2, $PM_{2.5}$ and SO_2, several inorganics (ammonia, arsenic, barium, hydrogen chloride, hydrogen fluoride, and nickel) and one organic (formaldehyde) are ranked in the top five chemicals to contribute more than 5% of toxic potential. The most frequently reported chemicals in the top three are NO_2, $PM_{2.5}$ and SO_2.

Table 5 Chemicals that Contribute More Than 0.1% to Chronic Toxic Potency

Rank	*EPCOR Genesee*	*HR Milner*	*TransAlta Centennial*	*TransAlta Sundance*	*Alberta Power Sheerness*	*Alberta Power Battle River*	*Fording Coal BPP*	*ENMAX Shepard*
1	SO_2 (71.87%)	SO_2 (55.56%)	SO_2 (76.34%)	SO_2 (60.71%)	SO_2 (91.96%)	SO_2 (86.27%)	SO_2 (56.1%)	$PM_{2.5}$ (42.2%)
2	NO_2 (13.48%)	Hydrogen Chloride (18.9%)	NO_2 (14.79%)	Hydrogen Fluoride (16.2%)	NO_2 (5.9%)	NO_2 (7.66%)	Barium (9.45%)	NO_2 (15.46%)
3	$PM_{2.5}$ (2.68%)	NO_2 (8.96%)	$PM_{2.5}$ (3.56%)	NO_2 (12.39%)	Sulphuric acid (0.65%)	$PM_{2.5}$ (4.14%)	NO_2 (8.05%)	Nickel (7.01%)
4	Aluminum (2.67%)	Arsenic (5.81%)	Aluminum (1.43%)	$PM_{2.5}$ (3.6%)	$PM_{2.5}$ (0.59%)	Hydrogen Chloride (0.95%)	Arsenic (4.44%)	NH_3 (6.8%)
5	Nickel (2.2%)	$PM_{2.5}$ (4.75%)	Hydrogen Chloride (0.81%)	Hydrogen Chloride (3.15%)	Hydrogen Chloride (0.49%)	Sulphuric acid (0.67%)	Chlorine (4.16%)	Formaldehyde (6.07%)
6	Uranium (1.43%)	Hydrogen Fluoride (1.52%)	Barium (0.63%)	Sulphuric acid (1.46%)	Hydrogen Fluoride (0.37%)	Hydrogen Fluoride (0.29%)	$PM_{2.5}$ (3.83%)	Cadmium (3.2%)
7	Barium (1.11%)	Cadmium (1.45%)	Manganese (0.42%)	Arsenic (0.6%)			Titanium (3.38%)	Acrolein (3.1%)
8	Arsenic (1.11%)	Nickel (0.79%)	Arsenic (0.42%)	Nickel (0.57%)			Aluminum (2.15%)	Benzo(a)pyrene (2.7%)
9	Hydrogen Fluoride (1.05%)	Beryllium (0.42%)	Hydrogen Fluoride (0.35%)	Vanadium (0.29%)			Nickel (2.1%)	Arsenic (2.44%)
10	Chromium (III) (0.81%)	Lead (0.4%)	Cadmium (0.31%)	Chromium (III) (0.24%)			Beryllium (1.38%)	SO_2 (2.4%)
11	Manganese (0.37%)	Manganese (0.35%)	Beryllium (0.3%)	Cadmium (0.24%)			Chromium (III) (1.24%)	Beryllium (2.33%)
12	Cadmium (0.27%)	Chromium (III) (0.26%)	Nickel (0.25%)	Manganese (0.19%)			Vanadium (1.11%)	Silver (1.76%)
13	Hydrogen Chloride (0.18%)	Acrolein (0.15%)		Chromium (VI) (0.15%)			Manganese (0.96%)	Manganese (1.49%)
14	Beryllium (0.15%)	Cobalt (0.14%)		Lead (0.1%)			Lead (0.54%)	Aluminum (0.9%)
15	Mercury (0.11%)	NH_3 (0.14%)					Mercury (0.32%)	Chromium (III) (0.59%)
16	Acrolein (0.11%)	Chromium (VI) (0.11%)					Cadmium (0.32%)	Lead (0.28%)
17	Benzyl Chloride (α-chlorotoluene) (0.11%)	Benzyl Chloride (α-chlorotoluene) (0.1%)					Cobalt (0.19%)	Barium (0.25%)
18	Lead (0.11%)						Acrolein (0.11%)	Titanium (0.25%)

19							Benzyl Chloride (α-chlorotoluene) (0.1%)	Copper (0.19%)
20								Benzene (0.18%)

3.3.3 Chronic Inhalation (Carcinogens)

Table 6 presents the toxic potency screening for chronic inhalation of carcinogens and presents the chemicals that contribute more than 0.1% for each facility. On a chronic inhalation basis, inorganics, such as arsenic, cadmium, chromium VI, cobalt, and nickel, and nickel) and three organics (benzene, formaldehyde and hexachlorobenzene) are ranked in the top five chemicals to contribute more than 5% of toxic potential. The most frequently reported chemicals in the top three are arsenic, cobalt and nickel.

Table 6 Chemicals that Contribute More Than 0.1% to Carcinogenic Toxic Potency

Rank	*EPCOR Genesee*	*HR Milner*	*TransAlta Centennial*	*TransAlta Sundance*	*Alberta Power Sheerness*	*Alberta Power Battle River*	*Fording Coal BPP*	*ENMAX Shepard*
1	Nickel (51.07%)	Chromium (VI) (57.75%)	Cobalt (48.52%)	Chromium (VI) (91.43%)	Benzene (82.22%)	Hexachlorobenzene (Perchlorobenzene) (100%)	Arsenic (43.68%)	Nickel (39.35%)
2	Arsenic (24.79%)	Arsenic (24.34%)	Arsenic (20.3%)	Arsenic (2.97%)	Hexachlorobenzene (Perchlorobenzene) (17.78%)		Cobalt (27.48%)	Formaldehyde (24.86%)
3	Cobalt (15.9%)	Cobalt (8.56%)	Nickel (12.38%)	Nickel (2.97%)			Nickel (21.45%)	Cadmium (13.83%)
4	Cadmium (4.81%)	Cadmium (4.86%)	Cadmium (11.88%)	Cobalt (1.67%)			Beryllium (3.81%)	Arsenic (13.17%)
5	Benzyl Chloride (α-chlorotoluene) (1.86%)	Nickel (3.46%)	Beryllium (4.08%)				Cadmium (2.54%)	Beryllium (3.53%)
6	Beryllium (0.92%)	Beryllium (0.5%)	Benzyl Chloride (α-chlorotoluene) (2.14%)				Benzyl Chloride (α-chlorotoluene) (0.78%)	Cobalt (1.72%)
7	Benzene (0.24%)	Benzyl Chloride (α-chlorotoluene) (0.33%)	Benzene (0.27%)				Lead (0.15%)	Benzene (1.54%)
8								Propylene Oxide (0.79%)
9								Ethylbenzene (0.41%)
10								Acetaldehyde (0.4%)
11								Naphthalene (0.31%)

3.3.4 Sensitivity Analysis

No sensitivity analysis was performed with the toxic potency screening. A sensitivity analysis would include the determination of results based on the selection of alternative TRVs. The ranking and toxic potential could be dramatically altered with the selection of alternative TRVs (e.g., such as a lower or higher value).

4.0 RADIONUCLIDES

Radionuclides were identified as part of the EPCOR (2001) and TransAlta (2001) emission inventory, but were excluded from the toxic potency screening due to the unique methods that are required to assess health risks from radioactivity releases to the environment. Therefore, atmospheric dispersion and unconditional derived release limits were used to assess the radionuclides identified in the emission inventories.

Radioactivity releases to the atmosphere are dispersed and diluted in air by prevailing winds. Health Canada (2009) presents methods that predict the long-term annual average ground level radionuclide concentration in air at various distances downwind from a release point. The predicted air concentration is also based on the release height of the radionuclide. Table 7 presents the emission rates and predicted maximum ground level long-term radionuclide concentrations based on the EPCOR (2001) and TransAlta (2001a) emission rates (Appendix A). The predicted radionuclide air concentrations are based on long-term average dilution factors for typical Canadian weather and a uniform wind rose. In addition, the predicted concentrations are based on the minimum dilution factor for a stack height of 60 m. This is fairly conservative because the EPCOR (2001) and TransAlta (2001a) stack heights are 121 m and 139 m, respectively. The predicted maximum long-term air concentrations in Table 7 are 3 to 5 orders in magnitude lower than the unconditional derived release limits (Health Canada 2000). The Health Canada (2000) derived release limits are recommended radiological guidelines that naturally occurring radioactive materials (NORM) may be released with no radiological restrictions when the associated dose is no more than 0.3 mSv in a year. The associated radiation dose limit is based on the sum of all tissue equivalent doses multiplied by the appropriate tissue weighting factors associated with each respective tissue (Health Canada 2000). The effective dose accumulated over a given period includes:

- the effective dose from external sources, and
- the committed effective dose from intakes of radionuclides in that period.

The radioactive hazard associated with this dose is considered insignificant and no further control on the material is necessary on radiological protection grounds (Health Canada 2000). The unconditional derived release limits take the following pathways into consideration:

- Air inhalation;
- Aquatic; and
- Terrestrial (groundshine, cloudshine, soil ingestion, vegetation ingestion).

Table 7 Predicted Maximum Ground Level Annual Average Radionuclide Concentrations

Radionuclide	*Emission Rate [Bq/s]*		*Min Dilution Factor (Based on Stack Height of 60m)*[1]	*Predicted Maximum Ground Level Annual Average Concentration [Bq/m³]*		*Unconditional Derived Release Limit [Bq/m³]*[2]
	EPCOR	*TAU*		*EPCOR*	*TAU*	
Actinium 228	3.7E+00	1.3E+01	2.0E-07	7.3E-07	2.6E-06	No Limit
Bismuth 214	3.7E+00	2.2E+01	2.0E-07	7.3E-07	4.4E-06	No Limit
Lead 210	7.3E+00	2.9E+01	2.0E-07	1.5E-06	5.8E-06	5.0E-02
Lead 212	2.7E+00	1.6E+01	2.0E-07	5.5E-07	3.2E-06	No Limit
Potassium 40	5.5E+01	1.2E+01	2.0E-07	1.1E-05	2.4E-06	Not Applicable
Radium 223	1.8E-01	1.8E+00	2.0E-07	3.7E-08	3.7E-07	No Limit
Radium 226	9.1E+00	2.3E+01	2.0E-07	1.8E-06	4.6E-06	5.0E-02
Radium 228	--	1.9E+01	--	--	3.8E-06	5.0E-03
Radon 222	3.7E+00	2.0E+01	2.0E-07	7.3E-07	3.9E-06	No Limit
Thorium 227	1.8E-01	6.1E+00	2.0E-07	3.7E-08	1.2E-06	No Limit
Thorium 228	2.7E+00	1.6E+01	2.0E-07	5.5E-07	3.2E-06	3.0E-03
Thorium 230	--	2.3E+01	--	--	4.6E-06	1.0E-02
Thorium 232	1.5E+00	9.8E+00	2.0E-07	2.9E-07	2.0E-06	2.0E-03
Thorium 234	5.5E+00	1.8E+01	2.0E-07	1.1E-06	3.7E-06	No Limit
Uranium 235	3.7E-01	1.2E+00	2.0E-07	7.3E-08	2.4E-07	No Limit
Uranium 238	2.4E+00	2.4E+01	2.0E-07	4.9E-07	4.9E-06	3.0E-03

Notes:
-- Indicates radionuclide not listed as part of the emission inventory.
(1) Health Canada 2009
(2) Health Canada 2000; Unconditional derived release limit based on an effective dose of 0.3 mSv/year.

5.0 PHYSICAL AND CHEMICAL SCREENING

Bio-accumulation and persistence potential was assessed based on physical and chemical criteria established by regulatory authorities such as Environment Canada and British Columbia Environmental Laboratory Quality Assurance Advisory Committee (BCELQAAC). In order to assess chemical bio-accumulation and persistence, it was necessary to identify those chemicals that would be expected to persist or accumulate in the environment in sufficient quantities for people to be exposed through soil, food, and water pathways. The purpose of the physical and chemical screening was to identify the organic chemicals emitted to air through the stacks that are non-volatile and thus have the potential to accumulate in environmental media other than air. Certain inorganic chemicals (i.e., hydrogen chloride, hydrogen fluoride, hydrochloric acid, sulphuric acid, ammonia, etc.) were excluded from the physical and chemical screening as the toxicity of these compounds are related to direct inhalation and included as part of the toxic potency screening (Section 3.0). In addition, inorganic chemicals, such as metals, were excluded from the physical and chemical screening, because these chemicals are assumed to be bio-accumulative and persistent. This is because inorganic chemicals are not degraded due the chemical (e.g., degradation due to oxidation), physical (i.e., photo-degradation) or biological (e.g., bacteria-degradation) processes like organic chemicals, but simply remain in their parent form or change chemical form (e.g., mercury converted to methyl mercury in sediment) Detailed results regarding the physical and chemical screening are presented in Appendix C.

5.1 Methods

Different criteria adopted by different regulatory agencies and committees were taken into consideration in classifying each organic chemical as volatile or as non-volatile. The approaches were based on those developed based on the United States Environmental Protection Agency (US EPA), California Environmental Protection Agency (Cal/EPA), and BCELQAAC.

Appendix C presents the results of the physical and chemical screening based on the various approaches developed by the US EPA (1998), Cal/EPA (1994), and BCELQAAC (2008) to identify non-volatile chemicals. The final approach that was used in the assessment for classifying chemicals as non-volatile was that of BCELQAAC (2008), as it is based on the most recent and well-documented of the studies considered in defining volatile or non-volatile substances.

Chemicals were classified as non-volatile in accordance with the following criteria from BCELQAAC (2008):

- Henry's Law constant ≤ 1.0E-05 atm-m³/mol, *and*
- Vapour pressure ≤ 5.0E-02 mm Hg.

Seventeen chemicals were identified as non-volatile and the remaining chemicals were identified as volatile (see Appendix C). Volatile chemicals were assumed to remain in air and not bio-accumulate or persist in other media (e.g., soil, water or sediment). Therefore, inhalation is the only viable pathway of exposure to these chemicals and was assessed via the toxic potency screening (Section 3.0). For non-volatile chemicals, further screening is required for the assessment bio-accumulation and persistence potential. Chemicals with high Log K_{OW}

were assumed to be bio-accumulative and chemicals with long half-lives in soil, water and sediment were assumed to be persistent. Finally, inorganic chemicals, such as metals, were excluded from the physical and chemical screening, because these chemicals are assumed to be bio-accumulative and persistent.

Bioaccumulative chemicals have the potential to accumulate in living organisms and were characterized in accordance with the following criterion from Environment Canada (2007):

- Octanol-water partition coefficient (Log K_{OW}) ≥ 5.

Physical and chemical properties (i.e., molecular weight, Henry's Law constant, vapour pressure, and octanol-water partition coefficient) were obtained from Syracuse Research Corp. (SRC 2013) and, if a property was not available from SRC 2013, the EPI Suite program developed by US EPA (2011) was searched.

Persistence is defined by how long a chemical will remain within an environmental compartment such as soil, water or sediment. The more persistent a chemical is the greater the potential for bio-accumulation. Chemicals that do not degrade or degrade very slowly remain available to potentially exert toxic effects, bio-accumulate and be transported to regions far from where they are emitted. Most frameworks for the designation of persistent organic pollutants use degradation half-life thresholds to define whether or not a chemical is considered persistent (Boethling et al. 2009).

Finally fugacity modelling was used show how a chemical would distribute the environment (i.e., air, soil, water and sediment) if released directly into the air. The information that is provided from the fugacity model helps identify which compartment a chemical prefers and provides an indication of environmental media where bioaccumulation is expected to be greatest. For example, if the chemical is shown to distribute primarily to soil then the chemical could bio-accumulate and persist in other terrestrial media such as plants, invertebrates and wildlife. Alternatively, if the chemical distributes primarily to water then the chemical could bio-accumulate and persist in other aquatic media such as fish. Fugacity model results were based on the "Level III" fugacity model developed by US EPA (2011) that adheres to methods developed by MacKay et al. (1992; 1993).

5.2 Chemicals Identified as Non-volatile

Table 8 presents the chemicals identified in the emission inventory based on physical and chemical screening that are considered non-volatile. Inorganic chemicals, such as metals, were excluded from Table 8, because these chemicals are assumed to be non-volatile. In addition, the volatile chemicals were excluded from Table 8, but are presented in Appendix C.

Table 8 Non-volatile Chemicals Based on Physical and Chemical Screening of the Emission Inventory

Chemical Group	*Chemical*
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)
Organics	2,4-Dinitrotoluene
	2-Chloroacetophenone
	Bis(2-ethylhexyl) phthalate
PAHs	3-Methylcholanthrene
	5-Methylchrysene
	7,12-Dimethylbenz(a)anthracene
	Benzo(a)pyrene
	Benzo(b,j,k)fluoranthene: Benzo(b)fluoranthene Benzo(j)fluoranthene Benzo(k)fluoranthene
	Benzo(e)pyrene
	Benzo(g,h,i)perylene
	Chrysene
	Dibenz(a,h)anthracene
	Fluoranthene
	Indeno(1,2,3-cd)pyrene
	Perylene

5.3 Chemicals Identified as Bio-accumulative

Table 9 presents the chemicals identified in the emission inventory based on physical and chemical screening that are bio-accumulative. Inorganic chemicals, such as metals, were excluded from Table 9, because these chemicals are assumed to be bio-accumulative. In addition, the volatile chemicals were excluded from Table 9, but are presented in Appendix C.

Table 9 Bio-accumulative Chemicals Based on Physical and Chemical Screening of the Emission Inventory

Chemical Group	*Chemical*	*Bio-accumulation Log Kow ≥ 5*
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	**6.8**
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	**6.5**
Organics	2,4-Dinitrotoluene	2.0
	2-Chloroacetophenone	1.9
	Bis(2-ethylhexyl) phthalate	**7.6**
PAHs	3-Methylcholanthrene	**6.4**
	5-Methylchrysene	**6.1**
	7,12-Dimethylbenz(a)anthracene	**5.8**
	Benzo(a)pyrene	**6.1**
	Benzo(b,j,k)fluoranthene: Benzo(b)fluoranthene Benzo(j)fluoranthene Benzo(k)fluoranthene	 **5.8** **6.1** **6.1**
	Benzo(e)pyrene	**6.4**
	Benzo(g,h,i)perylene	**6.6**
	Chrysene	**5.8**
	Dibenz(a,h)anthracene	**5.5**
	Fluoranthene	**6.8**
	Indeno(1,2,3-cd)pyrene	**6.7**
	Perylene	**6.3**

Notes: **Bold** indicates exceedance of criteria

5.4 Chemicals Identified as Persistent

Persistence can be estimated by calculating a hale-life value – the time that is required for half of the chemical to be removed from that compartment. The EPI Suite™ (US EPA 2011) package uses two different programs to estimate half-live values – AOPWIN and BIOWIN. The AOPWIN program estimates degradation in the air compartment using quantitative structural activity relationships, estimated hydroxyl radical and ozone rate constants. With a database containing more than 700 chemicals, if there is a database match, that value will be used. The BIOWIN program estimates the aerobic aqueous biodegradation of organic compounds. The model uses a combination of fragment contribution models and expert assessment to assign chemicals a degradation rate based on a scale ranging from hours to recalcitrant. Once the aqueous half-life values is estimate, a biodegradation ratio of 1:2:9 for water:soil:sediment is applied to estimate the half-life values for the remaining compartments.

Following regulations outlined in the Canadian Environmental Protection Act (Governement of Canada 2000), chemicals are considered persistent in the environment if the half-life is equal to or greater than:

- 2 days in the air compartment;
- 182 days in the soil compartment;
- 182 days in the water compartment; or

- 365 days in the sediment compartment

The half-life values for the non-volatile chemicals in each compartment were estimated using EPI Suite™ (US EPA 2011) and are presented in Table 10.

Table 10 Predicted Half-life of Organic Chemicals

Chemical Group	*Chemical*	*Air ≥2 Days*	*Soil ≥182 Days*	*Water ≥182 Days*	*Sediment ≥365 Days*
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	**14**	**360**	180	**1,621**
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	**42**	**360**	180	**1,621**
Organics	2,4-Dinitrotoluene	**50**	75	38	338
	2-Chloroacetophenone	**63**	75	38	338
	Bis(2-ethylhexyl) phthalate	0.5	30	15	135
PAHs	3-Methylcholanthrene	0.05	**360**	180	**1,621**
	5-Methylchrysene	0.1	120	60	**542**
	7,12-Dimethylbenz(a)anthracene	0.1	**360**	180	**1,621**
	Benzo(a)pyrene	0.2	120	60	**542**
	Benzo(b,j,k)fluoranthene:				
	Benzo(b)fluoranthene	0.1	120	60	**542**
	Benzo(j)fluoranthene	0.2	120	60	**542**
	Benzo(k)fluoranthene	0.2	120	60	**542**
	Benzo(e)pyrene	0.2	120	60	**542**
	Benzo(g,h,i)perylene	0.1	120	60	**542**
	Chrysene	0.1	120	60	**542**
	Dibenz(a,h)anthracene	0.2	120	60	**542**
	Fluoranthene	1	120	60	**542**
	Indeno(1,2,3-cd)pyrene	0.2	120	60	**542**
	Perylene	0.2	120	60	**542**

Notes: **Bold** indicates exceedance of criteria

Using the persistence criteria outlined in the CEPA, the following chemicals were identified as persistent:

- 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)
- 2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)
- 2,4-Dinitrotoluene
- 2-Chloroacetophenone
- 3-Methylcholanthrene
- 5-Methylchrysene
- 7,12-Dimethylbenz(a)anthracene
- Benzo(a)pyrene
- Benzo(b,j,k)fluoranthene:
- Benzo(e)pyrene
- Benzo(g,h,i)perylene

- Chrysene
- Dibenz(a,h)anthracene
- Fluoranthene
- Indeno(1,2,3-cd)pyrene
- Perylene

The only chemical that was not identified as persistent is Bis(2-ethylhexyl) phthalate. CEPA persistence guidelines are in accordance, or slightly higher, than other regulatory bodies. Cut-offs for persistence in the water compartment range from 60 days to 182 days, 60 to 365 days in sediment, and 60 to 182 days in the soil compartment (Boethling et al. 2009). The persistence criteria for air are consistent between CEPA and peer-reviewed literature (Scheringer et al. 2009). A detailed investigation into the definition of persistence was undertaken by Scheringer et al. (2006) for the European Commission on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Scheringer et al. (2006) make use of EPI Suite and other computer modeling programs to derive the following criteria for persistence based on half-life values:

- 60 days in marine or estuarine water
- 40 days in freshwater
- 180 days in marine or estuarine sediment
- 120 days in freshwater sediment
- 120-180 days in soil
- 2 days in air

Given that all the COPC (except one) were identified as persistent under the higher CEPA criteria, they would also be identified as persistent following other jurisdictional guidelines. The one chemical that was not identified as persistent in Table 10 does not trigger any endpoints from other jurisdictions, except the REACH guideline for freshwater sediment.

5.5 Fugacity Modelling

Fugacity modeling was completed to determine the potential relative apportionment of the chemicals in environmental media (i.e., air, soil, water and sediment) based on emissions to air. Fugacity models are restricted to organic compounds and cannot be used with inorganic compounds or highly polar organic compounds. If a chemical was found to partition in soil, water, or sediment more than 5%, there may be a “realistic presence” of the chemical in environmental media other than air (Boethling et al. 2009; Environment Canada 2003). The premise of this model is that if a chemical emitted to the air does not meet any of these criteria, the potential for the chemical to deposit in the environment and persist or accumulate in the environment is negligible and thus limited to air.

The output from the fugacity model is the mass amount distribution of the chemical in each compartment (air, water, soil and sediment). Each of those values is accompanied by a half-life value – the time that is required for half of the chemical to be removed from that compartment. The fugacity model cannot be run without a half-life value. In most cases this is not known, but will be automatically calculated using the EPI Suite™ (US EPA 2011) package as described above (Section 5.4). Table 11 presents the relative apportionment of organic chemicals in the environment when released to air based on Level III Fugacity Modelling and is based on when

the model reaches steady state. In the Level III model, a chemical is continuously discharged at a constant rate and achieves a steady state condition when input and output rates are equal. Finally, the relative apportionment does not provide an indication of chemical concentrations (e.g., mg/kg or mg/L) in environmental media; therefore, these relative values cannot be compared to levels of concern or guidelines. Actual concentration levels for chemicals in the environment based on measured and predicted concentrations are provided in the EIA that were submitted for each of the historical regulatory applications that are described in Section 6.0.

Table 11 Relative Apportionment of Non-volatile Organic Chemicals in the Environment when Released into Air [%]

Chemical Group	*Chemical*	*Air*	*Soil*	*Water*	*Sediment*
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	0.4	92	0.4	8
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	0.8	91	0.6	8
Organics	2,4-Dinitrotoluene	0.9	96	4	0.1
	2-Chloroacetophenone	35	52	14	0.1
	Bis(2-ethylhexyl) phthalate	9	83	4	4
PAHs	3-Methylcholanthrene	0.4	86	0.3	14
	5-Methylchrysene	5	70	1	24
	7,12-Dimethylbenz(a)anthracene	1	80	0.5	18
	Benzo(a)pyrene	0.8	82	0.7	16
	Benzo(b,j,k)fluoranthene:				
	Benzo(b)fluoranthene	1	80	0.7	18
	Benzo(j)fluoranthene	1	81	0.7	18
	Benzo(k)fluoranthene	1	82	0.7	16
	Benzo(e)pyrene	1	81	0.7	17
	Benzo(g,h,i)perylene	0.7	80	0.5	19
	Chrysene	0.8	87	1	11
	Dibenz(a,h)anthracene	0.7	80	0.5	19
	Fluoranthene	14	65	4	18
	Indeno(1,2,3-cd)pyrene	0.7	80	0.5	19
	Perylene	0.7	82	0.7	16

5.6 Summary Physical and Chemical Screening

Table 12 presents a summary of the potential chemicals that are non-volatile, bio-accumulative and persistent. Note that metals were not included as part of the physical and chemical screening, but were automatically included in Table 12. Finally, the relative apportionment of organic chemicals in the environment is primarily predicted to be soil based on the results of the fugacity modelling (Section 5.5). In most instances, soil is predicted to receive more than 80% of the chemical emitted.

Table 12 List of Chemicals Identified as Non-volatile, Bio-accumulative and Persistent

Group	*Chemical*
Metals	Aluminum
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Bromine
	Cadmium
	Chlorine
	Chromium (III)
	Chromium (VI)
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Mercury
	Molybdenum
	Nickel
	Phosphorus
	Potassium
	Rubidium
	Selenium
	Silicon
	Silver
	Sodium
	Strontium
	Thallium
	Thorium
	Titanium
	Uranium
	Vanadium
	Zinc
	Zirconium
Dioxin and Furan	2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)
Organics	2,4-Dinitrotoluene
	2-Chloroacetophenone
	Bis(2-ethylhexyl) phthalate

Group	Chemical
PAHs	3-Methylcholanthrene
	5-Methylchrysene
	7,12-Dimethylbenz(a)anthracene
	Benzo(a)pyrene
	Benzo(b,j,k)fluoranthene:
	Benzo(b)fluoranthene
	Benzo(j)fluoranthene
	Benzo(k)fluoranthene
	Benzo(e)pyrene
	Benzo(g,h,i)perylene
	Chrysene
	Dibenz(a,h)anthracene
	Fluoranthene
	Indeno(1,2,3-cd)pyrene
	Perylene

6.0 SUMMARY OF HISTORICAL REGULATORY APPLICATIONS

Five of the power generation facilities mentioned in Table 1, had completed comprehensive environmental impacts assessments (EIAs), which included a human health risk assessment (HHRA). A summary of the HHRA findings for the following five EIAs are summarized below:

1. EPCOR Genesee coal-fired thermal power plant (EPCOR 2001);
2. TransAlta Centennial Project (TransAlta 2001b);
3. Fording Brooks Power Project (Fording 2002);
4. ENMAX Shepard Energy Centre (ENMAX 2009); and
5. Maxim Power Corp. Milner Expansion Project (Maxim 2010).

Please note that this section provides a high level summary of the human health risk assessment findings and does not provide measured or predicted concentrations that were used as part of the assessments. These values can be obtained by accessing the individual EIA through the ESRD or AUC.

Each HHRA reviewed the predicted facility emissions for acute and chronic inhalation, as well as for chronic multiple pathway exposure. Potential exposure pathways are illustrated in Figure 1, and include, but are not limited to, air inhalation, agricultural country food ingestion, home garden produce ingestion, game meat ingestion and incidental soil ingestion. Each HHRA identified potential exposure pathways that were specific to each project. These can be found in the project-specific HHRA documents.

Different development cases are considered for each HHRA, however they all have the following three cases in common:

1. Background/baseline/existing case – This case includes all existing sources of emissions in the region as well as ambient exposures to measured concentrations of chemicals in soil, food and water.

2. Project only case – This case evaluates the impacts of emissions as a result of the project only without any other sources.
3. Application case – This case evaluates the background emissions, including ambient measurements, plus the project specific emissions.

The specific terminology and definitions will vary between reports based on who prepared the report and the year of the assessment. A fourth scenario for future case is sometimes included to evaluate incremental impacts based on planned future developments.

The information contained in these assessments is deemed to be critical to the objective because it provides a comprehensive evaluation of chemical emissions, fate and transport, chemical concentrations in environmental media and potential impacts on human health via inhalation and multiple pathways. The information presented below is a summary of the findings for each of the EIAs reviewed and does not draw any conclusions or make inferences.

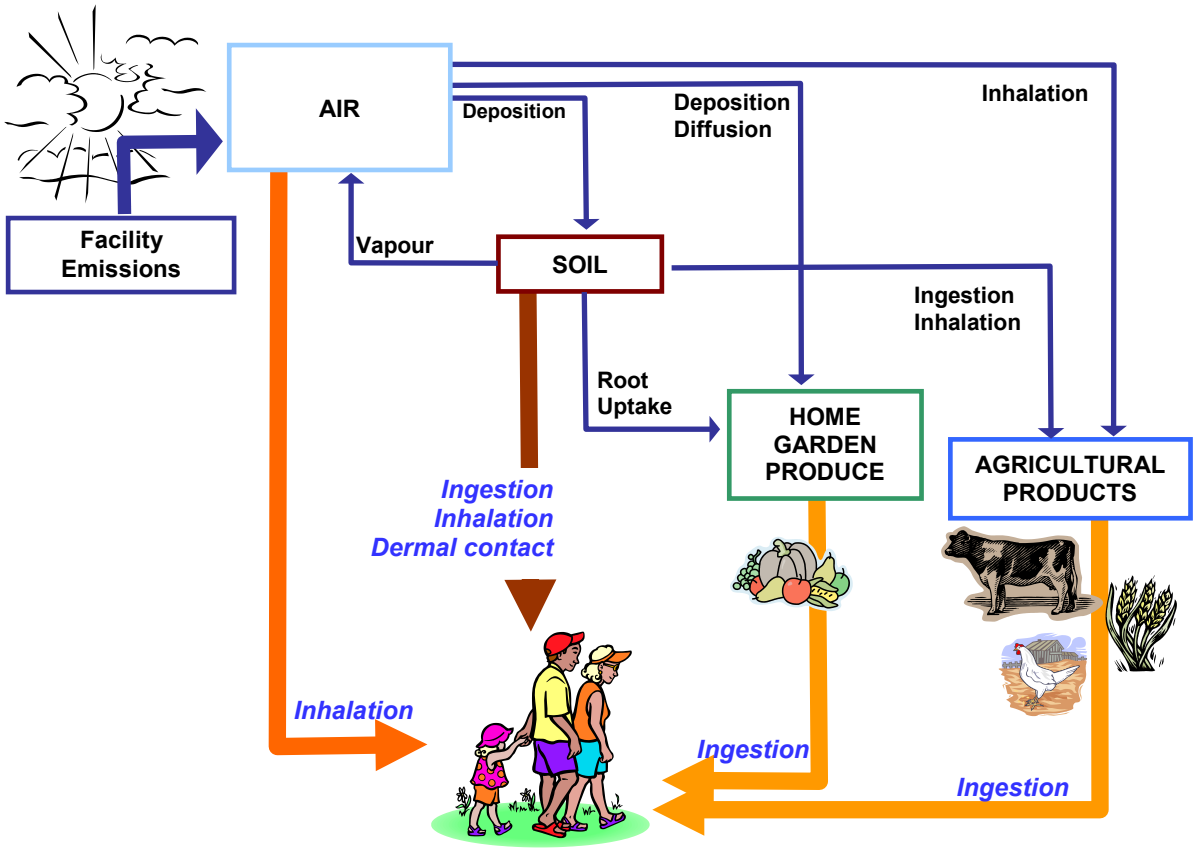

Figure 1 Potential routes of exposure included in a multiple pathway assessment

Each facility HHRA had different human receptor groups that represented the local populations with the greatest potential risk to the proposed facility. Receptor groups were selected to

represent a reasonable “worst-case” in terms of potential exposure to facility air emissions. Receptor groups included, but were not limited to, fulltime residents, farming residents, seasonal/recreational residents, and First Nations.

Tables 11 and 12 present a summary of the facilities and the findings of the priority pollutants for the inhalation pathway and multiple pathway risk assessment, respectively. Table 13 provides a comparison of the chemical groups assessed for each project in the multiple pathway assessment.

The HHRA results for each EIA present hazard quotient values based on exposure divided by the TRV, but are expressed in different terms such as concentration ratio (CR) values, exposure ratio (ER) values or risk quotient (RQ) values. In all instances, when the hazard quotient value is predicted to be greater than 1.0 then risks are predicted and further evaluation is required to determine the likelihood and magnitude of risks. Alternatively, when the hazard quotient value is less than 1.0 then risks are predicted to be acceptable and adverse health effects are not expected.

6.1 EPCOR Genesee

The Genesee coal-fired thermal power plant is operated by EPCOR Power Development Corporation (EPCOR) and generates 762 MW (net) of power. The facility is located 40 km west-southwest of Edmonton. EPCOR proposed a 450 MW expansion, co-owned by TransAlta, called the Genesee 3 which was completed in 2005. The expansion was considered the single largest addition to the Alberta grid.

6.1.1 Acute Inhalation Exposure

Acute inhalation exposure was calculated for both 1-hour and 24-hour peak exposure concentrations. Only one chemical, sulphur dioxide, had predicted concentration ratio (CR) values above 1.0. This exposure exceedance occurred for the 1-hour scenario, with concentrations reaching a maximum of 582 µg/m³, which resulted in a CR of 1.29. However, the maximum concentration was predicted to occur for one hour every five years and much lower concentrations would be expected for the majority of the time.

