Troilus Gold Project Technical Data Report – Air Quality Assessment

FINAL REPORT

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Prepared for:

Troilus Gold Corporation

Prepared by:

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Stantec

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Executive Summary

Troilus Gold Corporation (Troilus) proposes to develop, construct, operate, and progressively reclaim an open-pit gold mine, collectively known as the Troilus Gold Project ('the Project'), approximately 170 km north of Chibougamau, Quebec. The Project includes the development of four open pits, stockpiles, processing plant, and other mine-related infrastructure.

The Project was originally an open pit operation producing gold and copper continuously from October 1996 to April 2009. The former Troilus Mine produced over 2 million oz of gold and approximately 70,000 t of copper. After the mine ceased production in 2009, the 20,000 tonne per day mill processed low grade stockpiles until the end of June 2010. Following this, the mill was sold and shipped to Mexico and the main camp facilities were dismantled in late 2010. A significant amount of site infrastructure was left in place after the mine closure and disposition of some of the key assets.

This Technical Data Report (TDR) for the Air Quality Assessment describes the existing air quality conditions related to the Project followed by an analysis of potential effects, mitigation measures and cumulative effects of the Project. The TDR will inform the completion of the associated Valued Component (VC) chapter and will be appended to the Impact Statement.

This TDR has been prepared pursuant to the Quebec Regulation respecting the environmental impact assessment and review of certain projects (RREIARCP) as well as the Federal *Impact Assessment Act*, 2019 (IAA, 2019) and in consideration of the Federal Tailored Impact Statement Guidelines (TIS Guidelines) (IAAC, 2023) as well as the Quebec Directive Specific to the Troilus Project (Quebec Directives) (MELCCFP, 2022).

The assessment of potential changes in air quality due to the Project was performed by conducting dispersion modelling to predict the downwind concentrations of airborne contaminants of potential concern (CoPCs) and comparing these predictions to regulatory standards, objectives and guidelines. The assessment consisted of the following elements:

- Compilation of an emissions inventory for Project stationary and mobile sources.
- Assessment of baseline ambient air quality conditions for CoPCs from existing published sources of air quality data.
- Dispersion and deposition modelling of the Project to provide input to the Human Health and Ecological Risk Assessment, and to support the assessment of potential environmental effects, including cumulative effects, for the Impact Statement. Vehicle traffic on the mine access road was also evaluated.
- Comparison of dispersion model predictions to ambient air quality criteria as well as evaluation of the incremental change in air quality associated with the Project.

Using computer-based modelling, ground level CoPC concentrations from the Project were predicted over gridded and discrete receptors located along and outside of the Modelled Mine Boundary. Additionally, a series of special receptors were situated in areas where human activities more regularly take place (e.g., hunting/fishing cabins). The Modelled Mine Boundary includes a 300 m buffer around the Project Area

(PA) as specified in Section 4.3 of the ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) instruction guide, Preparation and Realization of Air Emission Dispersion Modelling (MELCCFP, 2017), and similar to other mining projects and industrial areas.

A total of 126 CoPCs were assessed for the Project construction phase and 132 CoPCs were assessed for the Project operations phase. Project operations include 6 additional CoPCs due to ore processing operations relative to the construction phase. The dispersion modelling was initially completed without considering plume deposition and depletion, which provides conservative predictions. For selected CoPCs, additional dispersion model simulations including deposition and depletion were completed to provide more representative characterizations of ambient particulate matter or metals concentrations.

Background Air Quality

Background (initial concentration) air quality data published by the MELCCFP in the following documents was used to conservatively characterize air quality in the LSA and to develop conservative background concentration levels to be used in the assessment.

- Quebec Air Quality Standards and Criteria, version 9, Quebec, Air Quality and Climate Branch (MELCCFP, 2025)
- Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017)

The predicted Project CoPCs were combined with background concentrations (where available) to assess cumulative impacts.

Where background concentrations for CoPCs were not available, representative ambient monitoring data from another proposed mining project, the Crawford Nickel Project (Stantec, 2024) was used to estimate background CoPC concentrations. The Crawford Nickel Project is located approximately 42 km north of the City of Timmins, Ontario in a remote area similar to that of the Project, and therefore the background levels are expected to be representative of the Troilus Project background levels. The background levels used in this assessment were the 90th percentile values for short-term averaging periods. For annual averages, an annual average value was used as the background level.

The results of the air quality assessment are provided for the following: Mine Boundary Modelling Results, Construction Special Receptor Modelling Results, Operations Special Receptor Modelling Results, and Deposition Results.

Mine Boundary Modelling Results

The maximum predicted cumulative (Project Alone + Background) ground level concentrations (GLCs) at the Modelled Mine Boundary are above the applicable air quality criteria and screening levels for 6 of 126 CoPCs during the construction phase and 7 of 132 CoPCs during the operation phase. In accordance with the Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017), Troilus is applying the mitigation measures listed in Sections 4.2.7.1 and 4.2.7.2 to reduce Project air emissions.

Construction Special Receptor Modelling Results

Project Alone

The maximum predicted concentrations for 123 of 126 CoPCs assessed for the construction scenario were below the MELCCFP or Ontario Ministry of the Environment, Conservation and Parks (MECP) criteria for all special receptors assessed.

Exceedances of 1-hour average elemental carbon (from diesel exhaust) criterion are predicted at all six special receptors, with the highest concentration predicted at the proposed Cree Camp CC2 which is located approximately 8 km north of the Project. The maximum predicted concentration of elemental carbon is 150% of the MELCCFP criterion.

The maximum predicted 24-hour average concentrations of actinolite and tremolite are above the Ontario Air Quality Screening Level which are based on health effects from asbestos. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level. Tremolite and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

Cumulative

The maximum predicted concentrations of the construction CoPCs when considering the Project cumulatively with background air quality are below the MELCCFP or MECP criteria for all six special receptors assessed other than:

- 1-hour average elemental carbon in diesel exhaust
- 1-hour average quartz in PM_{10}
- 24-hour average tremolite
- 24-hour average actinolite

Exceedances of the 1-hour average elemental carbon criterion when considering cumulative air quality are predicted at all six of the special receptors (up to 150% of the Quebec criterion). The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. Exceedances are predicted to occur a maximum of 3 hours over a period of five years (0.007% of the time).

Cumulative 1-hour average quartz in PM_{10} criterion exceedances are predicted at Cree Camp CC3 located approximately 9 km southwest of the Project and adjacent to the main access road. The maximum predicted cumulative 1-hour concentration is 3% above the MELCCFP criterion. Exceedances are predicted to occur very infrequently - a maximum of 1 hour over a five-year period or about 0.002% of the time.

The maximum predicted cumulative 24-hour average actinolite and tremolite GLCs are above the Ontario Air Quality Screening Level. However, the MECP actinolite and tremolite screening levels are based on health effects of asbestos, while these CoPCs have been identified by Troilus to be non-asbestiform. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level which is provided in the Human Heath and Ecological Risk Assessment.

CAAQS Comparisons

The maximum predicted 1-hour average NO_2 concentrations for construction are below the CAAQS at special receptors, and above the CAAQS at discrete receptors and over the gridded receptors. Annual average NO_2 concentrations are well below the CAAQS. Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

Operations Special Receptor Modelling Results

Project Alone

The maximum predicted Project Alone concentrations for 126 of 132 CoPCs are below the MELCCFP or MECP criteria for all six special receptors. The following CoPCs are predicted to have Project Alone concentrations above the applicable criteria:

- 1-hour average elemental carbon exceedance at all six special receptors. The maximum predicted concentration of elemental carbon exceeds the Quebec criterion by 150%.
- 1-hour average quartz in PM_{10} exceedance at two special receptors: Cree Camps CC3 and CC4, which are both adjacent to the main access road. The maximum predicted concentration of quartz exceeds the Quebec criterion by 15%.
- 1-hour average mica exceedance at two special receptors: Cree Camps CC3 and CC4. The maximum predicted concentration of mica exceeds the Quebec criterion by 17%.
- 24-hour average muscovite is above the Ontario Air Quality Screening Level. The Ontario screening levels are triggers for additional assessment to ensure that the predicted concentrations will not result in adverse effects, which is addressed in the Human Health and Ecological Risk Assessment.
- 24-hour average actinolite and tremolite above their Ontario Air Quality Screening Levels which are based on health effects from asbestos. Tremolite and actinolite in the Project ore or waste rock are non-asbestiform and additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

Cumulative

The maximum predicted concentrations (cumulative of Project Alone and Background) of all CoPCs were below the MELCCFP or MECP criteria for all six special receptors assessed other than the following:

- Exceedances of the 1-hour average elemental carbon criterion are predicted at all six special receptors when considering the Project cumulatively with background air quality. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. Background concentrations of elemental carbon from diesel exhaust are expected to be negligible since there are currently no significant industrial developments in the LSA. The maximum predicted 1-hour average cumulative concentration of elemental carbon exceeds the Quebec criterion by 150% with the exceedance predicted to occur a maximum of 32 hours over a period of five years (0.073% of the time).
- Exceedances of the 1-hour average quartz in PM_{10} criterion are predicted at two special receptors: Cree Camps CC3 and CC4, which are adjacent to the main access road. The maximum predicted 1-hour average cumulative concentration is predicted to exceed the Quebec criterion by 41%, however exceedances are predicted to occur a maximum of 5 hours over a period of five years (0.011% of the time). The background quartz in PM_{10} concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.
- Exceedances of the annual average quartz in PM_4 criterion are predicted at the same two special receptors (CC3 and CC4) when considering the Project cumulatively with background air quality. The maximum predicted annual average concentration is 20% above the Quebec criterion with the background concentration accounting for 48% of the total cumulative concentration. The background quartz in PM_4 concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.
- Exceedances of the 1-hour mica criterion are predicted at Cree Camps CC3 and CC4. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration is zero. The maximum predicted concentration exceeds the Quebec criterion by 17%. An exceedance is predicted to occur a maximum of 1 hour over a period of five years (0.002% of the time).
- The maximum predicted 24-hour average muscovite concentration is above the Ontario Air Quality Screening Level and is the same as the Project Alone scenario as no background muscovite concentration is available. The Ontario screening levels are triggers for additional assessment, which is addressed in the Human Health and Ecological Risk Assessment.
- The maximum predicted 24-hour average concentrations of actinolite and tremolite are above their Ontario Air Quality Screening Levels which are based on health effects from asbestos while tremolite and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

CAAQS Comparisons

The maximum predicted 1-hour average NO_2 concentrations for operations are above the CAAQS at special and discrete receptors, and over the gridded receptors. However, annual average NO_2 concentrations are well below the CAAQS. Exceedances of the 1-hour NO_2 CAAQS are predicted at two special receptors, Cree Camps CC3 and CC4 adjacent to the main access road (up to 147% of the CAAQS criteria). Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

Deposition Results

- Project Alone and cumulative predicted maximum monthly particulate matter depositions at the special receptors are compared against the MECP (Ontario) monthly criterion for dustfall. The Ontario monthly deposition criterion is based on a nuisance (soiling) effect. Over the modelled special receptors, the highest predicted Project Alone particulate deposition relative to the regulatory criteria is 10% for construction and 14% for operations at a Cree Camp CC4 adjacent to the main access road. The highest predicted cumulative particulate depositions are 31% for construction and 36% for operations. Based on the maximum predicted deposition levels, it is expected that the potential for visible soiling of surfaces near the special receptors due to the Project is low.

Dust Management Plan

A Dust Management Plan will be developed for the Project that will include:

- describing requirements for the routine management of sources of airborne dust during construction and operation.
- track air quality performance and provide feedback to the Environment Manager which may be used to refine the dust suppression program and other potentially significant air quality sources.
- Identify complaint response procedures and notification requirements

Air Quality Monitoring

An Air Quality Follow-up Monitoring Program Plan (AQFMP) will be developed to monitor selected CoPCs that may include dust (PM and/or $PM_{2.5}$), metals in PM, quartz and NO_2 at selected offsite locations during construction and operation. The AQFMP will specify the proposed ambient air quality monitoring program including the type of monitoring, the CoPCs to monitor and the frequency of monitoring.

Table of Contents

LIMITATIONS AND SIGN-OFF I
PROJECT PERSONNEL I
EXECUTIVE SUMMARY II
TABLE OF CONTENTS I
GLOSSARY V
ACRONYMS/ABBREVIATIONS VII

1 INTRODUCTION 1
1.1 Study Objectives 1
1.2 Project Overview 4
1.3 Key Project Activities 5
1.3.1 Construction Phase 5
1.3.2 Operations Phase 5
1.3.3 Decommissioning and Closure Phase 6
1.4 Study Area 6
1.4.1 Local Study Area (LSA) 6
1.4.2 Regional Study Area (RSA) 6
1.4.3 Mine Boundary used in the Assessment 7
1.5 Contaminants of Potential Concern 7

2 REGULATORY SETTING 9
2.1 Ambient Air Quality Criteria 9
2.1.1 Provincial Air Quality Criteria 9
2.1.2 Federal Air Quality Criteria 15
2.2 Emissions Reporting 16
2.3 Municipal Planning Policies and Bylaws 16

3 EXISTING CONDITIONS 17
3.1 Topography 17
3.2 Climate 18
3.2.1 Temperature 18
3.2.2 Precipitation 18
3.2.3 Relative Humidity 19
3.2.4 Wind Speed and Direction 19
3.3 Discrete and Special Receptors 19
3.4 Background Air Quality 20

4 EFFECTS ASSESSMENT METHODOLOGY 28
4.1 Overview 28
4.2 Emissions Inventory 28
4.2.1 Project Overview 28
4.2.2 Site Preparation 29
4.2.3 Construction Emissions 29
4.2.4 Operations Emissions 38
4.2.5 Closure Emissions 54
4.2.6 Existing and Future Development 54
4.2.7 Design and Mitigation Measures 55
4.3 Dispersion Modelling – Approach and Methods 56

4.3.1 Modelling Assessment Approach 56
4.3.2 Modelling Domain 57
4.3.3 Air Dispersion Modelling Methodology 57
4.3.4 Receptor Grid 60
4.3.5 Emission Source Data 60
4.3.6 Model Options and Approaches 66
4.3.7 Prediction Confidence 68

5 RESULTS AND DISCUSSION 69
5.1 Assessment of Project Construction on Air Quality 69
5.1.1 Construction – Mine Boundary Modelling Results 69
5.1.2 Construction – Special and Discrete Receptor Modelling Results 74
5.1.3 Construction – Full Grid Modelling Results 75
5.2 Assessment of Project Operations on Air Quality 82
5.2.1 Operations - Mine Boundary Modelling Results 82
5.2.2 Operations - Special and Discrete Receptor Modelling Results 87
5.2.3 Operations – Full Grid Modelling Results 95
5.3 Assessment of Air Quality at Indigenous Receptors 95
5.4 Deposition Results 96
5.5 Ozone Formation 98
5.6 Potential Acid Input 98
5.7 Model Sensitivity to Road Dust Mitigation Measures 99
5.8 Follow-Up and Ambient Monitoring 101
5.8.1 Dust Management Plan 101
5.8.2 Construction and Operations Air Quality Monitoring 101
5.8.3 Closure Air Quality Monitoring 102
5.8.4 Emissions Reporting 102

6 SUMMARY AND CONCLUSIONS 103
6.1 Background Air Quality 103
6.2 Mine Boundary Modelling Results 103
6.3 Special Receptor Modelling Results 104
6.3.1 Construction 104
6.3.2 Operations 105
6.4 Deposition Results 107
6.5 Dust Management Plan 107
6.6 Construction and Operations Air Quality Monitoring 107

7 REFERENCES 108

LIST OF TABLES

Table 2-1 Summary of Provincial Air Quality Criteria for PM, Metals and Metallic Compounds 10
Table 2-2 Summary of Provincial Air Quality Criteria for Criteria Air Contaminants (CACs) 13
Table 2-3 Summary of Provincial Air Quality Criteria for VOCs 14
Table 2-4 Summary of Provincial Air Quality Criteria for Selected PAHs 14
Table 2-5 Summary of Provincial Air Quality Criteria for Other CoPCs 15
Table 2-6 Summary of Canadian Ambient Air Quality Standards 15
Table 3-1 Summary of Average Temperature Data 18
Table 3-2 Mean Monthly Precipitation 18
Table 3-3 Summary of Average Relative Humidity Data 19
Table 3-4 Monthly Average Wind Speed and Direction Data 19
Table 3-5 Background Concentrations Used in the Dispersion Modelling Assessment 21

Table 3-6 Seasonal Background Ozone Data (ppb) 26
Table 4-1 Emissions Summary - Construction 35
Table 4-2 Summary of Assumed Mitigation Control Efficiencies 49
Table 4-3 Emissions Summary – Operations 50
Table 4-4 Summary of Dispersion Modelling Scenarios Assessed 56
Table 4-5 Summary of Particle Size Distributions used in the Assessment 65
Table 4-6 Open Pit Model Parameters 67
Table 5-1 Summary of Maximum Predicted CoPC Concentrations at Modelled Mine Boundary - Construction 70
Table 5-2 Maximum Predicted Full Grid CAAQS Concentrations (µg/m^3) During Construction (Project Alone) 75
Table 5-3 Summary of Maximum Predicted CoPC Concentrations at Special Receptors – Construction 77
Table 5-4 Summary of Maximum Predicted CoPC Concentrations at Modelled Mine Boundary - Operations 83
Table 5-5 Summary of Maximum Predicted CoPC Concentrations at Special Receptors – Operations 90
Table 5-6 Maximum Predicted Full Grid CAAQS Concentrations (µg/m^3) During Operations (Project Alone) 95
Table 5-7 Maximum Predicted Particulate Depositions 97
Table 5-8 Maximum Predicted PAI, S and N Deposition Fluxes 99
Table 5-9 Summary of Maximum Predicted Project Alone $PM_{2.5}$ Concentrations for Varying Haul Road Control Efficiencies 101