Further analyses of sulphur dioxide emissions were conducted at sensitive receptor locations. Using the maximum sulphur dioxide concentrations at those locations, it was determined that all 1-hour and 24-hour peak air concentrations yield a CR below 1.0. Based on that data, it was concluded that adverse health effects due to sulphur dioxide are unlikely to occur from this facility.

6.1.2 Chronic Inhalation Exposure

Chronic inhalation exposure was calculated based on the annual maximum air concentration for each of the four development scenarios. All chronic CR values were below the critical value of 1.0, indicating that chronic exposure to the air emissions from this facility would not pose potential health effects.

6.1.3 Multiple Pathway Exposure

The multiple pathway exposure assessment found exceedances for the following chemicals: arsenic (both cancer and non-cancer), barium, manganese, methyl mercury, and selenium. However, it is important to note that the high exposure ratios were driven by background exposure concentrations. When the emissions generated solely from the project are considered separately, they are not expected to increase chemical exposure above the levels already present in the background. Therefore no adverse health effects relating to existing and future facility emissions were predicted for the most sensitive receptor group.

6.2 TransAlta Centennial Project

The Keephills coal-fired thermal power plant is operated by TransAlta and generates 806 MW of power. The facility is located 70 km west of Edmonton. TransAlta proposed an expansion, called the Centennial Project, consisting of two new 450 MW generating units. The expansion was completed in 2011.

6.2.1 Acute Inhalation Exposure

Acute inhalation exposure was calculated for both 1-hour and 24-hour peak exposure concentrations. As seen with the Genesee facility, only sulphur dioxide had a CR above 1.0. For the Centennial Project, sulphur dioxide exposure exceedances occurred for both the 1-hour and 24-hour scenarios. The CR values of 1.53 and 2.0 for 1-hour and 24-hour, respectively, were predicted to occur for a future cumulative baseline scenario (a fourth development case). When the facility emissions were considered alone, no sulphur dioxide air concentrations exhibited exceedances for either averaging time.

6.2.2 Chronic Inhalation Exposure

Chronic inhalation exposure was calculated based on the annual maximum air concentration for each of the four development scenarios. All chronic CR values were below the critical value of 1.0, indicating that chronic exposure to the air emissions from this facility would not pose potential health effects.

6.2.3 Multiple Pathway Exposure

The multiple pathway exposure assessment found exceedances for the following chemicals: arsenic (both cancer and non-cancer), barium, and methyl mercury. Exposures were greatest for the Farming and First Nations receptors due to the relatively high country food consumption rates compared to other receptor groups. However, it is important to note that the high exposure ratios were driven by background exposure concentrations. When the emissions generated solely from the project are considered separately, they are not expected to increase chemical exposure above the levels already present in the background. Therefore no adverse health effects relating to existing and future facility emissions were predicted for any of the evaluated receptor groups.

6.3 Fording Brooks Power Project

The Fording Brooks Power Project is a project by Fording Coal Limited to build an expanded surface coal mine and construct a two-unit 1000 MW power generation station. The project is located 20 km southwest of the Town of Brooks, Alberta. This application was withdrawn in 2004 at the request of Luscar Energy Partnership following the acquisition of Fording Coal Limited's thermal coal assets (Luscar Ltd. 2005).

6.3.1 Acute Inhalation Exposure

Acute inhalation exposure was calculated for both 1-hour and 24-hour peak exposure concentrations. For the project only case, two chemicals had a CR greater than 1.0 for the 1-hour scenario: sulphur dioxide (1.2) and nitrogen dioxide (1.6). The CR values were calculated using the maximum predicted concentration, which was at a location near the facility where there were no people currently living. The 99.9th percentile concentrations of sulphur dioxide and nitrogen dioxide were all below health-based guidelines at all receptor locations.

Particulate matter showed CR exceedances for this facility, mainly due to fugitive dust from the surface mine. PM CR exceedances due to stack emissions did also occur. The CR values were calculated based on the maximum PM concentrations, which were from locations where no residence currently exists.

6.3.2 Chronic Inhalation Exposure

Chronic inhalation exposure was calculated based on the annual maximum air concentration for each of the three development scenarios. All chronic CR values were below the critical value of 1.0, indicating that chronic exposure to the air emissions from this facility would not pose potential health effects.

6.3.3 Multiple Pathway Exposure

The multiple pathway exposure assessment found exceedances for arsenic (carcinogenic) and methyl mercury. However, it is important to note that the high exposure ratios were driven by background exposure concentrations. When the emissions generated solely from the project are considered separately, they are not expected to increase chemical exposure above the levels already present in the background. Therefore no adverse health effects relating to existing and future facility emissions were predicted for any of the evaluated receptor groups.

6.4 ENMAX Shepard Energy Centre

The ENMAX Shepard Energy Centre is a natural gas-fired power plant located within the City of Calgary with an average capacity of 800 MW. The project is slated for completion in 2015.

6.4.1 Acute Inhalation Exposure

Acute inhalation exposure was calculated for both 1-hour and 24-hour peak exposure concentrations. No predicted acute inhalation CR values exceeded 1.0 for any of the chemicals

for any of the receptor groups or cases. The results indicate low baseline air inhalation risks in the study area, and extremely low acute inhalation risks from the proposed facility.

6.4.2 Chronic Inhalation Exposure

Chronic inhalation exposure was calculated based on the annual maximum air concentration for each of the four development scenarios. All chronic CR values were below the critical value of 1.0, indicating that chronic exposure to the air emissions from this facility would not pose potential health effects.

6.4.3 Multiple Pathway Exposure

The multiple pathway exposure assessment found no chemicals with exposure ratio (ER) values above 1.0 for this facility. The baseline ER values were attributed to background soil concentrations and the conservative assumptions made in the assessment. Therefore no adverse health effects relating to existing and future facility emissions were predicted for any of the evaluated receptor groups.

6.5 Maxim Power Corp. Milner Expansion Project

The Maxim Power Corp. Milner Expansion Project is located near Grande Cache, Alberta, approximately 400 km northwest of Edmonton. The site contains an existing 150 MW coal-fired power plant and the Milner Expansion Project is to develop a single unit 500 MW facility. As a result of Government of Canada regulations on greenhouse gas emissions enacted on September 12, 2012, Maxim has submitted an application to amend the existing licenses and permits in order to construct a 520 MW natural gas-fired power plant (Maxim 2013).

6.5.1 Acute Inhalation Exposure

Acute inhalation exposure was calculated for both 1-hour and 24-hour peak exposure concentrations. Only one chemical, hydrogen fluoride, had a CR above 1.0. This exposure exceedance occurred for the 1-hour scenario at two different receptor locations. One location saw an exceedance for the Application Case only, with CR=1.3. The second location saw exceedances for three Cases: Application (CR=1.49), Future (CR=1.1), and Project (CR=1.1). However, it was determined that the exposure limit (4.9 µg/m³) used by Alberta Environment was not appropriate for human health assessment as it was based on effects to vegetation. Hydrogen fluoride exposure limits updated in 2009 by other sources, provided a health-based exposure limit of 18-20 µg/m³. The re-calculation of CR values resulted in no expected health effects from this facility.

6.5.2 Chronic Inhalation Exposure

Chronic inhalation exposure was calculated based on the annual maximum air concentration for each of the four development scenarios. Only one chemical, acrolein, had a CR value above 1.0. This exceedance occurred for one location in the Future Case scenario, giving a CR of 1.2. However, it was noted that the exposure limit set for acrolein by the US EPA was based on a study of rats, in which only 1 in 12 rats exhibited nasal irritation. A 1,000-fold safety factor was

applied to derive a human equivalent exposure limit. It was concluded that prolonged exposure to projected ambient concentrations of acrolein would be unlikely to cause any appreciable health risks at the receptor location.

6.5.3 Multiple Pathway Exposure

The multiple pathway exposure assessment found no chemicals with ER values above 1.0 for this facility. However, the Baseline, Application, and Future Case scenarios did have predicted risks above one, which were found to be entirely driven by existing baseline conditions. Chemicals that exceeded 1.0 were: antimony, arsenic (non-cancer and cancer), cadmium, chromium, cobalt, lead, manganese, and methyl mercury.

6.6 Summary of Regulatory Applications

Table 11 and Table 12 present a summary of the chemicals at risk identified based on the review of historical regulatory applications. Table 11 focuses on the chemicals at risk via the inhalation pathway and Table 12 presents the chemicals at risk via multiple pathways (i.e., air, soil, water and food). Table 13 presents a summary of the persistent chemicals assessed via the multiple pathway assessments for selected projects. The regulatory review was based on the following applications:

- EPCOR Genesee
- TransAlta Centennial
- Fording Brooks Power Project
- ENMAX Shepard Energy Centre
- Maxim Power Corp. Milner Expansion Project

Combined these projects represent five applications that were submitted to the Alberta regulator and four of the five projects were approved, one (Fording Brooks) application was withdrawn. The assessments were comprehensive and the findings should be considered as part of the identification of chemicals in air and are critical to the identification of bio-accumulative and persistent chemicals. A high degree of confidence should be placed in these results because the risks were based on measured and predicted concentrations in air, soil and food.

On an acute inhalation basis, hydrogen fluoride, sulphur dioxide and $PM_{2.5}$ are three chemicals identified in the review of regulatory applications. These three chemicals are predicted to exceed TRVs based on predicted air concentrations on an acute basis. Chronic inhalation risks were predicted for acrolein and no cancer risks were predicted in the regulatory review. No determination was made regarding whether the inhalation risks are primarily due to background emission sources or the projects on their own.

In terms of multiple pathway risks the following chemicals were identified at risk:

- Antimony
- Arsenic
- Barium
- Cadmium
- Chromium

- Cobalt
- Lead
- Manganese
- Methyl mercury
- Selenium

In all instances the conclusions of the multiple pathway assessments for the selected projects predicted risks primarily due to background or baseline sources and that the project impacts via multiple pathway exposures were predicted to be negligible.

Table 13 Summary of Facilities with HHRAs Presenting the Findings of Priority Pollutants for the Inhalation Pathway Assessment

Facility	*Priority Pollutants Identified in the HHRA*		
	Acute Inhalation	*Chronic Inhalation*	
		Non-Cancer	*Cancer*
EPCOR Genesee coal-fired thermal power plant	CR(1) of 1.29 predicted for sulphur dioxide based on 1-hour exposure attributable to future Genesee emissions with cumulative effects.	All CR values below 1.0.	All ILCR(2) values below 1.0
TransAlta Centennial Project	CR of 1.53 and 2.0 for 1-hour and 24-hour averaging times, respectively were predicted for sulphur dioxide attributable to the future cumulative effects scenario.	All CR values below 1.0.	All ILCR values below 1.0
Fording Brooks Power Project	CR of 1.6 and 1.2 were predicted for nitrogen dioxide and sulphur dioxide, respectively, attributable to the Project alone and Application (baseline plus Project) scenarios. $PM_{2.5}$ exceedances were predicted for 24-hour averaging period, however no health concerns are indicated as no residences exist at the location and predicted low frequency of days with PM above the reference level.	All CR values below 1.0.	All ILCR values below 1.0
ENMAX Shepard Energy Centre	All CR values below 1.0	All CR values below 1.0	All ILCR values below 1.0
Maxim Power Corp. Milner Expansion Project	Exceedance of 1.0 for hydrogen fluoride was predicted, however the exposure limit was not a human health based limit but based on vegetative effects. In conclusion, the predicted concentrations of hydrogen fluoride are not expected to result in health effects.	CR value of 1.22 was predicted for acrolein for the Future Case.	All ILCR values below 1.0

Notes:
(1) CR – Concentration Ratio, the ratio of the acceptable concentration to the measured or modeled exposure limit. Calculated by dividing the maximum predicted air concentration by the reference exposure limit. A CR equal to or less than 1.0 indicated that the air concentration is equal to or less than the exposure limit and that no adverse health effects would be expected to occur. CR may also be called a Risk Quotient (RQ) or Hazard Quotient (HQ).
(2) ILCR – Incremental Lifetime Cancer Risk represents the risk of an individual within a given population developing cancer over their lifetime. ILCR is calculated as a product of the total daily exposure, the chemical's cancer slope factor, and receptor specific amortization factor.

Table 14 Summary of Facilities with HHRAs Presenting the Findings of Priority Pollutants for the Multiple Pathway Assessment

Facility	*Priority Pollutants Identified in the HHRA*		*Comments*
	Non-Cancer	*Cancer*	
EPCOR Genesee coal-fired thermal power plant	Arsenic Barium Manganese Methyl mercury Selenium	Arsenic	ER(1) values were driven by background exposure. CR resulting from the facility only was below one.
TransAlta Centennial Project	Arsenic Barium Methyl mercury	Arsenic	ERs were driven by background exposure. CR resulting from the facility only was below one.
Fording Brooks Power Project	Methyl mercury	Arsenic	ERs were driven by background exposure. CR resulting from the facility only was below one.
ENMAX Shepard Energy Centre	--	--	No chemicals were identified from the background, project, or future cases.
Maxim Power Corp. Milner Expansion Project	Antimony Arsenic Cadmium Chromium Cobalt Lead Manganese Methyl mercury	Arsenic	ERs were driven by background exposure. ER resulting from the facility only was below one.

Notes:
(1) ER – Exposure Ratio, the ratio of the estimated exposure concentration to the measured or modeled exposure limit. Calculated by dividing the estimated exposure from all pathways by the reference exposure limit. An ER equal to or less than 1.0 indicated that the air concentration is equal to or less than the exposure limit and that no adverse health effects would be expected to occur.

Table 15 Summary of Persistent Chemicals Assessed via the Multiple Pathway Assessments for Selected Projects

Chemical Group	*Facility*				
	EPCOR Genesee	*TransAlta Centennial*	*Fording Brooks Power Project*	*ENMAX Shepard Energy Centre*	*Maxim Power Corp. Milner Expansion Project*
Dioxins					✓
Inorganics	✓	✓	✓	✓	✓
PAHs	✓	✓	✓	✓	✓
VOCs	✓	✓	✓	✓	✓

7.0 BIO-MONITORING PROGRAMS

In 2002 as required by the amended Approvals 1032-02-03, 9830-01-11 and 10324-01-05, TransAlta Utilities Corporation (TransAlta) submitted a monitoring plan for chemicals that were related to human health. The monitoring plan was designed to update information on air, water and selected ecological receptors for selected chemicals in the Wabamun area where there are a number of operating coal fired power plants. TransAlta, jointly with EPCOR, proposed to conduct the monitoring and a summary of this program is described below. In addition, a community exposure and effects assessment was also completed in the Wabamun area by Alberta Health. A description of this program is also described below. Combined these two programs provide further lines of evidence for the purpose of characterizing risks to human health and ecological receptors from electrical generation in Alberta.

7.1 Wabamun Genesee Bio-monitoring Program

The Biomonitoring Program focuses on measuring and assessing potential changes in COPC concentrations resulting from aerial and water emissions from the generating stations in the Wabamun–Genesee region. The following COPCs were considered for the purposes of special monitoring: arsenic, barium, cadmium, lead, manganese, mercury, selenium, nitrogen dioxide, sulphur dioxide, $PM_{2.5}$, and ozone. COPCs focused on in the Biomonitoring Program are relatively stable, have potential to accumulate and are measurable in environmental media such as water, soil, sediment, and biota. As such, the Biomonitoring Program does not focus on nitrogen dioxide, sulphur dioxide, $PM_{2.5}$ or ozone; these are monitored through associated air programs.

The baseline for the Biomonitoring program was established in 2004; since that time there have been two monitoring series (i.e., 2006 and 2010). Concentrations of COPC are measured in environmental media including soils, vegetation, small mammals, surface water, sediment and fish. The most recent monitoring program occurred in 2010. The results from that program show that throughout the area there are no changes in metal concentrations since the inception of the program and that the results obtained from the program are within the range of concentrations expected in environmental media.

7.2 Wabamun and Area Community Exposure and Health Effects Assessment Program (WACEHEAP)

A community exposure and health effects assessment was undertaken in the Wabamun area to gauge the impact of airborne contaminants on the health of the population. Referred to as WACEHEAP (Wabamun and Area Community Exposure and Health Effects Assessment Program), the program was directed by a variety of community partners including government, industry and community associations (Alberta Health and Wellness 2006). The goals of WACEHEAP were to:

- Measure exposure of residents from Wabamun and area to airborne chemicals and particulates;
- Examine the role indoor and outdoor air have on personal exposure to air contaminants;

- Include bio-monitoring (i.e., hair and/or blood and/or urine) of community residents for arsenic and mercury; and
- Look at relationships between exposure to airborne chemicals and illness in people within Wabamun and surrounding area (i.e., review health determinant statistics).

Data was collected over a 21-week period from May to November 2004 using 196 volunteers from urban and rural areas in the vicinity (n=123; Stony Plain, Spruce Grove, Devon, Wabamun and Thorsby) as well as residents of Paul Band First Nation's (n=73). Data was evaluated and, where applicable, additional comparisons were made to the scientific literature or to comparable data collected elsewhere in Alberta. The program collected a variety of measures for each participant, including personal, indoor, and outdoor levels of selected contaminants (sulphur dioxide, nitrogen dioxide, ozone, a group of volatile organic compounds, and particulate matter), biomarker measures of other exposures (e.g., arsenic, benzene, mercury), dietary and health behaviours, and selected health outcomes.

Particulate matter and its associated metal content were measured for a consecutive 7-day period from selected participants in the WACEHEAP program. A total of 44 participants wore the particulate monitors (i.e., personal monitors) and had them placed in their homes. Particulate matter filters also were collected outside of 60 homes. Outdoor concentrations of $PM_{2.5}$ were similar to those found in other communities in that they were below guidelines (median of 6.5 µg/m³) (Alberta Health and Wellness 2006). Variations in personal exposure to $PM_{2.5}$ were affected primarily by variability in smoking and garage characteristics and not by variations in outdoor concentrations of $PM_{2.5}$.

A total of 163 to 165 subjects in the WACEHEAP program provided samples of hair, blood and urine for analysis of biomarkers of exposure. Biomarkers of exposure relevant to the updated HHRA for Genesee and Centennial included mercury levels in hair, blood and urine and arsenic levels in blood and urine.

Average mercury levels in Wabamun area residents were 1.4 µg/L in blood, 0.64 µg/L in urine and 0.22 µg/g in hair. A review of the literature by WACEHEAP indicated that these levels were similar to the levels of 1 to 8 µg/L in whole blood and lower than the levels of 4 to 5 µg/L in urine reported in the literature (Alberta Health and Wellness 2006).

Health Canada guidelines for acceptable levels of mercury in blood and hair for the general population are <20 ppb (µg/L) in blood and <6 ppm (µg/g) in hair (Health Canada 2004). Acceptable levels of mercury in blood and hair for the sensitive subgroup of the population are <8 ppb (µg/L) in blood and <2 ppm (µg/g) in hair. Based on these levels, mercury exposure in the Wabamun region does not appear to be presenting elevated health risks.

Average total arsenic levels in Wabamun area residents were determined to be 0.37 µg/L in blood (Alberta Health and Wellness 2006). The mean level of blood arsenic reported in the literature is <1.0 µg/L (ATSDR 2007); therefore, the blood levels were measured within the normal range (Alberta Health and Wellness 2006).

Health determinant record analysis revealed the following findings:

- Wabamun area residents did not have significantly different levels of autoimmune disease compared to other communities in Alberta;

- There was no evidence of significantly higher morbidity (period prevalence, frequency of medical visits) of asthma, bronchitis, and chronic obstructive pulmonary disease (COPD) in Wabamun and area, nor an increased risk of death from all causes, respiratory disorders, COPD, and major cardiovascular diseases;
- There was evidence of an increased prevalence and frequency of visits for all respiratory disorders combined in the Wabamun area. However, the mean visits of asthma and COPD were lower when compared to other Alberta communities.

8.0 LIMITATIONS

A number of theoretical and practical limitations should be considered when interpreting the results of the chemical screening assessment. These limitations are described for each of the chemical screening methods and information sources.

8.1 Emission Inventory

The emission inventory was used to generate a list of chemicals and emission rates associated with electrical generation in Alberta. Unfortunately no Alberta project for electrical generation with biomass was identified in the public literature; therefore, the chemical screening could not address the uncertainty associated with this data gap. Another limitation includes the fact that the emission inventories are theoretical and largely based on United States Environmental Protection Agency (US EPA 1995) AP-42 emission factors. It should be noted that emission rates obtained from the air quality assessments as part of an EIA were based on maximum facility output operating on a continual basis. Frequently electrical generation facilities do not actually operate at maximum capacity due to fluctuations in electrical demand.

8.2 Toxic Potency Screening

The methods or basis used to derive TRVs from each agency were not reviewed. In addition, no evaluation was made on the principal study upon which the TRV was based and the endpoint (e.g., health, odour, vegetation, etc.) as this was beyond the scope of the assessment. Therefore, TRVs from the regulatory agencies were accepted at face value and the lowest value was typically selected for the toxic potency screening when an ESRD AAQO or Health Canada limit was not available. This assumption (i.e., selecting the lowest TRV) makes no evaluation of the scientific merit or applicability of the TRV to the toxic potency screening. In addition, this assumption (i.e., selecting the lowest TRV) would be considered a source of uncertainty in the toxic potency screening. In some instances the lowest TRV may not be designed for the protection of human health, but derived for the protection of plants or odour based. In other instances the TRV may not have adequate supporting documentation describing the basis of the TRV; therefore, a critical evaluation cannot be provided to describe the confidence in the exposure limit and toxic potency.

A number of TRVs could not be determined for chemicals in the emission inventory on either an acute or chronic basis. This represents a data gap and level of uncertainty in the inhalation toxic potency screening. However, it should be noted that most chemicals were assessed in the inhalation toxic potency screening on an acute or chronic basis. For example, if an acute TRV was missing for a specific chemical then a chronic TRV was typically available.

The basis used to derive TRVs from each agency was not reviewed but is primarily based on the protection of human health and are not designed for the protection of ecological receptors (e.g., amphibians, reptiles, birds, mammals and fish). In some instances TRVs are based on odour or for the protection of vegetation, but these chemicals were not specifically identified. Finally, the inhalation toxic potency screening did not consider mixture toxicity as it is beyond the scope of the assessment; however, it should be noted that the historical regulatory applications would have assessed mixture toxicity for acute inhalation risks, chronic inhalation risks and multiple pathway risks.

Cancer potency assessments for some chemicals lack sufficient information to verify their carcinogenicity to humans; however, a substantial number of these chemicals have sufficient evidence of carcinogenicity in animal tests to be of concern. Toxicological studies with animals have proven ability in predicting adverse responses in humans; however, some uncertainty about the potential for induction of cancer in humans remains. Finally, for some potentially carcinogenic metals, there is a lack of knowledge about how much of the carcinogenic forms are actually emitted. Lack of specification of metal-chemical forms in the air emissions inventory adds to the uncertainty of the assessment.

It is important to remember that ranked toxicity-weighted emission inventories are only relative estimates of possible risk levels from each chemical in air and the rankings cannot be interpreted as quantitative risk estimates (Kadlec 2008). The reason for this is that the emission inventory data, although indirectly related to human exposure, are not exposure estimates (i.e., predicted ground level air concentrations). Further, no assessment was made to determine if the inventories are up-to-date, or if the inventories may not reflect increases or reductions in air emissions that have occurred subsequently.

There are limitations and uncertainties with the toxic potency screening of this assessment (i.e., the emissions inventories, the toxicity data). However, by bringing these components together in a single framework, the best effort was made so that the estimates of the relative potency of each of the chemicals were possible.

8.3 Physical and Chemical Screening

The primary sources of limitations of the physical and chemical screening are the methods used to derive the chemical constants (e.g., Kow, Henry's constant, vapour pressure) and criteria used to identify non-volatile, bio-accumulative and persistent chemicals. EPI Suite™ (US EPA 2011) has several assumptions and limitations that must be taken into account when interpreting the results. The model is designed to be a screening tool and should not be used if measured values are available (Kates et al. 2014). EPI Suite™ (US EPA 2011) uses a Level III Fugacity model which has several assumptions of its own, such as, the model assumes steady state conditions. In additon, there are numerous parameters that cannot be changed. For example, a fixed temperature of 25 °C is assumed (Kates et al. 2014). That temperature will not reflect many countries mean annual temperatures, nor will it take into account daytime and seasonal variations.

However, the limitations should be considered low given that multiple jurisdictions around the world (e.g., Canada, United States and Europe) use similar methods, criteria and models for the determination of persistent and bio-accumulative substances. Finally, the EPI Suite™ (US EPA

2011) package and fugacity model are internationally recognized models for the evaluation of fate and transport of organic chemicals emitted to the environment.

8.4 Historical Regulatory Applications

The air quality and human health assessments that were submitted as part of EIA for historical regulatory applications represent best available science at the time of the submission. Unfortunately, the methods used in an EIA are continuously changing and improving to meet rising regulatory and public requirements. The largest limitations in the EIA are that the human health assessments are largely based on predicted concentrations and exposures. The assessment contains limited amounts of measured concentrations with the exception of soil and water. However, the methods used to predict concentrations and incremental changes in media (i.e., soil, water and food) concentrations are based on conservative assumptions that are endorsed by regulatory authorities. Often baseline concentrations are measured in soil and water and sometimes measurements of chemicals are available in vegetation as part of the EIA for the baseline assessment. Another limitation is that none of the historical regulatory applications provided a comprehensive ecological risk assessment.

8.5 Bio-monitoring Programs

The bio-monitoring and community health programs were primarily conducted to address the uncertainties or limitations of the EIA in the Wabamun area. Specifically, the bio-monitoring program was used to address concentrations of chemicals in media that were not measured in TransAlta or EPCOR EIA and to repeatedly monitor these chemical concentrations to detect changes in the environment. In addition, the bio-monitoring study included measurements of specific chemicals in vegetation, terrestrial wildlife and fish, and also included measurements for chemical concentrations in air and measured ambient atmospheric deposition.

Limitations of the Wabamun and Area Community Exposure and Health Effects Assessment Program (Alberta Health and Wellness 2006) were not explicitly described in the report; however, uncertainty was highlighted due the small sample size used for the analysis of certain parameters (e.g., particulate matter). The study used data that was collected over a 21-week period (May 17, 2004 to October 22, 2004), using volunteers from the cities of Stony Plain and Spruce Grove and towns of Devon, Wabamun and Thorsby and surrounding rural areas. In addition, members of the Paul First Nation were also included in the program. The program collected a variety of health measures for each participant, including personal, indoor, and outdoor levels of selected contaminants (sulfur dioxide, nitrogen dioxide, ozone, a group of volatile organic compounds, and particulate matter), measures of other sources of exposure, diet and health behaviours, and selected health outcomes (Alberta Health and Wellness 2006).

9.0 CONCLUSIONS

The objective of the assessment was to screen air emissions associated with electrical generation facilities in Alberta and identify chemicals, with information about inhalation toxicity potency, bioaccumulation and persistence potential. The assessment focused on electrical power generation facilities based on combustion of coal and natural gas. The assessment incorporated the following lines of evidence to identify priority chemicals in air emissions:

1. Generated an inventory of chemicals and emission rates from electrical generation facilities in Alberta.
2. Conducted a toxic potency screening for each facility selected for the assessment and presented the chemicals that contributed 99.9% of the relative potency from the emission profiles.
3. Determined the bio-accumulation and persistence potential of chemicals emitted by electrical generation facilities.
4. Summarized the findings of human health risk assessments of historical environmental impact assessments and community based bio-monitoring that was conducted in close proximity to electrical generation facilities.

Appendix D presents a summary of findings of the assessment incorporating the outcomes of the inhalation toxic potency screening, and identifies non-volatile, bio-accumulative and persistence chemicals in the emission profiles of electrical generation facilites in Alberta.

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Appendix A
Toxic Potency
Screening

Appendix A1
Toxic Potency
Screening
With Criteria Air
Contaminants (CACs)

Acute Toxic Potency

Table A1-1 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04	3.00E+02	1.92E+02	37.59%	37.59%
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04	4.50E+02	1.37E+02	26.73%	64.32%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02	4.90E+00	1.28E+02	25.04%	89.36%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03	2.70E+01	3.73E+01	7.31%	96.67%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00	1.00E+00	4.86E+00	0.95%	97.62%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.00E-01	4.74E+00	0.93%	98.55%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	3.00E-02	1.92E+00	0.38%	98.92%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00	2.00E+00	1.56E+00	0.31%	99.23%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01	7.50E+01	9.18E-01	0.18%	99.41%
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	6.00E+00	7.83E-01	0.15%	99.56%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	2.50E+00	7.54E-01	0.15%	99.71%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01	6.00E-01	4.84E-01	0.09%	99.80%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	1.50E+00	4.49E-01	0.09%	99.89%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+01	2.81E-01	0.06%	99.95%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02	6.00E-01	1.23E-01	0.02%	99.97%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	9.00E+01	4.12E-02	0.01%	99.98%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01	3.00E+01	2.81E-02	0.01%	99.98%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	6.50E+01	2.40E-02	0.00%	99.99%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	2.40E+02	1.89E-02	0.00%	99.99%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00	1.00E+02	1.68E-02	0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00	1.94E+02	5.35E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.50E+02	4.19E-03	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00	1.03E+03	3.33E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	1.50E+02	2.56E-03	0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01	1.25E+02	2.50E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01	1.00E+02	1.04E-03	0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	1.88E+03	8.29E-04	0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01	2.15E+02	7.52E-04	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	7.00E+02	3.72E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	2.00E+03	3.05E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	1.36E+03	2.06E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01	2.30E+03	1.05E-04	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02	5.00E+02	6.58E-05	0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01	7.00E+03	6.22E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00	5.90E+04	4.29E-05	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	7.21E+03	3.19E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00	1.10E+05	2.24E-05	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	9.00E+03	1.43E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01	3.96E+04	6.85E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01	4.60E+04	3.10E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02	2.35E+04	2.10E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	6.97E+04	1.85E-06	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	3.53E+04	2.33E-07	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02			0.00%	100.00%
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02			0.00%	100.00%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01			0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03			0.00%	100.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02			0.00%	100.00%

Table A1-1 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	100.00%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01			0.00%	100.00%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02			0.00%	100.00%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01			0.00%	100.00%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	100.00%
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	5.11E+02	100.00%	

Table A1-2 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02	4.90E+00	9.47E+01	29.65%	29.65%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04	3.00E+02	6.53E+01	20.46%	50.11%
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04	4.50E+02	5.40E+01	16.91%	67.02%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03	7.50E+01	4.96E+01	15.53%	82.55%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02	2.70E+01	3.39E+01	10.61%	93.16%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.00E-01	1.27E+01	3.98%	97.14%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	3.00E-02	5.29E+00	1.66%	98.80%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	1.50E+00	8.69E-01	0.27%	99.07%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01	1.00E+00	8.05E-01	0.25%	99.32%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00	2.00E+00	7.61E-01	0.24%	99.56%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00	2.50E+00	5.18E-01	0.16%	99.72%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02	1.40E+03	1.54E-01	0.05%	99.77%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	6.00E+00	1.45E-01	0.05%	99.82%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+01	1.45E-01	0.05%	99.86%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02	6.00E-01	1.41E-01	0.04%	99.91%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03	1.50E+04	1.35E-01	0.04%	99.95%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	9.00E+01	7.38E-02	0.02%	99.97%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	6.50E+01	5.16E-02	0.02%	99.99%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01	3.00E+01	1.34E-02	0.00%	99.99%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	2.40E+02	9.08E-03	0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01	1.94E+02	2.55E-03	0.00%	100.00%
Organics	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	1.50E+01	2.41E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.50E+02	2.00E-03	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00	1.03E+03	1.59E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	1.50E+02	1.22E-03	0.00%	100.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01	1.25E+02	1.19E-03	0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00	1.88E+03	6.43E-04	0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02	1.00E+02	4.95E-04	0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02	2.15E+02	3.60E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01	2.30E+03	2.11E-04	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	7.00E+02	1.77E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	2.00E+03	1.73E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	1.36E+03	9.80E-05	0.00%	100.00%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	2.00E+03	5.62E-05	0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01	7.00E+03	3.35E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02	5.00E+02	3.28E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00	5.90E+04	2.05E-05	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert*-Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	7.21E+03	1.50E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00	1.10E+05	1.07E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	9.00E+03	6.88E-06	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01	3.96E+04	3.28E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02	4.60E+04	1.48E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02	2.35E+04	1.00E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	6.97E+04	8.88E-07	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	3.53E+04	1.05E-07	0.00%	100.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	100.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	100.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08			0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07			0.00%	100.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	100.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04			0.00%	100.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04			0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04			0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05			0.00%	100.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	100.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05			0.00%	100.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	100.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02			0.00%	100.00%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00			0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04			0.00%	100.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	100.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	100.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	100.00%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02			0.00%	100.00%
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01			0.00%	100.00%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01			0.00%	100.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	100.00%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	3.19E+02	100.00%	

Table A1-3 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Nox	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04	3.00E+02	2.50E+02	45.92%	45.92%
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04	4.50E+02	1.72E+02	31.59%	77.51%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03	2.70E+01	5.87E+01	10.79%	88.30%
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02	4.90E+00	5.04E+01	9.28%	97.57%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02	7.50E+01	4.89E+00	0.90%	98.47%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	3.00E-02	2.61E+00	0.48%	98.95%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00	2.00E+00	2.15E+00	0.39%	99.35%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.00E-01	2.14E+00	0.39%	99.74%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	2.50E+00	4.77E-01	0.09%	99.83%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01	1.00E+00	3.39E-01	0.06%	99.89%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+01	1.78E-01	0.03%	99.92%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02	6.00E-01	1.22E-01	0.02%	99.95%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	6.00E+00	1.04E-01	0.02%	99.96%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	1.50E+00	9.97E-02	0.02%	99.98%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	9.00E+01	2.60E-02	0.00%	99.99%
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01	3.00E+01	1.78E-02	0.00%	99.99%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	6.50E+01	1.52E-02	0.00%	99.99%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	2.40E+02	1.20E-02	0.00%	100.00%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01	1.00E+02	8.26E-03	0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01	1.94E+02	3.39E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.50E+02	2.65E-03	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00	1.03E+03	2.11E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	1.50E+02	1.62E-03	0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01	1.25E+02	1.58E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02	1.00E+02	6.57E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	1.88E+03	5.24E-04	0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01	2.15E+02	4.78E-04	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	7.00E+02	2.35E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	2.00E+03	1.93E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	1.36E+03	1.30E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01	2.30E+03	6.61E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02	5.00E+02	4.36E-05	0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01	7.00E+03	3.93E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00	5.90E+04	2.72E-05	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	7.21E+03	1.99E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00	1.10E+05	1.42E-05	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	9.00E+03	9.13E-06	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01	3.96E+04	4.36E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02	4.60E+04	1.96E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02	2.35E+04	1.33E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	6.97E+04	1.18E-06	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	3.53E+04	1.40E-07	0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02			0.00%	100.00%
Metals	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	100.00%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01			0.00%	100.00%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01			0.00%	100.00%
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01			0.00%	100.00%
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	100.00%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03			0.00%	100.00%
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01			0.00%	100.00%