LIST OF FIGURES

Figure 4.1 Annual Tonnages Mined (kt/yr) over LOM 43
Figure 4.2 Wind Class Frequency Distribution for the Site-Specific Meteorological Data Set 58
Figure 4.3 Wind Rose Plot for the Site-Specific Meteorological Data Set 59
Figure A.1 Site Layout A.1
Figure A.2 Project Area, Local Study Area and Regional Study Area A.2
Figure A.3 Extent of Modelled Mine Boundary Used in the Air Quality Assessment A.3
Figure A.4 Special Receptor Locations A.4
Figure A.5 Process Flow Diagram A.5
Figure A.6 Extended Receptor Grid A.6
Figure A.7 Location of Air Emission Sources - Construction A.7
Figure A.8 Location of Air Emission Sources – Operation A.8

LIST OF APPENDICES

APPENDIX A Figures
APPENDIX B Special Receptors
APPENDIX C Emission Inventory
APPENDIX D Rock Metal Composition
APPENDIX E Predicted Concentrations at Modelled Mine Boundary
APPENDIX F Predicted Concentrations at Special Receptors
APPENDIX G Predicted Dustfall Deposition at Special Receptors
APPENDIX H Predicted Acid Deposition at Special Receptors
APPENDIX I Concentration Contour Plots - Construction
APPENDIX J Concentration Contour Plots – Operations
APPENDIX K Deposition Contour Plots - Construction
APPENDIX L Deposition Contour Plots - Operations

Glossary

Air Contaminant Emissions	For stationary sources, the release or discharge of a pollutant from a facility or operation into the ambient air either by means of a stack, vent or as a fugitive dust, mist or vapour.
Canadian Council of Ministers of the Environment (CCME)	A council made up of environmental ministers from provincial and federal levels of government that proposes nationally consistent environmental standards and objectives to achieve high levels of environmental quality for waste management, air pollution, and toxic chemicals across Canada.
Carbon Monoxide (CO)	A colourless, odourless gas produced by incomplete fossil fuel combustion.
Combustion Product	Substance produced during the burning or oxidation of a material.
Combustion	1. Burning, or rapid oxidation, accompanied by the release of energy in the form of heat and light. 2. Refers to controlled burning of waste, in which heat chemically alters organic compounds, converting into stable compounds such as carbon dioxide and water.
Concentration	In air quality, concentration is defined as the abundance (mass or volume) of a substance suspended in a unit volume of ambient air.
Dust	A term used to describe particles of a solid or liquid that are suspended in air. Also referred to as particulate or suspended particulate.
Dustfall	A term used to describe the quantity of particles in the air that settle onto the ground over a given area and time under the influence of gravity and/or precipitation scavenging.
Ecological/Environmental Risk Assessment (ERA)	A scientific method used to examine the nature and magnitude of risks from the exposure of plants and animals to contaminants in the environment.
Emission Factor	A representative value that relates the quantity of pollutant released to the atmosphere with an activity or input associated with the release of that pollutant.
Emissions	Technically, all solid, liquid, or gaseous discharges from a processing facility, but normally referring to those released to the atmosphere (with solids referred to as residue and liquids as effluent).
Environment	The environment is broadly defined under the *Environmental Assessment Act* as follows: a) Air, land or water. b) Plant and animal life, including human life. c) The social, economic and cultural conditions that influence the life of humans or a community. d) Any building, structure, machine or other device or thing made by humans. e) Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities; or, f) Any part or combination of the foregoing and the interrelationships between any two or more of them.

Fugitive Emissions	Emissions from facilities or activities that could not reasonably pass through a stack, vent, or other functionally equivalent opening nor caught by a capture system.
Greenhouse Effect	The warming of the Earth's atmosphere attributed to a build-up of carbon dioxide or other gases; some scientists think that this build-up allows the sun's rays to heat the Earth, while making the infra-red radiation atmosphere opaque to infra-red radiation, thereby preventing a counterbalancing loss of heat.
Mitigation	Measures taken to reduce adverse effects on the environment.
Moisture Content	The percentage of a material that is water.
Monitoring	Periodic or continuous surveillance or testing to determine the characteristics of a substance or the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, plants, and animals.
National Pollutant Release Inventory (NPRI)	The only legislated, nation-wide, publicly accessible inventory of information on annual releases to air, water, land, and disposal or recycling from all sectors in Canada.
Particulate	A particle of a solid or liquid that is suspended in air.
Particulate Deposition	The quantity of particles of a solid or liquid in air that settles onto the ground over a given area and time under the influence of gravity and/or precipitation scavenging. Commonly referred to as dustfall.
Particulate Matter	A particle in solid or liquid phase that is suspended in air.
Point of Impingement	A defined point or points set at a defined distance from a facility (usually between the facility and sensitive community receptors) at which a specific limit for air pollutants must be met.
Pollutant	Generally, any substance introduced into the environment that can adversely affect the usefulness of a resource or the health of humans, animals, or ecosystems.
Pollution	Generally, the presence of a substance in the environment that because of its chemical composition or quantity can prevent the functioning of natural processes and produce undesirable environmental and health effects
Receptor	A person, plant or wildlife species that may be affected due to exposure to a contaminant.
RMRCECA	Respecting mandatory reporting of certain emissions of contaminants into the atmosphere
Stack	A chimney, smokestack, or vertical pipe that discharges flue gas or used air.
United States Environmental Protection Agency AP-42 (US EPA AP-42)	US EPA document Compilation of Air Emission Factors, Volume 1: Stationary Point and Area Sources.

Acronyms/Abbreviations

AAQC	ambient air quality criteria
AP-42	US Environmental Protection Agency Compilation of Air Pollution Emission Estimation Factors Document
B(a)P	benzo(a)pyrene
CAAQS	Canadian Ambient Air Quality Standards
CAC	criteria air contaminants
CAS	Chemical Abstracts Service
CCME	Canadian Council of Ministers of the Environment
CO	carbon monoxide
CoPC	Contaminants of Potential Concern
ECCC	Environment and Climate Change Canada
GLC	Ground Level Concentrations
IAAC	Impact Assessment Agency of Canada
LSA	Local Study Area
LOM	Life of Mine
m^3	cubic metre
m/s	metres per second
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
MELCCFP	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs
Mt/a	million tonnes per annum
N/A	not applicable

ND	not detected
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPRI	National Pollutant Release Inventory
NPI	National Pollutant Inventory
O_3	ozone
PA	Project Area
PAH	Polycyclic Aromatic Hydrocarbon
PM	particulate matter (also referred to as PM or TSP)
PM_{10}	particulate matter smaller than 10 microns
$PM_{2.5}$	particulate matter smaller than 2.5 microns
RH	relative humidity
RSA	Regional Study Area
SO_2	sulphur dioxide
t	tonnes
TDR	Technical Data Report
TSF	Tailings Storage Facility
tpd	tonnes per day
µg	Microgram
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VC	Valued Component
VOC	volatile organic compounds

1 Introduction

Troilus Gold Corporation (Troilus) proposes to develop, construct, operate, and progressively reclaim an open-pit gold mine, collectively known as the Troilus Gold Project ('the Project'), approximately 170 km north of Chibougamau, Quebec. The Project was originally an open pit operation producing gold and copper continuously from October 1996 to April 2009. The Project is being assessed in accordance with the Quebec Regulation respecting the environmental impact assessment and review of certain projects (RREIARCP) as well as the Federal *Impact Assessment Act*, 2019 (IAA, 2019).

Stantec Consulting Ltd. (Stantec) has been retained by Troilus to conduct an assessment of predicted changes in air quality resulting from the Project. This report provides an air quality assessment based on the proposed Project design and corresponding activities proposed during construction, operations, and decommissioning of the Project.

As per the Federal Tailored Impact Statement Guidelines (TIS Guidelines) (IAAC, 2023) as well as the Quebec Directive Specific to the Troilus Project (Quebec Directives) (MELCCFP, 2022), this Technical Data Report (TDR) for the Air Quality Assessment describes the existing air quality conditions related to the Project followed by an analysis of potential effects, mitigation measures and cumulative effects of the Project. The key components of the Air Quality Assessment include:

- Study methodology
- Review of applicable regulatory requirements
- Review of baseline ambient air quality
- Emission inventory for the Project
- Dispersion modelling
- Comparison of model predictions to applicable air quality criteria

The information presented in this TDR and used to quantify air quality impacts resulting from the Project have been obtained from Troilus existing literature, published technical data sources, engineering calculations, or from previous similar project experience.

1.1 Study Objectives

This report will inform the Impact Statement for the Project. The objectives of this study are to describe and present available information on the expected changes in air quality due to the Project within the study area.

The scope of this report is to address the general requirements of section 5.1.1 of the Quebec Directives to conduct an atmospheric dispersion study of the Project air contaminants as well as the detailed Federal requirements of the TIS Guidelines, Section 8.5 – Atmospheric, Acoustic, and Visual Environment:

Federal Requirement	Section where Addressed
• Characterize the ambient air quality in the project area, LSA, and RSA, and identify existing emissions and contaminant sources. • Provide baseline ambient air concentrations for contaminants, in particular near key receptors (e.g., traditional land users) and quantify emission sources for the following: - Total particulate matter - Particulate matter less than 2.5 microns ($PM_{2.5}$) - Particulate matter less than 10 microns (PM_{10}) - Carbon monoxide (CO) - Sulphur dioxide (SO_2) - Nitrogen dioxide (NO_2) and nitrogen oxides (NO_x) - Ozone (O_3) - Volatile organic compounds (VOCs), individual or an appropriate subset - Polycyclic aromatic compounds, including polycyclic aromatic hydrocarbons (PAHs), alkylated PAHs, PAH transformation products, including nitro and oxy-PAHs, and dibenzothiophenes (BDTs) - Metals (e.g. cadmium, lead, mercury, manganese, arsenic, nickel, sulfur, copper, cobalt, zinc); - Specific aldehydes contained in the products of diesel fuel combustion (e.g., acetaldehydes, formaldehydes, 1,3-butadiene, acrolein, benzene, diesel particulate matter [DPM]) - Any other relevant air pollutants from mobile, stationary, or fugitive sources (e.g., crystalline silica)	Sections 1.5 and 3.4
• Compare ambient air quality results with applicable provincial, and federal standards. For air pollutants subject to standards, the proponent must use the averaging period and statistical format associated with each numerical value	Section 3.4 and Section 5.0
• Standards include Canadian Ambient Air Quality Standards (CAAQS), National Ambient Air Quality Objectives (NAAQO), or relevant provincial criteria and standards. The proponent must refer to the new CAAQS established by the Canadian Council of Ministers of the Environment (CCME) for $PM_{2.5}$, O_3, SO_2 and NO_2 for 2020 and 2025	Section 2.1
• Describe dust and acid deposition through either existing long term, or new monitoring data for a duration of a minimum of one year	Section 3.4
• Describe the data source(s), including data validation and quality control methods	Section 3.4
• Identify and address issues related to the quality of the monitoring data and seasonal variability in the baseline survey and determine ambient contaminant concentrations using complete, exhaustive, and representative monitoring data, collected over an appropriate duration and geographic scope	N/A
• If modelling is undertaken to understand baseline ambient air quality, then describe direct and indirect sources of baseline air emissions, including mobile, stationary, and fugitive	N/A
• Describe existing radon gas conditions	Section 1.5
• If applicable, a description of the atmospheric, acoustic, and visual environmental issues encountered during the operation of the former Troilus Mine by Inmet Mining Corporation (1996–2010), explain how they were resolved, and present lessons learned that may be relevant to this project	Refer to Historical Issues in Section 6 of EA
• Provide a detailed description of emission sources of air pollutants from the project listed under section 8.5.1 Baseline conditions • Provide a detailed methodology and assumptions used to estimate emissions of air pollutants released at all stages of the Project	Section 4.2 and Appendix C

Federal Requirement	Section where Addressed
• All relevant emission factors should be provided and referenced • For all applicable emission sources, include the Group (Tier) and the emission standard • Provide details of the achievement of emission standards for all mobile and stationary engines used in the Project	
• Use atmospheric dispersion modelling to predict the fate of air pollutants resulting from project-related emission sources, and provide appropriately scaled contour maps plotting the predicted emission concentrations and the location of the most sensitive human receptors	Section 5, Appendix I and Appendix J
• Determine whether the formation of secondary pollutants (pollutants which are not directly emitted but form when other primary pollutants react in the atmosphere) resulting from the Project under assessment has the potential to raise concentrations above baseline levels – if so, identify and characterize these pollutants	Sections 5.5 and 5.6
• Provide the rationale for the choice of the atmospheric dispersion model, including the type and magnitude of emissions, source, terrain, and meteorological characteristics. If modelling is not considered necessary, justify the reasons	Section 4.3
• Justify the effectiveness of the mitigation and control measures used to reduce the emission rates of contaminants from the sources, including details of any assumptions associated with the related mitigation measures, and their feasibility;	Section 4.2.4.6
• Assess the uncertainty in the modelled air pollutant concentrations using relevant range of model inputs. All sources of uncertainty should be taken into account, including: - Model uncertainty, including a consideration for how uncertainty in modelled predictions may vary spatially and temporally - Uncertainty in baseline concentration estimates, in the estimates of meteorological inputs, and in estimates of source emissions and control efficiencies (from sources attributable to the Project, and externally)	Section 4.3.7
• Conduct a source contribution analysis to assess the relative contributions of project and non-project emission sources on pollutant concentrations at key receptors. The source contribution analysis should be conducted for all pollutants that exceed 10% of the relevant guidance or standard value. Emission sources should be grouped into appropriate categories	Sections 5.1.1, 5.2.1
• Model particulate matter emissions from unpaved road dust both with and without implementation of mitigation measures during the construction and operations phases. Mitigation measures with varying control efficiency scenarios should be modelled such as 50% and 70% control efficiency	Section 5.7
• Describe additional analyses that were undertaken, if any, to predict the likelihood and quantity of asbestos (chrysotile and amphibole) contamination in dust	Section 1.5
• Assess effects to receiving environment through: • Include the frequency of exceedances over the modelled periods (e.g., the frequency of exceedances would be 100 days over a five-year period); • Compare predicted air pollutant levels with the most stringent federal or provincial air quality standards, including the CAAQS and NAAQO (Where applicable, include regional and community air quality guidelines). The assessment against CAAQS should be based on the principles of “keeping clean areas clean” and continuous improvement, and in the context of air sheds and air zones with the Air Quality Management System • Comparison with critical thresholds (consider current, historical loadings, buffering capacity, including Acid Deposition Critical Loads)	Section 5, and HHRA TDR

Federal Requirement	Section where Addressed
• Compare with applicable thresholds for dust deposition taking into account current deposition, if any. It should be noted, however, that there are no longer thresholds for dust deposition in Quebec. It is possible to use the thresholds of the former Quebec regulation or the current Ontario regulation 419/05 • Comparison with sensitive ecological receptors (consider effects thresholds of species in question) • Analyze and describe changes to air quality at a scale and resolution that allows the results to be applied to the assessment of interdependent VCs, including human health	
• provide a dust management plan, including sources of air pollution, common air pollution mitigation measures (including a detailed complaint resolution process), air pollution control performance effectiveness, best practices and continuous improvement programs. The plan should identify the need for follow-up monitoring for model validation purposes or as a result of any concerns raised by participants, and describe opportunities for Indigenous knowledge holders to participate in the development of the dust management plan	Section 5.8.1
• provide a description of existing and planned measures to reduce odours and dust, including a description of improvements to existing infrastructure, as applicable	Section 1.5
• provide a description of any ambient air quality monitoring to be implemented to verify the predictions of the modelling results and to confirm the effectiveness of the mitigation measures. Ambient air quality monitoring must, at a minimum, consider the contaminants listed in Section 8.5.1, Baseline conditions	Section 5.8.2
• provide a description of participation in national or regional air emission tracking and reporting programs (e.g. National Pollutant Release Inventory) or provide rationale why participation is not required	Section 2.2
• develop and implement strategies compliant with regional and national commitments, such as the CCME's commitment regarding pollution prevention	Section 5.8

1.2 Project Overview

The Project includes the development of four open pits, waste rock, ore and overburden storage areas, an ore processing plant, and other mine related infrastructure. Project components are shown on Figure A.1 in APPENDIX A of this report. Ore will be extracted from four open pits known as Pit 87, Pit J, Pit SW and Pit X22. The Project has a mineral reserve estimate of 380 million tonnes (Mt) and an expected life of 22 years with two years of construction.

Based on the current Project design, the maximum rate of ore and waste extraction will be up to 238,082 tonnes per day (tpd) during year 6 of operations. The processing plant and associated service facilities will process run of mine ore delivered to primary crushers to produce gold/copper/silver concentrate, and tailings at an average capacity of approximately 50,000 dry tpd.

Concentrate from the processing plant will be loaded onto trucks and shipped offsite for further processing.

1.3 Key Project Activities

- The temporal boundary of the assessment includes all Project phases from the start of construction through to the end of closure. Based on the current Project schedule, the Project phases include:
- Construction (Year -2 to Year -1)
- Operations
- Operations (Year 1 to Year 21); milling capacity with ore extraction
- Operations (Year 22); milling capacity with no ore extraction
- Peak Operations (Year 6 to Year 8): 50 ktpd (dry) milling capacity and 238,082 tpd (86.9 Mtpy) ore extraction
- Decommissioning and closure (Year 23+)

Effects on air quality are assessed on a maximum basis for construction (Year -1) and operations (Year 6) of the Project (see Section 4.2.4.4).

1.3.1 Construction Phase

The construction phase will include site preparation up to the point immediately prior to commissioning the process plant. This phase will include site preparation and physical construction of site infrastructure. Construction is anticipated to begin in Pit 87 where overburden, waste rock and ore will be extracted. Ore will be stockpiled adjacent to the process plant for future processing. Waste rock extracted at this time may be crushed into aggregate using a mobile aggregate crusher for use during the construction of roads, Tailings Storage Facility (TSF) berms and other infrastructure, as necessary. Excess waste rock and overburden will be hauled to the appropriate storage facilities.

It is noted that some construction activities will occur through the operations phases of the Project (e.g. TSF dam raises), and that this phase is defined by the start of ore processing.

1.3.2 Operations Phase

The operations phase is focused on the processing of ore and generation of concentrate for delivery to market, specifically operation of the process plant. Mining operations will produce more ore than the process plant can process, with surplus material to be stockpiled for future processing. Dam raises will continue to increase the operating capacity of the TSF. At varying times though out the operations phase, all four pits will be active. As mine operations cease, there will be an opportunity for progressive reclamation of the pits, haul routes, storage areas, and other no longer used areas of the Project site. However, at any given time a maximum of three pits will be active simultaneously.

1.3.3 Decommissioning and Closure Phase

Following the completion of ore processing, all Project operations will cease, and active closure will commence. Active closure includes the removal of buildings, structures, and other infrastructure, as well as reclamation and site stabilization activities. Once complete, the Project will then enter a passive closure phase as the pit lakes fill. During this time, closure monitoring and adaptive mitigation will occur. Following pit lake filling, the Project site will be permanently closed.

Activities completed during the Decommissioning and Closure Phase of the Project are focused on reclaiming the environments, establishing physical, chemical, and biological stability at the site, and to meet desired end land functions and uses. The Closure Plan will be updated throughout the life of the Project as necessary to reflect the environmental requirements in place at the time of closure.

Progressive reclamation throughout the course of the mine life will occur, but the majority of the closure activities will commence at the cessation of mining activities. Ongoing closure monitoring and maintenance activities will be carried out throughout active and passive closure phases until the closure objectives have been satisfied, and the Project has been moved to a closed out and abandoned status.

1.4 Study Area

The **Project Area (PA)** encompasses the Project footprint and is the anticipated area of physical disturbance associated with the construction, operations and decommissioning/closure of the Project. The PA is approximately 2,600 hectares (ha) (26 square kilometres [km^2]) and includes but is not limited to the open pits, ore processing components, TSF, water management facilities and drainage works, mining infrastructure, site access and internal roads, power supply and distribution, and storage areas. The extent of the PA for the Project is shown in APPENDIX A, Figure A.2.

1.4.1 Local Study Area (LSA)

The **Local Study Area (LSA)** is the maximum area within which environmental effects from Project activities and components can be predicted or measured with a reasonable degree of accuracy and confidence. It consists of the PA and adjacent areas where Project-related environmental effects are reasonably expected to occur based on available information and professional judgment. The LSA for air quality is also depicted in APPENDIX A, Figure A.2 of this report. The LSA for air quality is considered to be an area extending about 10 km from the PA.

1.4.2 Regional Study Area (RSA)

The **Regional Study Area (RSA)** is the area within which residual environmental effects from Project activities and components may interact cumulatively with the residual environmental effects of other past, present and future (i.e., certain or reasonably foreseeable) physical activities. The RSA is based on the potential for interactions between the Project and other existing or future potential projects.

For air quality, the RSA is an area extending 40 km from the PA and is depicted in APPENDIX A, Figure A.2 of this report. This distance defines the extent that other projects within this area may have a measurable effect on air quality in this study's LSA based on the types of emission sources anticipated for this Project.

1.4.3 Mine Boundary used in the Assessment

The Modelled Mine Boundary includes a 300 m buffer around the PA as specified in Section 4.3 of the MELCCFP instruction guide Preparation and Realization of Air Emission Dispersion Modelling (MELCCFP, 2017). In accordance with the Instruction Guide, if the air quality standards and criteria are not met, for one or more contaminants, at a distance of 300 metres or more from the project facilities, the proponent must demonstrate that routine mitigation measures have been applied where technically and economically feasible. In addition, the proponent must demonstrate, using the results of the atmospheric dispersion modelling, that the standards and criteria are met at sensitive receptors located beyond 300 m of the facilities. A map of the proposed Modelled Mine Boundary is presented in APPENDIX A, Figure A.3 of this report.

1.5 Contaminants of Potential Concern

The expected emissions, based on the Project-specific design and operations, formed the basis of selecting the substances for evaluation. Stantec developed a comprehensive list of air contaminants of potential concern (CoPCs) for this study by using experience from similar projects and knowledge of the regulatory requirements. Several information sources were considered, including:

- Review of the Project design
- Review of mineralogical and trace constituent analysis of the ore, waste rock and overburden
- Review of Safety Data Sheets for additives and other chemicals used in the ore milling and concentrating processes
- Air contaminants with provincial criteria that may be emitted during construction, operations and closure
- Air contaminants emitted from vehicle tailpipe exhaust

The CoPCs on this list may be released to the atmosphere during the mining and associated processing activities. The CoPCs were reviewed and grouped to allow for comparison with regulatory air quality criteria and to assess potential effects on human health. The major contaminant groupings are as follows:

- Particulate Matter - Suspended particulate matter (PM or TSP), particulate matter with particles less than 10 microns in diameter (PM_{10}) and particulate matter with particles less than 2.5 microns in diameter ($PM_{2.5}$). PM is a measure of the particles in the atmosphere that are too small to settle out quickly but remain suspended for substantial periods of time. PM is produced by a variety of activities including wind erosion of agricultural or cleared fields and other open areas, abrasion of vehicle tires on paved and unpaved roads, and combustion processes (e.g., industrial boilers and heaters, power generation, vehicle emissions). Although total suspended particulate matter is an excellent measure of the loading of particulate matter in the air, it does not necessarily reflect the health risks of the

particulate matter. The larger aerodynamic particles (PM_{10}) are trapped by the upper airways, and do not enter the lungs. Smaller diameter particles ($PM_{2.5}$) can make their way deep into the lungs

- Other CAC – substances with regulatory limits including sulphur dioxide (SO_2), nitrogen dioxide (NO_2), and carbon monoxide (CO)
- Hazardous Air Pollutants - Substances that are capable of causing environmental or health effects including Volatile Organic Compounds (VOCs), Polycyclic Aromatic Hydrocarbons (PAHs) and metals. PAHs and VOCs (including benzo(a)pyrene and benzene) from vehicle tailpipe emissions were included in the assessment. PAH derivatives such as nitrated PAHs (nitro-PAHs) and oxygenated PAHs (oxy-PAHs) occur at far lower concentrations than those of parent PAHs in off-road diesel engine exhaust (CARB, 2020) and were therefore not included in the assessment
- Asbestiform minerals - The ore and waste rock types identified by Troilus contain amphibole minerals in the form of tremolite and actinolite. Troilus specified that no traces of asbestos-like amphibole are present due to unfavourable geological conditions. Amphiboles are generally of higher metamorphic grade and in the form of more coarse-grained hornblende-chermakite-gedrite. Tremolite and actinolite are included as CoPCs in the air quality assessment as non-asbestiform based on analysis by Troilus

The CoPCs that were considered in the assessment are presented in Table 2-1 to Table 2-5 of this Air Quality Assessment TDR. This CoPC list was used as a guide in developing the emissions inventory for the Project.

Radon is a radioactive gas that is produced from the radioactive decay of uranium, which is a constituent of the waste rock and ore in the LSA. Radon naturally escapes from the ground into the air, where it decays and produces further radioactive particles. Outdoors, radon quickly dilutes to very low concentrations and is generally not considered a health issue. Health effects of radon gas are associated with indoor areas with minimal ventilation where the gas can concentrate to high levels over time. Ambient exposure to radon was therefore not considered further in this assessment.

Detectable odours could result from emissions of odorous hydrocarbons, which would only be released to the atmosphere at negligible emission rates from mining equipment powered with fossil fuel. Odour emissions from chemicals used in the process plant were reviewed and considered negligible due to their low volatility. Other materials stored and used in the sewage and effluent treatment systems are all enclosed with negligible emissions. Odour emissions are not expected to be a concern provided adequate consideration of odour management is incorporated in the Project operations and therefore were not considered further in this assessment.

2 Regulatory Setting

This Air Quality Assessment TDR has been prepared pursuant to the Quebec Directive as well as the Federal IAA and in consideration of the TIS Guidelines (Appendix A.1 of the Impact Statement).

The Project may be regulated and/or influenced by a number of air quality policy mechanisms, including:

- Provincial emission limits (either standards or guidelines)
- Federal emission limits (guidelines)
- Emissions reporting through NPRI and RMRCECA
- Local municipal by-laws

2.1 Ambient Air Quality Criteria

Regulatory agencies have identified provincial air quality criteria and screening levels as described below.

2.1.1 Provincial Air Quality Criteria

In Quebec, air emissions from all sources, including mining operations, are regulated under the Clean Air Regulation (CAR). In regard to ambient air concentrations from industrial sources, these are regulated under Section 197 of the CAR that presents in Schedule K (applicable air quality standards).

In addition to regulatory standards of the CAR, additional air quality criteria (non-regulatory) are published by MELCCFP in the document entitled Quebec Air Quality Standards and Criteria, version 9, Quebec, Air Quality and Climate Branch (MELCCFP, 2025). These standards and criteria were used to assess air impacts in the LSA. Criteria are applied at a point of impingement, most commonly at or beyond a mine boundary.

Ontario air quality criteria were considered for CoPCs without Quebec Air Quality Standards and Criteria. The Ontario Ministry of the Environment, Conservation and Parks (MECP) publish criteria in the document “Air Contaminants Benchmarks (ACB) List – Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants” (MECP, 2023), which includes Benchmark 1 values (Standards and Guidelines) and Benchmark 2 values (Screening Levels). Modelled concentrations of chemicals that are below published screening levels are considered to be insignificant, while concentrations above a Benchmark 2 value require further assessment. In addition, Ontario has an Ambient Air Quality Criteria (AAQC), developed by the MECP which are used to assess general (ambient) air quality resulting from all sources of a contaminant in ambient air.

Summaries of the relevant provincial air quality criteria and screening levels are presented in Table 2-1 for suspended particulate matter (PM), metals and metallic compounds; Table 2-2 for Criteria Air Contaminants (CACs); Table 2-3 for volatile organic compounds (VOCs); Table 2-4 for polycyclic aromatic hydrocarbons (PAHs) and Table 2-5 for other CoPCs.

Table 2-1 Summary of Provincial Air Quality Criteria for PM, Metals and Metallic Compounds

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria ($\mu g/m^3$)	Ontario Air Quality Criteria and Screening Levels ($\mu g/m^3$)
PM	N/A	24 hour	120	N/A
PM_{10}	N/A	24 hour	--	50 (1)
$PM_{2.5}$	N/A	24 hour	30	N/A
Silver (Ag)	7440-22-4	annual	0.23	N/A
Aluminum (Al)	7429-90-5	-	-	N/A
Arsenic (As)	7440-38-2	annual	0.003	N/A
Gold (Au)	7440-57-5	24 hour	-	1.25 (3)
Boron (B)	7440-42-8	-	-	N/A
Barium (Ba)	7440-39-3	annual	0.05	N/A
Beryllium (Be)	7440-41-7	annual	0.0004	N/A
Bismuth (Bi)	7440-69-9	-	-	N/A
Carbon (C)	7440-44-0	1 hour	1	N/A
		annual	0.3	N/A
Calcium (Ca)	7440-70-2	-	-	N/A
Cadmium (Cd)	7440-43-9	annual	0.0036	N/A
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1 hour	21	N/A
		annual	0.7	N/A
Cobalt (Co)	7440-48-4	annual	0.1	N/A
Chromium (Cr) and Compounds (as Cr)	7440-47-3	annual	0.1	N/A
Cesium (Cs) and Compounds (as Ce)	7440-46-2	1 hour	17	N/A
		annual	0.4	N/A
Copper (Cu)	7440-50-8	24 hours	2.5	N/A
Iron (Fe)	7439-89-6	-	-	N/A
Gallium (Ga)	7440-55-3	-	-	N/A
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1 hour	5	N/A
		annual	0.9	N/A
Mercury (Hg)	7439-97-6	annual	0.005	N/A
Indium (In)	7440-74-6	-	-	N/A
Potassium (K)	7440-09-7	-	-	N/A
Lanthanum (La)	7439-91-0	-	-	N/A
Lithium (Li)	7439-93-2	1 hour	2	N/A
Lutetium (Lu)	7439-94-3	-	-	N/A
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	1 hour	24	N/A
Manganese (Mn) and Compounds (as Mn)	7439-96-5	annual	0.08 (4)	N/A
Molybdenum (Mo)	7439-98-7	24 hours	-	120 (2)

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria ($\mu g/m^3$)	Ontario Air Quality Criteria and Screening Levels ($\mu g/m^3$)
Sodium (Na)	7440-23-5	-	-	N/A
Niobium (Nb)	7440--03-1	-	-	N/A
Nickel (Ni)	7440-02-0	24 hours	0.07 (4)	N/A
		annual	0.02 (4)	N/A
Phosphorus (P)	7723-14-0	24 hours	-	0.5 (3)
Lead (Pb)	7439-92-1	annual	0.1	N/A
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	24 hours	4	N/A
Sulphur (S)	7704-34-9	-	-	N/A
Antimony (Sb)	7440-36-0	annual	0.17	N/A
Scandium (Sc)	7440-20-2	-	-	N/A
Selenium (Se)	7782-49-2	1 hour	2	N/A
Tin (Sn)	7440-31-5	4 min	2	N/A
		annual	0.1	N/A
Strontium (Sr)	7440-24-6	-	-	N/A
Tantalum (Ta)	7440-25-7	24 hours	-	25 (3)
Terbium (Tb)	7440-27-9	-	-	N/A
Tellurium (Te)	13494-80-9	1 hour	1	N/A
Titanium (Ti) and Compounds (as Ti)	7440-32-6	24 hours	2.5 (4)	N/A
Thallium (Tl)	7440-28-0	annual	0.25	N/A
Uranium (U)	7440-61-1	24 hours	-	0.3 (2,6)
		annual	-	0.06 (2,6)
Vanadium (v)	7440-62-2	annual	1	N/A
Tungsten (W) and Compounds (as W)	7440-33-7	24 hours	5.4	N/A
Yttrium (Y) and Compounds (as Y)	7440-65-5	24 hours	13	N/A
		annual	2.8	N/A
Ytterbium (Yb)	7440-64-4	-	-	N/A
Zinc (Zn)	7440-66-6	24 hours	2.5	N/A
Zirconium (Zr)	7440-67-7	24 hours	2.5	N/A
Silicon Dioxide (SiO_2)	7631-86-9	-	-	N/A
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	N/A
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	N/A
Magnesium Oxide (MgO)	1309-48-4	-	-	N/A
Calcium Oxide (CaO)	1305-78-8	-	-	N/A
Sodium Oxide (Na_2O)	1313-59-3	-	-	N/A
Potassium Oxide (K_2O)	12136-45-7	-	-	N/A
Titanium dioxide (TiO_2)	13463-67-7	-	-	N/A
Phosphorus Pentoxide (P_2O_5)	1314-56-3	24 hours	-	1 (3)

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria ($\mu g/m^3$)	Ontario Air Quality Criteria and Screening Levels ($\mu g/m^3$)
Manganese Oxide (MnO)	1344-43-0	-	-	N/A
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	N/A
Vanadium Pentoxide (V_2O_5)	1314-62-1	24 hours	-	1 (3)
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	N/A
Bornite (Cu_5FeS_4)	1308-82-3	-	-	N/A
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4, 19138-68-2	-	-	N/A
Tetrahedrite ($Cu_{12}Sb_4S_{13}$)/Tennantite ($Cu_{12}As_4S_{13}$)	N/A, 12178-49-3	-	-	N/A
Cuprite (CU_2O)	1317-39-1	-	-	N/A
Galena (PbS)	1314-87-0	-	-	N/A
Sphalerite (ZnS)	1314-98-3	24 hours	-	1 (3)
Pyrite (Fe,S_2)	1309-36-0	24 hours	-	120 (3)
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	N/A
Arsenopyrite (FeAsS)	1303-18-0	-	-	N/A
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	N/A
Quartz	14808-60-7	1 hour	23 (4)	N/A
		annual	0.07 (5)	N/A
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	N/A	-	-	N/A
K-Feldspars ($KAlSi_3O_8$)	N/A	-	-	N/A
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	N/A	-	-	N/A
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	24 hours	-	0.00008 (3)
Chlorite ($(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	-	-	N/A
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	24 hours	-	1.5 (3)
Epidote ($(Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	N/A	-	-	N/A
Augite ($((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)_2O_6)$	N/A	-	-	N/A
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	-	-	N/A
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	-	-	N/A
Calcite ($CaCO_3$)	1317-65-3	-	-	N/A
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, N/A	-	-	N/A
Titanite ($CaTiSiO_5$)	N/A	-	-	N/A
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	-	-	N/A
Mica	12001-26-2	1 hour	30	N/A
		annual	7	N/A
Tremolite ($Ca_2(Mg5.0-4.5Fe^{2+}0.0-0.5)Si_8O_{22}(OH)_2$)	77536-68-6	24 hours	-	0.00008 (3)

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria ($\mu g/m^3$)	Ontario Air Quality Criteria and Screening Levels ($\mu g/m^3$)
Bytownite $(Ca,Na)(Si,Al)_4O_8$	N/A	-	-	N/A
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	N/A	-	-	N/A
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	N/A
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	N/A	-	-	N/A
Albite $(NaAlSi_3O_8)$	N/A	-	-	N/A
Phlogopite $(KMg_3AlSi_3O_{10}(F,OH)_2)$	N/A	-	-	N/A
Sillimanite (Al_2SiO_5)	12141-45-6	-	-	N/A

Note: 1. Ontario AAQC. AAQC for PM_{10} is an interim AAQC provided as a guide for decision making.
2. Ontario ACB B1 Criteria
3. Ontario ACB B2 Screening Value
4. Measured in PM10.
5. Measured in PM4.
6. Converted from measurement in PM10 to PM
"-" indicates no background data available
N/A – not applicable

Table 2-2 Summary of Provincial Air Quality Criteria for Criteria Air Contaminants (CACs)

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria ($\mu g/m^3$)	Ontario Air Quality Criteria and Screening Levels ($\mu g/m^3$)
Carbon Monoxide (CO)	630-08-0	1 hour	34000	N/A
		8 hours	12700	N/A
Sulphur Dioxide (SO_2)	7446-09-5	4 min	1050	N/A
		24 hours	288	N/A
		annual	52	N/A
Nitrogen Dioxide (NO_2)	10102-44-0	1 hour	414	N/A
		24 hours	207	N/A
		annual	103	N/A

Table 2-3 Summary of Provincial Air Quality Criteria for VOCs

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria (µg/m³)	Ontario Air Quality Criteria and Screening Levels (µg/m³)
Hydrocarbons	N/A	-	-	N/A
1,3-Butadiene	106-99-0	4 min	352	N/A
		annual	0.5	N/A
Acetaldehyde	75-07-0	4 min	3	N/A
		annual	0.5	N/A
Acrolein	107-02-8	4 min	8.3	N/A
		annual	0.02	N/A
Benzene	71-43-2	24 hours	10	N/A
Formaldehyde	50-00-0	15 min	37	N/A

Note: "-" indicates no background data available
N/A – not applicable

Table 2-4 Summary of Provincial Air Quality Criteria for Selected PAHs

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria (µg/m³)	Ontario Air Quality Criteria and Screening Levels (µg/m³)
Acenaphthene	83-32-9	annual	- (1)	N/A
Acenaphthylene	208-96-8	annual	- (1)	N/A
Anthracene	120-12-7	annual	- (1)	N/A
Benzo(a)anthracene	56-55-3	annual	- (1)	N/A
Benzo(a)pyrene (B(a)P)	50-32-8	annual	- (1)	N/A
		annual	0.0009	N/A
Benzo(b+k) fluoranthene	205-99-2/ 207-08-9	annual	- (1)	N/A
Benzo(g,h,i)perylene	191-24-2	annual	- (1)	N/A
Chrysene	218-01-9	annual	- (1)	N/A
Fluoranthene	206-44-0	annual	- (1)	N/A
Fluorene	86-73-7	annual	- (1)	N/A
Phenanthrene	85-01-8	annual	- (1)	N/A
Pyrene	129-00-0	annual	- (1)	N/A
		annual	13	N/A
Total PAHs (as equivalent B(a)P)	N/A	annual	0.0024	N/A

Note: 1. The concentration of carcinogenic polycyclic aromatic hydrocarbons (PAHs) compounds in ambient air was expressed as toxic equivalent (TEQ) of benzo(a)pyrene (BaPET). The total concentration of BaP toxic equivalent (BaPET) was calculated by adding the product of the concentration of each of the different PAHs by the corresponding toxicity equivalency factor (TEF).