Table A1-3 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02			0.00%	100.00%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01			0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03			0.00%	100.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	5.44E+02	100.00%	

Table A1-4 Estimated Emissions from TransAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03	4.90E+00	1.91E+03	84.11%	84.11%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04	3.00E+02	1.71E+02	7.51%	91.62%
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04	4.50E+02	1.11E+02	4.90%	96.52%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03	2.70E+01	4.85E+01	2.13%	98.65%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03	7.50E+01	1.56E+01	0.69%	99.34%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01	1.00E+01	6.03E+00	0.27%	99.61%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.00E-01	2.47E+00	0.11%	99.71%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	3.00E-02	1.64E+00	0.07%	99.79%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00	8.00E-01	1.48E+00	0.07%	99.85%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00	1.00E+00	1.39E+00	0.06%	99.91%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00	2.00E+00	7.97E-01	0.04%	99.95%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	1.50E+00	4.18E-01	0.02%	99.97%
CACs	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03	1.50E+04	2.75E-01	0.01%	99.98%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01	6.00E-01	2.28E-01	0.01%	99.99%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	6.00E+00	1.98E-01	0.01%	100.00%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01	1.40E+03	2.15E-02	0.00%	100.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00	2.50E+02	9.98E-03	0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01	1.88E+03	7.92E-03	0.00%	100.00%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01	1.00E+02	5.34E-03	0.00%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01	7.00E+03	3.48E-03	0.00%	100.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00	9.90E+06	5.45E-07	0.00%	100.00%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02			0.00%	100.00%
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01			0.00%	100.00%
Metals	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01			0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01			0.00%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.27E+03	100.00%	

Table A1-5 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342	4.50E+02	2.05E+02	54.97%	54.97%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589	3.00E+02	9.88E+01	26.43%	81.40%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726	4.90E+00	5.31E+01	14.21%	95.61%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986	2.70E+01	9.74E+00	2.61%	98.21%
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233	1.00E+01	3.29E+00	0.88%	99.09%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082	7.50E+01	2.96E+00	0.79%	99.89%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589	6.00E-01	1.74E-01	0.05%	99.93%
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+01	1.39E-01	0.04%	99.97%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945	1.50E+04	1.15E-01	0.03%	100.00%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726	2.00E+00	1.37E-03	0.00%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.74E+02	100.00%	

Table A1-6 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes/year	6.31E+04	4.50E+02	1.40E+02	43.83%	43.83%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes/year	2.80E+04	3.00E+02	9.35E+01	29.20%	73.03%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes/year	1.33E+03	2.70E+01	4.93E+01	15.41%	88.43%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes/year	1.48E+02	4.90E+00	3.02E+01	9.43%	97.87%
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes/year	3.12E+02	7.50E+01	4.16E+00	1.30%	99.17%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes/year	2.44E+01	1.00E+01	2.44E+00	0.76%	99.93%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg/year	6.85E-02	6.00E-01	1.14E-01	0.04%	99.97%
CACs	Carbon monoxide	CO	6.05E+02	tonnes/year	1.66E+03	1.50E+04	1.11E-01	0.03%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	g/year	4.95E-03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.20E+02	100.00%	

Table A1-7 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04	3.00E+02	9.11E+01	35.53%	35.53%
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04	4.50E+02	8.47E+01	33.03%	68.57%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03	2.70E+01	4.24E+01	16.53%	85.09%
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.00E-01	1.51E+01	5.88%	90.97%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00	1.00E+00	5.89E+00	2.30%	93.27%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00	8.00E-01	4.69E+00	1.83%	95.10%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00	2.00E+00	3.25E+00	1.27%	96.36%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	1.50E+00	1.84E+00	0.72%	97.08%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	3.00E-02	1.83E+00	0.71%	97.80%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01	1.50E+01	1.41E+00	0.55%	98.35%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01	2.00E+01	1.15E+00	0.45%	98.80%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01	6.00E-01	1.10E+00	0.43%	99.22%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	6.00E+00	5.94E-01	0.23%	99.45%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00	2.50E+00	5.72E-01	0.22%	99.68%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01	1.08E+02	4.12E-01	0.16%	99.84%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03	1.50E+04	2.60E-01	0.10%	99.94%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	9.00E+01	3.12E-02	0.01%	99.95%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00	1.00E+02	2.63E-02	0.01%	99.96%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.01%	99.97%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.01%	99.98%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	6.50E+01	1.82E-02	0.01%	99.99%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	2.40E+02	1.44E-02	0.01%	99.99%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00	2.50E+02	1.35E-02	0.01%	100.00%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.50E+02	3.18E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	1.50E+02	1.94E-03	0.00%	100.00%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01	1.25E+02	1.88E-03	0.00%	100.00%
Organics	Phenol	Phenol	kg/year	2.90E+01	7.95E-02	1.00E+02	7.95E-04	0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00	1.88E+03	6.30E-04	0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01	2.15E+02	5.73E-04	0.00%	100.00%
Organics	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	2.00E+03	2.32E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	1.36E+03	1.56E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01	2.30E+03	7.98E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02	5.00E+02	5.48E-05	0.00%	100.00%
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01	7.00E+03	4.74E-05	0.00%	100.00%
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00	5.90E+04	3.26E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00	1.10E+05	1.70E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02	9.00E+03	1.10E-05	0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01	4.60E+04	2.38E-06	0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02	2.35E+04	1.64E-06	0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02	6.97E+04	1.42E-06	0.00%	100.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01			0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03			0.00%	100.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	100.00%

Table A1-7 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04			0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	100.00%
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02			0.00%	100.00%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01			0.00%	100.00%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01			0.00%	100.00%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01			0.00%	100.00%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01			0.00%	100.00%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02			0.00%	100.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	100.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	100.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	100.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	100.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	100.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	100.00%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.56E+02	100.00%	

Table A1-8 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03	3.00E+02	4.73E+00	60.42%	60.42%
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	6.50E+01	7.72E-01	9.86%	70.28%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	3.00E-02	4.90E-01	6.25%	76.53%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00	2.50E+00	4.56E-01	5.82%	82.35%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02	1.40E+03	3.12E-01	3.98%	86.34%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.00E-01	2.24E-01	2.86%	89.20%
CACs	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03	1.50E+04	1.77E-01	2.26%	91.45%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+01	1.63E-01	2.08%	93.54%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01	2.00E+00	1.37E-01	1.75%	95.29%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01	4.50E+02	9.78E-02	1.25%	96.54%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	9.00E+01	8.18E-02	1.04%	97.58%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02	1.00E+00	7.59E-02	0.97%	98.55%
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	6.00E+00	5.37E-02	0.69%	99.23%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	1.50E+00	2.60E-02	0.33%	99.57%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03	8.00E-01	1.05E-02	0.13%	99.70%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	4.80E+02	5.27E-03	0.07%	99.77%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01	7.00E+03	3.97E-03	0.05%	99.82%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00	1.88E+03	3.87E-03	0.05%	99.87%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01	3.00E+02	3.14E-03	0.04%	99.91%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01	1.00E+02	1.78E-03	0.02%	99.93%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00	2.30E+03	1.55E-03	0.02%	99.95%
Organics	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	1.50E+01	1.55E-03	0.02%	99.97%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01	2.50E+02	1.40E-03	0.02%	99.99%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	2.00E+03	8.70E-04	0.01%	100.00%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01	2.00E+05	1.02E-04	0.00%	100.00%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	2.00E+03	4.83E-05	0.00%	100.00%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	3.00E+03	3.13E-06	0.00%	100.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	100.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05			0.00%	100.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	100.00%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05			0.00%	100.00%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	100.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	100.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03			0.00%	100.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04			0.00%	100.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04			0.00%	100.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04			0.00%	100.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04			0.00%	100.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03			0.00%	100.00%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03			0.00%	100.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	100.00%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00			0.00%	100.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	100.00%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01			0.00%	100.00%

Table A1-8 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02			0.00%	100.00%
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03			0.00%	100.00%
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	100.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	100.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03			0.00%	100.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	100.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02			0.00%	100.00%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01			0.00%	100.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	100.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	100.00%
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02			0.00%	100.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	7.83E+00	100.00%	

Chronic Toxic Potency

Table A1-9 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04	2.00E+01	3.07E+03	71.87%	71.87%
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04	1.00E+02	5.76E+02	13.48%	85.35%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03	8.80E+00	1.15E+02	2.68%	88.03%
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02	5.00E+00	1.14E+02	2.67%	90.70%
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	5.00E-02	9.40E+01	2.20%	92.90%
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00	4.00E-02	6.10E+01	1.43%	94.33%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01	1.00E+00	4.74E+01	1.11%	95.44%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.00E-02	4.74E+01	1.11%	96.55%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02	1.40E+01	4.48E+01	1.05%	97.59%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00	1.40E-01	3.47E+01	0.81%	98.41%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00	2.00E-01	1.56E+01	0.37%	98.77%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	5.00E-03	1.15E+01	0.27%	99.04%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01	9.00E+00	7.65E+00	0.18%	99.22%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02	7.00E-03	6.26E+00	0.15%	99.36%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01	6.00E-02	4.84E+00	0.11%	99.48%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.00E-01	4.71E+00	0.11%	99.59%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	1.00E+00	4.55E+00	0.11%	99.69%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	1.50E-01	4.49E+00	0.11%	99.80%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01	1.00E-01	2.11E+00	0.05%	99.85%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00	1.00E+00	1.68E+00	0.04%	99.89%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02	3.00E-02	1.55E+00	0.04%	99.92%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02	6.00E-02	1.23E+00	0.03%	99.95%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01	2.50E+01	6.50E-01	0.02%	99.97%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00	8.00E+00	3.09E-01	0.01%	99.98%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+01	2.81E-01	0.01%	99.98%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00	5.00E+00	2.08E-01	0.00%	99.99%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00	2.00E+01	1.92E-01	0.00%	99.99%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	9.00E+00	1.73E-01	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00	9.00E+01	3.82E-02	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	7.00E+00	3.72E-02	0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08	3.00E-06	2.74E-02	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01	1.00E+01	1.42E-02	0.00%	100.00%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	3.90E+02	9.50E-03	0.00%	100.00%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01	1.00E+02	8.44E-03	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	3.70E+01	6.22E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01	2.00E+01	5.21E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.00E+02	4.71E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	9.80E+01	3.91E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00	2.00E+03	1.88E-03	0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01	9.20E+01	1.76E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01	1.80E+02	1.34E-03	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	9.30E+00	8.84E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	3.60E+02	7.76E-04	0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01	7.00E+02	6.22E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	1.00E+03	6.11E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00	5.00E+03	5.06E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	3.80E+03	4.10E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02	2.00E+02	2.47E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	7.00E+02	1.84E-04	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	1.00E+03	1.29E-04	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02	4.00E+02	8.22E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01	1.00E+04	2.71E-05	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02			0.00%	100.00%

Table A1-9 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01			0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01			0.00%	100.00%
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	4.27E+03	100.00%	

Table A1-10 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04	2.00E+01	1.22E+03	55.56%	55.56%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03	9.00E+00	4.13E+02	18.90%	74.46%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04	1.00E+02	1.96E+02	8.96%	83.42%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.00E-02	1.27E+02	5.81%	89.23%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02	8.80E+00	1.04E+02	4.75%	93.98%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02	1.40E+01	3.31E+01	1.52%	95.50%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	5.00E-03	3.17E+01	1.45%	96.95%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	5.00E-02	1.74E+01	0.79%	97.74%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02	7.00E-03	9.29E+00	0.42%	98.17%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	1.50E-01	8.69E+00	0.40%	98.56%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00	2.00E-01	7.61E+00	0.35%	98.91%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01	1.40E-01	5.75E+00	0.26%	99.17%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00	4.00E-01	3.24E+00	0.15%	99.32%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01	1.00E-01	3.10E+00	0.14%	99.46%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02	7.00E+01	3.09E+00	0.14%	99.60%
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01	1.00E-01	2.45E+00	0.11%	99.72%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	1.00E+00	2.18E+00	0.10%	99.82%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02	6.00E-02	1.41E+00	0.06%	99.88%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02	3.00E-02	7.23E-01	0.03%	99.91%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04	3.00E-04	4.56E-01	0.02%	99.93%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	9.00E+00	3.73E-01	0.02%	99.95%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00	2.50E+01	3.10E-01	0.01%	99.97%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00	2.00E+01	2.01E-01	0.01%	99.98%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00	8.00E+00	1.48E-01	0.01%	99.98%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+01	1.45E-01	0.01%	99.99%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01	5.00E+00	9.90E-02	0.00%	99.99%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	3.00E+00	3.74E-02	0.00%	99.99%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00	9.00E+01	1.82E-02	0.00%	100.00%
Organics	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	2.00E+00	1.81E-02	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	7.00E+00	1.77E-02	0.00%	100.00%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	3.90E+02	1.70E-02	0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08	3.00E-06	1.48E-02	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02	1.00E+01	6.81E-03	0.00%	100.00%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01	1.00E+02	4.02E-03	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert*-Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	3.70E+01	2.92E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01	1.80E+02	2.69E-03	0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02	2.00E+01	2.48E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.00E+02	2.25E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	9.80E+01	1.87E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00	2.00E+03	9.00E-04	0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02	9.20E+01	8.41E-04	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	9.30E+00	4.00E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	3.60E+02	3.69E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	1.00E+03	3.46E-04	0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01	7.00E+02	3.35E-04	0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00	3.80E+03	3.18E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00	5.00E+03	2.42E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02	2.00E+02	1.18E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	7.00E+02	8.84E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	1.00E+03	6.19E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02	4.00E+02	4.10E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01	1.00E+04	1.30E-05	0.00%	100.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	100.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	100.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07			0.00%	100.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	100.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	100.00%

Table A1-10 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04			0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04			0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05			0.00%	100.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	100.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05			0.00%	100.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	100.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01			0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	100.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	100.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	100.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	100.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01			0.00%	100.00%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	2.19E+03	100.00%	

Table A1-11 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04	2.00E+01	3.86E+03	76.34%	76.34%
CACs	NOx	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04	1.00E+02	7.49E+02	14.79%	91.13%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03	8.80E+00	1.80E+02	3.56%	94.69%
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02	5.00E+00	7.23E+01	1.43%	96.12%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02	9.00E+00	4.08E+01	0.81%	96.92%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01	1.00E+00	3.21E+01	0.63%	97.56%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00	2.00E-01	2.15E+01	0.42%	97.98%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.00E-02	2.14E+01	0.42%	98.40%
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02	1.40E+01	1.76E+01	0.35%	98.75%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	5.00E-03	1.56E+01	0.31%	99.06%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01	7.00E-03	1.53E+01	0.30%	99.36%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	5.00E-02	1.25E+01	0.25%	99.61%
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01	1.00E-01	3.54E+00	0.07%	99.68%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.00E-01	2.98E+00	0.06%	99.74%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	1.00E+00	2.88E+00	0.06%	99.80%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01	4.00E-02	2.72E+00	0.05%	99.85%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01	1.40E-01	2.42E+00	0.05%	99.90%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02	6.00E-02	1.22E+00	0.02%	99.92%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	1.50E-01	9.97E-01	0.02%	99.94%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02	3.00E-02	9.59E-01	0.02%	99.96%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01	1.00E+00	8.26E-01	0.02%	99.98%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01	2.50E+01	4.11E-01	0.01%	99.99%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00	8.00E+00	1.95E-01	0.00%	99.99%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+01	1.78E-01	0.00%	99.99%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01	5.00E+00	1.31E-01	0.00%	100.00%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	9.00E+00	1.10E-01	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00	9.00E+01	2.42E-02	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	7.00E+00	2.35E-02	0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08	3.00E-06	1.83E-02	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02	1.00E+01	9.04E-03	0.00%	100.00%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	3.90E+02	6.00E-03	0.00%	100.00%
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01	1.00E+02	5.34E-03	0.00%	100.00%
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01	2.00E+01	5.11E-03	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	3.70E+01	3.89E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02	2.00E+01	3.29E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.00E+02	2.98E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	9.80E+01	2.47E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00	2.00E+03	1.19E-03	0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01	9.20E+01	1.12E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01	1.80E+02	8.44E-04	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	9.30E+00	5.30E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	3.60E+02	4.91E-04	0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01	7.00E+02	3.93E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	1.00E+03	3.86E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00	5.00E+03	3.20E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	3.80E+03	2.59E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02	2.00E+02	1.56E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	7.00E+02	1.17E-04	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	1.00E+03	8.22E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02	4.00E+02	5.45E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01	1.00E+04	1.73E-05	0.00%	100.00%
Metals	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03			0.00%	100.00%

Table A1-11 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01			0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	100.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	5.06E+03	100.00%	

Table A1-12 Estimated Emissions from TransAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04	2.00E+01	2.51E+03	60.71%	60.71%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03	1.40E+01	6.69E+02	16.20%	76.91%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04	1.00E+02	5.12E+02	12.39%	89.30%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03	8.80E+00	1.49E+02	3.60%	92.91%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03	9.00E+00	1.30E+02	3.15%	96.06%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01	1.00E+00	6.03E+01	1.46%	97.52%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.00E-02	2.47E+01	0.60%	98.11%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	5.00E-02	2.37E+01	0.57%	98.69%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00	1.00E-01	1.19E+01	0.29%	98.97%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00	1.40E-01	9.92E+00	0.24%	99.21%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	5.00E-03	9.86E+00	0.24%	99.45%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00	2.00E-01	7.97E+00	0.19%	99.65%
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01	1.00E-01	6.16E+00	0.15%	99.80%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	1.50E-01	4.18E+00	0.10%	99.90%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01	6.00E-02	2.28E+00	0.06%	99.95%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02	1.00E-01	9.59E-01	0.02%	99.98%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01	1.00E+00	5.34E-01	0.01%	99.99%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01	7.00E+01	4.31E-01	0.01%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01	7.00E+02	3.48E-02	0.00%	100.00%
Metals	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01	2.00E+01	7.95E-03	0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01	3.80E+03	3.92E-03	0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01	5.00E+04	3.18E-06	0.00%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	100.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00			0.00%	100.00%
CACs	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03			0.00%	100.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	4.13E+03	100.00%	

Table A1-13 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342	2.00E+01	4.62E+03	91.96%	91.96%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589	1.00E+02	2.96E+02	5.90%	97.85%
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233	1.00E+00	3.29E+01	0.65%	98.51%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986	8.80E+00	2.99E+01	0.59%	99.10%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082	9.00E+00	2.47E+01	0.49%	99.59%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726	1.40E+01	1.86E+01	0.37%	99.96%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589	6.00E-02	1.74E+00	0.03%	100.00%
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+01	1.39E-01	0.00%	100.00%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726	2.00E-01	1.37E-02	0.00%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	100.00%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	5.03E+03	100.00%	

Table A1-14 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes/year	6.31E+04	2.00E+01	3.16E+03	86.27%	86.27%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes/year	2.80E+04	1.00E+02	2.80E+02	7.66%	93.93%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes/year	1.33E+03	8.80E+00	1.51E+02	4.14%	98.07%
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes/year	3.12E+02	9.00E+00	3.47E+01	0.95%	99.01%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes/year	2.44E+01	1.00E+00	2.44E+01	0.67%	99.68%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes/year	1.48E+02	1.40E+01	1.06E+01	0.29%	99.97%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg/year	6.85E-02	6.00E-02	1.14E+00	0.03%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	g/year	4.95E-03			0.00%	100.00%
CACs	Carbon monoxide	CO	6.05E+02	tonnes/year	1.66E+03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.66E+03	100.00%	

Table A1-15 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04	2.00E+01	1.91E+03	56.10%	56.10%
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02	1.00E+00	3.21E+02	9.45%	65.55%
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04	1.00E+02	2.73E+02	8.05%	73.59%
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.00E-02	1.51E+02	4.44%	78.03%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01	1.50E-01	1.41E+02	4.16%	82.18%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03	8.80E+00	1.30E+02	3.83%	86.01%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01	1.00E-01	1.15E+02	3.38%	89.39%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02	5.00E+00	7.30E+01	2.15%	91.54%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	5.00E-02	7.12E+01	2.10%	93.64%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01	7.00E-03	4.70E+01	1.38%	95.02%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00	1.40E-01	4.21E+01	1.24%	96.26%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00	1.00E-01	3.75E+01	1.11%	97.36%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00	2.00E-01	3.25E+01	0.96%	98.32%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	1.50E-01	1.84E+01	0.54%	98.86%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01	6.00E-02	1.10E+01	0.32%	99.18%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	5.00E-03	1.10E+01	0.32%	99.51%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01	1.00E-01	6.58E+00	0.19%	99.70%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00	4.00E-01	3.58E+00	0.11%	99.81%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	1.00E+00	3.45E+00	0.10%	99.91%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00	1.00E+00	2.63E+00	0.08%	99.98%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00	8.00E+00	2.34E-01	0.01%	99.99%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	9.00E+00	1.32E-01	0.00%	100.00%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01	1.20E+01	6.85E-02	0.00%	100.00%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.00%	100.00%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01	2.00E+01	1.64E-02	0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01	1.00E+01	1.10E-02	0.00%	100.00%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	3.90E+02	7.21E-03	0.00%	100.00%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01	1.00E+02	6.41E-03	0.00%	100.00%
Organics	Phenol	Phenol	kg/year	2.90E+01	7.95E-02	2.00E+01	3.97E-03	0.00%	100.00%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.00E+02	3.58E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	9.80E+01	2.96E-03	0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01	9.20E+01	1.34E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01	1.80E+02	1.02E-03	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	3.60E+02	5.86E-04	0.00%	100.00%
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01	7.00E+02	4.74E-04	0.00%	100.00%
Organics	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	1.00E+03	4.63E-04	0.00%	100.00%
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00	5.00E+03	3.85E-04	0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00	3.80E+03	3.11E-04	0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02	2.00E+02	1.92E-04	0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02	7.00E+02	1.41E-04	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02	1.00E+03	9.86E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02	4.00E+02	6.85E-05	0.00%	100.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01			0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03			0.00%	100.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	100.00%

Table A1-15 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04			0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	100.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	100.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	100.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	100.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	100.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	100.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	100.00%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01			0.00%	100.00%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01			0.00%	100.00%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01			0.00%	100.00%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00			0.00%	100.00%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.40E+03	100.00%	

Table A1-16 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
CACs	PM2.5	$PM_{2.5}$	3.11E-01	3.00E-02	3.41E-01	3.41E+02	8.80E+00	3.88E+01	42.20%	42.20%
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03	1.00E+02	1.42E+01	15.46%	57.67%
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	5.00E-02	6.44E+00	7.01%	64.68%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02	7.00E+01	6.24E+00	6.80%	71.48%
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	9.00E+00	5.58E+00	6.07%	77.55%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	5.00E-03	2.94E+00	3.20%	80.76%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00	4.00E-01	2.85E+00	3.10%	83.86%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04	3.00E-04	2.48E+00	2.70%	86.56%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.00E-02	2.24E+00	2.44%	89.00%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01	2.00E+01	2.20E+00	2.40%	91.40%
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02	7.00E-03	2.14E+00	2.33%	93.73%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01	4.00E-01	1.62E+00	1.76%	95.50%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01	2.00E-01	1.37E+00	1.49%	96.99%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00	5.00E+00	8.30E-01	0.90%	97.89%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02	1.40E-01	5.42E-01	0.59%	98.48%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	1.50E-01	2.60E-01	0.28%	98.77%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01	1.00E+00	2.29E-01	0.25%	99.02%
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02	1.00E-01	2.25E-01	0.25%	99.26%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01	1.00E+00	1.78E-01	0.19%	99.46%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+01	1.63E-01	0.18%	99.63%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	3.00E+01	8.43E-02	0.09%	99.73%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03	1.00E-01	8.41E-02	0.09%	99.82%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01	7.00E+02	3.97E-02	0.04%	99.86%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	3.00E+00	3.22E-02	0.04%	99.90%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01	1.00E+03	2.03E-02	0.02%	99.92%
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03	1.00E-01	2.03E-02	0.02%	99.94%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00	1.80E+02	1.98E-02	0.02%	99.96%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	3.90E+02	1.89E-02	0.02%	99.98%
Organics	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	2.00E+00	1.16E-02	0.01%	99.99%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00	3.80E+03	1.91E-03	0.00%	100.00%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	1.00E+03	1.74E-03	0.00%	100.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02	2.00E+01	1.21E-03	0.00%	100.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03	1.20E+01	3.29E-04	0.00%	100.00%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	9.50E+01	9.88E-05	0.00%	100.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05	1.00E+00	1.44E-05	0.00%	100.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	100.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	100.00%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05			0.00%	100.00%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	100.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	100.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03			0.00%	100.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04			0.00%	100.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04			0.00%	100.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04			0.00%	100.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03			0.00%	100.00%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03			0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03			0.00%	100.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	100.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	100.00%

Table A1-16 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	100.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	100.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	100.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	100.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	100.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	100.00%
CACs	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03			0.00%	100.00%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01			0.00%	100.00%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	9.18E+01	100.00%	

Cancer Toxic Potency

Table A1-17 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	7.70E-03	6.10E+02	51.07%	51.07%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.60E-03	2.96E+02	24.79%	75.86%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01	1.11E-03	1.90E+02	15.90%	91.76%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	1.00E-03	5.75E+01	4.81%	96.58%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	2.04E-01	2.23E+01	1.86%	98.44%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02	4.00E-03	1.10E+01	0.92%	99.36%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+00	2.81E+00	0.24%	99.59%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	4.00E-01	9.59E-01	0.08%	99.67%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	1.90E+00	8.20E-01	0.07%	99.74%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	8.33E-01	8.09E-01	0.07%	99.81%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	4.00E-01	6.51E-01	0.05%	99.86%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	1.70E-02	4.83E-01	0.04%	99.90%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08	2.63E-07	3.12E-01	0.03%	99.93%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	1.72E+01	2.15E-01	0.02%	99.95%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	1.70E+00	1.64E-01	0.01%	99.96%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	4.00E+00	1.53E-01	0.01%	99.98%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07	2.63E-06	1.25E-01	0.01%	99.99%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01	4.17E+00	1.14E-01	0.01%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01	9.00E+00	2.83E-02	0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03	1.12E-01	1.46E-02	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	3.85E+01	5.98E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.35E+02	4.33E-03	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02	3.23E+02	3.23E-05	0.00%	100.00%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00			0.00%	100.00%
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01			0.00%	100.00%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01			0.00%	100.00%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00			0.00%	100.00%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01			0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01			0.00%	100.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00			0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01			0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01			0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02			0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01			0.00%	100.00%
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02			0.00%	100.00%

Table A1-17 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00			0.00%	100.00%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01			0.00%	100.00%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00			0.00%	100.00%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01			0.00%	100.00%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02			0.00%	100.00%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00			0.00%	100.00%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00			0.00%	100.00%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02			0.00%	100.00%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01			0.00%	100.00%
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04			0.00%	100.00%
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04			0.00%	100.00%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	1.19E+03	100.00%	

Table A1-18 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01	1.30E-04	1.88E+03	57.75%	57.75%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.60E-03	7.94E+02	24.34%	82.08%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01	1.11E-03	2.79E+02	8.56%	90.64%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	1.00E-03	1.59E+02	4.86%	95.50%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	7.70E-03	1.13E+02	3.46%	98.96%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02	4.00E-03	1.63E+01	0.50%	99.46%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	2.04E-01	1.07E+01	0.33%	99.78%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	1.90E+00	1.76E+00	0.05%	99.84%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	8.33E-01	1.56E+00	0.05%	99.89%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+00	1.45E+00	0.04%	99.93%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	4.00E-01	4.58E-01	0.01%	99.95%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	1.72E+01	3.86E-01	0.01%	99.96%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	2.94E-01	3.82E-01	0.01%	99.97%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	4.00E-01	3.10E-01	0.01%	99.98%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	1.70E-02	2.19E-01	0.01%	99.98%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08	2.63E-07	1.68E-01	0.01%	99.99%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	4.00E+00	8.65E-02	0.00%	99.99%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	1.70E+00	7.82E-02	0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07	2.63E-06	6.00E-02	0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01	4.17E+00	5.42E-02	0.00%	100.00%
Organics	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	1.70E+00	2.13E-02	0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01	9.00E+00	1.34E-02	0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04	1.12E-01	7.72E-03	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert*-Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	3.85E+01	2.81E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.35E+02	2.06E-03	0.00%	100.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04	3.23E-01	4.24E-04	0.00%	100.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05	3.20E-01	2.13E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04	3.23E+00	1.84E-04	0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04	3.23E+00	1.60E-04	0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04	3.23E+00	6.78E-05	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02	3.23E+02	5.97E-05	0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03	3.23E+02	2.60E-05	0.00%	100.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04	3.23E+01	2.17E-05	0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05	3.23E+01	2.66E-06	0.00%	100.00%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01			0.00%	100.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	100.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	100.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	100.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	100.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	100.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	100.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	100.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	100.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	100.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	100.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01			0.00%	100.00%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02			0.00%	100.00%
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04			0.00%	100.00%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03			0.00%	100.00%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02			0.00%	100.00%

Table A1-18 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02			0.00%	100.00%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01			0.00%	100.00%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00			0.00%	100.00%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00			0.00%	100.00%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02			0.00%	100.00%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02			0.00%	100.00%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00			0.00%	100.00%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01			0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02			0.00%	100.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01			0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00			0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00			0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02			0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	3.26E+03	100.00%	

Table A1-19 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01	1.11E-03	3.19E+02	48.52%	48.52%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.60E-03	1.34E+02	20.30%	68.82%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	7.70E-03	8.14E+01	12.38%	81.20%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	1.00E-03	7.82E+01	11.88%	93.09%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01	4.00E-03	2.69E+01	4.08%	97.17%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	2.04E-01	1.41E+01	2.14%	99.31%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+00	1.78E+00	0.27%	99.58%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	4.00E-01	6.06E-01	0.09%	99.68%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	1.90E+00	5.19E-01	0.08%	99.75%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	4.00E-01	4.11E-01	0.06%	99.82%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	1.70E-02	2.90E-01	0.04%	99.86%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08	2.63E-07	2.08E-01	0.03%	99.89%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	8.33E-01	1.79E-01	0.03%	99.92%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	1.72E+01	1.36E-01	0.02%	99.94%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	1.70E+00	1.04E-01	0.02%	99.96%
Organics	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	4.00E+00	9.65E-02	0.01%	99.97%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07	2.63E-06	8.33E-02	0.01%	99.98%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01	4.17E+00	7.20E-02	0.01%	99.99%
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01	9.00E+00	1.78E-02	0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03	1.12E-01	1.02E-02	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	3.85E+01	3.74E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.35E+02	2.74E-03	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03	3.23E+00	6.96E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03	3.23E+02	1.66E-05	0.00%	100.00%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01			0.00%	100.00%
Metals	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	100.00%
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02			0.00%	100.00%
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04			0.00%	100.00%
CACs	NOx	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02			0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02			0.00%	100.00%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00			0.00%	100.00%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02			0.00%	100.00%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01			0.00%	100.00%
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01			0.00%	100.00%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01			0.00%	100.00%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00			0.00%	100.00%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01			0.00%	100.00%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02			0.00%	100.00%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00			0.00%	100.00%
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01			0.00%	100.00%

Table A1-19 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01			0.00%	100.00%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02			0.00%	100.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00			0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01			0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01			0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02			0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	6.58E+02	100.00%	

Table A1-20 Estimated Emissions from TranslAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01	1.30E-04	4.74E+03	91.43%	91.43%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.60E-03	1.54E+02	2.97%	94.40%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	7.70E-03	1.54E+02	2.97%	97.37%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02	1.11E-03	8.64E+01	1.67%	99.03%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	1.00E-03	4.93E+01	0.95%	99.98%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	8.33E-01	7.53E-01	0.01%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03	1.96E-02	6.80E-02	0.00%	100.00%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	100.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00			0.00%	100.00%
CACs	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03			0.00%	100.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03			0.00%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03			0.00%	100.00%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01			0.00%	100.00%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00			0.00%	100.00%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00			0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01			0.00%	100.00%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01			0.00%	100.00%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01			0.00%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01			0.00%	100.00%
Metals	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01			0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	5.19E+03	100.00%	

Table A1-21 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+00	1.39E+00	82.22%	82.22%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137	1.96E-02	3.01E-01	17.78%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	100.00%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342			0.00%	100.00%
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589			0.00%	100.00%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					Total	1.69E+00	100.00%	

Table A1-22 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	grams	4.95E-03	1.96E-02	2.53E-01	100.00%	100.00%
CACs	Carbon monoxide	CO	6.05E+02	tonnes	1.66E+03			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes	6.31E+04			0.00%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes	2.80E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes	1.33E+03			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes	3.12E+02			0.00%	100.00%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes	2.44E+01			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes	1.48E+02			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg	6.85E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.53E-01	100.00%	

Table A1-23 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.60E-03	9.42E+02	43.68%	43.68%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01	1.11E-03	5.92E+02	27.48%	71.16%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	7.70E-03	4.63E+02	21.45%	92.61%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01	4.00E-03	8.22E+01	3.81%	96.43%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	1.00E-03	5.48E+01	2.54%	98.97%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	2.04E-01	1.69E+01	0.78%	99.75%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	8.33E-01	3.32E+00	0.15%	99.91%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	4.00E-01	7.26E-01	0.03%	99.94%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	1.90E+00	6.23E-01	0.03%	99.97%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+00	2.14E-01	0.01%	99.98%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	1.72E+01	1.63E-01	0.01%	99.99%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	1.70E+00	1.24E-01	0.01%	99.99%
Organics	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	4.00E+00	1.16E-01	0.01%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01	9.00E+00	2.13E-02	0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03	1.12E-01	1.22E-02	0.00%	100.00%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.35E+02	3.29E-03	0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04	3.23E+00	1.68E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04	3.23E+00	1.22E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02	3.23E+02	4.13E-05	0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03	3.23E+02	1.09E-05	0.00%	100.00%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00			0.00%	100.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	100.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	100.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	100.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	100.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	100.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	100.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	100.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	100.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	100.00%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01			0.00%	100.00%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01			0.00%	100.00%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01			0.00%	100.00%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00			0.00%	100.00%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01			0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01			0.00%	100.00%
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02			0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02			0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02			0.00%	100.00%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01			0.00%	100.00%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02			0.00%	100.00%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00			0.00%	100.00%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00			0.00%	100.00%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01			0.00%	100.00%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00			0.00%	100.00%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00			0.00%	100.00%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01			0.00%	100.00%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01			0.00%	100.00%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01			0.00%	100.00%
Organics	Phenol	Phenol	kg/year	2.90E+01	7.95E-02			0.00%	100.00%
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01			0.00%	100.00%