"-" indicates no background data available

N/A – not applicable

Table 2-5 Summary of Provincial Air Quality Criteria for Other CoPCs

Parameter	CAS #	Averaging Period	Quebec Air Quality Standards and Criteria (µg/m3)	Ontario Air Quality Criteria and Screening Levels (µg/m3)
Diesel particulate matter	N/A	-	-	N/A
Elemental carbon	7440-44-0	1 hour	1	N/A
		annual	0.3	N/A
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	N/A
Sodium sulphite	7757-83-7	24 hours	-	0.14 (1)
Zinc sulphate	7733-02-0	24 hours	-	1 (1)
Sodium trithiocarbonate	534-18-9	-	-	N/A
Magnafloc 10	N/A	-	-	N/A

Note 1: Ontario ACB B2 Screening Value
"-" indicates no background data available
N/A – not applicable

2.1.2 Federal Air Quality Criteria

The Federal air quality criteria are published in the Canadian Ambient Air Quality Standards referred to as the CAAQS. The CAAQS were developed through a collaborative process involving the federal, provincial, and territorial governments and stakeholders, as directed by the Canadian Council of Ministers of the Environment (CCME) (CCME 2012, 2020a, 2020b).

The applicable federal criteria are summarized in Table 2-6 below.

Table 2-6 Summary of Canadian Ambient Air Quality Standards

Parameter	Averaging Time	CAAQS (µg/m^3)
NO_2	1 hour	83 (1)
	24 hours	-
	Annual	24 (1)
$PM_{2.5}$	24 hours	27 (2)
	Annual	8.8 (2)
SO_2	1 hour	179 (3)
	24 hours	-
	Annual	11 (3)

Parameter	Averaging Time	CAAQS (µg/m^3)

Notes:

1. 1 Hour and Annual CAAQS for NO_2, effective by 2025 (CCME, 2020b). The 1-hour CAAQS is referenced to the 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations. The annual CAAQS is the average over a single calendar year of all 1-hour average concentrations. The criteria were converted from ppb to µg/m3 based on standard temperature of 10^{o}C and pressure of 1 atm.
2. 24 Hour and Annual CAAQS for Respirable Particulate Matter, effective by 2020 (CCME, 2012). The 24-hour CAAQS is referenced to the 98th percentile daily average concentration averaged over 3 consecutive years. The annual CAAQS is referenced to the 3-year average of the annual average concentrations.
3. 1 Hour and Annual CAAQS for SO_2, effective by 2025 (CCME, 2020a). The 1 Hour CAAQS is the 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations. The annual CAAQS is the average over a single calendar year of all 1-hour average concentrations. The criteria were converted from ppb to µg/m^3 based on standard temperature of 10 ^{o}C and pressure of 1 atm.

2.2 Emissions Reporting

Project emissions would be required to be reported under Environment and Climate Change Canada's (ECCC's) National Pollutant Release Inventory (NPRI) program and MELCCFP's Respecting mandatory reporting of certain emissions of contaminants into the atmosphere (RMRCECA) program.

2.3 Municipal Planning Policies and Bylaws

No municipal policies or bylaws applicable to the Project for atmospheric environment were identified.

3 Existing Conditions

The Project is located in the southeastern part of the Nord-du-Québec administrative region in the James Bay Eeyou Istchee territory, approximately 76 km northwest of the Cree community of Mistissini and approximately 170 km north of the town of Chibougamau. The geographic coordinates (latitude/longitude, NAD 83) of the main components of the Project are as follows:

- Pit 87: 51°0'34.14 "N; 74°28'3.12 "W
- Pit J: 51°1'9.90 "N; 74°28'10.60 "W
- Tailings Storage Facility (TSF): 50°59'21.54 "N; 74°28'52.89 "W

A main access road, beginning at kilometre point (KP) 108 of the Route du Nord, provides access to the mine site. The spatial limits of the Project impact study include the following localities: the Cree community of Mistissini, the Cree community of Oujé-Bougoumou, the town of Chibougamau and the town of Chapais. Regional land use activities in the area include hunting, fishing, trapping and snowmobiling, as well as mineral exploration (and mining) and forestry.

To date, Troilus Gold has the following mining leases and claims:

- 1 mining lease (BM 829) of 840 hectares (ha) in place for the Pit J and Pit 87 areas
- 3,105 active claims representing a total area of 167,206 ha
- 3 land leases in force for the following infrastructures
- 210664 00 001 - exploration camp
- 210664 00 002 - landfill
- 210664 00 005 - TSF

The following sections describe the existing physical environment of the study area.

3.1 Topography

The Project is part of the Eastmain Lowlands, a division of the James Area physiographic unit. The terrain is rugged. To the south of the Project site, there are rocky hills aligned on a northeast/southwest axis with a maximum elevation of 520 m, while to the north, there is a rocky ridge oriented northeast/southwest with a maximum elevation of 430 m. Between these two reliefs, the sector forms a valley with an elevation ranging from 365 to 400 m with an undulating and irregular topography due to the presence of rocky outcrops intersecting the loose deposits (Geocon, 1993).

The bedrock consists mainly of felsic and intermediate metavolcanic rocks in the southern part of the Project, while the central and western parts are composed of intermediate to mafic basalt-type metavolcanic rocks. The eastern part of the Project site is crossed by a granitic pluton. This magma thrust introduced dykes into the fractures of the metamorphic rocks and caused alteration of the surrounding rock walls (Geocon, 1993).

3.2 Climate

The following sections describe the general climatology of the Project area. The climatology is based on 30-year (1991 – 2020) Canadian Climate Normal data obtained from Environment and Climate Change Canada (ECCC, 2025) for Chapais. Precipitation data from 1981 to 2010 was used since precipitation data were not available for the 1991- 2020 range. Chapais is the nearest climate normal station with a comprehensive set of measurements and with a similar setting to the Project area.

3.2.1 Temperature

A summary of the daily average, maximum and minimum temperatures on a monthly basis (1991 – 2020) is shown below in Table 3-1. Temperatures in Chapais are characterized by warm summers and cold winters with the coldest temperatures occurring during the winter months of December to February and the warmest temperatures occurring in the summer months of June to August. The daily average temperature varies between -18.5 °C and 16.6 °C, with an annual average temperature of 0.4 °C.

Table 3-1 Summary of Average Temperature Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Average (°C)	-18.5	-16.6	-9.9	-1.0	8.1	14.4	16.6	15.1	10.4	3.4	-4.5	-13.0	0.4
Daily Maximum (°C)	-12.7	-10.2	-3.0	5.1	14.7	21.2	22.9	21.0	15.9	7.3	-1.1	-8.4	6.1
Daily Minimum (°C)	-24.1	-23.0	-16.7	-7.0	1.4	7.5	10.2	9.2	4.8	-0.5	-8.0	-17.6	-5.3

3.2.2 Precipitation

A summary of the monthly average rainfall, snowfall, total precipitation (as equivalent rainfall based on a conversion factor for snowfall to equivalent rainfall of 0.1) and average snow depth (1981 – 2010) is presented in Table 3-2. The average annual precipitation for Chapais was 995.8 mm.

Table 3-2 Mean Monthly Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall (mm)	3.2	2.4	8.8	28.7	75.5	100.1	124.3	100.2	128.6	70.9	36.7	5.0	684.5
Snowfall (cm)	58.8	37.0	41.6	29.5	6.9	0.0	0.0	0.0	1.2	23.0	56.5	58.5	312.9
Total Precipitation (mm)	61.9	39.4	50.3	56.6	82.4	100.1	124.3	100.2	129.7	93.9	93.2	63.5	995.8
Average Snow Depth (cm)	58	74	77	45	2	0	0	0	0	1	10	33	25

3.2.3 Relative Humidity

Relative humidity (RH) is the gravimetric ratio of water vapour in a unit volume to the water vapour that would prevail under saturated conditions at a given temperature. Average monthly RH levels at 6:00 AM and 3:00 PM local standard time (LST) from Chapais (1991 – 2020) are presented in Table 3-3. Monthly average RH ranged from 78.7% - 93.5% at 6:00 AM and 45.4% - 83.8% at 3:00 PM.

Table 3-3 Summary of Average Relative Humidity Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Relative Humidity – 0600 LST (%)	80.2	79.7	79.9	82.2	78.7	n/a	89.3	93.5	93.5	92.4	91.3	86.2	n/a
Average Relative Humidity – 1500 LST (%)	77.2	67.7	52.8	52.1	45.4	49.8	56.3	60.9	64.6	74.4	83.5	83.8	64.0

3.2.4 Wind Speed and Direction

Wind speed and direction climate normal data for Chapais (1991 – 2020) are presented in Table 3-4. The annual average windspeed is 6.3 km/h with the most frequent wind direction being westerly.

Table 3-4 Monthly Average Wind Speed and Direction Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Speed (km/h)	6.1	6.4	6.9	7.1	6.7	6.0	5.7	5.5	6.1	6.4	6.7	5.9	6.3
Most Frequent Direction	W	W	W	W	W	W	W	W	S	W	W	W	W

3.3 Discrete and Special Receptors

Discrete receptors are specific locations where ambient air quality is assessed. Special receptors are locations where human activity more regularly takes place. The following discrete and special receptors were identified and included in the air modelling:

- Special Receptors: Locations where non-Indigenous or Indigenous overnight use has been confirmed or assumed.
- Surface Water Receptor (Discrete): Representative locations used for the surface water assessment.
- Fish Habitat Receptor (Discrete): Representative locations used for the fishery assessment.
- Terrestrial Receptor (Discrete): Representative locations used for the terrestrial environment assessment.

The special receptors identified for input into the human health risk assessment (HHRA) analysis include both non-Indigenous and Indigenous receptors.

The discrete and special receptors located nearest to the PA in all directions were identified for consideration in the air modelling. A total of 25 discrete and special receptors were identified and included in the air modelling. A tabular summary of the discrete and special receptors is presented in APPENDIX B and the locations are presented in APPENDIX A, Figure A.4 of this report.

In total, the air quality modelling included 4,787 gridded, Modelled Mine Boundary, discrete and special receptors covering the LSA. The gridded receptors were used to evaluate variations in air quality levels over the LSA and covered areas not assessed by special receptors for selected CoPCs.

3.4 Background Air Quality

Background air quality was considered in dispersion modelling to represent the effect of other emissions sources in addition to the sources being included in the dispersion modelling. Sources of ambient air emissions in the LSA may include:

- Transportation (traffic on local roads)
- Naturally occurring (wind erosion of open surfaces, forests, fires)
- Long-range transport from other sources outside the LSA

Background air quality levels due to these sources can be included in a dispersion modelling assessment in order to quantify the incremental change in local air quality with respect to the emissions source(s) being studied. Cumulative air quality levels due to the emissions sources being studied combined with background levels can then be compared to applicable air quality criteria to assess significance.

Due to the schedule for the Project Environmental Impact Assessment, baseline ambient monitoring for CoPs was not feasible. In the absence of site-specific ambient monitoring data, background air quality data published by the MELCCFP in the following documents (referred to as initial concentrations in these documents) was used to characterize air quality in the LSA and to develop background concentration levels to be used in the assessment.

- Quebec Air Quality Standards and Criteria, version 9, Quebec, Air Quality and Climate Branch (MELCCFP, 2025)
- Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017)

Where background concentrations for CoPCs were not available, representative ambient monitoring data from another proposed mining project was used to estimate background CoPC concentrations. The Crawford Nickel Project is located approximately 42 km north of the City of Timmins, Ontario in a remote area similar to that of the Project, and therefore the background levels are expected to be representative of the Troilus Project background levels. The Crawford Nickel Project ambient monitoring results are presented in Impact Statement Chapter 12: Assessment of the Potential Effects on the Atmospheric Environment dated September 30, 2024 (Stantec, 2024). The MECP normally requires that the that 90th

percentile ambient monitoring data be added to the dispersion model predictions to conservatively account for existing ambient concentrations. The background level used in the assessment were therefore the 90th percentile values for short-term averaging periods. For annual averages, an annual average value was used as the background level.

Table 3-5 summarizes the background air quality data published by the MELCCFP and the representative ambient monitoring data from the Crawford Nickel Project.

Table 3-5 Background Concentrations Used in the Dispersion Modelling Assessment

Parameter	CAS #	Averaging Period	Background Concentration (µg/m^3)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
PM	N/A	24 hours	40	N/A
		annual	-	11.6
PM_{10}	N/A	24 hours	-	13.1
		annual	-	8.3
$PM_{2.5}$	N/A	24 hours	15	N/A
		annual	-	6.2
Silver (Ag)	7440-22-4	24 hours	-	0.00026
		annual	0.005	N/A
Aluminum (Al)	7429-90-5	24 hours	-	0.42
		annual	-	0.146
Arsenic (As)	7440-38-2	24 hours	-	0.00126
		annual	0.002	N/A
Gold (Au)	7440-57-5	-	-	-
Boron (B)	7440-42-8	24 hours	-	0.026
		annual	-	0.026
Barium (Ba)	7440-39-3	24 hours	-	0.0086
		annual	0.02	N/A
Beryllium (Be)	7440-41-7	annual	0	N/A
Bismuth (Bi)	7440-69-9	24 hours	-	0.0013
		annual	-	0.0013
Carbon (C)	7440-44-0	1 hour	0	-
		annual	0	-
Calcium (Ca)	7440-70-2	24 hours	-	0.68
		annual	-	0.3
Cadmium (Cd)	7440-43-9	24 hours	-	0.00026
		annual	0.0005	N/A
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1 hour	0	N/A
		annual	0	N/A

Parameter	CAS #	Averaging Period	Background Concentration (µg/m³)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
Cobalt (Co)	7440-48-4	annual	0	N/A
Chromium (Cr) and Compounds (as Cr)	7440-47-3	24 hours	-	0.006
		annual	0.01	N/A
Cesium (Cs) and Compounds (as Ce)	7440-46-2	1 hour	0	N/A
		annual	0	N/A
Copper (Cu)	7440-50-8	24 hours	0.2	N/A
		annual	-	0.0032
Iron (Fe)	7439-89-6	24 hours	-	0.22
		annual	-	0.15
Gallium (Ga)	7440-55-3	-	-	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1 hour	0	-
		annual	0	-
Mercury (Hg)	7439-97-6	24 hours	-	0.000064
		annual	0.002	N/A
Indium (In)	7440-74-6	-	-	-
Potassium (K)	7440-09-7	24 hours	-	0.126
		annual	-	0.13
Lanthanum (La)	7439-91-0	-	-	-
Lithium (Li)	7439-93-2	1 hour	0	N/A
Lutetium (Lu)	7439-94-3	-	-	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	1 hour	6	N/A
		24 hours	-	0.19
		annual	-	0.096
Manganese (Mn) and Compounds (as Mn)	7439-96-5	24 hours	-	0.0086
		annual	0.005 (2)	N/A
Molybdenum (Mo)	7439-98-7	24 hours	-	0.00076
		annual	-	0.00078
Sodium (Na)	7440-23-5	24 hours	-	0.52
		annual	-	0.32
Niobium (Nb)	7440--03-1	-	-	-
Nickel (Ni)	7440-02-0	24 hours	0.005 (2)	N/A
		annual	0.002 (2)	N/A
Phosphorus (P)	7723-14-0	-	-	-
Lead (Pb)	7439-92-1	24 hours	-	0.0034
		annual	0.004	N/A
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	24 hours	0	-
Sulphur (S)	7704-34-9	-	-	-

Parameter	CAS #	Averaging Period	Background Concentration (µg/m³)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
Antimony (Sb)	7440-36-0	24 hours	-	0.00126
		annual	0.007	N/A
Scandium (Sc)	7440-20-2	-	-	-
Selenium (Se)	7782-49-2	1 hour	0.15	N/A
		24 hours	-	0.0026
		annual	-	0.0026
Tin (Sn)	7440-31-5	4 min	0	N/A
		annual	0	N/A
Strontium (Sr)	7440-24-6	24 hours	-	0.0015
		annual	-	0.00148
Tantalum (Ta)	7440-25-7	-	-	-
Terbium (Tb)	7440-27-9	-	-	-
Tellurium (Te)	13494-80-9	1 hour	0	N/A
Titanium (Ti) and Compounds (as Ti)	7440-32-6	24 hours	0 (2)	N/A
Thallium (Tl)	7440-28-0	24 hours	-	0.00026
		annual	0.005	N/A
Uranium (U)	7440-61-1	24 hours	-	0.00026
		annual	-	0.00026
Vanadium (v)	7440-62-2	24 hours	-	0.00076
		annual	0.01	N/A
Tungsten (W) and Compounds (as W)	7440-33-7	24 hours	0	N/A
Yttrium (Y) and Compounds (as Y)	7440-65-5	24 hours	0	N/A
		annual	0	N/A
Ytterbium (Yb)	7440-64-4	-	-	-
Zinc (Zn)	7440-66-6	24 hours	0.1	N/A
		annual	-	0.014
Zirconium (Zr)	7440-67-7	24 hours	0	N/A
Silicon Dioxide (SiO_2)	7631-86-9	-	-	-
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	-
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	-
Magnesium Oxide (MgO)	1309-48-4	-	-	-
Calcium Oxide (CaO)	1305-78-8	-	-	-
Sodium Oxide (Na_2O)	1313-59-3	-	-	-
Potassium Oxide (K_2O)	12136-45-7	-	-	-
Titanium dioxide (TiO_2)	13463-67-7	-	-	-
Phosphorus Pentoxide (P_2O_5)	1314-56-3	-	-	-
Manganese Oxide (MnO)	1344-43-0	-	-	-

Parameter	CAS #	Averaging Period	Background Concentration (µg/m^3)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	-
Vanadium Pentoxide (V_2O_5)	1314-62-1	-	-	-
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	-
Bornite (Cu_5FeS_4)	1308-82-3	-	-	-
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4, 19138-68-2	-	-	-
Tetrahedrite ($Cu_{12}Sb_4S_{13}$)/Tennantite ($Cu_{12}As_4S_{13}$)	N/A,12178-49-3	-	-	-
Cuprite (CU_2O)	1317-39-1	-	-	-
Galena (PbS)	1314-87-0	-	-	-
Sphalerite (ZnS)	1314-98-3	-	-	-
Pyrite (Fe,S_2)	1309-36-0	-	-	-
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	-
Arsenopyrite (FeAsS)	1303-18-0	-	-	-
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	-
Quartz	14808-60-7	1 hour	6 (2)	N/A
		24 hours	-	0.99
		annual	0.04 (3)	N/A
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	N/A	-	-	-
K-Feldspars ($KAlSi_3O_8$)	N/A	-	-	-
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	N/A	-	-	-
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	-	-	-
Chlorite $(Fe,(Mg, Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	-	-	-
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	-	-	-
Epidote $(Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	N/A	-	-	-
Augite ($(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)_2O_6$)	N/A	-	-	-
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	-	-	-
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	-	-	-
Calcite ($CaCO_3$)	1317-65-3	-	-	-
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, N/A	-	-	-
Titanite ($CaTiSiO_5$)	N/A	-	-	-
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	-	-	-
Mica	12001-26-2	1 hour	0	N/A
		annual	0	N/A
Tremolite ($Ca_2(Mg5.0-4.5Fe^{2+}0.0-0.5)Si_8O_{22}(OH)_2$)	77536-68-6	-	-	-
Bytownite $(Ca,Na)(Si,Al)_4O_8$	N/A	-	-	-

Parameter	CAS #	Averaging Period	Background Concentration (µg/m^3)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	N/A	-	-	-
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	N/A
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	N/A	-	-	N/A
Albite $(NaAlSi_3O_8)$	N/A	-	-	N/A
Phlogopite $(KMg_3AlSi_3O_{10}(F,OH)_2)$	N/A	-	-	N/A
Sillimanite (Al_2SiO_5)	12141-45-6	-	-	N/A
Carbon Monoxide (CO)	630-08-0	1 hour	600	N/A
		8 hours	400	N/A
Sulphur Dioxide (SO_2)	7446-09-5	4 min	150	N/A
		24 hours	50	N/A
		annual	20	N/A
Nitrogen Dioxide (NO_2)	10102-44-0	1 hour	150	N/A
		24 hours	100	N/A
		annual	30	N/A
Hydrocarbons	N/A	-	-	-
1,3-Butadiene	106-99-0	4 min	2	N/A
		24 hours	-	0.6
		annual	0.14	N/A
Acetaldehyde	75-07-0	-	-	-
Acrolein	107-02-8	-	-	-
Benzene	71-43-2	24 hours	3	N/A
		annual	-	0.4
Formaldehyde	50-00-0	15 min	3	N/A
Acenaphthene	83-32-9	24 hours	-	0.00441
		annual	-	0.000846
Acenaphthylene	208-96-8	24 hours	-	0.00815
		annual	-	0.00156
Anthracene	120-12-7	24 hours	-	0.000161
		annual	-	0.0000308
Benzo(a)anthracene	56-55-3	-	-	-
Benzo(a)pyrene (B(a)P)	50-32-8	24 hours	-	0.000053
		annual	0.0003	N/A
Benzo(b+k) fluoranthene	205-99-2/ 207-08-9	24 hours	-	0.000279
		annual	-	0.0000535
Benzo(g,h,i)perylene	191-24-2	-	-	-
Chrysene	218-01-9	24 hours	-	0.000338
		annual	-	0.0000649

Parameter	CAS #	Averaging Period	Background Concentration (µg/m³)	
			Quebec Air Quality Standards and Criteria – Initial Concentrations	Representative Ambient Monitoring Data (1)
Fluoranthene	206-44-0	24 hours	-	0.000815
		annual	-	0.000156
Fluorene	86-73-7	24 hours	-	0.00147
		annual	-	0.000282
Phenanthrene	85-01-8	24 hours	-	0.00221
		annual	-	0.000424
Pyrene	129-00-0	annual	0	N/A
Total PAHs (as equivalent B(a)P)	N/A	annual	0.0014	N/A
Diesel particulate matter	N/A	24 hours	-	0.094
		annual	-	0.0182
Elemental carbon	7440-44-0	1 hour	0	N/A
		annual	0	N/A
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	-
Sodium sulphite	7757-83-7	-	-	-
Zinc sulphate	7733-02-0	-	-	-
Sodium trithiocarbonate	534-18-9	-	-	-
Magnafloc 10	N/A	-	-	-
Dustfall (deposition)	N/A	monthly	-	1.5 g/m2

Note: 1. Crawford Nickel Project ambient monitoring results from the Impact Statement Chapter 12: Assessment of the Potential Effects on the Atmospheric Environment dated September 30, 2024

2. Measured in PM10.

3. Measured in PM4.

"-" indicates no background data available

N/A – not applicable or not used if MELCCFP data were available

Ozone data for 2019 to 2023 were examined for the Saguenay - UQAC, Rouyn-Noranda - Parc Tremblay, Rés, F, Ashuapmushuan - Pemonca and Senneterre monitoring stations which are the nearest ozone monitoring stations to the Project. Ozone data from the Senneterre station, which had the highest average concentration over the four stations was conservatively used to represent background ozone levels for the LSA. The background ozone data is summarized in Table 3-6.

Table 3-6 Seasonal Background Ozone Data (ppb)

Hour of Day	Winter	Spring	Summer	Fall
1:00	46.6	54.1	53.8	46.7
2:00	45.9	55	56	45.4
3:00	45.2	52.8	49.1	45.6
4:00	44.8	53.8	55.9	45.4

Hour of Day	Winter	Spring	Summer	Fall
5:00	45.4	53.2	42.6	44.9
6:00	47.9	54.3	53.1	43.9
7:00	48.4	54.6	49.3	44.4
8:00	47.7	57.4	47.2	44
9:00	48.1	59.5	51.2	42.9
10:00	47.6	60.4	54.3	41.2
11:00	46.8	59.6	59.2	45
12:00	46.3	62.5	65.3	48.6
13:00	46.1	62.5	64.4	56
14:00	45.8	64.3	67.4	59.7
15:00	46.4	63.6	73.9	57.3
16:00	46.4	66.6	80.2	57
17:00	46	66.8	81.9	55.9
18:00	45.9	66	75	54.5
19:00	45.2	64.3	65.4	52.7
20:00	44.5	62.2	63	50.8
21:00	44.2	58.8	57.7	51
22:00	45.3	56.3	55.8	50.3
23:00	45.6	57	58	49.8
24:00	46.2	55.7	51.4	48.8

There have been no forest fires identified in the LSA in the last 25 years; however portions of the RSA experienced forest fires in 2023. Wildfires covered a significant area of Canada (over 18.4 million hectares) in 2023 (MELCCFP, 2023). Air quality impacts from wildfires are associated with increases in $PM_{2.5}$ which can be transported over very long distances. During the 2023 wildfires, ambient $PM_{2.5}$ monitoring stations in northern Quebec measured exceedances of between 1042% to 2341% of the MELCCFP 24-hour average criteria, with between 16 to 25 days of exceedances occurring, depending on the station.

4 Effects Assessment Methodology

4.1 Overview

The potential effects of the Project activities on air quality were assessed by conducting dispersion modelling to predict the downwind concentrations of CoPCs and comparing these predictions to regulatory criteria and screening levels.

The assessment of air quality effects related to the construction and operations of the Project consisted of the following elements:

- Compiling emission inventories of stationary and mobile sources for the Project
- Establishing baseline ambient air quality conditions for CoPCs from existing published sources of air quality data
- Conducting dispersion and deposition modelling for the Project
- Comparing dispersion model predictions to air quality criteria and screening levels

The assessment also includes consideration of the following:

- Ambient air quality objectives, and standards
- Incremental change in ground level O_3 precursor emissions

Three timeframes (or phases) were considered for potential environmental effects - construction, operations and closure, as described in Section 1.3.

4.2 Emissions Inventory

The emissions inventory for Project activities is based on published emission factors (i.e., US EPA AP-42) or emission levels provided by manufacturers. Emissions estimates are expected to be conservative and represent worst-case short-term emissions from the Project activities during times when the Project is at maximum production.

4.2.1 Project Overview

The Project consists of the development of an open-pit mining and processing operation located approximately 170 km north of Chibougamau, Quebec. The design details of the Project described below are conceptual in nature and based on feasibility study work that will be finalized through subsequent detailed engineering and operational permitting.

Ore will be extracted from four open pits known as Pit 87, Pit J, Pit SW and Pit X22 and processed (crushed, ground, concentrated) at an on-site processing facility (processing plant). Ore will be transported from the pits to the processing plant via haul trucks. A series of internal roads will be established to facilitate the movement of mine rock and other materials around the site. Final

concentrates will be transported from the mine site via road for further processing. The Project components are shown on Figure A.1 in APPENDIX A.

4.2.2 Site Preparation

For the purposes of the Air Quality Assessment, site preparation activities were considered to include clearing, grubbing, and soil stripping of the PA as needed in preparation for the planned infrastructure. The duration of these preliminary activities will be relatively brief and based on past Stantec experience of mining operations with similar equipment and timelines, air contaminant emissions from these activities are expected to be less than those included in the construction assessment as the numbers of equipment units will be lower. Emissions from site preparation activities were therefore not assessed as the assessment of the construction scenario will implicitly address site preparation emissions.

4.2.3 Construction Emissions

The construction assessment focused on Year -1 since it has the maximum extraction rate from the open pit (Pit 87) during the construction phase.

4.2.3.1 Description of Project Construction

4.2.3.1.1 Open Pit Development

During construction, the focus will be on Pit 87 in preparation for the commencement of mining operations. Bulk earthworks such as stripping, grading and stockpiling will be completed using heavy equipment such as excavators and dozers. During construction, mine rock will be excavated from Pit 87. Excavated waste rock will be loaded onto haul trucks and hauled for immediate use in infrastructure development. Waste rock will be sorted based on size to identify its construction stream. A portable crushing plant will be used during construction to reduce waste rock to aggregate of various sizes. The ore that is removed from Pit 87 will be stored in the coarse ore storage area for future processing.

4.2.3.1.2 Storage Areas and TSF

The Project involves the construction of various storage areas and the TSF. The following storage areas are proposed to manage ore, waste rock, and overburden generated on site.

- Coarse ore storage area located east of the processing plant.
- Overburden storage area (OB87) located southeast of Pit 87.
- Waste rock storage area (WD87) located northeast of Pit 87.
- TSF located south of Pit 87 and the impoundment will be constructed of waste rock and other fill materials.

During the early stages of construction, the storage areas will be prepared so that the areas are ready to begin accepting material at the onset of operations. Most rock generated during construction will be used for building roads, laydowns and pads for buildings. Excess waste rock, and overburden will be stockpiled in the respective storage areas. Ore identified during this phase will be stockpiled in the coarse ore storage area.

4.2.3.1.3 Drilling and Blasting

Drilling and blasting will occur to develop Pit 87 and to prepare surfaces for construction where bedrock may be at or near the surface. Blast holes will be drilled using conventional drills. Explosives will be site mixed emulsion (SME) explosive-based products.

4.2.3.1.4 Aggregate and Rock Fill Supply

It is anticipated that aggregate and rock fill needed for site preparation and construction purposes will primarily come from on-site sources. This includes overburden removed during stripping, as well as waste rock that is excavated from the pit areas during pre-production mining. A mobile crushing plant (primary, secondary and tertiary crushers) located in Pit 87 will be used to generate the desired aggregate and rock fill types (sizes) from on-site sources. It may be necessary to supplement the on-site sources with off-site aggregate that is available from licensed local quarries, owned and operated by third parties.

4.2.3.1.5 Mine Infrastructure

Components of the Project will be installed and/or constructed during construction to support the operating mine, including, but not limited to, a water management system, the TSF, the process plant, primary and secondary crushers, mine services buildings, and the site road network. Construction of infrastructure will focus on supporting earth works, foundation construction, and erection of structures so that interior construction can be completed during winter months. Mine equipment will also be mobilized to the site. A portable batch concrete plant will be used to supply concrete for the onsite building construction.

4.2.3.1.6 Power Supply

Power to the site during the construction phase will be supplied by an existing transmission line. Continuous diesel-fired generators may be used to supply electricity to mobile equipment.

4.2.3.2 Construction Schedule

Site preparation and construction is estimated to be completed over a two year period. The work schedule will likely vary over this period according to the nature of the work that is being completed at any given time. For the purpose of this assessment, it was assumed that construction would occur 24 hours per day, seven days per week, with two shifts per day.

4.2.3.3 Potential Construction Emission Sources

The following potential sources of airborne emissions were identified based on the process descriptions and data supplied by Troilus for the construction phase and are included in this assessment (see APPENDIX C of this assessment for details).

The following construction emission sources were identified:

- Pit development: material handling, material movement, equipment travel, drilling, blasting, tailpipe emissions from mobile equipment
- Storage areas and TSF: wind erosion, material handling, material movement, tailpipe emissions from mobile equipment
- Mobile crushing plant: crushing, material handling, tailpipe emission from mobile equipment and generator, wind erosion
- Mobile concrete plant: material handling, tailpipe emission from mobile equipment and generator, wind erosion
- Process plant construction: general construction activities, and tailpipe emissions from mobile equipment
- Unpaved roads: unpaved road dust, tailpipe emissions from mobile equipment

4.2.3.4 Modelled Construction Emissions Sources

Construction activities that generate emissions are expected to occur intermittently over the duration of the construction period, and the quantities of air contaminants emitted will depend on the level of activity. Construction activities will be temporary and standard construction mitigation procedures will be implemented to reduce dust emissions.

Construction emissions sources are discussed in this section. Detailed emission calculations and methodologies are presented in APPENDIX C of this assessment.

4.2.3.4.1 Open Pit Development

The following emission sources are identified for pre-production mining during construction:

- Holes are drilled and used for placing explosives for blasting. Drilling of holes can occur throughout the workday. Emissions from drilling include particulate emissions (including PM, PM_{10}, $PM_{2.5}$ and associated metals in particulates). Drilling emissions were estimated using emission factors for particulates from US EPA AP-42, Chapter 11.9, Table 11.9-4 (Western Surface Coal Mining).
- Blasting would occur daily (typically between the hours of 10 am to 4 pm). Blasting is an intermittent and instantaneous emission and modelled as a separate source (but occurring concurrently) with the rest of the pit emission sources. Emission factors for blasting from US EPA AP-42, Chapter 11.9, Table 11.9-2 (Western Surface Coal Mining) were used to estimate particulate emissions from blasting. Emission factors for blasting from the Australia Government NPI Guide “Explosives

Detonation and Firing Ranges" (Australian NPI, 2016) were used to estimate combustion products (CO, NO_X, SO_2) emissions.

- Material movement (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates) using bulldozers, and front-end loaders. Particulate emissions were estimated using emission factors for bulldozing of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.
- Excavators and wheeled loaders transfer waste rock, ore, or overburden from the pit into haul trucks. CoPCs from material unloading/dropping include particulate matter (PM, PM_{10}, $PM_{2.5}$). Particulate emissions for material unloading/dropping were calculated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Emissions from mobile equipment travelling within the pit including dust and tailpipe emissions. CoPCs include particulate matter (PM, PM_{10}, $PM_{2.5}$), associated metals in particulates and tailpipe emissions (NOx, CO, PM_{10}, $PM_{2.5}$, PAHs, VOCs). Particulate emissions were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.2 (Unpaved Roads). Tailpipe emissions from non-road mobile equipment were estimated using equipment counts and make/model data provided by Troilus, following the methodology discussed in Section 4.2.3.4.7.
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz) content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).