Table A1-23 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01			0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01			0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02			0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02			0.00%	100.00%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03			0.00%	100.00%
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04			0.00%	100.00%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03			0.00%	100.00%
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.16E+03	100.00%	

Table A1-24 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	7.70E-03	4.18E+01	39.35%	39.35%
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	1.90E+00	2.64E+01	24.86%	64.21%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	1.00E-03	1.47E+01	13.83%	78.04%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.60E-03	1.40E+01	13.17%	91.22%
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02	4.00E-03	3.75E+00	3.53%	94.74%
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03	1.11E-03	1.83E+00	1.72%	96.46%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+00	1.63E+00	1.54%	98.00%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	3.00E+00	8.43E-01	0.79%	98.79%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	4.00E+00	4.35E-01	0.41%	99.20%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	1.72E+01	4.28E-01	0.40%	99.61%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	2.94E-01	3.29E-01	0.31%	99.92%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	8.33E-01	4.68E-02	0.04%	99.96%
Organics	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	1.70E+00	1.36E-02	0.01%	99.97%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	9.09E-01	1.03E-02	0.01%	99.98%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05	2.00E-03	7.05E-03	0.01%	99.99%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04	3.20E-02	3.91E-03	0.00%	99.99%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03	3.23E-01	3.88E-03	0.00%	100.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04	3.23E-01	2.31E-03	0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03	3.23E+00	3.91E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03	3.23E+00	3.75E-04	0.00%	100.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04	3.23E+00	1.90E-04	0.00%	100.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04	3.23E+00	1.85E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02	3.23E+02	5.21E-05	0.00%	100.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03	3.23E+01	4.19E-05	0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04	3.23E+01	2.28E-05	0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03	3.23E+02	7.38E-06	0.00%	100.00%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02			0.00%	100.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	100.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	100.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	100.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	100.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	100.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	100.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	100.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	100.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	100.00%
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	100.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	100.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	100.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	100.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	100.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	100.00%
CACs	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03			0.00%	100.00%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01			0.00%	100.00%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01			0.00%	100.00%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	3.11E-01	3.00E-02	3.41E-01	3.41E+02			0.00%	100.00%
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03			0.00%	100.00%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02			0.00%	100.00%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00			0.00%	100.00%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01			0.00%	100.00%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01			0.00%	100.00%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01			0.00%	100.00%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00			0.00%	100.00%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01			0.00%	100.00%

Table A1-24 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02			0.00%	100.00%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01			0.00%	100.00%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03			0.00%	100.00%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01			0.00%	100.00%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00			0.00%	100.00%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00			0.00%	100.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02			0.00%	100.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03			0.00%	100.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	1.06E+02	100.00%	

Table A1-25 List of Chemicals Removed from the Toxic Potency Screening	
Chemical	**Reason**
PM_{10}	Represented by PM2.5
Total PM	
TSP	
Total GHGs e-CO2	No air quality guidelines available
H2O	Not revelant to health risk assessment
Heptachlorodibenzo-p-dioxins	2,3,7,8-TCDD was used as a surrogate chemical, as exposure limits are not available for dioxin and furan groups
Hexachlorodibenzo-*p*-dioxins	
Octachlorodibenzo-*p*-dioxins	
Pentachlorodibenzo-*p*-dioxins	
Tetrachlorodibenzo-*p*-dioxins	
Heptachlorodibenzofurans	
Hexachlorodibenzofurans	
Octachlorodibenzofurans	
Pentachlorodibenzofurans	
Tetrachlorodibenzofurans	
Total PCDD/PCDF	
Mercury (Hg(0) elemental) - gas	Represented in 'Mercury (total)'
Mercury (Hg(II) oxidized) - gas	
Mercury (particulate bound Hg(II))	
Nox as NO2 (assuming 3 ppm limit)	Nox as NO2 (assuming 6 ppm limit)' was selected instead in order to be more conservative, as it was the higher estimated emission rate
Particulate Mercury	Elemental Mercury' was selected instead in order to be more conservative, as it was the highest estimated emission rate of the 3 forms
Oxidized Mercury	

Table A1-26 Toxicity Reference Values Used in the Toxic Potency Screening				
Chemical Group	**Chemical**	**Acute**	**Chronic**	**Carcinogenic**
CACs	$PM_{2.5}$	2.70E+01	8.80E+00	
	SO_2	4.50E+02	2.00E+01	
	CO	1.50E+04		
	NO_2	3.00E+02	1.00E+02	
	PM_{10}			
	Total PM	1.00E+02	6.00E+01	7.69E-02
	VOC (no C1, C2)			
	TSP			
Dioxins and Furans	2,3,7,8-TCDD		3.00E-06	2.63E-07
	2,3,7,8-TCDF			2.63E-06
GHGs	CH_4			
	CO_2			
	N_2O (Nitrous Oxide)			
Hydrogen Halides	Hydrogen Chloride	7.50E+01	9.00E+00	
	Hydrogen Fluoride	4.90E+00	1.40E+01	
Metals	Aluminum		5.00E+00	
	Antimony			
	Arsenic	1.00E-01	1.00E-02	1.60E-03
	Barium		1.00E+00	
	Beryllium		7.00E-03	4.00E-03
	Boron	3.00E+02		
	Bromine	1.08E+02		
	Cadmium	3.00E-02	5.00E-03	1.00E-03
	Calcium			
	Chlorine	1.50E+01	1.50E-01	
	Chromium (III)	1.00E+00	1.40E-01	
	Chromium (VI)		1.00E-01	1.30E-04
	Cobalt		1.00E-01	1.11E-03
	Copper	1.00E+02	1.00E+00	
	Iron			
	Lead	1.50E+00	1.50E-01	8.33E-01
	Magnesium			
	Manganese	2.00E+00	2.00E-01	
	Mercury	6.00E-01	6.00E-02	
	Molybdenum		1.20E+01	
	Nickel	6.00E+00	5.00E-02	7.70E-03
	Phosphorus	2.00E+01		
	Potassium			
	Rubidium			
	Selenium		2.00E+01	
	Silicon			
	Silver		4.00E-01	
	Sodium			

	Strontium			
	Thallium			
	Thorium			
	Titanium		1.00E-01	
	Uranium		4.00E-02	
	Vanadium	8.00E-01	1.00E-01	
	Zinc	2.50E+02		
	Zirconium			
Organics	1,1,1-Trichloroethane	9.00E+03	1.00E+03	
	1,3-Butadiene	1.50E+01	2.00E+00	1.70E+00
	2,4-Dinitrotoluene			1.12E-01
	2-Chloroacetophenone		3.00E-02	
	2-Chloronaphthalene		1.00E+00	
	2-Methylfluorene			
	2-Methylnaphthalene			
	3-Methylcholanthrene			2.00E-03
	5-Methylchrysene			3.20E-01
	7,12-Dimethylbenz(a)anthracene			3.20E-02
	Acetaldehyde	9.00E+01	3.90E+02	1.72E+01
	Acetophenone			
	Acrolein	2.50E+00	4.00E-01	
	Benzaldehyde			
	Benzene	3.00E+01	3.00E+01	3.00E+00
	Benzyl Chloride (α-chlorotoluene)	2.40E+02	1.00E+00	2.04E-01
	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)			4.17E+00
	Bromoform (Tribromomethane)			9.00E+00
	Carbon Disulphide	3.00E+01	1.00E+02	
	Chlorobenzene	4.60E+04	1.00E+01	
	Chloroform (Trichloromethane)	1.50E+02	9.80E+01	4.00E-01
	Cyanide		2.50E+01	
	Dichlorobenzene	3.00E+03	9.50E+01	9.09E-01
	Dimethyl Sulphate	1.25E+02		
	Ethylbenzene	2.00E+03	1.00E+03	4.00E+00
	Ethyl Chloride (Chloroethane, Monochloroethane)	3.96E+04	1.00E+04	
	Ethylene Dibromide (1,2-Dibromoethane)	3.53E+04	9.30E+00	1.70E-02
	Ethylene Dichloride (1,2-Dichloroethane)	7.00E+02	7.00E+00	4.00E-01
	Formaldehyde	6.50E+01	9.00E+00	1.90E+00

	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)		5.00E+04	
	Hexachlorobenzene (Perchlorobenzene)			1.96E-02
	Hexane	7.00E+03	7.00E+02	
	Isophorone		2.00E+03	
	Isopropylbenzene (Cumene)	5.00E+02	4.00E+02	
	Methyl Bromide (Bromomethane)	1.94E+02	5.00E+00	
	Methyl Chloride (Chloromethane)	1.03E+03	9.00E+01	
	Methyl Ethyl Ketone (Butanone)	5.90E+04	5.00E+03	
	Methyl Hydrazine (Monomethylhydrazine)			
	Methyl Methacrylate	6.97E+04	7.00E+02	
	Methyl *tert*-Butyl Ether	7.21E+03	3.70E+01	3.85E+01
	Methylene Chloride (Dichloromethane)	4.50E+02	4.00E+02	4.35E+02
	Pentane	2.00E+05	1.00E+03	
	Phenol	1.00E+02	2.00E+01	
	Propane	9.90E+06		
	Propionaldehyde	1.10E+05	8.00E+00	
	Propylene (Propene, Methylethylene)		3.00E+03	
	Propylene Oxide	4.80E+02	3.00E+01	3.00E+00
	Styrene	2.15E+02	9.20E+01	
	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	1.36E+03	3.60E+02	1.70E+00
	Toluene	1.88E+03	3.80E+03	
	Total Aldehydes			
	Total Ketones			
	Total VOC			
	Vinyl Acetate	2.35E+04	2.00E+02	
	Xylenes	2.30E+03	1.80E+02	
Other	Hydrochloric Acid	7.50E+01	9.00E+00	
	NH3	1.40E+03	7.00E+01	
	Sulphuric Acid	1.00E+01	1.00E+00	
	Acenaphthene			
	Acenaphthylene			
	Anthracene			
	Benz(a)anthracene			3.23E+00
	Benzo(a)fluorene			
	Benzo(a)pyrene		3.00E-04	3.23E-01
	Benzo(b)fluoranthene			3.23E+00
	Benzo(j)fluoranthene			3.23E+00
	Benzo(k)fluoranthene			3.23E+00

PAHs	Benzo(e)pyrene			
	Benzo(g,h,i)perylene			3.23E+01
	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)			
	Chrysene			3.23E+01
	Dibenz(a,h)anthracene			3.23E-01
	Fluoranthene			3.23E+02
	Fluorene			
	Indeno(1,2,3-cd)pyrene			3.23E+00
	Naphthalene	2.00E+03	3.00E+00	2.94E-01
	Perylene (Perilene)			
	Phenanthrene			3.23E+02
	Pyrene			
	Total PAH			

Appendix A2
Toxic Potency
Screening
Without Criteria Air
Contaminants (CACs)

Acute Toxic Potency

Table A2-1 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02	4.90E+00	1.28E+02	88.26%	88.26%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00	1.00E+00	4.86E+00	3.35%	91.61%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.00E-01	4.74E+00	3.27%	94.88%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	3.00E-02	1.92E+00	1.32%	96.20%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00	2.00E+00	1.56E+00	1.08%	97.28%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01	7.50E+01	9.18E-01	0.63%	97.91%
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	6.00E+00	7.83E-01	0.54%	98.45%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	2.50E+00	7.54E-01	0.52%	98.97%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01	6.00E-01	4.84E-01	0.33%	99.31%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	1.50E+00	4.49E-01	0.31%	99.62%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+01	2.81E-01	0.19%	99.81%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02	6.00E-01	1.23E-01	0.09%	99.90%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	9.00E+01	4.12E-02	0.03%	99.92%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01	3.00E+01	2.81E-02	0.02%	99.94%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	6.50E+01	2.40E-02	0.02%	99.96%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	2.40E+02	1.89E-02	0.01%	99.97%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00	1.00E+02	1.68E-02	0.01%	99.98%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00	1.94E+02	5.35E-03	0.00%	99.99%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.50E+02	4.19E-03	0.00%	99.99%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00	1.03E+03	3.33E-03	0.00%	99.99%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	1.50E+02	2.56E-03	0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01	1.25E+02	2.50E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01	1.00E+02	1.04E-03	0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	1.88E+03	8.29E-04	0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01	2.15E+02	7.52E-04	0.00%	100.00%
	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	7.00E+02	3.72E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	2.00E+03	3.05E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	1.36E+03	2.06E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01	2.30E+03	1.05E-04	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02	5.00E+02	6.58E-05	0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01	7.00E+03	6.22E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00	5.90E+04	4.29E-05	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	7.21E+03	3.19E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00	1.10E+05	2.24E-05	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	9.00E+03	1.43E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01	3.96E+04	6.85E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01	4.60E+04	3.10E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02	2.35E+04	2.10E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	6.97E+04	1.85E-06	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	3.53E+04	2.33E-07	0.00%	100.00%
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04			0.00%	0.00%
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04			0.00%	0.00%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02			0.00%	0.00%
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	0.00%
Organics	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01			0.00%	0.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02			0.00%	0.00%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01			0.00%	0.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03			0.00%	0.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	0.00%
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02			0.00%	0.00%

Table A2-1 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	0.00%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01			0.00%	0.00%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02			0.00%	0.00%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01			0.00%	0.00%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00			0.00%	0.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	0.00%
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	1.45E+02	100.00%	

Table A2-2 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02	4.90E+00	9.47E+01	57.05%	57.05%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03	7.50E+01	4.96E+01	29.88%	86.93%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.00E-01	1.27E+01	7.66%	94.58%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	3.00E-02	5.29E+00	3.19%	97.77%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	1.50E+00	8.69E-01	0.52%	98.30%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01	1.00E+00	8.05E-01	0.49%	98.78%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00	2.00E+00	7.61E-01	0.46%	99.24%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00	2.50E+00	5.18E-01	0.31%	99.55%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02	1.40E+03	1.54E-01	0.09%	99.64%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	6.00E+00	1.45E-01	0.09%	99.73%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+01	1.45E-01	0.09%	99.82%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02	6.00E-01	1.41E-01	0.08%	99.90%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	9.00E+01	7.38E-02	0.04%	99.95%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	6.50E+01	5.16E-02	0.03%	99.98%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01	3.00E+01	1.34E-02	0.01%	99.99%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	2.40E+02	9.08E-03	0.01%	99.99%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01	1.94E+02	2.55E-03	0.00%	99.99%
Organics	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	1.50E+01	2.41E-03	0.00%	99.99%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.50E+02	2.00E-03	0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00	1.03E+03	1.59E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	1.50E+02	1.22E-03	0.00%	100.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01	1.25E+02	1.19E-03	0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00	1.88E+03	6.43E-04	0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02	1.00E+02	4.95E-04	0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02	2.15E+02	3.60E-04	0.00%	100.00%
	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01	2.30E+03	2.11E-04	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	7.00E+02	1.77E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	2.00E+03	1.73E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	1.36E+03	9.80E-05	0.00%	100.00%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	2.00E+03	5.62E-05	0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01	7.00E+03	3.35E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02	5.00E+02	3.28E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00	5.90E+04	2.05E-05	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert* -Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	7.21E+03	1.50E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00	1.10E+05	1.07E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	9.00E+03	6.88E-06	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01	3.96E+04	3.28E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02	4.60E+04	1.48E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02	2.35E+04	1.00E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	6.97E+04	8.88E-07	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	3.53E+04	1.05E-07	0.00%	100.00%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04			0.00%	0.00%
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02			0.00%	0.00%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03			0.00%	0.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	0.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	0.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	0.00%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08			0.00%	0.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07			0.00%	0.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	0.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	0.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	0.00%
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04			0.00%	0.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04			0.00%	0.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04			0.00%	0.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05			0.00%	0.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	0.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02			0.00%	0.00%

Table A2-2 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	0.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05			0.00%	0.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	0.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01			0.00%	0.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02			0.00%	0.00%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00			0.00%	0.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04			0.00%	0.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	0.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	0.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	0.00%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02			0.00%	0.00%
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01			0.00%	0.00%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01			0.00%	0.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	0.00%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	1.66E+02	100.00%	

Table A2-3 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02	4.90E+00	5.04E+01	79.26%	79.26%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02	7.50E+01	4.89E+00	7.69%	86.95%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	3.00E-02	2.61E+00	4.10%	91.05%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00	2.00E+00	2.15E+00	3.37%	94.42%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.00E-01	2.14E+00	3.36%	97.78%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	2.50E+00	4.77E-01	0.75%	98.53%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01	1.00E+00	3.39E-01	0.53%	99.06%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+01	1.78E-01	0.28%	99.34%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02	6.00E-01	1.22E-01	0.19%	99.53%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	6.00E+00	1.04E-01	0.16%	99.70%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	1.50E+00	9.97E-02	0.16%	99.85%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	9.00E+01	2.60E-02	0.04%	99.89%
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01	3.00E+01	1.78E-02	0.03%	99.92%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	6.50E+01	1.52E-02	0.02%	99.95%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	2.40E+02	1.20E-02	0.02%	99.97%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01	1.00E+02	8.26E-03	0.01%	99.98%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01	1.94E+02	3.39E-03	0.01%	99.98%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.50E+02	2.65E-03	0.00%	99.99%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00	1.03E+03	2.11E-03	0.00%	99.99%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	1.50E+02	1.62E-03	0.00%	99.99%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01	1.25E+02	1.58E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02	1.00E+02	6.57E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	1.88E+03	5.24E-04	0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01	2.15E+02	4.78E-04	0.00%	100.00%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	7.00E+02	2.35E-04	0.00%	100.00%
	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	2.00E+03	1.93E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	1.36E+03	1.30E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01	2.30E+03	6.61E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02	5.00E+02	4.36E-05	0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01	7.00E+03	3.93E-05	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00	5.90E+04	2.72E-05	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	7.21E+03	1.99E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00	1.10E+05	1.42E-05	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	9.00E+03	9.13E-06	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01	3.96E+04	4.36E-06	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02	4.60E+04	1.96E-06	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02	2.35E+04	1.33E-06	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	6.97E+04	1.18E-06	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	3.53E+04	1.40E-07	0.00%	100.00%
CACs	Nox	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04			0.00%	0.00%
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03			0.00%	0.00%
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02			0.00%	0.00%
Metals	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	0.00%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01			0.00%	0.00%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01			0.00%	0.00%
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01			0.00%	0.00%
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01			0.00%	0.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	0.00%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03			0.00%	0.00%
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	0.00%
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01			0.00%	0.00%

Table A2-3 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01			0.00%	0.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02			0.00%	0.00%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01			0.00%	0.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03			0.00%	0.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	6.36E+01	100.00%	

Table A2-4 Estimated Emissions from TransAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03	4.90E+00	1.91E+03	98.44%	98.44%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03	7.50E+01	1.56E+01	0.80%	99.24%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01	1.00E+01	6.03E+00	0.31%	99.55%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.00E-01	2.47E+00	0.13%	99.68%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	3.00E-02	1.64E+00	0.08%	99.77%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00	8.00E-01	1.48E+00	0.08%	99.84%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00	1.00E+00	1.39E+00	0.07%	99.91%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00	2.00E+00	7.97E-01	0.04%	99.95%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	1.50E+00	4.18E-01	0.02%	99.98%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01	6.00E-01	2.28E-01	0.01%	99.99%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	6.00E+00	1.98E-01	0.01%	100.00%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01	1.40E+03	2.15E-02	0.00%	100.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00	2.50E+02	9.98E-03	0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01	1.88E+03	7.92E-03	0.00%	100.00%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01	1.00E+02	5.34E-03	0.00%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01	7.00E+03	3.48E-03	0.00%	100.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00	9.90E+06	5.45E-07	0.00%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03			0.00%	100.00%
CACs	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03			0.00%	100.00%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02			0.00%	100.00%
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01			0.00%	100.00%
Metals	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01			0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01			0.00%	100.00%
	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	1.94E+03	100.00%	

Table A2-5 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726	4.90E+00	5.31E+01	89.01%	89.01%
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233	1.00E+01	3.29E+00	5.51%	94.52%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082	7.50E+01	2.96E+00	4.96%	99.47%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589	6.00E-01	1.74E-01	0.29%	99.76%
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+01	1.39E-01	0.23%	100.00%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726	2.00E+00	1.37E-03	0.00%	100.00%
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342			0.00%	0.00%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986			0.00%	0.00%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945			0.00%	0.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137			0.00%	0.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	5.97E+01	100.00%	

Table A2-6 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes/year	1.48E+02	4.90E+00	3.02E+01	81.80%	81.80%
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes/year	3.12E+02	7.50E+01	4.16E+00	11.28%	93.08%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes/year	2.44E+01	1.00E+01	2.44E+00	6.61%	99.69%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg/year	6.85E-02	6.00E-01	1.14E-01	0.31%	100.00%
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes/year	6.31E+04			0.00%	0.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes/year	2.80E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes/year	1.33E+03			0.00%	0.00%
CACs	Carbon monoxide	CO	6.05E+02	tonnes/year	1.66E+03			0.00%	0.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	g/year	4.95E-03			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.69E+01	100.00%	

Table A2-7 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.00E-01	1.51E+01	39.69%	39.69%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00	1.00E+00	5.89E+00	15.52%	55.21%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00	8.00E-01	4.69E+00	12.36%	67.57%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00	2.00E+00	3.25E+00	8.55%	76.12%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	1.50E+00	1.84E+00	4.86%	80.98%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	3.00E-02	1.83E+00	4.81%	85.79%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01	1.50E+01	1.41E+00	3.72%	89.51%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01	2.00E+01	1.15E+00	3.03%	92.55%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01	6.00E-01	1.10E+00	2.89%	95.43%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	6.00E+00	5.94E-01	1.56%	97.00%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00	2.50E+00	5.72E-01	1.51%	98.50%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01	1.08E+02	4.12E-01	1.08%	99.59%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	9.00E+01	3.12E-02	0.08%	99.67%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00	1.00E+02	2.63E-02	0.07%	99.74%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.06%	99.80%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.06%	99.85%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	6.50E+01	1.82E-02	0.05%	99.90%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	2.40E+02	1.44E-02	0.04%	99.94%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00	2.50E+02	1.35E-02	0.04%	99.97%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.50E+02	3.18E-03	0.01%	99.98%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	1.50E+02	1.94E-03	0.01%	99.99%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01	1.25E+02	1.88E-03	0.00%	99.99%
Organics	Phenol	Phenol	kg/year	2.90E+01	7.95E-02	1.00E+02	7.95E-04	0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00	1.88E+03	6.30E-04	0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01	2.15E+02	5.73E-04	0.00%	100.00%
	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	2.00E+03	2.32E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	1.36E+03	1.56E-04	0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01	2.30E+03	7.98E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02	5.00E+02	5.48E-05	0.00%	100.00%
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01	7.00E+03	4.74E-05	0.00%	100.00%
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00	5.90E+04	3.26E-05	0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00	1.10E+05	1.70E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02	9.00E+03	1.10E-05	0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01	4.60E+04	2.38E-06	0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02	2.35E+04	1.64E-06	0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02	6.97E+04	1.42E-06	0.00%	100.00%
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04			0.00%	0.00%
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04			0.00%	0.00%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03			0.00%	0.00%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03			0.00%	0.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01			0.00%	0.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03			0.00%	0.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	0.00%
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	0.00%

Table A2-7 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	0.00%
PAHs	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04			0.00%	0.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02			0.00%	0.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	0.00%
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02			0.00%	0.00%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01			0.00%	0.00%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01			0.00%	0.00%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01			0.00%	0.00%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01			0.00%	0.00%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02			0.00%	0.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	0.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	0.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	0.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	0.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	0.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	0.00%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	3.80E+01	100.00%	

Table A2-8 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	6.50E+01	7.72E-01	27.33%	27.33%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	3.00E-02	4.90E-01	17.34%	44.66%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00	2.50E+00	4.56E-01	16.13%	60.80%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02	1.40E+03	3.12E-01	11.04%	71.84%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.00E-01	2.24E-01	7.93%	79.77%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+01	1.63E-01	5.78%	85.55%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01	2.00E+00	1.37E-01	4.85%	90.40%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	9.00E+01	8.18E-02	2.89%	93.29%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02	1.00E+00	7.59E-02	2.69%	95.98%
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	6.00E+00	5.37E-02	1.90%	97.87%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	1.50E+00	2.60E-02	0.92%	98.79%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03	8.00E-01	1.05E-02	0.37%	99.17%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	4.80E+02	5.27E-03	0.19%	99.35%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01	7.00E+03	3.97E-03	0.14%	99.49%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00	1.88E+03	3.87E-03	0.14%	99.63%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01	3.00E+02	3.14E-03	0.11%	99.74%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01	1.00E+02	1.78E-03	0.06%	99.80%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00	2.30E+03	1.55E-03	0.05%	99.86%
Organics	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	1.50E+01	1.55E-03	0.05%	99.91%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01	2.50E+02	1.40E-03	0.05%	99.96%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	2.00E+03	8.70E-04	0.03%	99.99%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01	2.00E+05	1.02E-04	0.00%	100.00%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	2.00E+03	4.83E-05	0.00%	100.00%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	3.00E+03	3.13E-06	0.00%	100.00%
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03			0.00%	0.00%
	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03			0.00%	0.00%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01			0.00%	0.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	0.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05			0.00%	0.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	0.00%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05			0.00%	0.00%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04			0.00%	0.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	0.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	0.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	0.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03			0.00%	0.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04			0.00%	0.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04			0.00%	0.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	0.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04			0.00%	0.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04			0.00%	0.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03			0.00%	0.00%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	0.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03			0.00%	0.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02			0.00%	0.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	0.00%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00			0.00%	0.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	0.00%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01			0.00%	0.00%
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02			0.00%	0.00%

Table A2-8 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Acute TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03			0.00%	0.00%
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	0.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	0.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03			0.00%	0.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	0.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02			0.00%	0.00%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01			0.00%	0.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	0.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	0.00%
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02			0.00%	0.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	2.83E+00	100.00%	

Chronic Toxic Potency

Table A2-9 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02	5.00E+00	1.14E+02	22.34%	22.34%
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	5.00E-02	9.40E+01	18.37%	40.71%
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00	4.00E-02	6.10E+01	11.91%	52.62%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01	1.00E+00	4.74E+01	9.27%	61.89%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.00E-02	4.74E+01	9.26%	71.15%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02	1.40E+01	4.48E+01	8.75%	79.90%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00	1.40E-01	3.47E+01	6.78%	86.68%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00	2.00E-01	1.56E+01	3.05%	89.73%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	5.00E-03	1.15E+01	2.25%	91.98%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01	9.00E+00	7.65E+00	1.49%	93.47%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02	7.00E-03	6.26E+00	1.22%	94.70%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01	6.00E-02	4.84E+00	0.95%	95.64%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.00E-01	4.71E+00	0.92%	96.56%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	1.00E+00	4.55E+00	0.89%	97.45%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	1.50E-01	4.49E+00	0.88%	98.33%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01	1.00E-01	2.11E+00	0.41%	98.74%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00	1.00E+00	1.68E+00	0.33%	99.07%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02	3.00E-02	1.55E+00	0.30%	99.37%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02	6.00E-02	1.23E+00	0.24%	99.61%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01	2.50E+01	6.50E-01	0.13%	99.74%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00	8.00E+00	3.09E-01	0.06%	99.80%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+01	2.81E-01	0.06%	99.86%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00	5.00E+00	2.08E-01	0.04%	99.90%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00	2.00E+01	1.92E-01	0.04%	99.93%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	9.00E+00	1.73E-01	0.03%	99.97%
	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00	9.00E+01	3.82E-02	0.01%	99.98%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	7.00E+00	3.72E-02	0.01%	99.98%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08	3.00E-06	2.74E-02	0.01%	99.99%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01	1.00E+01	1.42E-02	0.00%	99.99%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	3.90E+02	9.50E-03	0.00%	99.99%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01	1.00E+02	8.44E-03	0.00%	99.99%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	3.70E+01	6.22E-03	0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01	2.00E+01	5.21E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.00E+02	4.71E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	9.80E+01	3.91E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00	2.00E+03	1.88E-03	0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01	9.20E+01	1.76E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01	1.80E+02	1.34E-03	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	9.30E+00	8.84E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	3.60E+02	7.76E-04	0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01	7.00E+02	6.22E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	1.00E+03	6.11E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00	5.00E+03	5.06E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	3.80E+03	4.10E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02	2.00E+02	2.47E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	7.00E+02	1.84E-04	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01	1.00E+03	1.29E-04	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02	4.00E+02	8.22E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01	1.00E+04	2.71E-05	0.00%	100.00%
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04			0.00%	0.00%
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04			0.00%	0.00%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02			0.00%	0.00%

Table A2-9 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	0.00%
Organics	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01			0.00%	0.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	0.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01			0.00%	0.00%
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	0.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	5.12E+02	100.00%	

Table A2-10 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03	9.00E+00	4.13E+02	61.50%	61.50%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.00E-02	1.27E+02	18.91%	80.41%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02	1.40E+01	3.31E+01	4.93%	85.34%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	5.00E-03	3.17E+01	4.72%	90.06%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	5.00E-02	1.74E+01	2.59%	92.65%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02	7.00E-03	9.29E+00	1.38%	94.03%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	1.50E-01	8.69E+00	1.29%	95.32%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00	2.00E-01	7.61E+00	1.13%	96.46%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01	1.40E-01	5.75E+00	0.86%	97.31%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00	4.00E-01	3.24E+00	0.48%	97.79%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01	1.00E-01	3.10E+00	0.46%	98.26%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02	7.00E+01	3.09E+00	0.46%	98.71%
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01	1.00E-01	2.45E+00	0.36%	99.08%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	1.00E+00	2.18E+00	0.32%	99.40%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02	6.00E-02	1.41E+00	0.21%	99.61%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02	3.00E-02	7.23E-01	0.11%	99.72%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04	3.00E-04	4.56E-01	0.07%	99.79%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	9.00E+00	3.73E-01	0.06%	99.84%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00	2.50E+01	3.10E-01	0.05%	99.89%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00	2.00E+01	2.01E-01	0.03%	99.92%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00	8.00E+00	1.48E-01	0.02%	99.94%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+01	1.45E-01	0.02%	99.96%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01	5.00E+00	9.90E-02	0.01%	99.98%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	3.00E+00	3.74E-02	0.01%	99.98%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00	9.00E+01	1.82E-02	0.00%	99.99%
	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	2.00E+00	1.81E-02	0.00%	99.99%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	7.00E+00	1.77E-02	0.00%	99.99%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	3.90E+02	1.70E-02	0.00%	99.99%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08	3.00E-06	1.48E-02	0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02	1.00E+01	6.81E-03	0.00%	100.00%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01	1.00E+02	4.02E-03	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert* -Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	3.70E+01	2.92E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01	1.80E+02	2.69E-03	0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02	2.00E+01	2.48E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.00E+02	2.25E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	9.80E+01	1.87E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00	2.00E+03	9.00E-04	0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02	9.20E+01	8.41E-04	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	9.30E+00	4.00E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	3.60E+02	3.69E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	1.00E+03	3.46E-04	0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01	7.00E+02	3.35E-04	0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00	3.80E+03	3.18E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00	5.00E+03	2.42E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02	2.00E+02	1.18E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	7.00E+02	8.84E-05	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02	1.00E+03	6.19E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02	4.00E+02	4.10E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01	1.00E+04	1.30E-05	0.00%	100.00%
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04			0.00%	0.00%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02			0.00%	0.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	0.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	0.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	0.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07			0.00%	0.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	0.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	0.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	0.00%

Table A2-10 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04			0.00%	0.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04			0.00%	0.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05			0.00%	0.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	0.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02			0.00%	0.00%
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	0.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05			0.00%	0.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	0.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01			0.00%	0.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	0.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	0.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	0.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	0.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01			0.00%	0.00%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	6.72E+02	100.00%	

Table A2-11 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02	5.00E+00	7.23E+01	26.89%	26.89%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02	9.00E+00	4.08E+01	15.17%	42.05%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01	1.00E+00	3.21E+01	11.95%	54.00%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00	2.00E-01	2.15E+01	7.98%	61.98%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.00E-02	2.14E+01	7.95%	69.93%
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02	1.40E+01	1.76E+01	6.57%	76.49%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	5.00E-03	1.56E+01	5.82%	82.31%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01	7.00E-03	1.53E+01	5.71%	88.02%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	5.00E-02	1.25E+01	4.66%	92.68%
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01	1.00E-01	3.54E+00	1.32%	94.00%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.00E-01	2.98E+00	1.11%	95.11%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	1.00E+00	2.88E+00	1.07%	96.18%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01	4.00E-02	2.72E+00	1.01%	97.19%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01	1.40E-01	2.42E+00	0.90%	98.09%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02	6.00E-02	1.22E+00	0.45%	98.54%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	1.50E-01	9.97E-01	0.37%	98.91%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02	3.00E-02	9.59E-01	0.36%	99.27%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01	1.00E+00	8.26E-01	0.31%	99.58%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01	2.50E+01	4.11E-01	0.15%	99.73%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00	8.00E+00	1.95E-01	0.07%	99.80%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+01	1.78E-01	0.07%	99.87%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01	5.00E+00	1.31E-01	0.05%	99.92%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	9.00E+00	1.10E-01	0.04%	99.96%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00	9.00E+01	2.42E-02	0.01%	99.97%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	7.00E+00	2.35E-02	0.01%	99.98%
	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08	3.00E-06	1.83E-02	0.01%	99.98%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02	1.00E+01	9.04E-03	0.00%	99.99%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	3.90E+02	6.00E-03	0.00%	99.99%
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01	1.00E+02	5.34E-03	0.00%	99.99%
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01	2.00E+01	5.11E-03	0.00%	99.99%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	3.70E+01	3.89E-03	0.00%	99.99%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02	2.00E+01	3.29E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.00E+02	2.98E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	9.80E+01	2.47E-03	0.00%	100.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00	2.00E+03	1.19E-03	0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01	9.20E+01	1.12E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01	1.80E+02	8.44E-04	0.00%	100.00%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	9.30E+00	5.30E-04	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	3.60E+02	4.91E-04	0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01	7.00E+02	3.93E-04	0.00%	100.00%
Organics	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	1.00E+03	3.86E-04	0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00	5.00E+03	3.20E-04	0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	3.80E+03	2.59E-04	0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02	2.00E+02	1.56E-04	0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	7.00E+02	1.17E-04	0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02	1.00E+03	8.22E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02	4.00E+02	5.45E-05	0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01	1.00E+04	1.73E-05	0.00%	100.00%
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04			0.00%	0.00%
CACs	NOx	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03			0.00%	0.00%
Metals	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	0.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03			0.00%	0.00%
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	0.00%