4.2.3.4.2 Storage Areas and TSF

The CoPCs that may be released to the atmosphere from storage areas and TSF construction include particulate (dust) and metals emissions as well as tailpipe emissions. Emissions sources include the following:

- Unloading of ore, waste rock, or overburden at the storage areas and TSF. Particulates (PM, PM_{10}, $PM_{2.5}$), and metals emissions are the CoPCs expected from this activity. Particulate emissions for material unloading/dropping were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Material movement of storage areas and TSF (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates) using bulldozers, and front-end loaders. Particulate emissions were estimated using emission factors for bulldozing of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.
- Wind erosion of the storage areas (active areas) (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates). Particulate emissions were estimated following the methodology in Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (Mining Guide).
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz)

content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).

- Tailpipe emissions from non-road mobile equipment were estimated using equipment counts and make/model data provided by Troilus following the methodology discussed in Section 4.2.3.4.7.

4.2.3.4.3 Mobile Crushing Plant

Crushing operations generate particulate matter emissions from material handling and crushing of waste rock. The following sources are considered:

- Primary crushing, secondary crushing, tertiary crushing and screening using jaw and cone crushers. PM, PM_{10}, $PM_{2.5}$, and metals emissions are the CoPCs expected from this activity. Particulate emissions for crushing were estimated using emission factors in US EPA AP-42, Chapter 11.24 (Metallic Minerals Processing), Table 11.24-1. The emission factor includes hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems and assumed a high moisture rock content (>= 4%).
- Wind erosion of the crushed waste rock stockpile for the crushing plant. Particulate emissions were estimated following the methodology in Section 3.10.2.5 of the MELCCFP Mining Guide.
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz) content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).

4.2.3.4.4 Process Plant Construction

Construction activities for the process plant and other ancillary facilities generate dust emissions. A mobile concrete batch plant will be used to produce concrete for the onsite building construction. Particulate emission for material handling and concrete production were estimated using emission factors from US EPA AP-42, Chapter 11.12 (Concrete Batching) Table 11.12-1.

Tailpipe emissions from process plant construction equipment were estimated using equipment counts and make/model data provided by Troilus following the methodology discussed in Section 4.2.3.4.7.

4.2.3.4.5 Unpaved Roads

Mining trucks and other support vehicles travel within the PA via unpaved haul and access roads. Particulate matter (PM, PM_{10}, $PM_{2.5}$ and associated metals in particulates) from road dust, and products of combustion from the heavy equipment are the CoPCs. Particulate emissions were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.2 (Unpaved Roads).

Graders maintain the haul roads for efficient operation of haul trucks. Emissions from grading include particulate matter (PM, PM_{10}, $PM_{2.5}$), associated metals in particulates and tailpipe emissions from mobile equipment. Particulate emissions from grading were estimated using emission factors for grading of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.

Metals emissions were estimated using speciation profiles of metals in particulates for waste rock obtained from Troilus. Unpaved roads included in the inventory are:

- R1: main access road from processing plant to PA boundary.
- R1B: main access road from PA boundary extending toward Route du Nord.
- HR2: haul road from Pit 87 to processing plant
- HR3: haul road from Pit 87 to overburden storage area OB87
- HR4: haul road from Pit 87 to TSF
- HR5: haul road from Pit 87 to waste rock storage area WD87

4.2.3.4.6 Generators

During construction, power will be supplied to the mobile crushing and concrete batch plant by diesel-fired generators. The CoPCs include nitrogen oxide (NOx), SO_2, CO, PM, PAHs, and hydrocarbons. The emissions were estimated using the emission factors for large stationary diesel engine provided in US EPA AP-42 Chap 3.4 (Large Stationary Diesel and All Stationary Dual-fuel Engines), Tables 3.4-1, 3.4-3 and 3.4-4, manufacturer specifications and applicable sulphur regulations.

4.2.3.4.7 Vehicle and Non-Road Equipment Emissions

The construction fleet will consist of heavy equipment units including excavators, wheeled loaders, haul trucks, drills, wheeled and tracked dozers, graders, and other support vehicles. Not all of the equipment will be operating simultaneously. Different construction equipment will be used during different phases of the construction as needed. Emissions from the diesel fuel-fired mobile equipment would be expected to be combustion emissions including NOx, SO_2, CO, PM, PAHs, and hydrocarbons. The following methodologies were used for on-road and non-road equipment:

- Vehicle tailpipe emissions for on-road vehicle emissions were estimated using the US EPA's Motor Vehicle Emission Simulator (MOVES), MOVES3 project level (US EPA, 2021).
- Vehicle tailpipe emissions for non-road CACs, VOCs and PAHs were estimated based on the US EPA Emissions Standards for Nonroad Engines and Vehicles document "Nonroad Compression-Ignition Engines: Exhaust Emission Standards" (US EPA, 2016). Where applicable, Tier 4 standards were used. For other CoPCs such as VOCs / PAHs, speciation profiles from US EPA (US EPA, 2022a) were applied to the total VOC estimates. The VOC emissions were calculated based on the ratio of VOC/NMHC as provided in the MOVES documentation. Particulate PAH speciation profiles were based on $PM_{2.5}$ emissions.

4.2.3.5 Emissions Summary

A summary of the maximum daily emissions of each CoPC from the Project (after the implementation of mitigation) is presented in Table 4-1 below. The emission inventory included several sources/source types that will have mitigation measures applied to them. The expected control efficiencies, rationale and reference for these measures are summarized in Table 4-2

Table 4-2. The substantial contributors to the maximum daily emissions include the haul roads, blasting, material handling in the pit and crushing activities.

Table 4-1 Emissions Summary - Construction

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
PM	N/A	7,300
PM_{10}	N/A	2,198
$PM_{2.5}$	N/A	326
Silver (Ag)	7440-22-4	5.03E-03
Aluminum (Al)	7429-90-5	548
Arsenic (As)	7440-38-2	6.39E-02
Gold (Au)	7440-57-5	8.08E-04
Boron (B)	7440-42-8	0.7
Barium (Ba)	7440-39-3	2.7
Beryllium (Be)	7440-41-7	8.49E-03
Bismuth (Bi)	7440-69-9	1.53E-02
Carbon (C)	7440-44-0	6.7
Calcium (Ca)	7440-70-2	229
Cadmium (Cd)	7440-43-9	1.05E-02
Cerium (Ce)	7440-45-1	0.5
Cobalt (Co)	7440-48-4	0.1
Chromium (Cr)	7440-47-3	0.6
Cesium (Cs)	7440-46-2	2.15E-02
Copper (Cu)	7440-50-8	1.1
Iron (Fe)	7439-89-6	249
Gallium (Ga)	7440-55-3	0.1
Hafnium (Hf)	7440-58-6	2.96E-02
Mercury (Hg)	7439-97-6	1.79E-04
Indium (In)	7440-74-6	3.58E-05
Potassium (K)	7440-09-7	107
Lanthanum (La)	7439-91-0	0.1
Lithium (Li)	7439-93-2	0.2
Lutetium (Lu)	7439-94-3	1.67E-03
Magnesium (Mg)	7439-95-4	99
Manganese (Mn)	7439-96-5	1.0
Molybdenum (Mo)	7439-98-7	4.61E-02
Sodium (Na)	7440-23-5	212

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Niobium (Nb)	7440--03-1	4.18E-02
Nickel (Ni)	7440-02-0	0.1
Phosphorus (P)	7723-14-0	4.5
Lead (Pb)	7439-92-1	0.1
Rubidium (Rb)	7440-17-7	0.5
Sulphur (S)	7704-34-9	14
Antimony (Sb)	7440-36-0	3.72E-02
Scandium (Sc)	7440-20-2	7.93E-02
Selenium (Se)	7782-49-2	2.50E-03
Tin (Sn)	7440-31-5	6.13E-02
Strontium (Sr)	7440-24-6	2.4
Tantalum (Ta)	7440-25-7	7.20E-03
Terbium (Tb)	7440-27-9	3.81E-03
Tellurium (Te)	13494-80-9	1.25E-03
Titanium (Ti)	7440-32-6	6.8
Thallium (Tl)	7440-28-0	6.47E-03
Uranium (U)	7440-61-1	9.59E-03
Vanadium (v)	7440-62-2	0.7
Tungsten (W)	7440-33-7	0.4
Yttrium (Y)	7440-65-5	9.30E-02
Ytterbium (Yb)	7440-64-4	1.07E-02
Zinc (Zn)	7440-66-6	0.9
Zirconium (Zr)	7440-67-7	0.7
Silicon Dioxide (SiO_2)	7631-86-9	4,677
Aluminum Oxide (Al_2O_3)	1344-28-1	1,081
Iron Oxide (Fe_2O_3)	1309-37-1	358
Magnesium Oxide (MgO)	1309-48-4	151
Calcium Oxide (CaO)	1305-78-8	258
Sodium Oxide (Na_2O)	1313-59-3	246
Potassium Oxide (K_2O)	12136-45-7	174
Titanium dioxide (TiO_2)	13463-67-7	10
Phosphorus Pentoxide (P_2O_5)	1314-56-3	8.4
Manganese Oxide (MnO)	1344-43-0	1.4
Chromium Oxide (Cr_2O_3)	1308-38-9	2.1
Vanadium Pentoxide (V_2O_5)	1314-62-1	1.6
Chalcopyrite ($CuFeS_2$)	1308-56-1	16
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	0.4

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Cuprite (CU_2O)	1317-39-1	0.4
Galena (PbS)	1314-87-0	1.4
Sphalerite (ZnS)	1314-98-3	2.9
Pyrite (Fe,S_2)	1309-36-0	43
Pyrrhotite (Fe_7S_8)	12305-96-3	20
Arsenopyrite (FeAsS)	1303-18-0	0.4
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	1.1
Quartz	14808-60-7	251
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	N/A	3,878
K-Feldspars ($KAlSi_3O_8$)	N/A	255
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	N/A	601
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	144
Chlorite ($Fe,(Mg, Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	46
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	95
Epidote ($Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	N/A	140
Augite ($(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)_2O_6$)	N/A	1.7
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	16
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	3.6
Calcite ($CaCO_3$)	1317-65-3	35
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, N/A	0.2
Titanite ($CaTiSiO_5$)	N/A	6.2
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	16
Mica	12001-26-2	766
Tremolite ($Ca_2(Mg5.0-4.5Fe^{2+}0.0-0.5)Si_8O_{22}(OH)_2$)	77536-68-6	379
Bytownite $(Ca,Na)(Si,Al)_4O_8$	N/A	309
Labradorite $(Na,Ca)_{1-2}Si_{3-2}\ O_8$	N/A	240
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	837
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	N/A	1,825
Albite ($NaAlSi_3O_8$)	N/A	681
Phlogopite ($KMg_3AlSi_3O_{10}(F,OH)_2$)	N/A	99
Sillimanite (Al_2SiO_5)	12141-45-6	31
Carbon Monoxide (CO)	630-08-0	250
Sulphur Dioxide (SO_2)	7446-09-5	3.4
Hydrocarbons	N/A	45
Nitrogen Oxides (NOx)	10102-44-0	1,867
1,3-butadiene	106-99-0	3.79E-02
Acenaphthene	83-32-9	1.37E-02

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Acenaphthylene	208-96-8	2.75E-02
Acetaldehyde	75-07-0	2.1
Acrolein	107-02-8	0.4
Anthracene	120-12-7	2.52E-03
Benzene	71-43-2	1.3
Benzo(a)anthracene	56-55-3	4.32E-04
Benzo(a)pyrene	50-32-8	1.58E-04
Benzo(b+k)fluoranthene	205-99-2	5.50E-04
Benzo(g,h,i)perylene	191-24-2	3.65E-04
Chrysene	218-01-9	7.47E-04
Fluoranthene	206-44-0	4.75E-03
Fluorene	86-73-7	2.07E-02
Formaldehyde	50-00-0	1.8
Phenanthrene	85-01-8	4.05E-02
Pyrene	129-00-0	4.46E-03
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	N/A	21
Elemental Carbon (from diesel exhaust)	7440-44-0	14
Total PAHs (as equivalent B(a)P)	N/A	4.04E-04

4.2.4 Operations Emissions

The operations assessment focused on Year 6 since it has the maximum combined extraction rates from the open pits (Pit 87, Pit J and Pit SW operating concurrently) during the operations phase (see Section 4.2.4.4).

4.2.4.1 Description of Project Operations

4.2.4.1.1 Open Pit Mining

Waste rock, ore and overburden will be extracted from four open pits known as Pit 87, Pit J, Pit SW and Pit X22. Based on the current Project design, the maximum mining rate will be up to 238,082 tpd and an average processing plant capacity of approximately 50,000 dry tpd.

4.2.4.1.2 Ore Handling

The run-of-mine or stockpiled ore will be hauled from the pits or storage piles and dumped into a bin above the primary crusher. The primary crusher will be an enclosed and partially buried structure with a dust collection system.

The crushed ore is transferred to the secondary crusher structure via a conveyor. The conveyor will feed the crushed ore into a surge bin. The ore will be drawn from the surge bin via a belt feeder onto a

secondary screen equipped with a dust collection system. Oversized ore from the screen will be fed into two parallel closed-circuit secondary cone crushers equipped with a dust collection system. The product from the secondary crusher will be deposited onto the stockpile feed conveyor where it will be combined with the undersized ore from the secondary screen and transported to the crushed ore stockpile. The crushed ore stockpile will be covered, and ore will be reclaimed using three variable-speed apron feeders.

4.2.4.1.3 Ore Processing

Minerals will be recovered from the ore and processed into a copper/gold/silver concentrate in the process plant. The average daily feed rate will be approximately 50,000 dry tpd. The conceptual mill process flow diagram is shown in APPENDIX A, Figure A.5 of this report.

The ore will be reclaimed from the crushed ore stockpile into the high-pressure grinding rolls (HPGR) grinding circuit equipped with a dust collection system and consisting of a ball mill circuit operating in a closed circuit with a cyclone cluster. The overflow from the cyclone cluster will then feed the rougher in the flotation circuit. Ball mill grinding and subsequent ore processing steps will be wet processes with no potential to generate particulate emissions.

The flotation circuit consists of three stages of cleaning. The product from the cleaners will then be transferred to the concentrate thickener. The product will then be pumped to a filter press for further dewatering before stockpiling. The tails from the coarse rougher and cleaner circuit will be thickened and pumped to the TSF.

The primary reagents that are planned for use in the flotation process to produce concentrate may include:

- Lime and associated dust collector
- Potassium amyl xanthate (PAX) and associated dust collector
- Sodium sulphite and associated dust collector
- Zinc sulphate and associated dust collector
- Sodium trithiocarbonate and associated dust collector
- Magnafloc flocculant
- PolyPro Froth FRF-B
- SPRI 206
- Future design allows for gold bearing gravity concentrates from the rougher scavenger and cleaner circuit to be smelted into gold bars. Emissions from the smelting process will be vented through a dust collector. The concentrates from the rougher, scavenger, and regrind shaking table circuit will be collected, where it will be filtered using a vacuum sludge pan filter and dried in an oven. Once the dried concentrate cake has cooled, it will be mixed with fluxes and loaded into the smelting furnace. The fluxes will react with base metal oxides to form a slag, whilst the gold will remain as molten metal. The molten metal will be poured into moulds, to form gold ingots, which will be cleaned,

assayed, stamped, and stored in a secure vault ready for dispatch. The slag produced will periodically be returned to the ball mill feed chute by hand.

4.2.4.1.4 Concentrate Handling, Storage and Transportation

The copper/gold/silver concentrate will be transferred by a front-end loader to the concentrate load-out buildings where it will be stored in shipping containers prior to it being sold and shipped off site by road.

It is estimated that at peak concentrate production, six concentrate trucks will be used to transport concentrate off-site daily.

4.2.4.1.5 Waste Rock and Overburden Management

The Project involves the management of waste rock and overburden with pit development. The following storage areas are proposed to manage waste rock, and overburden generated on site.

- Overburden storage area (OBNW) located north of Pit J.
- Overburden storage area (OB West) located west of Pit 87.
- Overburden storage area (OBSW) located southeast of Pit SW.
- Waste rock storage area (WDSW) located west of Pit SW
- Waste rock storage area (WD87) located northeast of Pit 87.
- TSF located south of Pit 87 and the impoundment/dam raises will be constructed of waste rock and other fill materials.

Excess waste rock and overburden will be stockpiled in their respective storage areas.

4.2.4.1.6 Process Solids Management

The TSF will be located south of Pit 87 and has been designed to hold 113 million m^3 of tailings. Tailings will be thickened to approximately 54% solids in the process plant and then pumped to the TSF for long-term storage. The TSF will reach its full capacity during Year 10 and tailings are planned to be disposed into mined out pits until the end of Mine Life (Year 22). In-pit tailings disposal will progress sequentially into the Pit SW, Pit J and then Pit 87. The mine plan was developed with this constraint of concept for migration to in-pit disposal in the later years of mine development (WSP, 2024).

4.2.4.1.7 Haul Roads

A series of internal haul and access roads will be constructed to facilitate access to various Project components. Haul roads will be 36.5 m wide, and the main access road will be 8 m wide. Roads will be constructed of waste rock and/or aggregate.

4.2.4.1.8 Power Supply

Electric power for the Project is planned to be supplied through the development of an existing 161 kV electricity transmission line to the Project site. A continuous diesel-fired generator may be used to supply electricity to the mobile crushing plant.

Generators will also be used to provide standby power in emergency situations. Each diesel generator will be contained within a weatherproof enclosure. Additional smaller scale generators may be employed in other areas of the site for emergency power backup. These generators will only operate during a power outage or for short duration routine testing and the emissions are considered negligible.

4.2.4.1.9 Aggregate and Rock Fill Supply

A mobile crushing plant (primary, secondary and tertiary crushers) located in Pit SW will be used to generate the desired aggregate and rock fill types (sizes) from on-site sources. It may be necessary to supplement the on-site sources with off-site aggregate that is available from licensed local quarries, owned and operated by third parties.

4.2.4.1.10 Miscellaneous Sources

Miscellaneous sources of air contaminants on site that are expected to be negligible contributors to emissions include the following:

- Fuel Management Facility – Fuel will be stored in above ground vertical or horizontal bulk tanks. Fueling stations are considered negligible sources following MECP guidance (MECP, 2018)
- Explosive Storage Facility – the Project will utilize site mixed emulsion explosives that will only be sensitized when injected with a gassing agent in a bulk delivery truck used to charge the blast holes. As a result, materials stored on site will not be considered explosive. The inert materials used for explosives will be stored in tanks in an explosive storage facility
- An Assay Lab – located adjacent to the process plant that will analyze samples taken from the process plant
- Water and sewage treatment plant – sewage and effluent treatment plants will be enclosed and expected to have negligible odour emissions
- Propane heaters used for comfort heat in onsite buildings during the winter months until sufficient electrical power is available.

4.2.4.2 Operating Schedule

The Project will operate 24 hours per day, 365 days per year for the life of mine (LOM). The proposed mining schedule is as follows:

- Pit 87: Year -2 to Year 19
- Pit SW: Year 1 to Year 9
- Pit J: Year 5 to Year 15

- Pit X22: Year 18 to Year 21

4.2.4.3 Potential Operation Emission Sources

The following potential sources of airborne emissions were identified based on the process descriptions and data supplied by Troilus for the operation phase and are included in this assessment (see APPENDIX C of this assessment for details):

- Pit operation: material handling, material movement, equipment travel, drilling, blasting, tailpipe emissions from mobile equipment
- Storage areas and TSF: wind erosion, material handling, material movement, tailpipe emissions from mobile equipment
- Mobile crushing plant: crushing, material handling, tailpipe emission from mobile equipment and generator, wind erosion
- Primary and secondary crushing: material handling, primary crushing, secondary crushing, dust collection
- Crushed ore stockpile and reclaim tunnel: material handling
- Ore processing: material handling, HPGR circuit, reagents, smelting, dust collection
- Concentrate handling: material handling, tailpipe emission from mobile equipment
- Unpaved roads: unpaved road dust, tailpipe emission from mobile equipment

4.2.4.4 Modelled Project Emissions Sources

The variation in material mined and moved over the Project LOM is presented on Figure 4.1. For modelling, the year with the highest mass of material moved (mining rate + material transported from the ore stockpile to the primary crusher) was selected for assessment, as this year is expected to have the highest emission rates. As can be seen on Figure 4.1, Project material movements remain reasonably consistent through Years 6 to 8 and decrease following that. Using Year 6 operating data to represent the entire operations phase will provide a conservative estimate of air quality levels as the depth of the Open Pit will be less in Year 6 versus later years, which will result in “worst-case” impacts due to emissions of particulate matter in the pits being increasingly retained in the pits as their depths increase.

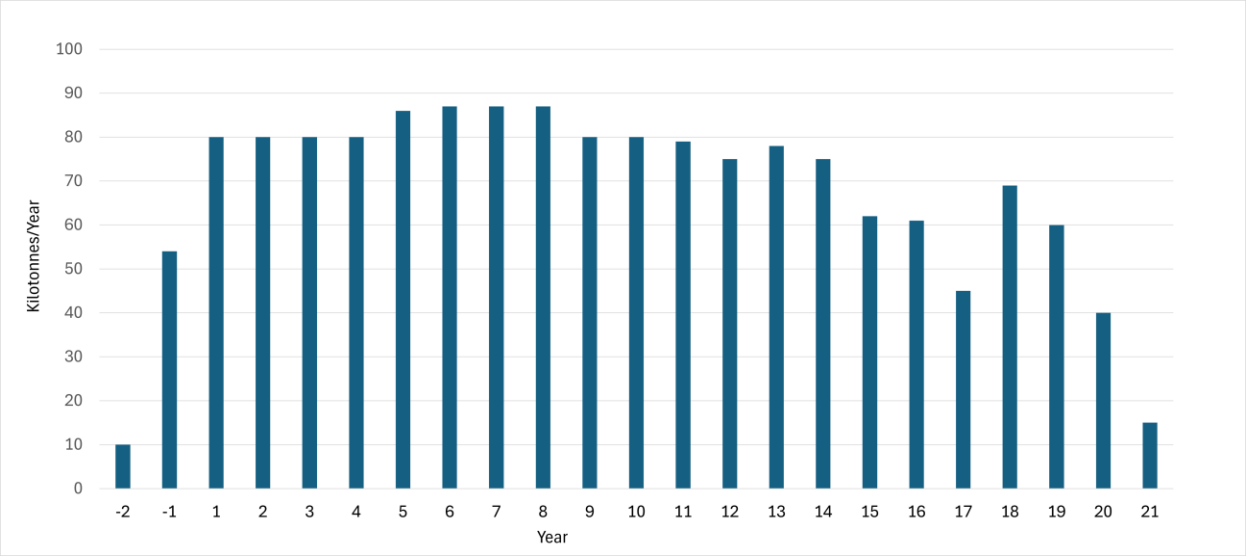

Figure 4.1 Annual Tonnages Mined (kt/yr) over LOM

Project emission sources and operations are discussed in this section along with an overview of the emission estimation techniques. Metals emissions for all sources were calculated by speciating the particulate emissions using measured metals contents in ore, waste rock and overburden obtained from Troilus. Detailed emission calculations and methodologies are presented in APPENDIX C of this assessment.

4.2.4.4.1 Open Pit Operation

The following emission sources are identified in the open pits:

- Holes are drilled and used for placing explosives for blasting. Drilling of holes can occur throughout the workday. Emissions from drilling include particulate emissions (including PM, PM_{10}, $PM_{2.5}$ and associated metals in particulates). Drilling emissions were estimated using emission factors for particulates from US EPA AP-42, Chapter 11.9, Table 11.9-4 (Western Surface Coal Mining).
- Blasting would occur daily (typically between the hours of 10 am to 4 pm). Blasting is an intermittent and instantaneous emission and modelled as a separate source (but occurring concurrently) with the rest of the pit emission sources. Emission factors for blasting from US EPA AP-42, Chapter 11.9, Table 11.9-2 (Western Surface Coal Mining) were used to estimate particulate emissions from blasting. Emission factors for blasting from the Australia Government NPI Guide “Explosives Detonation and Firing Ranges” (Australian NPI, 2016) were used to estimate combustion products (CO, NO_X, SO_2) emissions.
- Material movement (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates) using bulldozers, and front-end loaders. Particulate emissions were estimated using emission factors for bulldozing of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.

- Excavators and wheeled loaders transfer waste rock, ore, or overburden from the pit into haul trucks. CoPCs from material unloading/dropping include particulate matter (PM, PM_{10}, $PM_{2.5}$), associated metals in particulates. Particulate emissions for material unloading/dropping were calculated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Emissions from mobile equipment travelling within the pits including dust and tailpipe emissions. CoPCs include particulate matter (PM, PM_{10}, $PM_{2.5}$), associated metals in particulates and tailpipe emissions (NOx, CO, PM_{10}, $PM_{2.5}$, PAHs, VOCs). Particulate emissions were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.2 (Unpaved Roads). Tailpipe emissions from non-road mobile equipment were estimated using equipment counts and make/model data provided by Troilus, following the methodology discussed in Section 4.2.4.4.8.
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz) content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).

4.2.4.4.2 Storage Areas and TSF

The CoPCs that may be released to the atmosphere from storage areas and TSF include particulate (dust) and metals emissions as well as tailpipe emissions. Emissions sources include the following

- Unloading of ore, mine rock, or overburden at the storage areas and TSF. Particulates (PM, PM_{10}, $PM_{2.5}$), and metals emissions are the CoPCs expected from this activity. Particulate emissions for material unloading/dropping were calculated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Material movement of storage areas and TSF (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates) using bulldozers, and front-end loaders. Particulate emissions were estimated using emission factors for bulldozing of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.
- Wind erosion of the storage areas (active areas) and TSF (exposed beach) (emissions of PM, PM_{10}, $PM_{2.5}$, and metals in particulates). Particulate emissions were estimated following the methodology in Section 3.10.2.5 of the MELCCFP Mining Guide.
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz) content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).
- Tailpipe emissions from non-road mobile equipment were estimated using equipment counts and make/model data provided by Troilus following the methodology discussed in Section 4.2.4.4.8.

4.2.4.4.3 Mobile Crushing Plant

Crushing operations generate particulate matter emissions from material handling and crushing of waste rock. The following sources are considered:

- Primary crushing, secondary crushing, tertiary crushing and screening using jaw and cone crushers. PM, PM_{10}, $PM_{2.5}$, and metals emissions are the CoPCs expected from this activity. Particulate emissions for crushing were estimated using emission factors in US EPA AP-42, Chapter 11.24 (Metallic Minerals Processing), Table 11.24-1. The emission factor includes hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems and assumed a high moisture rock content (>= 4%).
- Wind erosion of the crushed waste rock stockpile for the crushing plant. Particulate emissions were estimated following the methodology in Section 3.10.2.5 of the MELCCFP Mining Guide.
- Metals emissions for all sources were estimated using speciation profiles of metals in particulates for ore, waste rock, and overburden obtained from Troilus (see APPENDIX D). Crystalline silica (quartz) content in particulate was assumed to be 44% of the quartz content in the ore, waste rock or overburden based upon Richards et al (2009).
- Continuous diesel-fired generator to power the plant. The CoPCs include NOx, SO_2, CO, PM, PAHs, and hydrocarbons. The emissions were estimated using the emission factors for large stationary diesel engine provided in US EPA AP-42 Chap 3.4 (Large Stationary Diesel and All Stationary Dual-fuel Engines), Tables 3.4-1, 3.4-3 and 3.4-4, manufacturer specifications and applicable sulphur regulations.

4.2.4.4.4 Processing Plant Crushing

Crushing operations generate particulate emissions from material handling and crushing operations. Products of combustion are also generated from trucks unloading aggregate. The following sources are considered:

- Unloading of aggregate at the coarse ore pile/primary crusher. PM, PM_{10}, $PM_{2.5}$, and metals emissions are the CoPCs expected from these operations. Particulate emissions for material unloading were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Primary crushing using a gyratory crusher and conveying material to secondary screening and crushing. PM, PM_{10}, $PM_{2.5}$, and speciated metals emissions are the CoPCs expected from these operations. Particulate emissions for crushing were estimated using emission factors in US EPA AP-42, Chapter 11.24 (Metallic Minerals Processing), Table 11.24-1. The emission factor includes hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems and assumed a high moisture rock content (>= 4%).
- Secondary screening and crushing using a cone crusher and conveying material to the crushed ore stockpile. Particulates (PM, PM_{10}, $PM_{2.5}$) and speciated metals emissions are the CoPCs expected from these operations. Particulate emissions for crushing were estimated using emission factors in US EPA AP-42, Chapter 11.24 (Metallic Minerals Processing), Table 11.24-1. The emission factor

includes hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems and assumed a high moisture rock content (>= 4%).

- Crushed ore from the secondary screen and crusher are conveyed and dropped to a covered stockpile. The expected CoPCs are particulates (PM, PM_{10}, $PM_{2.5}$) and speciated metals. Particulate emissions for material drops were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Dust collectors controlling emissions from the primary crusher, secondary screening and crushing and conveying. Particulate emissions were estimated based on the MECP recommended emission factor of 20 mg/m^3 for the most substantial baghouse and 10 mg/m^3 for other units as per Table C-2, Appendix C, Guideline A-10. Emission factors for PM_{10}, $PM_{2.5}$ are estimated using data from US EPA AP-42, Appendix B-1, Section 11.xx (Fluorspar Ore Rotary Drum Dryer) of this assessment.
- Tailpipe emissions from non-road mobile equipment. CoPCs include NOx, CO, PM_{10}, $PM_{2.5}$, PAHs, VOCs. Tailpipe emissions were estimated using equipment counts and make/model data supplied by Troilus following methodology presented in Section 4.2.4.4.8.

4.2.4.4.5 Ore Processing

Emission sources considered during ore processing operations are the following:

- Material transfer from the crushed ore stockpile to the HPGR circuit for grinding. The expected CoPCs are particulate matter (PM, PM_{10} and $PM_{2.5}$) and speciated metals. Particulate emissions for material unloading were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Unloading of solid reagents received in bags and transferred to holding/storage/mix tanks where they are diluted to form solutions. The CoPCs include particulate matter (PM, PM_{10}, $PM_{2.5}$) and the various components of the reagents used. The emissions were estimated using the emission factor for product loading and transferring from US EPA AP-42 Chap 11.17 (Lime Manufacturing) along with the annual usage (in tonnes/year) for each contaminant.
- Liquid reagents such as PolyPro Froth FRF-B and SPRI 206 are in sealed containers with a low vapour pressure. The evaporative emissions from these liquid reagents were considered insignificant.
- Smelting furnace and material handling. The CoPCs include particulate matter (PM, PM_{10}, $PM_{2.5}$), SO_2 and lead. The emissions were estimated using the emission factor for concentrate dryer followed by electric furnace and fugitive emission provided in US EPA AP-42 Chap 12.3 (Primary Copper Smelting), Tables 12.3-2 and 12.3-10.
- Dust collectors controlling emissions from the HPGR circuit, solid reagent transfers and smelting. Particulate emissions were estimated based on the MECP recommended emission factor of 20 mg/m^3 for the most substantial baghouse and 10 mg/m^3 for other units as per Table C-2, Appendix C, Guideline A-10. Emission factors for PM_{10}, $PM_{2.5}$ are estimated using data from US EPA AP-42, Appendix B-1, Section 11.xx (Fluorspar Ore Rotary Drum Dryer) of this assessment.

4.2.4.4.6 Concentrate Handling

Particulate matter (PM, PM_{10}, $PM_{2.5}$ and associated metals in particulates) from loading/unloading operations and products of combustion from the mobile equipment are the CoPCs. Emissions sources include the following:

- Particulate emissions from the concentrate due to material loading into sealed storage containers. PM, PM_{10}, $PM_{2.5}$, and speciated metals emissions are the CoPCs expected from these operations. Particulate emissions for material unloading/dropping were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.4 (Aggregate Handling and Storage Piles).
- Tailpipe emissions from mobile equipment. CoPCs include NOx, CO, PM_{10}, $PM_{2.5}$, PAHs, VOCs. Tailpipe emissions were estimated using equipment counts and make/model data supplied by Troilus following the methodology presented in Section 4.2.4.4.8.

4.2.4.4.7 Unpaved Roads

Mining trucks and other support vehicles travel within the Project Area via unpaved haul and access roads. Particulate matter (PM, PM_{10}, $PM_{2.5}$ and associated metals in particulates) from road dust, and products of combustion from the heavy equipment are the CoPCs. Particulate emissions from road dust were estimated using Equation (1) in US EPA AP-42, Chapter 13.2.2 (Unpaved Roads).

Graders maintain the haul roads for efficient operation of haul trucks. Emissions from grading include particulate matter (PM, PM_{10}, $PM_{2.5}$), associated metals in particulates and tailpipe emissions from mobile equipment. Particulate emissions from grading were estimated using emission factors for grading of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2.

Metals emissions were estimated using speciation profiles of metals in particulates for mine rock obtained from Troilus. Haul roads segments included in the assessment were:

- R1: main access road from processing plant to PA boundary.
- R1B: main access road from PA boundary extending toward Route du Nord.
- HR2: haul road from Pit 87 to processing plant
- HR3: haul road from Pit J to processing plant
- HR4: haul road from Pit SW to processing plant
- HR5: haul road from Pit J to overburden storage area OBNW
- HR6: haul road from Pit J to overburden storage area OB West
- HR7: haul road from Pit SW to overburden storage area OBSW
- HR8: haul road from Pit SW to waste rock storage area WDSW
- HR9: haul road from Pit 87 to TSF
- HR10: haul road from Pit 87 to WD87
- R11: haul road from Pit SW to TSF

4.2.4.4.8 Vehicle and Non-Road Equipment Emissions

The operations fleet will consist of heavy equipment units including excavators, wheeled loaders, haul trucks, drills, wheeled and tracked dozers, graders, and other support vehicles. Not all of the equipment will be operating simultaneously. Different equipment will be used during different phases of operations as needed. Emissions from the diesel fuel-fired mobile equipment would be expected to be combustion emissions including nitrogen oxide (NOx), SO_2, CO, PM, PAHs, and hydrocarbons. The following methodologies were used for on-road and non-road equipment:

- Vehicle tailpipe emissions for on-road vehicle emissions were estimated using the US EPA's Motor Vehicle Emission Simulator (MOVES), MOVES3 project level (US EPA, 2021).
- Vehicle tailpipe emissions for non-road CACs and PAHs were estimated based on the US EPA Emissions Standards for Nonroad Engines and Vehicles document "Nonroad Compression-Ignition Engines: Exhaust Emission Standards" (US EPA, 2016). Where applicable, Tier 4 standards were used. For other CoPCs such as VOCs/ PAHs, speciation profiles from "Speciation Profiles for Toxic Emission Factors for Non- Road Engines" (US EPA, 2022a) were applied to the total VOC estimates. VOCs were calculated based on the ratio of VOC/NMHC as provided in the MOVES documentation. Particulate PAH speciation profiles were based on $PM_{2.5}$ emissions.

4.2.4.4.9 Negligible Sources

The following emission sources are considered to be negligible following the MECP procedure document (MECP, 2018):

- HPGR grinding is a wet process
- Evaporation of liquid reagents stored in storage/mix tanks as the contents are non-volatile.
- Emissions from tailings pumped to the TSF as the tailings are in a slurry form and the contents are non-volatile
- Assay Lab
- Raw materials used for explosives mixing will be in prill or liquid (solutions) form and a non-volatile state
- Fuel storage tanks. Diesel storage tanks have negligible emissions due to the low vapour pressure of diesel fuel.
- Standby power generators firing liquid or gaseous fuels that are used for standby power with only periodic testing.

4.2.4.5 Accidents and Malfunctions

Accidents and malfunctions that could have an adverse effect on the atmospheric environment are presented in Chapter 28 of the Impact Statement.

4.2.4.6 Emissions Controls and Mitigation Efficiency Estimates

The emission inventory included several sources/source types that will have mitigation measures applied to them. The expected control efficiencies, rationale and reference for these measures are summarized in Table 4-2.