Table A2-11 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	0.00%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01			0.00%	0.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03			0.00%	0.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	0.00%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07			0.00%	0.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	2.69E+02	100.00%	

Table A2-12 Estimated Emissions from TransAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03	1.40E+01	6.69E+02	69.56%	69.56%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03	9.00E+00	1.30E+02	13.51%	83.07%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01	1.00E+00	6.03E+01	6.27%	89.33%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.00E-02	2.47E+01	2.56%	91.90%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	5.00E-02	2.37E+01	2.47%	94.36%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00	1.00E-01	1.19E+01	1.23%	95.60%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00	1.40E-01	9.92E+00	1.03%	96.63%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	5.00E-03	9.86E+00	1.03%	97.65%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00	2.00E-01	7.97E+00	0.83%	98.48%
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01	1.00E-01	6.16E+00	0.64%	99.12%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	1.50E-01	4.18E+00	0.43%	99.56%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01	6.00E-02	2.28E+00	0.24%	99.80%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02	1.00E-01	9.59E-01	0.10%	99.89%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01	1.00E+00	5.34E-01	0.06%	99.95%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01	7.00E+01	4.31E-01	0.04%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01	7.00E+02	3.48E-02	0.00%	100.00%
Metals	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01	2.00E+01	7.95E-03	0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01	3.80E+03	3.92E-03	0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01	5.00E+04	3.18E-06	0.00%	100.00%
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04			0.00%	0.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03			0.00%	0.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03			0.00%	0.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	0.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00			0.00%	0.00%
	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03			0.00%	0.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	9.62E+02	100.00%	

Table A2-13 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233	1.00E+00	3.29E+01	42.14%	42.14%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082	9.00E+00	2.47E+01	31.61%	73.75%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726	1.40E+01	1.86E+01	23.83%	97.58%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589	6.00E-02	1.74E+00	2.22%	99.80%
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+01	1.39E-01	0.18%	99.98%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726	2.00E-01	1.37E-02	0.02%	100.00%
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342			0.00%	0.00%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986			0.00%	0.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137			0.00%	0.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	0.00%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	7.80E+01	100.00%	

Table A2-14 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes/year	3.12E+02	9.00E+00	3.47E+01	49.02%	49.02%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes/year	2.44E+01	1.00E+00	2.44E+01	34.44%	83.46%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes/year	1.48E+02	1.40E+01	1.06E+01	14.93%	98.39%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg/year	6.85E-02	6.00E-02	1.14E+00	1.61%	100.00%
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes/year	6.31E+04			0.00%	0.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes/year	2.80E+04			0.00%	0.00%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes/year	1.33E+03			0.00%	0.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	g/year	4.95E-03			0.00%	0.00%
CACs	Carbon monoxide	CO	6.05E+02	tonnes/year	1.66E+03			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	7.08E+01	100.00%	

Table A2-15 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02	1.00E+00	3.21E+02	29.49%	29.49%
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.00E-02	1.51E+02	13.85%	43.34%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01	1.50E-01	1.41E+02	12.98%	56.32%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01	1.00E-01	1.15E+02	10.55%	66.87%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02	5.00E+00	7.30E+01	6.71%	73.58%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	5.00E-02	7.12E+01	6.55%	80.13%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01	7.00E-03	4.70E+01	4.32%	84.45%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00	1.40E-01	4.21E+01	3.87%	88.32%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00	1.00E-01	3.75E+01	3.45%	91.77%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00	2.00E-01	3.25E+01	2.98%	94.75%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	1.50E-01	1.84E+01	1.70%	96.45%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01	6.00E-02	1.10E+01	1.01%	97.45%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	5.00E-03	1.10E+01	1.01%	98.46%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01	1.00E-01	6.58E+00	0.60%	99.07%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00	4.00E-01	3.58E+00	0.33%	99.39%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	1.00E+00	3.45E+00	0.32%	99.71%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00	1.00E+00	2.63E+00	0.24%	99.95%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00	8.00E+00	2.34E-01	0.02%	99.97%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	9.00E+00	1.32E-01	0.01%	99.99%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01	1.20E+01	6.85E-02	0.01%	99.99%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+01	2.14E-02	0.00%	99.99%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01	2.00E+01	1.64E-02	0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01	1.00E+01	1.10E-02	0.00%	100.00%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	3.90E+02	7.21E-03	0.00%	100.00%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01	1.00E+02	6.41E-03	0.00%	100.00%
	Phenol	Phenol	kg/year	2.90E+01	7.95E-02	2.00E+01	3.97E-03	0.00%	100.00%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.00E+02	3.58E-03	0.00%	100.00%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	9.80E+01	2.96E-03	0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01	9.20E+01	1.34E-03	0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01	1.80E+02	1.02E-03	0.00%	100.00%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	3.60E+02	5.86E-04	0.00%	100.00%
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01	7.00E+02	4.74E-04	0.00%	100.00%
Organics	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	1.00E+03	4.63E-04	0.00%	100.00%
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00	5.00E+03	3.85E-04	0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00	3.80E+03	3.11E-04	0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02	2.00E+02	1.92E-04	0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02	7.00E+02	1.41E-04	0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02	1.00E+03	9.86E-05	0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02	4.00E+02	6.85E-05	0.00%	100.00%
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04			0.00%	0.00%
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04			0.00%	0.00%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03			0.00%	0.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	0.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01			0.00%	0.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03			0.00%	0.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	0.00%
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	0.00%
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	0.00%

Table A2-15 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
PAHs	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04			0.00%	0.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02			0.00%	0.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	0.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	0.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	0.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	0.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	0.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	0.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	0.00%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01			0.00%	0.00%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01			0.00%	0.00%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01			0.00%	0.00%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00			0.00%	0.00%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	1.09E+03	100.00%	

Table A2-16 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	5.00E-02	6.44E+00	17.56%	17.56%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02	7.00E+01	6.24E+00	17.02%	34.59%
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	9.00E+00	5.58E+00	15.21%	49.80%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	5.00E-03	2.94E+00	8.02%	57.81%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00	4.00E-01	2.85E+00	7.77%	65.59%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04	3.00E-04	2.48E+00	6.77%	72.36%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.00E-02	2.24E+00	6.11%	78.47%
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02	7.00E-03	2.14E+00	5.84%	84.31%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01	4.00E-01	1.62E+00	4.42%	88.73%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01	2.00E-01	1.37E+00	3.74%	92.46%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00	5.00E+00	8.30E-01	2.26%	94.73%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02	1.40E-01	5.42E-01	1.48%	96.20%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	1.50E-01	2.60E-01	0.71%	96.91%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01	1.00E+00	2.29E-01	0.62%	97.54%
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02	1.00E-01	2.25E-01	0.61%	98.15%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01	1.00E+00	1.78E-01	0.49%	98.64%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+01	1.63E-01	0.45%	99.08%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	3.00E+01	8.43E-02	0.23%	99.31%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03	1.00E-01	8.41E-02	0.23%	99.54%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01	7.00E+02	3.97E-02	0.11%	99.65%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	3.00E+00	3.22E-02	0.09%	99.74%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01	1.00E+03	2.03E-02	0.06%	99.79%
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03	1.00E-01	2.03E-02	0.06%	99.85%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00	1.80E+02	1.98E-02	0.05%	99.90%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	3.90E+02	1.89E-02	0.05%	99.95%
	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	2.00E+00	1.16E-02	0.03%	99.99%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00	3.80E+03	1.91E-03	0.01%	99.99%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	1.00E+03	1.74E-03	0.00%	100.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02	2.00E+01	1.21E-03	0.00%	100.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03	1.20E+01	3.29E-04	0.00%	100.00%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	9.50E+01	9.88E-05	0.00%	100.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05	1.00E+00	1.44E-05	0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	3.11E-01	3.00E-02	3.41E-01	3.41E+02			0.00%	0.00%
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03			0.00%	0.00%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01			0.00%	0.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	0.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	0.00%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05			0.00%	0.00%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04			0.00%	0.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	0.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	0.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	0.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	0.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03			0.00%	0.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04			0.00%	0.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	0.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04			0.00%	0.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04			0.00%	0.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03			0.00%	0.00%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03			0.00%	0.00%
PAHs	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03			0.00%	0.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	0.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03			0.00%	0.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	0.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02			0.00%	0.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	0.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	0.00%

Table A2-16 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Chronic TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	0.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	0.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	0.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	0.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	0.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	0.00%
CACs	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03			0.00%	0.00%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01			0.00%	0.00%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01			0.00%	0.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	3.67E+01	100.00%	

Cancer Toxic Potency

Table A2-17 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Nickle oxide	Nickel	1.17E+03	5.44E+02	1.72E+03	kg/year	4.70E+00	7.70E-03	6.10E+02	51.07%	51.07%
Metals	Arsenic oxide	Arsenic	1.13E+02	6.00E+01	1.73E+02	kg/year	4.74E-01	1.60E-03	2.96E+02	24.79%	75.86%
Metals	Cobalt oxide	Cobalt	4.60E+01	3.10E+01	7.70E+01	kg/year	2.11E-01	1.11E-03	1.90E+02	15.90%	91.76%
Metals	Cadmium oxide	Cadmium	1.70E+01	4.00E+00	2.10E+01	kg/year	5.75E-02	1.00E-03	5.75E+01	4.81%	96.58%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.09E+03	5.70E+02	1.66E+03	kg/year	4.55E+00	2.04E-01	2.23E+01	1.86%	98.44%
Metals	Beryllium oxide	Beryllium	1.00E+01	6.00E+00	1.60E+01	kg/year	4.38E-02	4.00E-03	1.10E+01	0.92%	99.36%
Organics	Benzene	Benzene	2.02E+03	1.06E+03	3.08E+03	kg/year	8.44E+00	3.00E+00	2.81E+00	0.24%	99.59%
Organics	Chloroform	Chloroform (Trichloromethane)	9.20E+01	4.80E+01	1.40E+02	kg/year	3.84E-01	4.00E-01	9.59E-01	0.08%	99.67%
Organics	Formaldehyde	Formaldehyde	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00	1.90E+00	8.20E-01	0.07%	99.74%
Metals	Lead oxide	Lead	1.54E+02	9.20E+01	2.46E+02	kg/year	6.74E-01	8.33E-01	8.09E-01	0.07%	99.81%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	6.20E+01	3.30E+01	9.50E+01	kg/year	2.60E-01	4.00E-01	6.51E-01	0.05%	99.86%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03	1.70E-02	4.83E-01	0.04%	99.90%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	1.00E-02	3.00E-02	g/year	8.22E-08	2.63E-07	3.12E-01	0.03%	99.93%
Organics	Acetaldehyde	Acetaldehyde	8.88E+02	4.64E+02	1.35E+03	kg/year	3.70E+00	1.72E+01	2.15E-01	0.02%	99.95%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.70E+01	3.50E+01	1.02E+02	kg/year	2.79E-01	1.70E+00	1.64E-01	0.01%	99.96%
Organics	Ethyl Benzene	Ethylbenzene	1.46E+02	7.70E+01	2.23E+02	kg/year	6.11E-01	4.00E+00	1.53E-01	0.01%	99.98%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	4.00E-02	1.20E-01	g/year	3.29E-07	2.63E-06	1.25E-01	0.01%	99.99%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.14E+02	5.90E+01	1.73E+02	kg/year	4.74E-01	4.17E+00	1.14E-01	0.01%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	6.10E+01	3.20E+01	9.30E+01	kg/year	2.55E-01	9.00E+00	2.83E-02	0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.00E-01	2.00E-01	6.00E-01	kg/year	1.64E-03	1.12E-01	1.46E-02	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.50E+01	2.90E+01	8.40E+01	kg/year	2.30E-01	3.85E+01	5.98E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00	4.35E+02	4.33E-03	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.50E+00	1.30E+00	3.80E+00	kg/year	1.04E-02	3.23E+02	3.23E-05	0.00%	100.00%
Metals	Chromium trioxide	Chromium (III)	1.11E+03	6.62E+02	1.77E+03	kg/year	4.86E+00			0.00%	100.00%
PAHs	2-methyl-fluorene	2-Methylfluorene	3.00E+00	1.60E+00	4.60E+00	kg/year	1.26E-02			0.00%	100.00%
	Acetophenone	Acetophenone	2.30E+01	1.20E+01	3.50E+01	kg/year	9.59E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.65E+02	1.38E+02	4.03E+02	kg/year	1.10E+00			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.50E+01	3.90E+01	1.14E+02	kg/year	3.12E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.10E+01	6.00E+00	1.70E+01	kg/year	4.66E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.49E+02	1.30E+02	3.79E+02	kg/year	1.04E+00			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	8.25E+02	4.31E+02	1.26E+03	kg/year	3.44E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.40E+01	1.80E+01	5.20E+01	kg/year	1.42E-01			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.20E+01	6.00E+00	1.80E+01	kg/year	4.93E-02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.50E+01	3.40E+01	9.90E+01	kg/year	2.71E-01			0.00%	100.00%
Organics	Cyanide	Cyanide	3.89E+03	2.03E+03	5.93E+03	kg/year	1.62E+01			0.00%	100.00%
Organics	Acrolein	Acrolein	4.52E+02	2.36E+02	6.88E+02	kg/year	1.88E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.92E+02	3.09E+02	9.01E+02	kg/year	2.47E+00			0.00%	100.00%
Organics	Carbon Disulphide	Carbon Disulphide	2.02E+02	1.06E+02	3.08E+02	kg/year	8.44E-01			0.00%	100.00%
Organics	Phenol	Phenol	2.50E+01	1.30E+01	3.80E+01	kg/year	1.04E-01			0.00%	100.00%
Organics	Isophorone	Isophorone	9.03E+02	4.72E+02	1.38E+03	kg/year	3.77E+00			0.00%	100.00%
Organics	Hexane	Hexane	1.04E+02	5.50E+01	1.59E+02	kg/year	4.36E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	6.07E+02	3.17E+02	9.24E+02	kg/year	2.53E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	5.80E+01	3.00E+01	8.80E+01	kg/year	2.41E-01			0.00%	100.00%
Organics	Styrene	Styrene	3.90E+01	2.00E+01	5.90E+01	kg/year	1.62E-01			0.00%	100.00%
Organics	Toluene	Toluene	3.74E+02	1.95E+02	5.69E+02	kg/year	1.56E+00			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	8.00E+00	4.00E+00	1.20E+01	kg/year	3.29E-02			0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	3.10E+01	1.60E+01	4.70E+01	kg/year	1.29E-01			0.00%	100.00%
Metals	Antimony oxide	Antimony	2.00E+00	1.00E+00	3.00E+00	kg/year	8.22E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.90E+01	2.90E+01	7.80E+01	kg/year	2.14E-01			0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.37E+05	7.17E+04	2.09E+05	kg/year	5.72E+02			0.00%	100.00%

Table A2-17 Estimated Emissions from the Proposed EPCOR Genesee Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Existing	Proposed GP3 (Genesee Phase 3)	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Uranium oxide	Uranium	5.58E+02	3.32E+02	8.90E+02	kg/year	2.44E+00			0.00%	100.00%
Metals	Barium oxide	Barium	1.08E+04	6.46E+03	1.73E+04	kg/year	4.74E+01			0.00%	100.00%
Metals	Manganese oxide	Manganese	7.14E+02	4.25E+02	1.14E+03	kg/year	3.12E+00			0.00%	100.00%
Metals	Elemental Mercury	Mercury	8.50E+01	2.10E+01	1.06E+02	kg/year	2.90E-01			0.00%	100.00%
Metals	Oxidized Mercury	Mercury	2.10E+01	6.00E+00	2.70E+01	kg/year	7.40E-02			0.00%	100.00%
Metals	Copper oxide	Copper	3.84E+02	2.28E+02	6.12E+02	kg/year	1.68E+00			0.00%	100.00%
Metals	Selenium oxide	Selenium	8.78E+02	5.22E+02	1.40E+03	kg/year	3.84E+00			0.00%	100.00%
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.56E+05	7.28E+04	2.29E+05	kg/year	6.27E+02			0.00%	100.00%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.71E+04	8.00E+03	2.51E+04	kg/year	6.88E+01			0.00%	100.00%
CACs	SO2	SO2	1.63E+04	6.13E+03	2.24E+04	tonnes/year	6.14E+04			0.00%	100.00%
CACs	NOx	NO2	1.54E+04	5.61E+03	2.10E+04	tonnes/year	5.76E+04			0.00%	100.00%
CACs	PM2.5	PM2.5	2.63E+02	1.05E+02	3.68E+02	tonnes/year	1.01E+03			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency							**Total**	1.19E+03	100.00%	

Table A2-18 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Chromium (VI)	Chromium (VI)	7.58E-05	0.00E+00	1.69E-04	0.00E+00	2.45E-04	0.00E+00	2.45E-04	tonnes/day	2.45E-01	1.30E-04	1.88E+03	57.75%	57.75%
Metals	Arsenic	Arsenic	3.94E-04	7.23E-07	8.76E-04	0.00E+00	1.27E-03	7.23E-07	1.27E-03	tonnes/day	1.27E+00	1.60E-03	7.94E+02	24.34%	82.08%
Metals	Cobalt	Cobalt	9.60E-05	0.00E+00	2.14E-04	0.00E+00	3.10E-04	0.00E+00	3.10E-04	tonnes/day	3.10E-01	1.11E-03	2.79E+02	8.56%	90.64%
Metals	Cadmium	Cadmium	4.90E-05	6.78E-07	1.09E-04	0.00E+00	1.58E-04	6.78E-07	1.59E-04	tonnes/day	1.59E-01	1.00E-03	1.59E+02	4.86%	95.50%
Metals	Nickel	Nickel	2.69E-04	1.76E-06	5.98E-04	0.00E+00	8.67E-04	1.76E-06	8.69E-04	tonnes/day	8.69E-01	7.70E-03	1.13E+02	3.46%	98.96%
Metals	Beryllium	Beryllium	2.02E-05	0.00E+00	4.49E-05	0.00E+00	6.50E-05	0.00E+00	6.50E-05	tonnes/day	6.50E-02	4.00E-03	1.63E+01	0.50%	99.46%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	6.76E-04	0.00E+00	1.50E-03	0.00E+00	2.18E-03	0.00E+00	2.18E-03	tonnes/day	2.18E+00	2.04E-01	1.07E+01	0.33%	99.78%
Organics	Formaldehyde	Formaldehyde	2.30E-04	2.30E-03	5.13E-04	3.12E-04	7.43E-04	2.61E-03	3.35E-03	tonnes/day	3.35E+00	1.90E+00	1.76E+00	0.05%	99.84%
Metals	Lead	Lead	4.03E-04	3.75E-06	8.97E-04	0.00E+00	1.30E-03	3.75E-06	1.30E-03	tonnes/day	1.30E+00	8.33E-01	1.56E+00	0.05%	99.89%
Organics	Benzene	Benzene	1.25E-03	2.82E-04	2.78E-03	3.84E-05	4.02E-03	3.20E-04	4.34E-03	tonnes/day	4.34E+00	3.00E+00	1.45E+00	0.04%	99.93%
Organics	Chloroform	Chloroform (Trichloromethane)	5.66E-05	0.00E+00	1.26E-04	0.00E+00	1.83E-04	0.00E+00	1.83E-04	tonnes/day	1.83E-01	4.00E-01	4.58E-01	0.01%	99.95%
Organics	Acetaldehyde	Acetaldehyde	5.47E-04	4.30E-03	1.22E-03	5.85E-04	1.76E-03	4.88E-03	6.64E-03	tonnes/day	6.64E+00	1.72E+01	3.86E-01	0.01%	99.96%
PAHs	Naphthalene	Naphthalene	1.25E-05	6.35E-05	2.78E-05	8.64E-06	4.02E-05	7.21E-05	1.12E-04	tonnes/day	1.12E-01	2.94E-01	3.82E-01	0.01%	99.97%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	3.84E-05	0.00E+00	8.54E-05	0.00E+00	1.24E-04	0.00E+00	1.24E-04	tonnes/day	1.24E-01	4.00E-01	3.10E-01	0.01%	99.98%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.15E-06	0.00E+00	2.56E-06	0.00E+00	3.72E-06	0.00E+00	3.72E-06	tonnes/day	3.72E-03	1.70E-02	2.19E-01	0.01%	99.98%
Dioxins and Furans	2,3,7,8-TCDD	2,3,7,8-TCDD	1.37E-11	0.00E+00	3.05E-11	0.00E+00	4.43E-11	0.00E+00	4.43E-11	tonnes/day	4.43E-08	2.63E-07	1.68E-01	0.01%	99.99%
Organics	Ethyl Benzene	Ethylbenzene	9.02E-05	4.84E-05	2.01E-04	6.58E-06	2.91E-04	5.50E-05	3.46E-04	tonnes/day	3.46E-01	4.00E+00	8.65E-02	0.00%	99.99%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	4.13E-05	0.00E+00	9.18E-05	0.00E+00	1.33E-04	0.00E+00	1.33E-04	tonnes/day	1.33E-01	1.70E+00	7.82E-02	0.00%	100.00%
Dioxins and Furans	2,3,7,8-TCDF	2,3,7,8-TCDF	4.90E-11	0.00E+00	1.09E-10	0.00E+00	1.58E-10	0.00E+00	1.58E-10	tonnes/day	1.58E-07	2.63E-06	6.00E-02	0.00%	100.00%
Organics	Bis(2-ethylhexyl)phthalate (DEHP)	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	7.01E-05	0.00E+00	1.56E-04	0.00E+00	2.26E-04	0.00E+00	2.26E-04	tonnes/day	2.26E-01	4.17E+00	5.42E-02	0.00%	100.00%
Organics	1,3-Butadiene	1,3-Butadiene	0.00E+00	3.19E-05	0.00E+00	4.34E-06	0.00E+00	3.62E-05	3.62E-05	tonnes/day	3.62E-02	1.70E+00	2.13E-02	0.00%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	3.74E-05	0.00E+00	8.33E-05	0.00E+00	1.21E-04	0.00E+00	1.21E-04	tonnes/day	1.21E-01	9.00E+00	1.34E-02	0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	2.69E-07	0.00E+00	5.98E-07	0.00E+00	8.67E-07	0.00E+00	8.67E-07	tonnes/day	8.67E-04	1.12E-01	7.72E-03	0.00%	100.00%
Organics	Methyl tert Butyl Ether	Methyl *tert*-Butyl Ether	3.36E-05	0.00E+00	7.48E-05	0.00E+00	1.08E-04	0.00E+00	1.08E-04	tonnes/day	1.08E-01	3.85E+01	2.81E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	2.78E-04	0.00E+00	6.19E-04	0.00E+00	8.98E-04	0.00E+00	8.98E-04	tonnes/day	8.98E-01	4.35E+02	2.06E-03	0.00%	100.00%
	Benzo(a)pyrene	Benzo(a)pyrene	3.65E-08	1.64E-08	8.12E-08	2.24E-09	1.18E-07	1.87E-08	1.37E-07	tonnes/day	1.37E-04	3.23E-01	4.24E-04	0.00%	100.00%
PAHs	5-Methyl Chrysene	5-Methylchrysene	2.11E-08	0.00E+00	4.70E-08	0.00E+00	6.81E-08	0.00E+00	6.81E-08	tonnes/day	6.81E-05	3.20E-01	2.13E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	7.68E-08	3.04E-07	1.71E-07	4.14E-08	2.48E-07	3.46E-07	5.94E-07	tonnes/day	5.94E-04	3.23E+00	1.84E-04	0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	1.06E-07	1.54E-07	2.35E-07	2.09E-08	3.41E-07	1.75E-07	5.16E-07	tonnes/day	5.16E-04	3.23E+00	1.60E-04	0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	5.86E-08	2.62E-08	1.30E-07	3.56E-09	1.89E-07	2.97E-08	2.19E-07	tonnes/day	2.19E-04	3.23E+00	6.78E-05	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	2.59E-06	9.59E-06	5.77E-06	1.30E-06	8.36E-06	1.09E-05	1.93E-05	tonnes/day	1.93E-02	3.23E+02	5.97E-05	0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	6.82E-07	5.46E-06	1.52E-06	7.43E-07	2.20E-06	6.20E-06	8.40E-06	tonnes/day	8.40E-03	3.23E+02	2.60E-05	0.00%	100.00%
PAHs	Chrysene	Chrysene	9.60E-08	3.42E-07	2.14E-07	4.66E-08	3.10E-07	3.89E-07	6.99E-07	tonnes/day	6.99E-04	3.23E+01	2.17E-05	0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	2.59E-08	2.04E-09	5.77E-08	2.77E-10	8.36E-08	2.32E-09	8.59E-08	tonnes/day	8.59E-05	3.23E+01	2.66E-06	0.00%	100.00%
Metals	Chromium (total)	Chromium (III)	2.50E-04	2.71E-07	5.55E-04	0.00E+00	8.05E-04	2.71E-07	8.05E-04	tonnes/day	8.05E-01			0.00%	100.00%
GHGs	CO2	CO_2	3.50E+03	1.00E+01	8.25E+03	0.00E+00	1.17E+04	1.00E+01	1.18E+04	tonnes/day	1.18E+07			0.00%	100.00%
GHGs	CH4	CH_4	3.80E-02	1.00E-03	8.50E-02	0.00E+00	1.24E-01	1.00E-03	1.25E-01	tonnes/day	1.25E+02			0.00%	100.00%
GHGs	N2O	N_2O (Nitrous Oxide)	2.90E-02	1.00E-03	6.40E-02	0.00E+00	9.30E-02	1.00E-03	9.40E-02	tonnes/day	9.40E+01			0.00%	100.00%
PAHs	Biphenyl	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)	1.63E-06	0.00E+00	3.63E-06	0.00E+00	5.26E-06	0.00E+00	5.26E-06	tonnes/day	5.26E-03			0.00%	100.00%
PAHs	Acenapthene	Acenaphthene	4.90E-07	1.98E-06	1.09E-06	2.69E-07	1.58E-06	2.25E-06	3.83E-06	tonnes/day	3.83E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	2.40E-07	7.21E-06	5.34E-07	9.81E-07	7.74E-07	8.19E-06	8.96E-06	tonnes/day	8.96E-03			0.00%	100.00%
PAHs	Anthracene	Anthracene	2.02E-07	1.29E-06	4.49E-07	1.76E-07	6.50E-07	1.47E-06	2.12E-06	tonnes/day	2.12E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	8.74E-07	6.72E-06	1.94E-06	9.13E-07	2.82E-06	7.63E-06	1.05E-05	tonnes/day	1.05E-02			0.00%	100.00%
PAHs	Pyrene	Pyrene	3.17E-07	3.27E-07	7.05E-07	4.45E-08	1.02E-06	3.72E-07	1.39E-06	tonnes/day	1.39E-03			0.00%	100.00%
PAHs	total PAH	Total PAH	1.99E-05	9.69E-05	4.43E-05	1.32E-05	6.43E-05	1.10E-04	1.74E-04	tonnes/day	1.74E-01			0.00%	100.00%
Organics	Acetophenone	Acetophenone	1.44E-05	0.00E+00	3.20E-05	0.00E+00	4.64E-05	0.00E+00	4.64E-05	tonnes/day	4.64E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	1.63E-04	0.00E+00	3.63E-04	0.00E+00	5.26E-04	0.00E+00	5.26E-04	tonnes/day	5.26E-01			0.00%	100.00%
Organics	Total VOC	Total VOC	8.82E-03	8.07E-03	1.96E-02	1.10E-03	2.85E-02	9.16E-03	3.77E-02	tonnes/day	3.77E+01			0.00%	100.00%
Metals	Antimony	Antimony	1.73E-05	0.00E+00	3.84E-05	0.00E+00	5.57E-05	0.00E+00	5.57E-05	tonnes/day	5.57E-02			0.00%	100.00%
Metals	Magnesium	Magnesium	1.06E-02	0.00E+00	2.35E-02	0.00E+00	3.41E-02	0.00E+00	3.41E-02	tonnes/day	3.41E+01			0.00%	100.00%
Organics	Dimethyl sulfate	Dimethyl Sulphate	4.61E-05	0.00E+00	1.03E-04	0.00E+00	1.49E-04	0.00E+00	1.49E-04	tonnes/day	1.49E-01			0.00%	100.00%
CACs	CO	CO	4.80E-01	4.03E-01	9.70E-01	1.71E-01	1.45E+00	5.74E-01	2.02E+00	tonnes/day	2.02E+03			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	6.72E-06	0.00E+00	1.50E-05	0.00E+00	2.17E-05	0.00E+00	2.17E-05	tonnes/day	2.17E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	1.54E-04	0.00E+00	3.42E-04	0.00E+00	4.95E-04	0.00E+00	4.95E-04	tonnes/day	4.95E-01			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	5.09E-04	0.00E+00	1.13E-03	0.00E+00	1.64E-03	0.00E+00	1.64E-03	tonnes/day	1.64E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	2.11E-05	0.00E+00	4.70E-05	0.00E+00	6.81E-05	0.00E+00	6.81E-05	tonnes/day	6.81E-02			0.00%	100.00%
CACs	SO2	SO_2	1.56E+01	0.00E+00	8.68E+00	0.00E+00	2.43E+01	0.00E+00	2.43E+01	tonnes/day	2.43E+04			0.00%	100.00%
Hydrogen Halides	Hydrogen Chloride	Hydrogen Chloride	1.15E+00	0.00E+00	2.56E+00	0.00E+00	3.72E+00	0.00E+00	3.72E+00	tonnes/day	3.72E+03			0.00%	100.00%
CACs	NOx	NO_2	1.20E+01	9.60E-02	7.51E+00	0.00E+00	1.95E+01	9.60E-02	1.96E+01	tonnes/day	1.96E+04			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	7.30E-06	0.00E+00	1.62E-05	0.00E+00	2.35E-05	0.00E+00	2.35E-05	tonnes/day	2.35E-02			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.49E-01	7.80E-02	3.60E-01	2.70E-02	8.09E-01	1.06E-01	9.15E-01	tonnes/day	9.15E+02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02			0.00%	100.00%

Table A2-18 Estimated Emissions from the MAXIM HR Milner Generating Station Expansion (2009)

Chemical Group	Chemical in Project	Chemical in Report	Existing M1 (Milner Plant)		Proposed M2 (Milner Plant)		M1 + M2 (Combined Milner Plant)		Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Hydrogen Halides	Hydrogen Fluoride	Hydrogen Fluoride	1.44E-01	0.00E+00	3.20E-01	0.00E+00	4.64E-01	0.00E+00	4.64E-01	tonnes/day	4.64E+02			0.00%	100.00%
Metals	Manganese	Manganese	4.70E-04	1.40E-06	1.05E-03	0.00E+00	1.52E-03	1.40E-06	1.52E-03	tonnes/day	1.52E+00			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	4.03E-05	0.00E+00	8.97E-05	0.00E+00	1.30E-04	0.00E+00	1.30E-04	tonnes/day	1.30E-01			0.00%	100.00%
Organics	Acrolein	Acrolein	2.78E-04	3.50E-04	6.19E-04	4.76E-05	8.98E-04	3.98E-04	1.30E-03	tonnes/day	1.30E+00			0.00%	100.00%
Organics	Cyanide	Cyanide	2.40E-03	0.00E+00	5.34E-03	0.00E+00	7.74E-03	0.00E+00	7.74E-03	tonnes/day	7.74E+00			0.00%	100.00%
Metals	Mercury (total)	Mercury	2.59E-05	9.03E-07	5.76E-05	0.00E+00	8.35E-05	9.03E-07	8.44E-05	tonnes/day	8.44E-02			0.00%	100.00%
CACs	NH3	NH3	0.00E+00	0.00E+00	2.16E-01	0.00E+00	2.16E-01	0.00E+00	2.16E-01	tonnes/day	2.16E+02			0.00%	100.00%
Metals	Selenium	Selenium	1.25E-03	9.94E-07	2.78E-03	0.00E+00	4.02E-03	9.94E-07	4.02E-03	tonnes/day	4.02E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	3.65E-04	0.00E+00	8.12E-04	0.00E+00	1.18E-03	0.00E+00	1.18E-03	tonnes/day	1.18E+00			0.00%	100.00%
Organics	Carbon Disulfide	Carbon Disulphide	1.25E-04	0.00E+00	2.78E-04	0.00E+00	4.02E-04	0.00E+00	4.02E-04	tonnes/day	4.02E-01			0.00%	100.00%
Organics	Phenol	Phenol	1.54E-05	0.00E+00	3.42E-05	0.00E+00	4.95E-05	0.00E+00	4.95E-05	tonnes/day	4.95E-02			0.00%	100.00%
Organics	Isophorone	Isophorone	5.57E-04	0.00E+00	1.24E-03	0.00E+00	1.80E-03	0.00E+00	1.80E-03	tonnes/day	1.80E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	3.55E-05	3.25E-04	7.90E-05	4.42E-05	1.15E-04	3.70E-04	4.85E-04	tonnes/day	4.85E-01			0.00%	100.00%
Organics	Hexane	Hexane	6.43E-05	2.42E-05	1.43E-04	3.29E-06	2.07E-04	2.74E-05	2.34E-04	tonnes/day	2.34E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	3.74E-04	0.00E+00	8.33E-04	0.00E+00	1.21E-03	0.00E+00	1.21E-03	tonnes/day	1.21E+00			0.00%	100.00%
Organics	Toluene	Toluene	2.30E-04	4.10E-04	5.13E-04	5.57E-05	7.43E-04	4.65E-04	1.21E-03	tonnes/day	1.21E+00			0.00%	100.00%
Organics	Styrene	Styrene	2.40E-05	0.00E+00	5.34E-05	0.00E+00	7.74E-05	0.00E+00	7.74E-05	tonnes/day	7.74E-02			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	5.09E-06	0.00E+00	1.13E-05	0.00E+00	1.64E-05	0.00E+00	1.64E-05	tonnes/day	1.64E-02			0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	1.92E-05	0.00E+00	4.27E-05	0.00E+00	6.19E-05	0.00E+00	6.19E-05	tonnes/day	6.19E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency											**Total**	3.26E+03	100.00%	

Table A2-19 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Cobalt oxide	Cobalt	1.27E+02	1.29E+02		1.29E+02	kg/year	3.54E-01	1.11E-03	3.19E+02	48.52%	48.52%
Metals	Arsenic pentaoxide	Arsenic	7.66E+01	7.80E+01		7.80E+01	kg/year	2.14E-01	1.60E-03	1.34E+02	20.30%	68.82%
Metals	Nickle oxide	Nickel	2.25E+02	2.29E+02		2.29E+02	kg/year	6.27E-01	7.70E-03	8.14E+01	12.38%	81.20%
Metals	Cadmium oxide	Cadmium	2.80E+01	2.85E+01		2.85E+01	kg/year	7.82E-02	1.00E-03	7.82E+01	11.88%	93.09%
Metals	Beryllium oxide	Beryllium	3.85E+01	3.92E+01		3.92E+01	kg/year	1.07E-01	4.00E-03	2.69E+01	4.08%	97.17%
Organics	Benzyl Chloride	Benzyl Chloride (α-chlorotoluene)	1.03E+03	1.05E+03		1.05E+03	kg/year	2.88E+00	2.04E-01	1.41E+01	2.14%	99.31%
Organics	Benzene	Benzene	1.91E+03	1.95E+03		1.95E+03	kg/year	5.34E+00	3.00E+00	1.78E+00	0.27%	99.58%
Organics	Chloroform	Chloroform (Trichloromethane)	8.69E+01	8.85E+01		8.85E+01	kg/year	2.42E-01	4.00E-01	6.06E-01	0.09%	99.68%
Organics	Formaldehyde	Formaldehyde	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01	1.90E+00	5.19E-01	0.08%	99.75%
Organics	Ethylene Dichloride	Ethylene Dichloride (1,2-Dichloroethane)	5.89E+01	6.00E+01		6.00E+01	kg/year	1.64E-01	4.00E-01	4.11E-01	0.06%	99.82%
Organics	Ethylene Dibromide	Ethylene Dibromide (1,2-Dibromoethane)	1.77E+00	1.80E+00		1.80E+00	kg/year	4.93E-03	1.70E-02	2.90E-01	0.04%	99.86%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	2.00E-02	2.00E-02		2.00E-02	g/year	5.48E-08	2.63E-07	2.08E-01	0.03%	99.89%
Metals	Lead oxide	Lead	5.36E+01	5.46E+01		5.46E+01	kg/year	1.50E-01	8.33E-01	1.79E-01	0.03%	99.92%
Organics	Acetaldehyde	Acetaldehyde	8.39E+02	8.55E+02		8.55E+02	kg/year	2.34E+00	1.72E+01	1.36E-01	0.02%	99.94%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	6.33E+01	6.45E+01		6.45E+01	kg/year	1.77E-01	1.70E+00	1.04E-01	0.02%	99.96%
Organics	Ethyl Benzene	Ethylbenzene	1.38E+02	1.41E+02		1.41E+02	kg/year	3.86E-01	4.00E+00	9.65E-02	0.01%	99.97%
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	8.00E-02	8.00E-02		8.00E-02	g/year	2.19E-07	2.63E-06	8.33E-02	0.01%	99.98%
Organics	Bis(2-ethylhexyl)phthalate	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	1.08E+02	1.09E+02		1.09E+02	kg/year	3.00E-01	4.17E+00	7.20E-02	0.01%	99.99%
Organics	Bromoform	Bromoform (Tribromomethane)	5.74E+01	5.85E+01		5.85E+01	kg/year	1.60E-01	9.00E+00	1.78E-02	0.00%	100.00%
Organics	2-4 Dinitrotoluene	2,4-Dinitrotoluene	4.10E-01	4.20E-01		4.20E-01	kg/year	1.15E-03	1.12E-01	1.02E-02	0.00%	100.00%
Organics	Methyl t-Butyl Ether	Methyl *tert*-Butyl Ether	5.15E+01	5.25E+01		5.25E+01	kg/year	1.44E-01	3.85E+01	3.74E-03	0.00%	100.00%
Organics	Methylene Chloride	Methylene Chloride (Dichloromethane)	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00	4.35E+02	2.74E-03	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	8.10E-01	8.20E-01		8.20E-01	kg/year	2.25E-03	3.23E+00	6.96E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.93E+00	1.96E+00		1.96E+00	kg/year	5.37E-03	3.23E+02	1.66E-05	0.00%	100.00%
Metals	Chromium trioxide	Chromium (III)	1.22E+02	1.24E+02		1.24E+02	kg/year	3.39E-01			0.00%	100.00%
	Antimony oxide	Antimony	1.79E+00	1.82E+00		1.82E+00	kg/year	4.99E-03			0.00%	100.00%
Metals	Thorium oxide	Thorium	4.39E+01	4.47E+01		4.47E+01	kg/year	1.22E-01			0.00%	100.00%
PAHs	Benzo(a)fluorine	Benzo(a)fluorene	7.60E-01	7.80E-01		7.80E-01	kg/year	2.14E-03			0.00%	100.00%
Organics	Acetophenone	Acetophenone	2.21E+01	2.25E+01		2.25E+01	kg/year	6.16E-02			0.00%	100.00%
Organics	Methyl Hydrazine	Methyl Hydrazine (Monomethylhydrazine)	2.50E+02	2.55E+02		2.55E+02	kg/year	6.98E-01			0.00%	100.00%
Organics	Dimethyl Sulphate	Dimethyl Sulphate	7.07E+01	7.20E+01		7.20E+01	kg/year	1.97E-01			0.00%	100.00%
Organics	2-Chloroacetophenone	2-Chloroacetophenone	1.03E+01	1.05E+01		1.05E+01	kg/year	2.88E-02			0.00%	100.00%
Organics	Methyl Bromide	Methyl Bromide (Bromomethane)	2.36E+02	2.40E+02		2.40E+02	kg/year	6.57E-01			0.00%	100.00%
Organics	Methyl Chloride	Methyl Chloride (Chloromethane)	7.80E+02	7.95E+02		7.95E+02	kg/year	2.18E+00			0.00%	100.00%
Organics	Chlorobenzene	Chlorobenzene	3.24E+01	3.30E+01		3.30E+01	kg/year	9.04E-02			0.00%	100.00%
CACs	SO2	SO_2	1.41E+04	1.41E+04	1.23E+04	2.82E+04	tonnes/year	7.73E+04			0.00%	100.00%
CACs	NOx	NO_2	1.37E+04	1.37E+04	8.50E+03	2.73E+04	tonnes/year	7.49E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	2.89E+02	2.89E+02	3.07E+02	5.78E+02	tonnes/year	1.58E+03			0.00%	100.00%
Organics	Vinyl Acetate	Vinyl Acetate	1.12E+01	1.14E+01		1.14E+01	kg/year	3.12E-02			0.00%	100.00%
Organics	Methyl Methacrylate	Methyl Methacrylate	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02			0.00%	100.00%
Metals	Aluminum oxide	Aluminum	1.30E+05	1.32E+05		1.32E+05	kg/year	3.61E+02			0.00%	100.00%
Metals	Manganese oxide	Manganese	1.54E+03	1.57E+03		1.57E+03	kg/year	4.29E+00			0.00%	100.00%
Hydrogen Halides	HCl	Hydrogen Chloride	1.32E+05	1.34E+05		1.34E+05	kg/year	3.67E+02			0.00%	100.00%
Metals	Barium oxide	Barium	1.15E+04	1.17E+04		1.17E+04	kg/year	3.21E+01			0.00%	100.00%
Hydrogen Halides	HF	Hydrogen Fluoride	8.86E+04	9.02E+04		9.02E+04	kg/year	2.47E+02			0.00%	100.00%
Organics	Ethyl Chloride	Ethyl Chloride (Chloroethane, Monochloroethane)	6.19E+01	6.30E+01		6.30E+01	kg/year	1.73E-01			0.00%	100.00%
Organics	Cyanide	Cyanide	3.68E+03	3.75E+03		3.75E+03	kg/year	1.03E+01			0.00%	100.00%
Organics	Acrolein	Acrolein	4.27E+02	4.35E+02		4.35E+02	kg/year	1.19E+00			0.00%	100.00%
Metals	Uranium oxide	Uranium	3.90E+01	3.97E+01		3.97E+01	kg/year	1.09E-01			0.00%	100.00%
Metals	Elemental Mercury	Mercury	2.62E+01	2.67E+01		2.67E+01	kg/year	7.31E-02			0.00%	100.00%
Metals	Copper oxide	Copper	2.96E+02	3.01E+02		3.01E+02	kg/year	8.26E-01			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	5.60E+02	5.70E+02		5.70E+02	kg/year	1.56E+00			0.00%	100.00%

Table A2-19 Estimated Emissions from TransAlta Centennial Generating Station (2001)

Chemical Group	Chemical in Project	Chemical in Report	Keephills Existing (Units 1 and 2)	Debottlenecked (Units 1 and 2)	Keephills Centennial	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Carbon Disulphide	Carbon Disulphide	1.91E+02	1.95E+02		1.95E+02	kg/year	5.34E-01			0.00%	100.00%
Metals	Selenium oxide	Selenium	3.66E+01	3.73E+01		3.73E+01	kg/year	1.02E-01			0.00%	100.00%
Organics	Phenol	Phenol	2.36E+01	2.40E+01		2.40E+01	kg/year	6.57E-02			0.00%	100.00%
Organics	Isophorone	Isophorone	8.54E+02	8.70E+02		8.70E+02	kg/year	2.38E+00			0.00%	100.00%
Organics	Hexane	Hexane	9.87E+01	1.00E+02		1.00E+02	kg/year	2.75E-01			0.00%	100.00%
Organics	Methyl Ethyl Ketone	Methyl Ethyl Ketone (Butanone)	5.74E+02	5.85E+02		5.85E+02	kg/year	1.60E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	5.45E+01	5.55E+01		5.55E+01	kg/year	1.52E-01			0.00%	100.00%
Organics	Styrene	Styrene	3.68E+01	3.75E+01		3.75E+01	kg/year	1.03E-01			0.00%	100.00%
Organics	Toluene	Toluene	3.53E+02	3.60E+02		3.60E+02	kg/year	9.86E-01			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	7.80E+00	7.95E+00		7.95E+00	kg/year	2.18E-02			0.00%	100.00%
Organics	1,1,1 Trichloroethane	1,1,1-Trichloroethane	2.95E+01	3.00E+01		3.00E+01	kg/year	8.22E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency								**Total**	6.58E+02	100.00%	

Table A2-20 Estimated Emissions from TranslAlta Sundance Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Total	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Hexavalent chromium (and its compounds)	Chromium (VI)	2.25E+02	kg/year	6.16E-01	1.30E-04	4.74E+03	91.43%	91.43%
Metals	Arsenic (and its compounds)	Arsenic	9.00E+01	kg/year	2.47E-01	1.60E-03	1.54E+02	2.97%	94.40%
Metals	Nickel (and its compounds)	Nickel	4.33E-01	tonnes/year	1.19E+00	7.70E-03	1.54E+02	2.97%	97.37%
Metals	Cobalt (and its compounds)	Cobalt	3.50E-02	tonnes/year	9.59E-02	1.11E-03	8.64E+01	1.67%	99.03%
Metals	Cadmium (and its compounds)	Cadmium	1.80E+01	kg/year	4.93E-02	1.00E-03	4.93E+01	0.95%	99.98%
Metals	Lead (and its compounds)	Lead	2.29E+02	kg/year	6.27E-01	8.33E-01	7.53E-01	0.01%	100.00%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	4.87E+02	g/year	1.33E-03	1.96E-02	6.80E-02	0.00%	100.00%
Metals	Chromium (and its compounds)	Chromium (III)	5.07E-01	tonnes/year	1.39E+00			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	5.00E+01	kg/year	1.37E-01			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.76E+02	tonnes/year	4.82E+02			0.00%	100.00%
Organics	Propane	Propane	1.97E+00	tonnes/year	5.39E+00			0.00%	100.00%
CACs	Carbon monoxide	CO	1.51E+03	tonnes/year	4.13E+03			0.00%	100.00%
Metals	Zinc (and its compounds)	Zinc	9.11E-01	tonnes/year	2.50E+00			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	1.83E+04	tonnes/year	5.01E+04			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	3.42E+03	tonnes/year	9.37E+03			0.00%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.87E+04	tonnes/year	5.12E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.78E+02	tonnes/year	1.31E+03			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	4.27E+02	tonnes/year	1.17E+03			0.00%	100.00%
Other	Sulphuric acid	Sulphuric acid	2.20E+01	tonnes/year	6.03E+01			0.00%	100.00%
Metals	Manganese (and its compounds)	Manganese	5.82E-01	tonnes/year	1.59E+00			0.00%	100.00%
Metals	Vanadium (except when in an alloy) and its compounds	Vanadium	4.33E-01	tonnes/year	1.19E+00			0.00%	100.00%
Organics	HCFC-22 (Hydrochlorofluorocarbon 22) (75-45-6)	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)	5.80E-02	tonnes/year	1.59E-01			0.00%	100.00%
Metals	Copper (and its compounds)	Copper	1.95E-01	tonnes/year	5.34E-01			0.00%	100.00%
Other	Ammonia (total)	NH3	1.10E+01	tonnes/year	3.01E+01			0.00%	100.00%
Organics	n-Hexane	Hexane	8.89E+00	tonnes/year	2.44E+01			0.00%	100.00%
	Selenium (and its compounds)	Selenium	5.80E+01	kg/year	1.59E-01			0.00%	100.00%
Organics	Toluene	Toluene	5.44E+00	tonnes/year	1.49E+01			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	5.19E+03	100.00%	

Table A2-21 Estimated Emissions from Alberta Power Sheerness Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Benzene	Benzene	1.52E+00	tonnes/year	4.174246575	3.00E+00	1.39E+00	82.22%	82.22%
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	2.15E+03	g/year	0.00590137	1.96E-02	3.01E-01	17.78%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO2	1.08E+04	tonnes/year	29641.09589			0.00%	100.00%
Organics	Volatile Organic Compounds (VOCs)	Total VOC	1.60E+01	tonnes/year	43.83561644			0.00%	100.00%
CACs	Carbon monoxide	CO	6.28E+02	tonnes/year	1720.547945			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	3.38E+04	tonnes/year	92465.75342			0.00%	100.00%
Other	Sulphuric Acid	Sulphuric acid	1.20E+01	tonnes/year	32.87671233			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	9.60E+01	tonnes/year	263.0136986			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	8.10E+01	tonnes/year	221.9178082			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	9.50E+01	tonnes/year	260.2739726			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	3.80E+01	kg/year	0.104109589			0.00%	100.00%
Metals	Manganese (and its compounds)	Manganese	1.00E-03	tonnes/year	0.002739726			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					Total	1.69E+00	100.00%	

Table A2-22 Estimated Emissions from Alberta Power Battle River Generating Station

Chemical Group	Chemical in Project	Chemical in Report	Value	Units	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Hexachlorobenzene	Hexachlorobenzene (Perchlorobenzene)	1.81E+03	grams	4.95E-03	1.96E-02	2.53E-01	100.00%	100.00%
CACs	Carbon monoxide	CO	6.05E+02	tonnes	1.66E+03			0.00%	100.00%
CACs	Sulphur dioxide	SO_2	2.30E+04	tonnes	6.31E+04			0.00%	100.00%
CACs	Nitrogen oxides (expressed as NO2)	NO_2	1.02E+04	tonnes	2.80E+04			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	4.86E+02	tonnes	1.33E+03			0.00%	100.00%
Other	Hydrochloric acid	Hydrogen Chloride	1.14E+02	tonnes	3.12E+02			0.00%	100.00%
Other	Sulphuric acid	Sulphuric acid	8.90E+00	tonnes	2.44E+01			0.00%	100.00%
Hydrogen Halides	Hydrogen fluoride	Hydrogen Fluoride	5.40E+01	tonnes	1.48E+02			0.00%	100.00%
Metals	Mercury (and its compounds)	Mercury	2.50E+01	kg	6.85E-02			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.53E-01	100.00%	

Table A2-23 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Arsenic	Arsenic	tonnes/year	5.50E-01	1.51E+00	1.60E-03	9.42E+02	43.68%	43.68%
Metals	Cobalt (Co)	Cobalt	tonnes/year	2.40E-01	6.58E-01	1.11E-03	5.92E+02	27.48%	71.16%
Metals	Nickel (Ni)	Nickel	tonnes/year	1.30E+00	3.56E+00	7.70E-03	4.63E+02	21.45%	92.61%
Metals	Beryllium (Be)	Beryllium	tonnes/year	1.20E-01	3.29E-01	4.00E-03	8.22E+01	3.81%	96.43%
Metals	Cadmium (Cd)	Cadmium	tonnes/year	2.00E-02	5.48E-02	1.00E-03	5.48E+01	2.54%	98.97%
Organics	Benzyl chloride	Benzyl Chloride (α-chlorotoluene)	kg/year	1.26E+03	3.45E+00	2.04E-01	1.69E+01	0.78%	99.75%
Metals	Lead (Pb)	Lead	tonnes/year	1.01E+00	2.77E+00	8.33E-01	3.32E+00	0.15%	99.91%
Organics	Chloroform	Chloroform (Trichloromethane)	kg/year	1.06E+02	2.90E-01	4.00E-01	7.26E-01	0.03%	99.94%
Organics	Formaldehyde	Formaldehyde	kg/year	4.32E+02	1.18E+00	1.90E+00	6.23E-01	0.03%	99.97%
Organics	Benzene	Benzene	kg/year	2.34E+02	6.41E-01	3.00E+00	2.14E-01	0.01%	99.98%
Organics	Acetaldehyde	Acetaldehyde	kg/year	1.03E+03	2.81E+00	1.72E+01	1.63E-01	0.01%	99.99%
Organics	Tetrachloroethylene	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	kg/year	7.70E+01	2.11E-01	1.70E+00	1.24E-01	0.01%	99.99%
Organics	Ethyl benzene	Ethylbenzene	kg/year	1.69E+02	4.63E-01	4.00E+00	1.16E-01	0.01%	100.00%
Organics	Bromoform	Bromoform (Tribromomethane)	kg/year	7.00E+01	1.92E-01	9.00E+00	2.13E-02	0.00%	100.00%
Organics	2,4-Dinitrotoluene	2,4-Dinitrotoluene	kg/year	5.00E-01	1.37E-03	1.12E-01	1.22E-02	0.00%	100.00%
Organics	Methylene chloride	Methylene Chloride (Dichloromethane)	kg/year	5.22E+02	1.43E+00	4.35E+02	3.29E-03	0.00%	100.00%
PAHs	Benzo(b,j,k)fluoranthene	Benzo(b)fluoranthene	kg/year	1.98E-01	5.42E-04	3.23E+00	1.68E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	kg/year	1.44E-01	3.95E-04	3.23E+00	1.22E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	kg/year	4.86E+00	1.33E-02	3.23E+02	4.13E-05	0.00%	100.00%
PAHs	Fluoranthene	Fluoranthene	kg/year	1.28E+00	3.50E-03	3.23E+02	1.09E-05	0.00%	100.00%
Metals	Chromium (Cr)	Chromium (III)	tonnes/year	2.15E+00	5.89E+00			0.00%	100.00%
Organics	Acetophenone	Acetophenone	kg/year	2.70E+01	7.40E-02			0.00%	100.00%
Organics	Methyl hydrazine	Methyl Hydrazine (Monomethylhydrazine)	kg/year	3.06E+02	8.38E-01			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	kg/year	9.18E-01	2.52E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	kg/year	4.50E-01	1.23E-03			0.00%	100.00%
	Anthracene	Anthracene	kg/year	3.78E-01	1.04E-03			0.00%	100.00%
PAHs	Fluorene	Fluorene	kg/year	1.64E+00	4.49E-03			0.00%	100.00%
PAHs	Pyrene	Pyrene	kg/year	5.94E-01	1.63E-03			0.00%	100.00%
Metals	Magnesium Oxide (MgO)	Magnesium	tonnes/year	9.72E+00	2.66E+01			0.00%	100.00%
Metals	Silicon Dioxide (SiO2)	Silicon	tonnes/year	1.04E+02	2.84E+02			0.00%	100.00%
Metals	Iron Trioxide (Fe2O3)	Iron	tonnes/year	3.23E+01	8.85E+01			0.00%	100.00%
Metals	Calcium Oxide (CaO)	Calcium	tonnes/year	6.06E+01	1.66E+02			0.00%	100.00%
Metals	Sodium Oxide (Na2O)	Sodium	tonnes/year	3.18E+01	8.71E+01			0.00%	100.00%
Metals	Potassium Oxide (K2O)	Potassium	tonnes/year	4.85E+00	1.33E+01			0.00%	100.00%
Metals	Phosphorus Oxide (P2O5)	Phosphorus	tonnes/year	8.41E+00	2.30E+01			0.00%	100.00%
Metals	Bromine (Br)	Bromine	tonnes/year	1.62E+01	4.43E+01			0.00%	100.00%
Organics	Dimethyl sulphate	Dimethyl Sulphate	kg/year	8.60E+01	2.36E-01			0.00%	100.00%
Metals	Zinc (Zn)	Zinc	tonnes/year	1.23E+00	3.37E+00			0.00%	100.00%
Metals	Chlorine (Cl)	Chlorine	tonnes/year	7.73E+00	2.12E+01			0.00%	100.00%
Organics	2-Chlorobenzene	Chlorobenzene	kg/year	4.00E+01	1.10E-01			0.00%	100.00%
Metals	Barium (Ba)	Barium	tonnes/year	1.17E+02	3.21E+02			0.00%	100.00%
Organics	Vinyl acetate	Vinyl Acetate	kg/year	1.40E+01	3.84E-02			0.00%	100.00%
Organics	Methyl methacrylate	Methyl Methacrylate	kg/year	3.60E+01	9.86E-02			0.00%	100.00%
Metals	Titanium Oxide (TiO)	Titanium	tonnes/year	4.19E+00	1.15E+01			0.00%	100.00%
Metals	Aluminum Trioxide (Al2O3)	Aluminum	tonnes/year	1.33E+02	3.65E+02			0.00%	100.00%
Metals	Manganese (Mn)	Manganese	tonnes/year	2.37E+00	6.49E+00			0.00%	100.00%
Metals	Vanadium (V)	Vanadium	tonnes/year	1.37E+00	3.75E+00			0.00%	100.00%
Metals	Mercury (Hg)	Mercury	tonnes/year	2.40E-01	6.58E-01			0.00%	100.00%
Organics	Acrolein	Acrolein	kg/year	5.22E+02	1.43E+00			0.00%	100.00%
Metals	Copper (Cu)	Copper	tonnes/year	9.60E-01	2.63E+00			0.00%	100.00%
Organics	Propionaldehyde	Propionaldehyde	kg/year	6.84E+02	1.87E+00			0.00%	100.00%
Metals	Molybdenum (Mo)	Molybdenum	tonnes/year	3.00E-01	8.22E-01			0.00%	100.00%
Metals	Selenium (Se)	Selenium	tonnes/year	1.20E-01	3.29E-01			0.00%	100.00%
Organics	Carbon disulfide	Carbon Disulphide	kg/year	2.34E+02	6.41E-01			0.00%	100.00%
Organics	Phenol	Phenol	kg/year	2.90E+01	7.95E-02			0.00%	100.00%

Table A2-23 Estimated Emissions from Fording Brooks Power Project

Chemical Group	Chemical in Project	Chemical in Report	Unit	Value	Total (1000 MW Production) (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Organics	Hexane	Hexane	kg/year	1.21E+02	3.32E-01			0.00%	100.00%
Organics	Methyl ethyl ketone	Methyl Ethyl Ketone (Butanone)	kg/year	7.02E+02	1.92E+00			0.00%	100.00%
Organics	Xylenes	Xylenes	kg/year	6.70E+01	1.84E-01			0.00%	100.00%
Organics	Styrene	Styrene	kg/year	4.50E+01	1.23E-01			0.00%	100.00%
Organics	Toluene	Toluene	kg/year	4.32E+02	1.18E+00			0.00%	100.00%
Organics	Cumene	Isopropylbenzene (Cumene)	kg/year	1.00E+01	2.74E-02			0.00%	100.00%
Organics	1,1,1-Trichloroethane	1,1,1-Trichloroethane	kg/year	3.60E+01	9.86E-02			0.00%	100.00%
CACs	Total CO	CO	g/second	4.51E+01	3.90E+03			0.00%	100.00%
CACs	Total SO2	SO_2	g/second	1.14E+03	3.81E+04			0.00%	100.00%
CACs	Total PM2.5	$PM_{2.5}$	g/second	1.32E+01	1.14E+03			0.00%	100.00%
CACs	Total NOx	NO_2	g/second	3.16E+02	2.73E+04			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency					**Total**	2.16E+03	100.00%	

Table A2-24 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Nickel	Nickel	9.81E-06	3.12E-04	3.22E-04	3.22E-01	7.70E-03	4.18E+01	39.35%	39.35%
Organics	Formaldehyde	Formaldehyde	5.02E-02	0.00E+00	5.02E-02	5.02E+01	1.90E+00	2.64E+01	24.86%	64.21%
Metals	Cadmium	Cadmium	0.00E+00	1.47E-05	1.47E-05	1.47E-02	1.00E-03	1.47E+01	13.83%	78.04%
Metals	Arsenic	Arsenic	0.00E+00	2.24E-05	2.24E-05	2.24E-02	1.60E-03	1.40E+01	13.17%	91.22%
Metals	Beryllium	Beryllium	0.00E+00	1.50E-05	1.50E-05	1.50E-02	4.00E-03	3.75E+00	3.53%	94.74%
Metals	Cobalt	Cobalt	2.03E-06	0.00E+00	2.03E-06	2.03E-03	1.11E-03	1.83E+00	1.72%	96.46%
Organics	Benzene	Benzene	4.90E-03	0.00E+00	4.90E-03	4.90E+00	3.00E+00	1.63E+00	1.54%	98.00%
Organics	Propylene Oxide	Propylene Oxide	2.53E-03	0.00E+00	2.53E-03	2.53E+00	3.00E+00	8.43E-01	0.79%	98.79%
Organics	Ethylbenzene	Ethylbenzene	1.74E-03	0.00E+00	1.74E-03	1.74E+00	4.00E+00	4.35E-01	0.41%	99.20%
Organics	Acetaldehyde	Acetaldehyde	7.36E-03	0.00E+00	7.36E-03	7.36E+00	1.72E+01	4.28E-01	0.40%	99.61%
PAHs	Naphthalene	Naphthalene	9.66E-05	0.00E+00	9.66E-05	9.66E-02	2.94E-01	3.29E-01	0.31%	99.92%
Metals	Lead	Lead	5.91E-06	3.31E-05	3.90E-05	3.90E-02	8.33E-01	4.68E-02	0.04%	99.96%
Organics	1,3-Butadiene	1,3-Butadiene	2.32E-05	0.00E+00	2.32E-05	2.32E-02	1.70E+00	1.36E-02	0.01%	99.97%
Organics	Dichlorobenzene	Dichlorobenzene	9.39E-06	0.00E+00	9.39E-06	9.39E-03	9.09E-01	1.03E-02	0.01%	99.98%
Organics	3-Methylcholanthrene	3-Methylcholanthrene	1.41E-08	0.00E+00	1.41E-08	1.41E-05	2.00E-03	7.05E-03	0.01%	99.99%
Organics	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	1.25E-07	0.00E+00	1.25E-07	1.25E-04	3.20E-02	3.91E-03	0.00%	99.99%
PAHs	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	1.25E-06	0.00E+00	1.25E-06	1.25E-03	3.23E-01	3.88E-03	0.00%	100.00%
PAHs	Benzo(a)pyrene	Benzo(a)pyrene	7.45E-07	0.00E+00	7.45E-07	7.45E-04	3.23E-01	2.31E-03	0.00%	100.00%
PAHs	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	1.26E-06	0.00E+00	1.26E-06	1.26E-03	3.23E+00	3.91E-04	0.00%	100.00%
PAHs	Benzo(a)anthracene	Benz(a)anthracene	1.21E-06	0.00E+00	1.21E-06	1.21E-03	3.23E+00	3.75E-04	0.00%	100.00%
PAHs	Benzo(b)fluoranthene	Benzo(b)fluoranthene	6.12E-07	0.00E+00	6.12E-07	6.12E-04	3.23E+00	1.90E-04	0.00%	100.00%
PAHs	Benzo(k)fluoranthene	Benzo(k)fluoranthene	5.96E-07	0.00E+00	5.96E-07	5.96E-04	3.23E+00	1.85E-04	0.00%	100.00%
PAHs	Phenanthrene	Phenanthrene	1.68E-05	0.00E+00	1.68E-05	1.68E-02	3.23E+02	5.21E-05	0.00%	100.00%
PAHs	Chrysene	Chrysene	1.35E-06	0.00E+00	1.35E-06	1.35E-03	3.23E+01	4.19E-05	0.00%	100.00%
PAHs	Benzo(g,h,i)perylene	Benzo(g,h,i)perylene	7.35E-07	0.00E+00	7.35E-07	7.35E-04	3.23E+01	2.28E-05	0.00%	100.00%
	Fluoranthene	Fluoranthene	2.38E-06	0.00E+00	2.38E-06	2.38E-03	3.23E+02	7.38E-06	0.00%	100.00%
Metals	Chromium	Chromium (III)	3.39E-05	4.20E-05	7.59E-05	7.59E-02			0.00%	100.00%
CACs	VOC (no C1, C2)	VOC (no C1, C2)	1.39E-01	0.00E+00	1.39E-01	1.39E+02			0.00%	100.00%
Organics	2-Methylnaphthalene	2-Methylnaphthalene	4.68E-07	0.00E+00	4.68E-07	4.68E-04			0.00%	100.00%
PAHs	Acenaphthene	Acenaphthene	1.02E-06	0.00E+00	1.02E-06	1.02E-03			0.00%	100.00%
PAHs	Acenaphthylene	Acenaphthylene	8.72E-07	0.00E+00	8.72E-07	8.72E-04			0.00%	100.00%
PAHs	Anthracene	Anthracene	1.81E-06	0.00E+00	1.81E-06	1.81E-03			0.00%	100.00%
Organics	Benzaldehyde	Benzaldehyde	1.28E-04	0.00E+00	1.28E-04	1.28E-01			0.00%	100.00%
PAHs	Benzo(e)pyrene	Benzo(e)pyrene	2.88E-08	0.00E+00	2.88E-08	2.88E-05			0.00%	100.00%
PAHs	Fluorene	Fluorene	3.10E-06	0.00E+00	3.10E-06	3.10E-03			0.00%	100.00%
PAHs	Perylene	Perylene (Perilene)	3.70E-08	0.00E+00	3.70E-08	3.70E-05			0.00%	100.00%
PAHs	Pyrene	Pyrene	1.51E-06	0.00E+00	1.51E-06	1.51E-03			0.00%	100.00%
Metals	Antimony	Antimony	0.00E+00	1.29E-05	1.29E-05	1.29E-02			0.00%	100.00%
Metals	Iron	Iron	3.44E-04	1.75E-03	2.09E-03	2.09E+00			0.00%	100.00%
Metals	Magnesium	Magnesium	6.30E-05	0.00E+00	6.30E-05	6.30E-02			0.00%	100.00%
Metals	Rubidium	Rubidium	9.55E-08	0.00E+00	9.55E-08	9.55E-05			0.00%	100.00%
Metals	Strontium	Strontium	3.64E-06	2.04E-03	2.04E-03	2.04E+00			0.00%	100.00%
Metals	Thallium	Thallium	0.00E+00	1.90E-05	1.90E-05	1.90E-02			0.00%	100.00%
Metals	Zirconium	Zirconium	2.46E-06	0.00E+00	2.46E-06	2.46E-03			0.00%	100.00%
CACs	CO	CO	2.65E+00	0.00E+00	2.65E+00	2.65E+03			0.00%	100.00%
Metals	Boron	Boron	0.00E+00	9.43E-04	9.43E-04	9.43E-01			0.00%	100.00%
Metals	Zinc	Zinc	3.19E-05	3.17E-04	3.49E-04	3.49E-01			0.00%	100.00%
Organics	Pentane	Pentane	2.03E-02	0.00E+00	2.03E-02	2.03E+01			0.00%	100.00%
CACs	PM2.5	$PM_{2.5}$	3.11E-01	3.00E-02	3.41E-01	3.41E+02			0.00%	100.00%
CACs	Nox as NO2 (assuming 6 ppm limit)	NO_2	1.42E+00	0.00E+00	1.42E+00	1.42E+03			0.00%	100.00%
Other	NH3	NH3	4.37E-01	0.00E+00	4.37E-01	4.37E+02			0.00%	100.00%
Organics	Acrolein	Acrolein	1.14E-03	0.00E+00	1.14E-03	1.14E+00			0.00%	100.00%
Metals	Manganese	Manganese	9.50E-06	2.64E-04	2.74E-04	2.74E-01			0.00%	100.00%
CACs	SO2	SO_2	4.40E-02	0.00E+00	4.40E-02	4.40E+01			0.00%	100.00%
Metals	Silver	Silver	4.10E-05	6.07E-04	6.48E-04	6.48E-01			0.00%	100.00%
Metals	Aluminum	Aluminum	1.36E-04	4.01E-03	4.15E-03	4.15E+00			0.00%	100.00%
Metals	Barium	Barium	0.00E+00	2.29E-04	2.29E-04	2.29E-01			0.00%	100.00%

Table A2-24 Estimated Emissions from ENMAX Shepard Energy Centre

Chemical Group	Chemical in Project	Chemical in Report	Value	Value	Total (tonnes/day)	Total (kg/day)	Cancer TRV	Toxic Potency	Relative Potency	Cumulative Potency
Metals	Titanium	Titanium	2.25E-05	0.00E+00	2.25E-05	2.25E-02			0.00%	100.00%
Metals	Copper	Copper	2.50E-05	1.53E-04	1.78E-04	1.78E-01			0.00%	100.00%
Metals	Vanadium	Vanadium	8.41E-06	0.00E+00	8.41E-06	8.41E-03			0.00%	100.00%
Organics	Hexane	Hexane	2.78E-02	0.00E+00	2.78E-02	2.78E+01			0.00%	100.00%
Organics	Xylene (Total)	Xylenes	3.57E-03	0.00E+00	3.57E-03	3.57E+00			0.00%	100.00%
Organics	Toluene	Toluene	7.27E-03	0.00E+00	7.27E-03	7.27E+00			0.00%	100.00%
Metals	Selenium	Selenium	0.00E+00	2.42E-05	2.42E-05	2.42E-02			0.00%	100.00%
Metals	Molybdenum	Molybdenum	3.95E-06	0.00E+00	3.95E-06	3.95E-03			0.00%	100.00%
Organics	2-Chloronaphthalene	2-Chloronaphthalene	1.44E-08	0.00E+00	1.44E-08	1.44E-05			0.00%	100.00%
	Denotes cut-off level of chemicals that contribute more than 0.1% to toxic potency						**Total**	1.06E+02	100.00%	

Table A2-25 List of Chemicals Removed from the Toxic Potency Screening	
Chemical	**Reason**
PM_{10}	Represented by PM2.5
Total PM	
TSP	
Total GHGs e-CO2	No air quality guidelines available
H2O	Not revelant to health risk assessment
Heptachlorodibenzo-p-dioxins	2,3,7,8-TCDD was used as a surrogate chemical, as exposure limits are not available for dioxin and furan groups
Hexachlorodibenzo-*p*-dioxins	
Octachlorodibenzo-*p*-dioxins	
Pentachlorodibenzo-*p*-dioxins	
Tetrachlorodibenzo-*p*-dioxins	
Heptachlorodibenzofurans	
Hexachlorodibenzofurans	
Octachlorodibenzofurans	
Pentachlorodibenzofurans	
Tetrachlorodibenzofurans	
Total PCDD/PCDF	
Mercury (Hg(0) elemental) - gas	Represented in 'Mercury (total)'
Mercury (Hg(II) oxidized) - gas	
Mercury (particulate bound Hg(II))	
Nox as NO2 (assuming 3 ppm limit)	Nox as NO2 (assuming 6 ppm limit)' was selected instead in order to be more conservative, as it was the higher estimated emission rate
Particulate Mercury	Elemental Mercury' was selected instead in order to be more conservative, as it was the highest estimated emission rate of the 3 forms
Oxidized Mercury	

Table A2-26 Toxicity Reference Values Used in the Toxic Potency Screening				
Chemical Group	**Chemical**	**Acute**	**Chronic**	**Carcinogenic**
CACs	$PM_{2.5}$			
	SO_2			
	CO			
	NO_2			
	PM_{10}			
	Total PM			
	VOC (no C1, C2)			
	TSP			
Dioxins and Furans	2,3,7,8-TCDD		3.00E-06	2.63E-07
	2,3,7,8-TCDF			2.63E-06
GHGs	CH_4			
	CO_2			
	N_2O (Nitrous Oxide)			
Hydrogen Halides	Hydrogen Chloride	7.50E+01	9.00E+00	
	Hydrogen Fluoride	4.90E+00	1.40E+01	
Metals	Aluminum		5.00E+00	
	Antimony			
	Arsenic	1.00E-01	1.00E-02	1.60E-03
	Barium		1.00E+00	
	Beryllium		7.00E-03	4.00E-03
	Boron	3.00E+02		
	Bromine	1.08E+02		
	Cadmium	3.00E-02	5.00E-03	1.00E-03
	Calcium			
	Chlorine	1.50E+01	1.50E-01	
	Chromium (III)	1.00E+00	1.40E-01	
	Chromium (VI)		1.00E-01	1.30E-04
	Cobalt		1.00E-01	1.11E-03
	Copper	1.00E+02	1.00E+00	
	Iron			
	Lead	1.50E+00	1.50E-01	8.33E-01
	Magnesium			
	Manganese	2.00E+00	2.00E-01	
	Mercury	6.00E-01	6.00E-02	
	Molybdenum		1.20E+01	
	Nickel	6.00E+00	5.00E-02	7.70E-03
	Phosphorus	2.00E+01		
	Potassium			
	Rubidium			
	Selenium		2.00E+01	
	Silicon			
	Silver		4.00E-01	
	Sodium			
	Strontium			

Table A2-26 Toxicity Reference Values Used in the Toxic Potency Screening				
Chemical Group	**Chemical**	**Acute**	**Chronic**	**Carcinogenic**
	Thallium			
	Thorium			
	Titanium		1.00E-01	
	Uranium		4.00E-02	
	Vanadium	8.00E-01	1.00E-01	
	Zinc	2.50E+02		
	Zirconium			
Organics	1,1,1-Trichloroethane	9.00E+03	1.00E+03	
	1,3-Butadiene	1.50E+01	2.00E+00	1.70E+00
	2,4-Dinitrotoluene			1.12E-01
	2-Chloroacetophenone		3.00E-02	
	2-Chloronaphthalene		1.00E+00	
	2-Methylfluorene			
	2-Methylnaphthalene			
	3-Methylcholanthrene			2.00E-03
	5-Methylchrysene			3.20E-01
	7,12-Dimethylbenz(a)anthracene			3.20E-02
	Acetaldehyde	9.00E+01	3.90E+02	1.72E+01
	Acetophenone			
	Acrolein	2.50E+00	4.00E-01	
	Benzaldehyde			
	Benzene	3.00E+01	3.00E+01	3.00E+00
	Benzyl Chloride (α-chlorotoluene)	2.40E+02	1.00E+00	2.04E-01
	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)			4.17E+00
	Bromoform (Tribromomethane)			9.00E+00
	Carbon Disulphide	3.00E+01	1.00E+02	
	Chlorobenzene	4.60E+04	1.00E+01	
	Chloroform (Trichloromethane)	1.50E+02	9.80E+01	4.00E-01
	Cyanide		2.50E+01	
	Dichlorobenzene	3.00E+03	9.50E+01	9.09E-01
	Dimethyl Sulphate	1.25E+02		
	Ethylbenzene	2.00E+03	1.00E+03	4.00E+00
	Ethyl Chloride (Chloroethane, Monochloroethane)	3.96E+04	1.00E+04	
	Ethylene Dibromide (1,2-Dibromoethane)	3.53E+04	9.30E+00	1.70E-02
	Ethylene Dichloride (1,2-Dichloroethane)	7.00E+02	7.00E+00	4.00E-01
	Formaldehyde	6.50E+01	9.00E+00	1.90E+00

Table A2-26 Toxicity Reference Values Used in the Toxic Potency Screening				
Chemical Group	**Chemical**	**Acute**	**Chronic**	**Carcinogenic**
	HCFC-22 (Hydrochlorofluorocarbon 22) (Chlorodifluoromethane, Difluoromonochloromethane)		5.00E+04	
	Hexachlorobenzene (Perchlorobenzene)			1.96E-02
	Hexane	7.00E+03	7.00E+02	
	Isophorone		2.00E+03	
	Isopropylbenzene (Cumene)	5.00E+02	4.00E+02	
	Methyl Bromide (Bromomethane)	1.94E+02	5.00E+00	
	Methyl Chloride (Chloromethane)	1.03E+03	9.00E+01	
	Methyl Ethyl Ketone (Butanone)	5.90E+04	5.00E+03	
	Methyl Hydrazine (Monomethylhydrazine)			
	Methyl Methacrylate	6.97E+04	7.00E+02	
	Methyl *tert*-Butyl Ether	7.21E+03	3.70E+01	3.85E+01
	Methylene Chloride (Dichloromethane)	4.50E+02	4.00E+02	4.35E+02
	Pentane	2.00E+05	1.00E+03	
	Phenol	1.00E+02	2.00E+01	
	Propane	9.90E+06		
	Propionaldehyde	1.10E+05	8.00E+00	
	Propylene (Propene, Methylethylene)		3.00E+03	
	Propylene Oxide	4.80E+02	3.00E+01	3.00E+00
	Styrene	2.15E+02	9.20E+01	
	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	1.36E+03	3.60E+02	1.70E+00
	Toluene	1.88E+03	3.80E+03	
	Total Aldehydes			
	Total Ketones			
	Total VOC			
	Vinyl Acetate	2.35E+04	2.00E+02	
	Xylenes	2.30E+03	1.80E+02	
Other	Hydrochloric Acid	7.50E+01	9.00E+00	
	NH3	1.40E+03	7.00E+01	
	Sulphuric Acid	1.00E+01	1.00E+00	
	Acenaphthene			
	Acenaphthylene			
	Anthracene			
	Benz(a)anthracene			3.23E+00
	Benzo(a)fluorene			
	Benzo(a)pyrene		3.00E-04	3.23E-01
	Benzo(b)fluoranthene			3.23E+00

Table A2-26 Toxicity Reference Values Used in the Toxic Potency Screening				
Chemical Group	**Chemical**	**Acute**	**Chronic**	**Carcinogenic**
PAHs	Benzo(j)fluoranthene			3.23E+00
	Benzo(k)fluoranthene			3.23E+00
	Benzo(e)pyrene			
	Benzo(g,h,i)perylene			3.23E+01
	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)			
	Chrysene			3.23E+01
	Dibenz(a,h)anthracene			3.23E-01
	Fluoranthene			3.23E+02
	Fluorene			
	Indeno(1,2,3-cd)pyrene			3.23E+00
	Naphthalene	2.00E+03	3.00E+00	2.94E-01
	Perylene (Perilene)			
	Phenanthrene			3.23E+02
	Pyrene			
	Total PAH			

Appendix B
Toxicity Reference Values

Table B-1 Acute Toxicity Reference Values									
Chemical Category	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or AEGL-1)**	**WHO**	**Other**
CACs	CO	15000	15000		23000		40000 (1-hour NAAQS), 10000 (8-hour NAAQS)	30000 (1-hour), 10000 (8-hour)	
CACs	NO_2	300	300		470		188 (NAAQS)	200	
CACs	$PM_{2.5}$	27	27				35 (NAAQS)	25	27 (CCME)
CACs	SO_2	450	450	26	660		196 (NAAQS)	500 (10-min), 20 (24-hour)	
Dioxins and Furans	2,3,7,8-TCDD								
Dioxins and Furans	2,3,7,8-TCDF								
Hydrogen Halides	Hydrogen Chloride	75	75		2100	660			
Hydrogen Halides	Hydrogen Fluoride	4.9	4.9	17	240	60			
Metals	Aluminum								
Metals	Antimony								
Metals	Arsenic	0.1	0.1		0.2	9.9			
Metals	Barium								
Metals	Beryllium								
Metals	Boron	300		300					
Metals	Cadmium	0.03		0.03 (24-hour)					
Metals	Chromium (III)	1	1			12			
Metals	Chromium (VI)								
Metals	Cobalt								
Metals	Copper	100			100				
Metals	Iron								
Metals	Lead	1.5	1.5						
Metals	Magnesium								
Metals	Manganese	2	2		0.17				
Metals	Mercury	0.6			0.6				
Metals	Molybdenum								
Metals	Nickel	6	6		0.2	1.1			
Metals	Phosphorus	20		20			470 (AEGL-1)		
Metals	Potassium								
Metals	Rubidium								
Metals	Selenium								
Metals	Silicon								

Table B-1 Acute Toxicity Reference Values									
Chemical Category	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or AEGL-1)**	**WHO**	**Other**
Metals	Silver								
Metals	Sodium								
Metals	Strontium								
Metals	Thallium								
Metals	Thorium								
Metals	Titanium								
Metals	Uranium								
Metals	Vanadium	0.8 (24-hour)		0.8 (24-hour)	30			1 (24-hour)	
Metals	Zinc	250							250 (ACGIH)
Metals	Zirconium								
Organics	1,1,1-Trichloroethane	9000		10800	68000	9500	9000 (IRIS)		
Organics	1,3-Butadiene	15			660	3700	15 (24-hour) (IRIS)		
Organics	2,4-Dinitrotoluene								
Organics	2-Chloroacetophenone								
Organics	2-Chloronaphthalene								
Organics	2-Methylnaphthalene								
Organics	Acetaldehyde	90	90		470				
Organics	Acetophenone								
Organics	Acrolein	2.5		6.9	2.5	11			
Organics	Benzaldehyde								
Organics	Benzene	30	30	30 (24-hour)	1300 (6-hour)	580			
Organics	Benzyl Chloride (α-chlorotoluene)	240			240				
Organics	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)								
Organics	Bromoform (Tribromomethane)								
Organics	Carbon Disulphide	30	30		6200 (6-hour)			100 (24-hour)	
Organics	CH4								
Organics	Chlorobenzene	46000					46000 (AEGL-1)		
Organics	Chloroform (Trichloromethane)	150		488	150				
Organics	Dichlorobenzene	3000		12000 (8-hour)		3000			
Organics	Dimethyl Sulphate	124					124 (AEGL-1)		
Organics	Ethyl Chloride (Chloroethane, Monochloroethane)	39576		39576					
Organics	Ethylbenzene	2000	2000	21700		86000			

Table B-1 Acute Toxicity Reference Values									
Chemical Category	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or AEGL-1)**	**WHO**	**Other**
Organics	Ethylene Dibromide (1,2-Dibromoethane)	35343					35343 (AEGL-1)		
Organics	Ethylene Dichloride (1,2-Dichloroethane)	700						700	
Organics	Formaldehyde	65	65	50	55	50		100 (30-minute)	
Organics	HCFC-22 (Hydrochlorofluorocarbon 22)								
Organics	Hexachlorobenzene (Perchlorobenzene)								
Organics	Hexane	7000	21000 (1-hour); 7000 (8-hour)						
Organics	Isophorone								
Organics	Isopropylbenzene (Cumene)	500	500				246000 (AEGL-1)		
Organics	Methyl Bromide (Bromomethane)	194		194	3900				
Organics	Methyl Chloride (Chloromethane)	1032		1032					
Organics	Methyl Ethyl Ketone (Butanone)	59000			13000	59000			
Organics	Methyl Hydrazine (Monomethylhydrazine)								
Organics	Methyl Methacrylate	69700					69700 (AEGL-1)		
Organics	Methyl tert Butyl Ether	7210		7210					
Organics	Methylene Chloride (Dichloromethane)	450		2084	14000	12000		450	
Organics	Pentane	200000				200000			
Organics	Phenol	100	100		5800				
Organics	Propane	9900000					9900000 (AEGL-1)		
Organics	Propionaldehyde	110000					110000 (AEGL-1)		
Organics	Propylene (Propene, Methylethylene)								
Organics	Propylene Oxide	480	480		3100				
Organics	Styrene	215	215	22000	21000	22000			
Organics	Sulphuric acid	10	10		120				
Organics	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	1356		1356	20000	6800	238000 (AEGL-1)		
Organics	Toluene	1880	1880	3800 (24-hour)	37000	15000			
Organics	Vinyl Acetate	23450					23450 (AEGL-1)		

Table B-1 Acute Toxicity Reference Values									
Chemical Category	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or AEGL-1)**	**WHO**	**Other**
Organics	Xylenes	2300	2300	8700	22000	7400			
Other	Bromine	107					107 (AEGL-1)		
Other	Chlorine	15	15	174	210		1450 (AEGL-1)		
Other	CO2								
Other	Cyanide								
Other	Hydrochloric acid	75	75		2100	660			
Other	N_2O (Nitrous Oxide)								
Other	NH_3	1400	1400	1200	3200				
PAHs	2-Methylfluorene								
PAHs	3-Methylcholanthrene								
PAHs	5-Methylchrysene								
PAHs	7,12-Dimethylbenz(a)anthracene								
PAHs	Acenaphthene								
PAHs	Acenaphthylene								
PAHs	Anthracene								
PAHs	Benz(a)anthracene								
PAHs	Benzo(a)fluorene								
PAHs	Benzo(a)pyrene								
PAHs	Benzo(b)fluoranthene								
PAHs	Benzo(e)pyrene								
PAHs	Benzo(g,h,i)perylene								
PAHs	Benzo(j)fluoranthene								
PAHs	Benzo(k)fluoranthene								
PAHs	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)								
PAHs	Chrysene								
PAHs	Dibenz(a,h)anthracene								
PAHs	Fluoranthene								
PAHs	Fluorene								
PAHs	Indeno(1,2,3-cd)pyrene								
PAHs	Naphthalene	2000							2000 (ACGIH)
PAHs	Perylene (Perilene)								
PAHs	Phenanthrene								
PAHs	Pyrene								

Notes:

All acute exposure limits are based on 1-hour averaging period unless otherwise noted

Table B-2 Chronic Toxicity Reference Values											
Group	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or PPRTV)**	**WHO**	**HC**	**RIVM**	**Other**
CACs	CO										
CACs	NO_2	100					100 (NAAQS)				
CACs	$PM_{2.5}$	8.8					12 (NAAQS)				8.8 (CCME)
CACs	SO_2	20	20					50			
Dioxins and Furans	2,3,7,8-TCDD	0.000003			0.00004		0.000003 (IRIS)				
Dioxins and Furans	2,3,7,8-TCDF										
Hydrogen Halides	Hydrogen Chloride	9			9	28	20 (IRIS)				
Halides	Hydrogen Fluoride	14			14	29					
Metals	Aluminum	5					5 (PPRTV)				
Metals	Antimony										
Metals	Arsenic	0.01	0.01		0.015					1	
Metals	Barium	1								1	
Metals	Beryllium	0.007			0.007		0.02 (IRIS)				
Metals	Boron										
Metals	Cadmium	0.005		0.01	0.02			0.005			
Metals	Chromium (III)	0.14				0.14				60	
Metals	Chromium (VI)	0.1			0.2		0.1 (IRIS)				
Metals	Cobalt	0.1		0.1						0.5	
Metals	Copper	1								1	
Metals	Iron										
Metals	Lead	0.5					0.15 (NAAQS)	0.5			
Metals	Magnesium										
Metals	Manganese	0.2	0.2	0.3	0.09		0.05 (IRIS)	0.15			
Metals	Mercury	0.06		0.2	0.03		0.3 (IRIS)	1	0.06	0.2	
Metals	Molybdenum	12								12	
Metals	Nickel	0.05	0.05	0.09	0.014	0.23			0.018	0.05	
Metals	Phosphorus										
Metals	Potassium										
Metals	Rubidium										
Metals	Selenium	20			20						
Metals	Silicon										
Metals	Silver	0.4									0.4 (ACGIH)
Metals	Sodium										
Metals	Strontium										
Metals	Thallium										
Metals	Thorium										
Metals	Titanium	0.1		0.1							
Metals	Uranium	0.04		0.04							
Metals	Vanadium	0.1		0.1						1	
Metals	Zinc										
Metals	Zirconium										
Organics	1,1,1-Trichloroethane	1000			1000	5100	5000 (IRIS)				

Table B-2 Chronic Toxicity Reference Values											
Group	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or PPRTV)**	**WHO**	**HC**	**RIVM**	**Other**
Organics	1,3-Butadiene	2			2	33	2 (IRIS)				
Organics	2,4-Dinitrotoluene										
Organics	2-Chloroacetophenone	0.03					0.03 (IRIS)				
Organics	2-Chloronaphthalene	1								1	
Organics	2-Methylnaphthalene										
Organics	Acetaldehyde	390			140		9 (IRIS)		390		
Organics	Acetophenone										
Organics	Acrolein	0.4			0.35	2.7	0.02 (IRIS)		0.4		
Organics	Benzaldehyde										
Organics	Benzene	30	30	9.8	60	280	30 (IRIS)				
Organics	Benzyl Chloride (α-chlorotoluene)	1					1 (PPRTV)				
Organics	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)										
Organics	Bromoform (Tribromomethane)										
Organics	Carbon Disulphide	100		930	800		700 (IRIS)		100		
Organics	CH4										
Organics	Chlorobenzene	10			1000		50 (PPRTV)		10	500	
Organics	Chloroform (Trichloromethane)	98		98	300					100	
Organics	Dichlorobenzene	95		60	800	530	800 (IRIS)		95	670	
Organics	Dimethyl Sulphate										
Organics	Ethyl Chloride (Chloroethane, Monochloroethane)	10000			30000		10000 (IRIS)				
Organics	Ethylbenzene	1000		260	2000	1900	1000 (IRIS)		1000	770	
Organics	Ethylene Dibromide (1,2-Dibromoethane)	9.3			0.8		9 (IRIS)		9.3		
Organics	Ethylene Dichloride (1,2-Dichloroethane)	7		2400	400		7 (PPRTV)				
Organics	Formaldehyde	9		10	9	11					
Organics	HCFC-22 (Hydrochlorofluorocarbon 22)	50000					50000 (IRIS)				
Organics	Hexachlorobenzene (Perchlorobenzene)										
Organics	Hexane	700		2100	7,000	670	700 (IRIS)		700		
Organics	Isophorone	2000			2000						
Organics	Isopropylbenzene (Cumene)	400					400 (IRIS)		400		
Organics	Methyl Bromide (Bromomethane)	5		19.5	5		5 (IRIS)				
Organics	Methyl Chloride (Chloromethane)	90		103			90 (IRIS)				
Organics	Methyl Ethyl Ketone (Butanone)	5000				8800	5000 (IRIS)				
Organics	Methyl Hydrazine (Monomethylhydrazine)										
Organics	Methyl Methacrylate	700					700 (IRIS)				
Organics	Methyl tert Butyl Ether	37		2520	8000		3000 (IRIS)		37	2600	
Organics	Methylene Chloride (Dichloromethane)	400		1044	400	1300	600 (IRIS)			3000	
Organics	Pentane	1000				24000	1000 (PPRTV)				
Organics	Phenol	20			200					20	
Organics	Propane										

Table B-2 Chronic Toxicity Reference Values											
Group	**Chemical**	**Selected Exposure Limit (µg/m^3)**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (NAAQS or IRIS or PPRTV)**	**WHO**	**HC**	**RIVM**	**Other**
Organics	Propionaldehyde	8					8 (IRIS)				
Organics	Propylene (Propene, Methylethylene)	3000			3000						
Organics	Propylene Oxide	30	30		30		30 (IRIS)				
Organics	Styrene	92		870	900	470	1000 (IRIS)		92	900	
Organics	Sulphuric acid	1			1			30			
Organics	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	360		272	35	370	40 (IRIS)	250	360	250	
Organics	Toluene	3800		300	300	4100	5000 (IRIS)		3800	400	
Organics	Vinyl Acetate	200			200		200 (IRIS)				
Organics	Xylenes	180		220	700	610	100 (IRIS)		180	870	
Other	Bromine										
Other	Chlorine	0.15		0.15	0.2						
Other	CO2										
Other	Cyanide	25								25	
Other	Hydrochloric acid	9			9	28	20 (IRIS)				
Other	N_2O (Nitrous Oxide)										
Other	NH_3	70		70	200		100 (IRIS)				
PAHs	2-Methylfluorene										
PAHs	3-Methylcholanthrene										
PAHs	5-Methylchrysene										
PAHs	7,12-Dimethylbenz(a)anthracene										
PAHs	Acenaphthene										
PAHs	Acenaphthylene										
PAHs	Anthracene										
PAHs	Benz(a)anthracene										
PAHs	Benzo(a)fluorene										
PAHs	Benzo(a)pyrene	0.0003	0.0003								
PAHs	Benzo(b)fluoranthene										
PAHs	Benzo(e)pyrene										
PAHs	Benzo(g,h,i)perylene										
PAHs	Benzo(j)fluoranthene										
PAHs	Benzo(k)fluoranthene										
PAHs	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)										
PAHs	Chrysene										
PAHs	Dibenz(a,h)anthracene										
PAHs	Fluoranthene										
PAHs	Fluorene										
PAHs	Indeno(1,2,3-cd)pyrene										
PAHs	Naphthalene	3		3.7	9		3 (IRIS)		3		
PAHs	Perylene (Perilene)										
PAHs	Phenanthrene										
PAHs	Pyrene										

Table B-3 Cancer Toxicity Reference Values											
Group	**Chemical**	**Selected Risk-specific Concentration (ug/m^3)**	**PEFs**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (IRIS or PPRTV)**	**HC**	**RIVM**	**WHO**
CACs	CO										
CACs	NO_2										
CACs	$PM_{2.5}$										
CACs	SO_2										
Dioxins and Furans	2,3,7,8-TCDD	0.00000026				0.00000026					
Dioxins and Furans	2,3,7,8-TCDF	0.0000026				0.0000026					
Hydrogen Halides	Hydrogen Chloride										
Hydrogen Halides	Hydrogen Fluoride										
Metals	Aluminum										
Metals	Antimony										
Metals	Arsenic	0.0016				0.003	0.067	0.002 (IRIS)	0.0016		
Metals	Barium										
Metals	Beryllium	0.004				0.004		0.004 (IRIS)			
Metals	Boron										
Metals	Cadmium	0.001				0.002		0.006 (IRIS)	0.001		
Metals	Chromium (III)										
Metals	Chromium (VI)	0.00013				0.00007		0.0008 (IRIS)	0.00013	0.00025	0.00025
Metals	Cobalt	0.0011						0.0011 (PPRTV)			
Metals	Copper										
Metals	Iron										
Metals	Lead	0.83				0.83					
Metals	Magnesium										
Metals	Manganese										
Metals	Mercury										
Metals	Molybdenum										
Metals	Nickel	0.0077				0.04	0.059	0.02 (IRIS)	0.0077		0.025
Metals	Phosphorus										
Metals	Potassium										
Metals	Rubidium										
Metals	Selenium										
Metals	Silicon										
Metals	Silver										
Metals	Sodium										
Metals	Strontium										
Metals	Thallium										
Metals	Thorium										
Metals	Titanium										
Metals	Uranium										
Metals	Vanadium										
Metals	Zinc										
Metals	Zirconium										
Organics	1,1,1-Trichloroethane										

Table B-3 Cancer Toxicity Reference Values											
Group	Chemical	Selected Risk-specific Concentration (ug/m^3)	PEFs	AESRD	ATSDR	OEHHA	TCEQ	USEPA (IRIS or PPRTV)	HC	RIVM	WHO
Organics	1,3-Butadiene	1.7				0.06	20 (ESL)	0.3 (IRIS)	1.7	0.3	
Organics	2,4-Dinitrotoluene	0.11				0.11					
Organics	2-Chloroacetophenone										
Organics	Acetaldehyde	17.2				3.7		5 (IRIS)	17.2		
Organics	Acetophenone										
Organics	Acrolein										
Organics	Benzaldehyde										
Organics	Benzene	3				0.3	4.5	1.3 (IRIS)	3	2	1.7
Organics	Benzyl Chloride (α-chlorotoluene)	0.2				0.2					
Organics	Bis(2-ethylhexyl)phthalate ((di-2-ethylhexyl phthalate, diethylhexyl phthalate, DEHP; dioctyl phthalate, DOP)	4.16				4.16					
Organics	Bromoform (Tribromomethane)	9						9 (IRIS)			
Organics	Carbon Disulphide										
Organics	CH4										
Organics	Chlorobenzene										
Organics	Chloroform (Trichloromethane)	0.4				1.9		0.4 (IRIS)			
Organics	Dichlorobenzene	0.9				0.9					
Organics	Dimethyl Sulphate										
Organics	Ethyl Chloride (Chloroethane, Monochloroethane)										
Organics	Ethylbenzene	4				4					
Organics	Ethylene Dibromide (1,2-Dibromoethane)	0.017				0.14		0.02 (IRIS)	0.017		
Organics	Ethylene Dichloride (1,2-Dichloroethane)	0.4				0.47		0.4 (IRIS)		4.8	
Organics	Formaldehyde	1.9				2	18	0.8 (IRIS)	1.9		
Organics	HCFC-22 (Hydrochlorofluorocarbon 22)										
Organics	Hexachlorobenzene (Perchlorobenzene)	0.019				0.019				0.075	
Organics	Hexane										
Organics	Isophorone										
Organics	Isopropylbenzene (Cumene)										
Organics	Methyl Bromide (Bromomethane)										
Organics	Methyl Chloride (Chloromethane)										
Organics	Methyl Ethyl Ketone (Butanone)										
Organics	Methyl Hydrazine (Monomethylhydrazine)										
Organics	Methyl Methacrylate										
Organics	Methyl tert Butyl Ether	38.46				38.46					
Organics	Methylene Chloride (Dichloromethane)	435				10	350	1000 (IRIS)	435		
Organics	Pentane										
Organics	Phenol										
Organics	Propane										
Organics	Propionaldehyde										
Organics	Propylene (Propene, Methylethylene)										
Organics	Propylene Oxide	3				3		3 (IRIS)			
Organics	Styrene										

Table B-3 Cancer Toxicity Reference Values											
Group	**Chemical**	**Selected Risk-specific Concentration (ug/m^3)**	**PEFs**	**AESRD**	**ATSDR**	**OEHHA**	**TCEQ**	**USEPA (IRIS or PPRTV)**	**HC**	**RIVM**	**WHO**
Organics	Sulphuric acid										
Organics	Tetrachloroethylene (Tetrachloroethene, Perchloroethylene)	1.7				1.7	26	40 (IRIS)			
Organics	Toluene										
Organics	Vinyl Acetate										
Organics	Xylenes										
Other	Bromine										
Other	Chlorine										
Other	CO2										
Other	Cyanide										
Other	Hydrochloric acid										
Other	N_2O (Nitrous Oxide)										
Other	NH_3										
PAHs	2-Chloronaphthalene										
PAHs	2-Methylfluorene										
PAHs	2-Methylnaphthalene										
PAHs	3-Methylcholanthrene	0.002				0.002					
PAHs	5-Methylchrysene	0.32	1						0.32		
PAHs	7,12-Dimethylbenz(a)anthracene	0.032	10			0.00014			0.032		
PAHs	Acenaphthene										
PAHs	Acenaphthylene										
PAHs	Anthracene										
PAHs	Benz(a)anthracene	3.2	0.1			0.091			3.2		
PAHs	Benzo(a)fluorene										
PAHs	Benzo(a)pyrene	0.32	1			0.0091			0.32		
PAHs	Benzo(b)fluoranthene	3.2	0.1			0.091			3.2		
PAHs	Benzo(e)pyrene										
PAHs	Benzo(g,h,i)perylene	32.2	0.01						32.2		
PAHs	Benzo(j)fluoranthene	3.2	0.1			0.091			3.2		
PAHs	Benzo(k)fluoranthene	3.2	0.1			0.091			3.2		
PAHs	Biphenyl (Diphenyl, Phenylbenzene, 1,1'-biphenyl, Lemonene)										
PAHs	Chrysene	32.2	0.01			0.91			32.2		
PAHs	Dibenz(a,h)anthracene	0.32	1			0.0083			0.32		
PAHs	Fluoranthene	322	0.001						322		
PAHs	Fluorene										
PAHs	Indeno(1,2,3-cd)pyrene	3.2	0.1			0.09			3.2		
PAHs	Naphthalene	0.29				0.29					
PAHs	Perylene (Perilene)										
PAHs	Phenanthrene	322	0.001						322		
PAHs	Pyrene										

Notes:

PEF = Potency Equivalency Factor for carcinogenic PAHs as defined in Health Canada 2010.

Appendix C

Physical and Chemical Screening

Table C1 Identification of Non-volatile Chemicals According to USEPA Criteria

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight (g/mol)	*Henry's Law Constant (atm-m³/mol)*	*Vapour Pressure (mm Hg)*	
CRITERIA:		**≥2.0E+02**	**≤1.0E-05**		
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)[5]	**3.20E+02**	5.00E-05	1.50E-09	No
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)[6]	**3.10E+02**	1.70E-05	1.50E-08	No
Organics	1,1,1-Trichloroethane	1.30E+02	1.70E-02	1.20E+02	No
	1,3-Butadiene	5.40E+01	7.40E-02	2.10E+03	No
	2,4-Dinitrotoluene	1.80E+02	**5.40E-08**	1.50E-04	No
	2-Chloroacetophenone	1.50E+02	**3.50E-06**	5.40E-03	No
	2-Chloronaphthalene	1.60E+02	3.20E-04	1.20E-02	No
	2-Methylfluorene	1.80E+02	3.70E-05	4.00E-04	No
	2-Methylnaphthalene	1.40E+02	5.20E-04	5.50E-02	No
	3-Methylcholanthrene	**2.70E+02**	**5.20E-06**	4.30E-08	**Yes**
	5-Methylchrysene	**2.40E+02**	**5.50E-06**	2.50E-07	**Yes**
	7,12-Dimethylbenz(a)anthracene	**2.60E+02**	**3.80E-06**	6.80E-07	**Yes**
	Acetaldehyde	4.40E+01	6.70E-05	9.00E+02	No
	Acetophenone	1.20E+02	**1.0E-05**	4.00E-01	No
	Acrolein	5.60E+01	1.20E-04	2.70E+02	No
	Benzaldehyde	1.10E+02	2.70E-05	1.30E+00	No
	Benzene	7.80E+01	5.60E-03	9.50E+01	No
	Benzyl Chloride	1.30E+02	4.10E-04	1.20E+00	No
	Bis(2-ethylhexyl) phthalate	**3.90E+02**	**2.70E-07**	1.40E-07	**Yes**
	Bromoform	**2.50E+02**	5.40E-04	5.40E+00	No
	Carbon Disulphide	7.60E+01	1.40E-02	3.60E+02	No
	Chlorobenzene	1.10E+02	3.10E-03	1.20E+01	No
	Chloroform	1.20E+02	3.70E-03	2.00E+02	No
	Cyanide	2.60E+01	2.40E-02	3.10E+02	No
	Dichlorobenzenes: 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene	 1.50E+02 1.50E+02 1.50E+02	 1.90E-03 2.60E-03 2.40E-03	 1.40E+00 2.20E+00 1.70E+00	No
	Dimethyl Sulphate	1.30E+02	**4.00E-06**	6.80E-01	No
	Ethylbenzene	1.10E+02	7.90E-03	9.60E+00	No
	Ethyl Chloride	6.50E+01	1.10E-02	1.00E+03	No
	Ethylene Dibromide	1.90E+02	6.50E-04	1.10E+01	No
	Ethylene Dichloride	9.90E+01	1.20E-03	7.90E+01	No
	Formaldehyde	3.00E+01	**3.40E-07**	3.90E+03	No
	Hydrochlorofluorocarbon 22 (HCFC-22)	8.60E+01	4.10E-02	7.30E+03	No
	Hexachlorobenzene	**2.80E+02**	1.70E-03	1.80E-05	No
	Hexane	8.60E+01	1.80E+00	1.50E+02	No
	Isophorone	1.40E+02	**6.60E-06**	4.40E-01	No
	Isopropylbenzene (Cumene)	1.20E+02	1.20E-02	4.50E+00	No
	Methyl Bromide	9.50E+01	7.30E-03	1.60E+03	No
	Methyl Chloride	5.00E+01	8.80E-03	4.30E+03	No
	Methyl Ethyl Ketone	7.20E+01	5.70E-05	9.10E+01	No
	Methyl Hydrazine	4.60E+01	**3.00E-06**	5.00E+01	No
	Methyl Methacrylate	1.00E+02	3.20E-04	3.90E+01	No
	Methyl *tert*-Butyl Ether	8.80E+01	5.90E-04	2.50E+02	No
	Methylene Chloride	8.50E+01	3.30E-03	4.40E+02	No

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight ***(g/mol)***	***Henry's Law Constant*** ***(atm-m³/mol)***	***Vapour Pressure*** ***(mm Hg)***	
CRITERIA:		**≥2.0E+02**	**≤1.0E-05**		
	Pentane	7.20E+01	1.30E+00	5.10E+02	No
	Phenol	9.40E+01	**3.30E-07**	3.50E-01	No
	Propane	4.40E+01	7.10E-01	7.20E+03	No
	Propionaldehyde	5.80E+01	7.30E-05	3.20E+02	No
	Propylene (Propene)	4.20E+01	2.00E-01	8.70E+03	No
	Propylene Oxide	5.80E+01	7.00E-05	5.40E+02	No
	Styrene	1.00E+02	2.80E-03	6.40E+00	No
	Tetrachloroethylene	1.70E+02	1.80E-02	1.90E+01	No
	Toluene	9.20E+01	6.60E-03	2.80E+01	No
	Vinyl Acetate	8.60E+01	5.10E-04	9.00E+01	No
	Xylenes:				
	m-Xylene	1.10E+02	7.20E-03	8.30E+00	No
	o-Xylene	1.10E+02	5.20E-03	6.60E+00	No
	p-Xylene	1.10E+02	6.90E-03	8.80E+00	No
PAHs	Acenaphthene	1.50E+02	1.80E-04	2.20E-03	No
	Acenaphthylene	1.50E+02	1.10E-04	6.70E-03	No
	Anthracene	1.80E+02	5.60E-05	6.50E-06	No
	Benz(a)anthracene	**2.30E+02**	1.20E-05	2.10E-07	No
	Benzo(a)fluorene	**2.20E+02**	2.70E-05	2.40E-07	No
	Benzo(a)pyrene	**2.50E+02**	**4.60E-07**	5.50E-09	**Yes**
	Benzo(b,j,k)fluoranthene:				
	Benzo(b)fluoranthene	**2.50E+02**	**6.60E-07**	5.00E-07	**Yes**
	Benzo(j)fluoranthene	**2.50E+02**	**2.00E-07**	2.60E-08	**Yes**
	Benzo(k)fluoranthene	**2.50E+02**	**5.80E-07**	9.70E-10	**Yes**
	Benzo(e)pyrene	**2.50E+02**	**3.00E-07**	5.70E-09	**Yes**
	Benzo(g,h,i)perylene	**2.80E+02**	**3.30E-07**	1.00E-10	**Yes**
	Biphenyl	1.50E+02	3.10E-04	8.90E-03	No
	Chrysene	**2.30E+02**	**5.20E-06**	6.20E-09	**Yes**
	Dibenz(a,h)anthracene	**2.80E+02**	**1.40E-07**	9.60E-10	**Yes**
	Fluoranthene	**2.00E+02**	**8.90E-06**	9.20E-06	**Yes**
	Fluorene	1.70E+02	9.60E-05	6.00E-04	No
	Indeno(1,2,3-cd)pyrene	**2.80E+02**	**3.50E-07**	1.30E-10	**Yes**
	Naphthalene	1.30E+02	4.40E-04	8.50E-02	No
	Perylene	**2.50E+02**	**3.70E-06**	5.30E-09	**Yes**
	Phenanthrene	1.80E+02	4.20E-05	1.20E-04	No
	Pyrene	**2.00E+02**	1.20E-05	4.50E-06	No

1. Gaseous chemicals (i.e., CO, NO_2, SO_2, hydrogen fluoride, hydrogen chloride and hydrogen sulphide) were evaluated on an inhalation basis only.
2. $PM_{2.5}$ was excluded from the screening as it is a mixture for which the physical-chemical properties and fugacity are not known.
3. With scientific notation, values too large or small to be conveniently written in standard decimal notation are expressed either to the negative power (i.e., E-x) or to the positive power (i.e., E+x). For example, molecular weight for 2-methylnaphthalene is 1.4E+02 to 140.
4. Bold values indicate that the physical-chemical parameter meets or exceeds the pre-established criterion, and the chemical is eligible for inclusion in the multiple pathway assessment, provided that defensible exposure limits are available.
5. 2,3,7,8-TCDD was identified as a surrogate chemical for the following dioxins: Heptachlorodibenzo-*p*-dioxins, Hexachlorodibenzo-*p*-dioxins, Octachlorodibenzo-*p*-dioxins, Pentachlorodibenzo-*p*-dioxins, and Tetrachlorodibenzo-*p*-dioxins.
6. 2,3,7,8-TCDF was identified as a surrogate chemical for the following furans: Heptachlorodibenzofurans, Hexachlorodibenzofurans, Octachlorodibenzofurans, Pentachlorodibenzofurans, and Tetrachlorodibenzofurans.

Table C2 Identification of Non-volatile Chemicals According to Cal/EPA Criteria

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight (g/mol)	*Henry's Law Constant (atm-m³/mol)*	*Vapour Pressure (mm Hg)*	
CRITERIA:			**≤1.0E-05**	**≤1.0E-03**	
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)[5]	3.20E+02	5.00E-05	**1.50E-09**	No
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)[6]	3.10E+02	1.70E-05	**1.50E-08**	No
Organics	1,1,1-Trichloroethane	1.30E+02	1.70E-02	1.20E+02	No
	1,3-Butadiene	5.40E+01	7.40E-02	2.10E+03	No
	2,4-Dinitrotoluene	1.80E+02	**5.40E-08**	**1.50E-04**	**Yes**
	2-Chloroacetophenone	1.50E+02	**3.50E-06**	5.40E-03	No
	2-Chloronaphthalene	1.60E+02	3.20E-04	1.20E-02	No
	2-Methylfluorene	1.80E+02	3.70E-05	**4.00E-04**	No
	2-Methylnaphthalene	1.40E+02	5.20E-04	5.50E-02	No
	3-Methylcholanthrene	2.70E+02	**5.20E-06**	**4.30E-08**	**Yes**
	5-Methylchrysene	2.40E+02	**5.50E-06**	**2.50E-07**	**Yes**
	7,12-Dimethylbenz(a)anthracene	2.60E+02	**3.80E-06**	**6.80E-07**	**Yes**
	Acetaldehyde	4.40E+01	6.70E-05	9.00E+02	No
	Acetophenone	1.20E+02	**1.0E-05**	4.00E-01	No
	Acrolein	5.60E+01	1.20E-04	2.70E+02	No
	Benzaldehyde	1.10E+02	2.70E-05	1.30E+00	No
	Benzene	7.80E+01	5.60E-03	9.50E+01	No
	Benzyl Chloride	1.30E+02	4.10E-04	1.20E+00	No
	Bis(2-ethylhexyl) phthalate	3.90E+02	**2.70E-07**	**1.40E-07**	**Yes**
	Bromoform	2.50E+02	5.40E-04	5.40E+00	No
	Carbon Disulphide	7.60E+01	1.40E-02	3.60E+02	No
	Chlorobenzene	1.10E+02	3.10E-03	1.20E+01	No
	Chloroform	1.20E+02	3.70E-03	2.00E+02	No
	Cyanide	2.60E+01	2.40E-02	3.10E+02	No
	Dichlorobenzenes: 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene	 1.50E+02 1.50E+02 1.50E+02	 1.90E-03 2.60E-03 2.40E-03	 1.40E+00 2.20E+00 1.70E+00	No
	Dimethyl Sulphate	1.30E+02	**4.00E-06**	6.80E-01	No
	Ethylbenzene	1.10E+02	7.90E-03	9.60E+00	No
	Ethyl Chloride	6.50E+01	1.10E-02	1.00E+03	No
	Ethylene Dibromide	1.90E+02	6.50E-04	1.10E+01	No
	Ethylene Dichloride	9.90E+01	1.20E-03	7.90E+01	No
	Formaldehyde	3.00E+01	**3.40E-07**	3.90E+03	No
	Hydrochlorofluorocarbon 22 (HCFC-22)	8.60E+01	4.10E-02	7.30E+03	No
	Hexachlorobenzene	2.80E+02	1.70E-03	**1.80E-05**	No
	Hexane	8.60E+01	1.80E+00	1.50E+02	No
	Isophorone	1.40E+02	**6.60E-06**	4.40E-01	No
	Isopropylbenzene (Cumene)	1.20E+02	1.20E-02	4.50E+00	No
	Methyl Bromide	9.50E+01	7.30E-03	1.60E+03	No
	Methyl Chloride	5.00E+01	8.80E-03	4.30E+03	No
	Methyl Ethyl Ketone	7.20E+01	5.70E-05	9.10E+01	No
	Methyl Hydrazine	4.60E+01	**3.00E-06**	5.00E+01	No
	Methyl Methacrylate	1.00E+02	3.20E-04	3.90E+01	No
	Methyl *tert*-Butyl Ether	8.80E+01	5.90E-04	2.50E+02	No
	Methylene Chloride	8.50E+01	3.30E-03	4.40E+02	No

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight (g/mol)	*Henry's Law Constant (atm-m³/mol)*	*Vapour Pressure (mm Hg)*	
CRITERIA:			**≤1.0E-05**	**≤1.0E-03**	
	Pentane	7.20E+01	1.30E+00	5.10E+02	No
	Phenol	9.40E+01	**3.30E-07**	3.50E-01	No
	Propane	4.40E+01	7.10E-01	7.20E+03	No
	Propionaldehyde	5.80E+01	7.30E-05	3.20E+02	No
	Propylene (Propene)	4.20E+01	2.00E-01	8.70E+03	No
	Propylene Oxide	5.80E+01	7.00E-05	5.40E+02	No
	Styrene	1.00E+02	2.80E-03	6.40E+00	No
	Tetrachloroethylene	1.70E+02	1.80E-02	1.90E+01	No
	Toluene	9.20E+01	6.60E-03	2.80E+01	No
	Vinyl Acetate	8.60E+01	5.10E-04	9.00E+01	No
	Xylenes:				
	m-Xylene	1.10E+02	7.20E-03	8.30E+00	No
	o-Xylene	1.10E+02	5.20E-03	6.60E+00	No
	p-Xylene	1.10E+02	6.90E-03	8.80E+00	No
PAHs	Acenaphthene	1.50E+02	1.80E-04	2.20E-03	No
	Acenaphthylene	1.50E+02	1.10E-04	6.70E-03	No
	Anthracene	1.80E+02	5.60E-05	**6.50E-06**	No
	Benz(a)anthracene	2.30E+02	1.20E-05	**2.10E-07**	No
	Benzo(a)fluorene	2.20E+02	2.70E-05	**2.40E-07**	No
	Benzo(a)pyrene	2.50E+02	**4.60E-07**	**5.50E-09**	**Yes**
	Benzo(b,j,k)fluoranthene:				
	Benzo(b)fluoranthene	2.50E+02	**6.60E-07**	**5.00E-07**	**Yes**
	Benzo(j)fluoranthene	2.50E+02	**2.00E-07**	**2.60E-08**	**Yes**
	Benzo(k)fluoranthene	2.50E+02	**5.80E-07**	**9.70E-10**	**Yes**
	Benzo(e)pyrene	2.50E+02	**3.00E-07**	**5.70E-09**	**Yes**
	Benzo(g,h,i)perylene	2.80E+02	**3.30E-07**	**1.00E-10**	**Yes**
	Biphenyl	1.50E+02	3.10E-04	8.90E-03	No
	Chrysene	2.30E+02	**5.20E-06**	**6.20E-09**	**Yes**
	Dibenz(a,h)anthracene	2.80E+02	**1.40E-07**	**9.60E-10**	**Yes**
	Fluoranthene	2.00E+02	**8.90E-06**	**9.20E-06**	**Yes**
	Fluorene	1.70E+02	9.60E-05	**6.00E-04**	No
	Indeno(1,2,3-cd)pyrene	2.80E+02	**3.50E-07**	**1.30E-10**	**Yes**
	Naphthalene	1.30E+02	4.40E-04	8.50E-02	No
	Perylene	2.50E+02	**3.70E-06**	**5.30E-09**	**Yes**
	Phenanthrene	1.80E+02	4.20E-05	**1.20E-04**	No
	Pyrene	2.00E+02	1.20E-05	**4.50E-06**	No

1. Gaseous chemicals (i.e., CO, NO_2, SO_2, hydrogen fluoride, hydrogen chloride and hydrogen sulphide) were evaluated on an inhalation basis only.
2. $PM_{2.5}$ was excluded from the screening as it is a mixture for which the physical-chemical properties and fugacity are not known.
3. With scientific notation, values too large or small to be conveniently written in standard decimal notation are expressed either to the negative power (i.e., E-x) or to the positive power (i.e., E+x). For example, molecular weight for 2-methylnaphthalene is 1.4E+02 to 140.
4. Bold values indicate that the physical-chemical parameter meets or exceeds the pre-established criterion, and the chemical is eligible for inclusion in the multiple pathway assessment, provided that defensible exposure limits are available.
5. 2,3,7,8-TCDD was identified as a surrogate chemical for the following dioxins: Heptachlorodibenzo-*p*-dioxins, Hexachlorodibenzo-*p*-dioxins, Octachlorodibenzo-*p*-dioxins, Pentachlorodibenzo-*p*-dioxins, and Tetrachlorodibenzo-*p*-dioxins.
6. 2,3,7,8-TCDF was identified as a surrogate chemical for the following furans: Heptachlorodibenzofurans, Hexachlorodibenzofurans, Octachlorodibenzofurans, Pentachlorodibenzofurans, and Tetrachlorodibenzofurans.

Table C3 Identification of Non-volatile Chemicals According to BCELQAAC Criteria

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight ***(g/mol)***	***Henry's Law Constant*** ***(atm-m³/mol)***	***Vapour Pressure*** ***(mm Hg)***	
CRITERIA:			**≤1.0E-05**	**≤5.0E-02**	
Dioxins and Furans	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)[5]	3.20E+02	5.00E-05	**1.50E-09**	No
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)[6]	3.10E+02	1.70E-05	**1.50E-08**	No
Organics	1,1,1-Trichloroethane	1.30E+02	1.70E-02	1.20E+02	No
	1,3-Butadiene	5.40E+01	7.40E-02	2.10E+03	No
	2,4-Dinitrotoluene	1.80E+02	**5.40E-08**	**1.50E-04**	**Yes**
	2-Chloroacetophenone	1.50E+02	**3.50E-06**	**5.40E-03**	**Yes**
	2-Chloronaphthalene	1.60E+02	3.20E-04	**1.20E-02**	No
	2-Methylfluorene	1.80E+02	3.70E-05	**4.00E-04**	No
	2-Methylnaphthalene	1.40E+02	5.20E-04	5.50E-02	No
	3-Methylcholanthrene	2.70E+02	**5.20E-06**	**4.30E-08**	**Yes**
	5-Methylchrysene	2.40E+02	**5.50E-06**	**2.50E-07**	**Yes**
	7,12-Dimethylbenz(a)anthracene	2.60E+02	**3.80E-06**	**6.80E-07**	**Yes**
	Acetaldehyde	4.40E+01	6.70E-05	9.00E+02	No
	Acetophenone	1.20E+02	**1.0E-05**	4.00E-01	No
	Acrolein	5.60E+01	1.20E-04	2.70E+02	No
	Benzaldehyde	1.10E+02	2.70E-05	1.30E+00	No
	Benzene	7.80E+01	5.60E-03	9.50E+01	No
	Benzyl Chloride	1.30E+02	4.10E-04	1.20E+00	No
	Bis(2-ethylhexyl) phthalate	3.90E+02	**2.70E-07**	**1.40E-07**	**Yes**
	Bromoform	2.50E+02	5.40E-04	5.40E+00	No
	Carbon Disulphide	7.60E+01	1.40E-02	3.60E+02	No
	Chlorobenzene	1.10E+02	3.10E-03	1.20E+01	No
	Chloroform	1.20E+02	3.70E-03	2.00E+02	No
	Cyanide	2.60E+01	2.40E-02	3.10E+02	No
	Dichlorobenzenes: 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene	 1.50E+02 1.50E+02 1.50E+02	 1.90E-03 2.60E-03 2.40E-03	 1.40E+00 2.20E+00 1.70E+00	No
	Dimethyl Sulphate	1.30E+02	**4.00E-06**	6.80E-01	No
	Ethylbenzene	1.10E+02	7.90E-03	9.60E+00	No
	Ethyl Chloride	6.50E+01	1.10E-02	1.00E+03	No
	Ethylene Dibromide	1.90E+02	6.50E-04	1.10E+01	No
	Ethylene Dichloride	9.90E+01	1.20E-03	7.90E+01	No
	Formaldehyde	3.00E+01	**3.40E-07**	3.90E+03	No
	Hydrochlorofluorocarbon 22 (HCFC-22)	8.60E+01	4.10E-02	7.30E+03	No
	Hexachlorobenzene	2.80E+02	1.70E-03	**1.80E-05**	No
	Hexane	8.60E+01	1.80E+00	1.50E+02	No
	Isophorone	1.40E+02	**6.60E-06**	4.40E-01	No
	Isopropylbenzene (Cumene)	1.20E+02	1.20E-02	4.50E+00	No
	Methyl Bromide	9.50E+01	7.30E-03	1.60E+03	No
	Methyl Chloride	5.00E+01	8.80E-03	4.30E+03	No
	Methyl Ethyl Ketone	7.20E+01	5.70E-05	9.10E+01	No
	Methyl Hydrazine	4.60E+01	**3.00E-06**	5.00E+01	No
	Methyl Methacrylate	1.00E+02	3.20E-04	3.90E+01	No
	Methyl *tert*-Butyl Ether	8.80E+01	5.90E-04	2.50E+02	No
	Methylene Chloride	8.50E+01	3.30E-03	4.40E+02	No

Chemical[1,2]		*Volatility*[3,4]			*Non-Volatile Chemical*
		Molecular Weight (g/mol)	*Henry's Law Constant (atm-m³/mol)*	*Vapour Pressure (mm Hg)*	
CRITERIA:			**≤1.0E-05**	**≤5.0E-02**	
	Pentane	7.20E+01	1.30E+00	5.10E+02	No
	Phenol	9.40E+01	**3.30E-07**	3.50E-01	No
	Propane	4.40E+01	7.10E-01	7.20E+03	No
	Propionaldehyde	5.80E+01	7.30E-05	3.20E+02	No
	Propylene (Propene)	4.20E+01	2.00E-01	8.70E+03	No
	Propylene Oxide	5.80E+01	7.00E-05	5.40E+02	No
	Styrene	1.00E+02	2.80E-03	6.40E+00	No
	Tetrachloroethylene	1.70E+02	1.80E-02	1.90E+01	No
	Toluene	9.20E+01	6.60E-03	2.80E+01	No
	Vinyl Acetate	8.60E+01	5.10E-04	9.00E+01	No
	Xylenes:				
	m-Xylene	1.10E+02	7.20E-03	8.30E+00	No
	o-Xylene	1.10E+02	5.20E-03	6.60E+00	No
	p-Xylene	1.10E+02	6.90E-03	8.80E+00	No
PAHs	Acenaphthene	1.50E+02	1.80E-04	**2.20E-03**	No
	Acenaphthylene	1.50E+02	1.10E-04	**6.70E-03**	No
	Anthracene	1.80E+02	5.60E-05	**6.50E-06**	No
	Benz(a)anthracene	2.30E+02	1.20E-05	**2.10E-07**	No
	Benzo(a)fluorene	2.20E+02	2.70E-05	**2.40E-07**	No
	Benzo(a)pyrene	2.50E+02	**4.60E-07**	**5.50E-09**	**Yes**
	Benzo(b,j,k)fluoranthene:				
	Benzo(b)fluoranthene	2.50E+02	**6.60E-07**	**5.00E-07**	**Yes**
	Benzo(j)fluoranthene	2.50E+02	**2.00E-07**	**2.60E-08**	**Yes**
	Benzo(k)fluoranthene	2.50E+02	**5.80E-07**	**9.70E-10**	**Yes**
	Benzo(e)pyrene	2.50E+02	**3.00E-07**	**5.70E-09**	**Yes**
	Benzo(g,h,i)perylene	2.80E+02	**3.30E-07**	**1.00E-10**	**Yes**
	Biphenyl	1.50E+02	3.10E-04	**8.90E-03**	No
	Chrysene	2.30E+02	**5.20E-06**	**6.20E-09**	**Yes**
	Dibenz(a,h)anthracene	2.80E+02	**1.40E-07**	**9.60E-10**	**Yes**
	Fluoranthene	2.00E+02	**8.90E-06**	**9.20E-06**	**Yes**
	Fluorene	1.70E+02	9.60E-05	**6.00E-04**	No
	Indeno(1,2,3-cd)pyrene	2.80E+02	**3.50E-07**	**1.30E-10**	**Yes**
	Naphthalene	1.30E+02	4.40E-04	8.50E-02	No
	Perylene	2.50E+02	**3.70E-06**	**5.30E-09**	**Yes**
	Phenanthrene	1.80E+02	4.20E-05	**1.20E-04**	No
	Pyrene	2.00E+02	1.20E-05	**4.50E-06**	No

1. Gaseous chemicals (i.e., CO, NO_2, SO_2, hydrogen fluoride, hydrogen chloride and hydrogen sulphide) were evaluated on an inhalation basis only.
2. $PM_{2.5}$ was excluded from the screening as it is a mixture for which the physical-chemical properties and fugacity are not known.
3. With scientific notation, values too large or small to be conveniently written in standard decimal notation are expressed either to the negative power (i.e., E-x) or to the positive power (i.e., E+x). For example, molecular weight for 2-methylnaphthalene is 1.4E+02 to 140.
4. Bold values indicate that the physical-chemical parameter meets or exceeds the pre-established criterion, and the chemical is eligible for inclusion in the multiple pathway assessment, provided that defensible exposure limits are available.
5. 2,3,7,8-TCDD was identified as a surrogate chemical for the following dioxins: Heptachlorodibenzo-*p*-dioxins, Hexachlorodibenzo-*p*-dioxins, Octachlorodibenzo-*p*-dioxins, Pentachlorodibenzo-*p*-dioxins, and Tetrachlorodibenzo-*p*-dioxins.
6. 2,3,7,8-TCDF was identified as a surrogate chemical for the following furans: Heptachlorodibenzofurans, Hexachlorodibenzofurans, Octachlorodibenzofurans, Pentachlorodibenzofurans, and Tetrachlorodibenzofurans.

Table C4 Summary of Physical and Chemical Screening Based on Chemicals Identified as Non-volatile, Bio-accumulative and Persistent.

Chemical of Potential Concern		*Volatility*[1]			*Bioaccumulation*[2]	*Persistence (Days)*[3]				*Chemical Considered Non-volatile, Bio-accumulative and Persistent*
		Molecular Weight (g/mol)	*Henry's Law Constant (atm-m³/mol)*	*Vapour Pressure (mm Hg)*	*Log K_{ow}*	*Air*	*Soil*	*Water*	*Sediment*	
CRITERIA:		**≥2.0E+02**	**≤1.0E-05**	**≤5.0E-02**	**≥5.0**	**≥2**	**≥182**	**≥182**	**≥365**	
Dioxins and Furans[4]	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)	3.20E+02	5.00E-05	1.50E-09	**6.8**	**14**	**360**	180	**1621**	**Yes**
	2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	3.10E+02	1.70E-05	1.50E-08	**6.5**	**42**	**360**	180	**1621**	**Yes**
Organics	2,4-Dinitrotoluene	1.80E+02	5.40E-08	1.50E-04	2.0	**50**	75	38	338	**Yes**
	2-Chloroacetophenone	1.50E+02	3.50E-06	5.40E-03	1.9	**63**	75	38	338	**Yes**
	Bis(2-ethylhexyl) phthalate	3.90E+02	2.70E-07	1.40E-07	**7.6**	0.5	30	15	135	**Yes**
PAHs	3-Methylcholanthrene	2.70E+02	5.20E-06	4.30E-08	**6.4**	0.05	**360**	180	**1621**	**Yes**
	5-Methylchrysene	2.40E+02	5.50E-06	2.50E-07	**6.1**	0.1	120	60	**542**	**Yes**
	7,12-Dimethylbenz(a)anthracene	2.60E+02	3.80E-06	6.80E-07	**5.8**	0.1	**360**	180	**1621**	**Yes**
	Benzo(a)pyrene	2.50E+02	4.60E-07	5.50E-09	**6.1**	0.2	120	60	**542**	**Yes**
	Benzo(b,j,k)fluoranthene:									
	Benzo(b)fluoranthene	2.50E+02	6.60E-07	5.00E-07	**5.8**	0.1	120	60	**542**	**Yes**
	Benzo(j)fluoranthene	2.50E+02	2.00E-07	2.60E-08	**6.1**	0.2	120	60	**542**	**Yes**
	Benzo(k)fluoranthene	2.50E+02	5.80E-07	9.70E-10	**6.1**	0.2	120	60	**542**	**Yes**
	Benzo(e)pyrene	2.50E+02	3.00E-07	5.70E-09	**6.4**	0.2	120	60	**542**	**Yes**
	Benzo(g,h,i)perylene	2.80E+02	3.30E-07	1.00E-10	**6.6**	0.1	120	60	**542**	**Yes**
	Chrysene	2.30E+02	5.20E-06	6.20E-09	**5.8**	0.1	120	60	**542**	**Yes**
	Dibenz(a,h)anthracene	2.80E+02	1.40E-07	9.60E-10	**5.5**	0.2	120	60	**542**	**Yes**
	Fluoranthene	2.00E+02	8.90E-06	9.20E-06	**6.8**	1	120	60	**542**	**Yes**
	Indeno(1,2,3-cd)pyrene	2.80E+02	3.50E-07	1.30E-10	**6.7**	0.2	120	60	**542**	**Yes**
	Perylene	2.50E+02	3.70E-06	5.30E-09	**6.3**	0.2	120	60	**542**	**Yes**

1. With scientific notation, values too large or small to be conveniently written in standard decimal notation are expressed either to the negative power (i.e., E-x) or to the positive power (i.e., E+x). For example, molecular weight for 2-methylnaphthalene is 1.4E+02 to 140.
2. Bold values indicate that the physical-chemical parameter meets or exceeds the pre-established criterion, and the chemical is considered bio-accumulative.
3. Bold values indicate that the physical-chemical parameter meets or exceeds the pre-established criterion, and the chemical is considered persistent.
4. Dioxins and furans were included in the Level III fugacity modeling as they are known to be bio-accumulative and persistent in the environment.

Table C5 Chemicals Identified as Non-volatile Bio-accumulative and Persistent

Group	*Chemical*
Metals	Aluminum
	Antimony
	Arsenic
	Barium
	Beryllium
	Boron
	Bromine
	Cadmium
	Chlorine
	Chromium (III)
	Chromium (VI)
	Cobalt
	Copper
	Iron
	Lead
	Magnesium
	Manganese
	Mercury
	Molybdenum
	Nickel
	Phosphorus
	Potassium
	Rubidium
	Selenium
	Silicon
	Silver
	Sodium
	Strontium
	Thallium
	Thorium
	Titanium
	Uranium
	Vanadium
	Zinc
	Zirconium
Organics	2,4-Dinitrotoluene
	2-Chloroacetophenone
	3-Methylcholanthrene
	5-Methylchrysene
	7,12-Dimethylbenz(a)anthracene
	Bis(2-ethylhexyl)phthalate
PAHs	Benzo(a)pyrene
	Benzo(b,j,k)fluoranthene: Benzo(b)fluoranthene Benzo(j)fluoranthene Benzo(k)fluoranthene
	Benzo(e)pyrene

Group	*Chemical*
	Benzo(g,h,i)perylene
	Chrysene
	Dibenz(a,h)anthracene
	Fluoranthene
	Indeno(1,2,3-cd)pyrene
	Perylene

Appendix D
Summary of Chemical Screening of Emissions Associated with Electrical Generation Facilities

Table D-1 Summary of Chemical Screening of Emissions Associated with Electrical Generation Facilities

		Emission Inventory		Inhalation Toxic Potency Screening (>0.1%)			Physical & Chemical Screening				Historical Applications
		Coal Combustion	Natural Gas	Acute	Chronic (non-carcinogens)	Chronic (carcinogens)	Chemical non-volatile	Bio-accumulative	Fugacity Model	Persistence	COPC
Chemical Group	Chemical	Yes / No		Yes / No / No TRV			Volatile / Non-volatile / Not Assessed	Yes / No / Not Assessed / Automatically Included			Yes / No
CACs	PM2.5	Yes	No	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Yes
	SO2	Yes	Yes	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Yes
	CO	Yes	Yes	Yes	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	NO2	Yes	Yes	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	PM10	Yes	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Total PM	Yes	No	No	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	VOC (no C1, C2)	Yes	Yes	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	TSP	Yes	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
Dioxins and Furans	2,3,7,8-TCDD	Yes	No	No TRV	No	No	Non-volatile	Yes	Yes	Yes	No
	2,3,7,8-TCDF	Yes	No	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
GHGs	CH4	Yes	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	CO2	Yes	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	N2O (Nitrous Oxide)	Yes	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
Hydrogen Halides	Hydrogen Chloride	Yes	No	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Hydrogen Fluoride	Yes	No	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Yes
Metals	Aluminum	Yes	Yes	No TRV	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Antimony	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Arsenic	Yes	Yes	Yes	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Barium	Yes	Yes	No TRV	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Beryllium	Yes	Yes	No TRV	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Boron	Yes	Yes	No	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Bromine	Yes	No	Yes	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Cadmium	Yes	Yes	Yes	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Calcium	Yes	No	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Chlorine	Yes	No	Yes	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Chromium (III)	Yes	Yes	Yes	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Chromium (VI)	Yes	Yes	No TRV	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Cobalt	Yes	Yes	No TRV	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Copper	Yes	Yes	No	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Iron	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Lead	Yes	Yes	Yes	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Magnesium	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Manganese	Yes	Yes	Yes	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Mercury	Yes	Yes	Yes	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Molybdenum	Yes	Yes	No TRV	No	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Nickel	Yes	Yes	Yes	Yes	Yes	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Phosphorus	Yes	No	Yes	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Potassium	Yes	No	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Rubidium	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Selenium	Yes	Yes	No TRV	No	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	Yes
	Silicon	Yes	No	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Silver	Yes	Yes	No TRV	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Sodium	Yes	No	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Strontium	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Thallium	Yes	Yes	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Thorium	Yes	No	No TRV	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Titanium	Yes	Yes	No TRV	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Uranium	Yes	No	No TRV	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Vanadium	Yes	Yes	Yes	Yes	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Zinc	Yes	Yes	No	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	Zirconium	Yes	Yes	No	No TRV	No TRV	Automatically Included	Automatically Included	Automatically Included	Automatically Included	No
	1,1,1-Trichloroethane	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	1,3-Butadiene	No	Yes	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	2,4-Dinitrotoluene	Yes	No	No TRV	No TRV	No	Non-volatile	No	Yes	Yes	No
	2-Chloroacetophenone	Yes	No	No TRV	No	No TRV	Non-volatile	No	Yes	Yes	No
	2-Chloronaphthalene	No	Yes	No TRV	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	2-Methylfluorene	Yes	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	2-Methylnaphthalene	No	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	3-Methylcholanthrene	No	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	5-Methylchrysene	Yes	No	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	7,12-Dimethylbenz(a)anthracene	No	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Acetaldehyde	Yes	Yes	Yes	No	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Acetophenone	Yes	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Acrolein	Yes	Yes	Yes	Yes	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	Yes
	Benzaldehyde	No	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Benzene	Yes	Yes	Yes	Yes	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Benzyl Chloride	Yes	No	No	Yes	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Bis(2-ethylhexyl)phthalate	Yes	No	No TRV	No TRV	No	Non-volatile	Yes	Yes	No	No
	Bromoform	Yes	No	No TRV	No TRV	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Carbon Disulphide	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Chlorobenzene	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Chloroform	Yes	No	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Cyanide	Yes	No	No TRV	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Dichlorobenzene	No	Yes	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Dimethyl Sulphate	Yes	No	No	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No

Table D-1 Summary of Chemical Screening of Emissions Associated with Electrical Generation Facilities

		Emission Inventory		Inhalation Toxic Potency Screening (>0.1%)			Physical & Chemical Screening				Historical Applications
		Coal Combustion	Natural Gas	Acute	Chronic (non-carcinogens)	Chronic (carcinogens)	Chemical non-volatile	Bio-accumulative	Fugacity Model	Persistence	COPC
Chemical Group	Chemical	Yes / No		Yes / No / No TRV			Volatile / Non-volatile / Not Assessed	Yes / No / Not Assessed / Automatically Included			Yes / No
Organics	Ethylbenzene	Yes	Yes	No	No	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Ethyl Chloride	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Ethylene Dibromide	Yes	No	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Ethylene Dichloride	Yes	No	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Formaldehyde	Yes	Yes	Yes	Yes	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	HCFC-22 (Hydrochlorofluorocarbon 22)	Yes	No	No TRV	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Hexachlorobenzene	Yes	No	No TRV	No TRV	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Hexane	Yes	Yes	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Isophorone	Yes	No	No TRV	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Isopropylbenzene (Cumene)	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl Bromide	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl Chloride	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl Ethyl Ketone (Butanone)	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl Hydrazine	Yes	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl Methacrylate	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methyl tert-Butyl Ether	Yes	No	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Methylene Chloride	Yes	No	No	No	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Pentane	No	Yes	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Phenol	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Propane	Yes	No	No	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Propionaldehyde	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Propylene	No	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Propylene Oxide	No	Yes	No	No	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Styrene	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Tetrachloroethylene	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Toluene	Yes	Yes	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Total Aldehydes	No	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Total Ketones	No	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Total VOC	No	No	No TRV	No TRV	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Vinyl Acetate	Yes	No	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Xylenes	Yes	Yes	No	No	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
Other	Hydrochloric Acid	Yes	No	No	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	NH3	No	Yes	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Sulphuric Acid	Yes	No	Yes	Yes	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
PAHs	Acenaphthene	Yes	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Acenaphthylene	Yes	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Anthracene	Yes	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Benz(a)anthracene	Yes	Yes	No TRV	No TRV	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Benzo(a)fluorene	Yes	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Benzo(a)pyrene	Yes	Yes	No TRV	Yes	No	Non-volatile	Yes	Yes	Yes	No
	Benzo(b)fluoranthene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Benzo(j)fluoranthene	Yes	No	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Benzo(k)fluoranthene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Benzo(e)pyrene	Yes	Yes	No TRV	No TRV	No TRV	Non-volatile	Yes	Yes	Yes	No
	Benzo(g,h,i)perylene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Biphenyl	Yes	No	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Chrysene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Dibenz(a,h)anthracene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Fluoranthene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Fluorene	Yes	Yes	No TRV	No TRV	No TRV	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Indeno(1,2,3-cd)pyrene	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Naphthalene	Yes	Yes	No	No	Yes	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Perylene (Perilene)	Yes	Yes	No TRV	No TRV	No	Non-volatile	Yes	Yes	Yes	No
	Phenanthrene	Yes	Yes	No TRV	No TRV	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Pyrene	Yes	Yes	No TRV	No TRV	No	Volatile	Not Assessed	Not Assessed	Not Assessed	No
	Total PAH	Yes	No	No TRV	No TRV	No	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
Radionuclides	Potassium 40	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Uranium 238	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Thorium 234	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Radium 226	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Radon 222	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Bismuth 214	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Lead 210	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Radium 223	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Polonium 210	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Thorium 232	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Actinium 228	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Thorium 228	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Lead 212	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Uranium 235	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No
	Thorium 227	Yes	No	No TRV	No	No TRV	Not Assessed	Not Assessed	Not Assessed	Not Assessed	No

Notes:
TRV: Toxicity Reference Value