Table 4-2 Summary of Assumed Mitigation Control Efficiencies

Source/Source Type	Expected Collection Efficiency (%)	Control	Reference/Rationale
Drilling in Open Pit	85%	Wet Drilling	Typical drill configuration. US Office of Mine Safety and Health Research (OMSHR, 2014) estimates wet drilling eliminates up to 97% of respirable dust. Control of 85% equivalent to a moderate water flow rate of 0.6 gpm assumed for control efficiency.
Blasting	20%	Improved Practices	A 20% emission reduction was considered since particulate emissions are controlled by optimizing each blast through techniques (e.g. type, timing sequence and blast patterns). The USEPA blasting data is outdated and primarily based on measurements of blasting coal and current blasting practices and technologies are improved.
Truck Loading / Unloading (Pits, Storage Areas & TSF)	0%	Uncontrolled	-
Grading	0%	Uncontrolled	-
Material movement	0%	Uncontrolled	-
Wind Erosion (Storage Areas)	0%	Uncontrolled	-
Wind Erosion (TSF)	50%	Water / surfactant application or limiting the size of the active cell	Maintaining a high moisture content in the surface material (Australian NPI, 2012)
Primary Crusher, Secondary Crusher, Secondary Screener, HPGR, Smelting,	90%	Full enclosure	Rock Crushing Plants: Technical Guidance for Rock Crushing Plants (TCEQ, 2002)
Solid Reagent Handling	75%	Partial Enclosure	Western Regional Air Partnership Report (WRAP, 2006)
Unpaved Roads – Summer	90%	Road watering / surfactant	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%. Parvej et al 2021 notes dust suppressant control efficiencies of up to 95.2%

Source/Source Type	Expected Collection Efficiency (%)	Control	Reference/Rationale
Unpaved Roads – Summer	31%	Speed limitation to a maximum of 50 km/h	The amount of dust emissions from an unpaved road is directly related to the speed and type of vehicle using the road, with emissions varying linearly with vehicle speed (NRC, 2005). The control efficiency achieved by limiting vehicle speeds was determined using a linear relationship between dust emissions and vehicle speed with an uncontrolled speed of 45 mph (72 km/h) (WRAP, 2006)
Unpaved Roads – Winter	95%	Natural mitigation	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)

4.2.4.7 Project Emissions Summary

A summary of the maximum daily emissions of each CoPC from the Project (after the implementation of mitigation) is presented in Table 4-3. The substantial contributors to the maximum daily emissions include the haul roads, blasting, material handling in the pits and crushing activities.

Table 4-3 Emissions Summary – Operations

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
PM	N/A	30,101
PM_{10}	N/A	13,146
$PM_{2.5}$	N/A	1,944
Silver (Ag)	7440-22-4	1.55E-02
Aluminum (Al)	7429-90-5	2,324
Arsenic (As)	7440-38-2	0.4
Gold (Au)	7440-57-5	1.40E-03
Boron (B)	7440-42-8	3.3
Barium (Ba)	7440-39-3	12.8
Beryllium (Be)	7440-41-7	2.88E-02
Bismuth (Bi)	7440-69-9	3.07E-02
Carbon (C)	7440-44-0	41
Calcium (Ca)	7440-70-2	850
Cadmium (Cd)	7440-43-9	1.97E-02
Cerium (Ce)	7440-45-1	2.2
Cobalt (Co)	7440-48-4	0.6

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Chromium (Cr)	7440-47-3	5.8
Cesium (Cs)	7440-46-2	0.1
Copper (Cu)	7440-50-8	2.8
Iron (Fe)	7439-89-6	1,383
Gallium (Ga)	7440-55-3	0.6
Hafnium (Hf)	7440-58-6	0.1
Mercury (Hg)	7439-97-6	7.52E-04
Indium (In)	7440-74-6	5.18E-04
Potassium (K)	7440-09-7	477
Lanthanum (La)	7439-91-0	0.9
Lithium (Li)	7439-93-2	0.8
Lutetium (Lu)	7439-94-3	8.00E-03
Magnesium (Mg)	7439-95-4	441
Manganese (Mn)	7439-96-5	6.3
Molybdenum (Mo)	7439-98-7	0.1
Sodium (Na)	7440-23-5	893
Niobium (Nb)	7440--03-1	0.2
Nickel (Ni)	7440-02-0	0.8
Phosphorus (P)	7723-14-0	15.7
Lead (Pb)	7439-92-1	0.4
Rubidium (Rb)	7440-17-7	2.3
Sulphur (S)	7704-34-9	127
Antimony (Sb)	7440-36-0	7.33E-02
Scandium (Sc)	7440-20-2	0.5
Selenium (Se)	7782-49-2	1.05E-02
Tin (Sn)	7440-31-5	2.78E-01
Strontium (Sr)	7440-24-6	6.7
Tantalum (Ta)	7440-25-7	2.83E-02
Terbium (Tb)	7440-27-9	1.85E-02
Tellurium (Te)	13494-80-9	6.12E-03
Titanium (Ti)	7440-32-6	50.9
Thallium (Tl)	7440-28-0	3.05E-02
Uranium (U)	7440-61-1	4.27E-02
Vanadium (v)	7440-62-2	4.2
Tungsten (W)	7440-33-7	0.3
Yttrium (Y)	7440-65-5	0.5
Ytterbium (Yb)	7440-64-4	5.28E-02

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Zinc (Zn)	7440-66-6	2.4
Zirconium (Zr)	7440-67-7	2.9
Silicon Dioxide (SiO_2)	7631-86-9	19,171
Aluminum Oxide (Al_2O_3)	1344-28-1	4,470
Iron Oxide (Fe_2O_3)	1309-37-1	1,961
Magnesium Oxide (MgO)	1309-48-4	755
Calcium Oxide (CaO)	1305-78-8	1,287
Sodium Oxide (Na_2O)	1313-59-3	1,130
Potassium Oxide (K_2O)	12136-45-7	600
Titanium dioxide (TiO_2)	13463-67-7	90
Phosphorus Pentoxide (P_2O_5)	1314-56-3	34
Manganese Oxide (MnO)	1344-43-0	8.7
Chromium Oxide (Cr_2O_3)	1308-38-9	9.7
Vanadium Pentoxide (V_2O_5)	1314-62-1	8.2
Chalcopyrite ($CuFeS_2$)	1308-56-1	77
Bornite (Cu_5FeS_4)	1308-82-3	2.8
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.1
Tetrahedrite ($Cu_{12}Sb_4S_{13}$)/Tennantite ($Cu_{12}As_4S_{13}$)	N/A, 12178-49-3	0.9
Cuprite (CU_2O)	1317-39-1	1.5
Galena (PbS)	1314-87-0	6.1
Sphalerite (ZnS)	1314-98-3	12.5
Pyrite (Fe,S_2)	1309-36-0	216
Pyrrhotite (Fe_7S_8)	12305-96-3	190
Arsenopyrite (FeAsS)	1303-18-0	7.3
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	96
Quartz	14808-60-7	1,373
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	N/A	13,664
K-Feldspars ($KAlSi_3O_8$)	N/A	878
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	N/A	3,238
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	1,138
Chlorite $(Fe,(Mg, Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	295
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	1,274
Epidote (Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)	N/A	506
Augite ((Ca,Na)(Mg,Fe,Al,Ti)$(Si,Al)_2O_6$)	N/A	6.7
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	74
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	18.0
Calcite ($CaCO_3$)	1317-65-3	274

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, N/A	6.3
Titanite ($CaTiSiO_5$)	N/A	82.7
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	81
Mica	12001-26-2	3,221
Tremolite ($Ca_2(Mg5.0\text{-}4.5Fe^{2+}0.0\text{-}0.5)Si_8O_{22}(OH)_2$)	77536-68-6	1,591
Bytownite $(Ca,Na)(Si,Al)_4O_8$	N/A	1,299
Labradorite $(Na,Ca)_{1-2}Si_{3-2}\ O_8$	N/A	1,008
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3,516
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	N/A	7,670
Albite ($NaAlSi_3O_8$)	N/A	2,860
Phlogopite ($KMg_3AlSi_3O_{10}(F,OH)_2$)	N/A	418
Sillimanite (Al_2SiO_5)	12141-45-6	132
Carbon Monoxide (CO)	630-08-0	298
Sulphur Dioxide (SO_2)	7446-09-5	57
Hydrocarbons	N/A	38
Nitrogen Oxides (NOx)	10102-44-0	1,926
1,3-butadiene	106-99-0	4.64E-02
Acenaphthene	83-32-9	1.58E-02
Acenaphthylene	208-96-8	3.19E-02
Acetaldehyde	75-07-0	2.6
Acrolein	107-02-8	0.5
Anthracene	120-12-7	2.85E-03
Benzene	71-43-2	1.4
Benzo(a)anthracene	56-55-3	4.08E-04
Benzo(a)pyrene	50-32-8	1.44E-04
Benzo(b+k)fluoranthene	205-99-2	4.59E-04
Benzo(g,h,i)perylene	191-24-2	3.40E-04
Chrysene	218-01-9	6.15E-04
Fluoranthene	206-44-0	5.05E-03
Fluorene	86-73-7	2.29E-02
Formaldehyde	50-00-0	2.2
Phenanthrene	85-01-8	4.16E-02
Pyrene	129-00-0	4.75E-03
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	N/A	20
Elemental Carbon (from diesel exhaust)	7440-44-0	13
Total PAHs (as equivalent B(a)P)	N/A	3.91E-04
Magnafloc 10	N/A	1.1

CoPC	CAS No.	Maximum Daily Emission Rate (kg/day)
Potassium Amyl Xanthate (PAX)	2720-73-2	0.8
Sodium sulphite	7757-83-7	5.7
Zinc sulphate	7733-02-0	0.3
Sodium trithiocarbonate	534-18-9	0.3

4.2.5 Closure Emissions

Following the completion of ore processing, all Project operations will cease, and active closure will commence. Active closure includes the removal of buildings, structures, and other infrastructure, as well as reclamation and site stabilization activities. Active closure emissions are expected to be less than construction emissions (as no ore extraction or TSF construction would be occurring) and, therefore, the assessment of the construction scenario will implicitly address active closure phase emissions as well.

4.2.6 Existing and Future Development

This section provides an assessment of the potential for Project interactions with the existing and future development in an area extending approximately 40 km around the Project (RSA).

4.2.6.1 Existing Sources

Existing sources of air contaminants within the RSA with air CoPCs in common with the Project would include:

- Forestry activities
- Mining exploration activities
- Transportation along Route Du Nord

The above-mentioned activities would be expected to only affect air quality in close proximity to these activities and, therefore, have minimal impact on air quality near the Project. Air quality concentrations due to these sources were conservatively accounted for in this assessment through the use of background concentration levels in the cumulative effects assessment that will account for the influence of these sources.

4.2.6.2 Future Development

The Moblan Lithium Project is a proposed open pit lithium mine located approximately 40 km southwest of the Project near the edge of the RSA. Due to its distance, is expected to have minimal potential for contaminant emissions from this source to significantly affect air quality in the LSA. No other significant future development is known for the RSA.

The reasonably foreseeable future developments are, therefore, not expected to have the potential for significant cumulative effects with the Project.

4.2.7 Design and Mitigation Measures

4.2.7.1 Construction Emission Control

Proposed mitigation measures for potential air emission concerns during the construction phase will include:

- Wet drilling in the pits
- Optimized blasting practices (e.g. type, timing sequence and blast patterns)
- Troilus will implement the following unpaved road mitigation methodologies:
    - Usage of dust suppressants during non-precipitation days in the summertime. Watering application rates and intervals will be adjusted to achieve the required mitigation efficiency, and additional operational measures that can control water evaporation rates will be implemented if needed
    - Limit speeds on onsite roads to 50 km
- Maintenance of vehicles to increase fuel efficiency
- Troilus will acquire mobile equipment that meet applicable Transport Canada off-road vehicle emission requirements (Tier 4 emissions standards), where feasible
- Troilus will implement effective and timely vehicle maintenance to maintain equipment in good working condition
- Implement an idling policy on site for mobile equipment and vehicles

4.2.7.2 Operations Emission Control

Troilus will implement the following design mitigation measures for operations:

- Wet drilling in the pits
- Optimized blasting practices (e.g. type, timing sequence and blast patterns)
- The following equipment will be enclosed and equipped with dust collectors that filter the internal air and exhaust it to the environment.
    - Primary crusher
    - Secondary crusher
    - Secondary screener
    - HPGP
    - Solid reagent handling
    - Smelter
- Maintain a high moisture content in the TSF surface material by controlling spigot discharge points
- Crushed ore Stockpile will be enclosed

- Troilus will optimize the road network design and the mining schedule to reduce haulage distances
- Troilus will implement the following unpaved road mitigation methodologies:
    - Usage of dust suppressants during non-precipitation days in the summertime. Watering application rates and intervals will be adjusted to achieve the required mitigation efficiency, and additional operational measures that can control water evaporation rates will be implemented if needed
    - Limit speeds on onsite roads to 50 km/h
- Troilus will acquire mobile equipment that meet applicable Transport Canada off-road vehicle emission requirements (Tier 4 emissions standards), where feasible
- Troilus will implement effective and timely vehicle maintenance to maintain equipment in good working condition
- Troilus will implement a Traffic Management Plan for the Project
- Implement an idling policy on site for mobile equipment and vehicles

4.2.7.3 Closure Emission Control

Mitigation measures for potential air emission concerns during the closure phase will be similar to those for the construction phase.

4.3 Dispersion Modelling – Approach and Methods

This section presents an overview of the dispersion modelling methodologies used in this study.

4.3.1 Modelling Assessment Approach

In this study, several dispersion modelling scenarios were assessed to represent different construction and operational aspects of the Project. A summary of the dispersion modelling scenarios assessed in this study is presented in Table 4-4. For modelling purposes, the worst-case emissions for construction were selected to be Year -1 and for operations in Year 6 as these represent the years with maximum mine activity or throughputs that correspond to maximum emission rates.

Table 4-4 Summary of Dispersion Modelling Scenarios Assessed

Scenario	Air CoPCs	Sources Modelled	Receptors
Construction	All [1]	Construction Sources, Access Road Beyond PA	Special Receptors
Construction	Selected CoPCs [2]	Construction Sources	Gridded Receptors[3]
Construction	All [1]	Construction Sources	Modelled Mine Boundary
Operation	All [1]	Operation Sources, Access Road Beyond PA	Special Receptors
Operation	Selected CoPCs [2]	Operation Sources	Gridded Receptors[3]

Scenario	Air CoPCs	Sources Modelled	Receptors
Operation	All [1]	Operation Sources	Modelled Mine Boundary

Notes:

1. CoPCs from the Project include PM, PM_{10}, $PM_{2.5}$; other CACs including NO_2, SO_2, CO; and hazardous air pollutants including PAHs, VOCs and metals.
2. CoPCs requiring additional modelling analysis to determine magnitude, extent, frequency, severity and sensitivity.
3. Details on gridded receptors provided in Section 4.3.4.

4.3.2 Modelling Domain

The assessment area for air quality dispersion modelling was composed of a 29 km by 30 km domain, which is consistent with the LSA shown in APPENDIX A, Figure A.2 of this report.

4.3.3 Air Dispersion Modelling Methodology

The MELCCFP requires concentrations to be calculated with an approved dispersion model used in accordance with the publication Modelling Guide of Atmospheric Dispersion (Modelling Guide) (MELCCFP, 2005).

4.3.3.1 Dispersion Model Used

The methodology applied to predict the air quality effect of the releases of air CoPCs to the atmosphere is based on the Quebec Modelling Guide and is presented herein. The results of the emission inventory were used to prepare a dispersion modelling assessment of the Project for comparison against the applicable ambient air quality standards. The US EPA dispersion model, AERMOD (Version 24142) (US EPA, 2024), was used to predict the maximum 1-hour, 24-hour, and annual average ground level concentrations (GLCs). AERMOD is an approved model by the MELCCFP for assessing contaminants against the Quebec Air Quality Standards and Criteria. Maximum ground level concentration estimates from Project emissions were determined over an approximate 29 km by 30 km domain with varying receptor grid points to capture the maximum concentrations.

AERMOD is a steady-state plume model that is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including, point, area and volume sources). In the Stable Boundary Layer, the concentration distribution is assumed to be Gaussian in both the vertical and horizontal. Vertical profiles of wind speed wind direction, turbulence temperature, and temperature gradient are estimated using available meteorological observations. AERMOD accounts for the vertical inhomogeneity of the Planetary Boundary Layer (PBL). This is accomplished by "averaging" the parameters of the actual Stable Boundary Layer into "effective" parameters of an equivalent homogeneous PBL. With these effective parameters, AERMOD accounts for the inhomogeneity of the PBL, in an averaged sense.

Parameters that directly influence the dispersion of pollutants include wind speed and direction, atmospheric stability and mixing layer depths. Meteorological conditions that may lead to high GLCs from elevated point sources are typically either convective atmospheric stability with light winds or neutral conditions with high wind speeds. Both of these conditions lead to the plume rapidly being carried to

ground level close to the source. High concentrations from low elevated sources, elevated sources with building or topography effects, or virtual sources are typically due to stable conditions with light winds.

4.3.3.2 Meteorological Data Sources

The local meteorology of the region must be characterized to evaluate the short-term atmospheric dispersion and transport of emissions released by the Project. The data required for predicting dispersion and transport includes wind speed and direction, temperature, atmospheric stability, and mixing layer depth. Wind and temperature data are readily available from meteorological stations, but atmospheric stability and mixing layer depth are calculated from additional raw meteorological data including cloud cover and opaque sky cover.

A five-year (2019 – 2023) site-specific meteorological dataset was used in the modelling assessment. Upper air data from ECCC's Maniwaki station and surface data from ECCC's Chapais station were processed using AERMET version 24142. The meteorological data were processed to reflect the land uses surrounding the proposed site.

4.3.3.3 Wind Speed and Direction

The frequency distribution of wind speeds (from AERMET) at the Project is shown on Figure 4.2. A wind rose plot is presented on Figure 4.3. The predominant winds blow from southerly, northwesterly, and southwesterly directions.

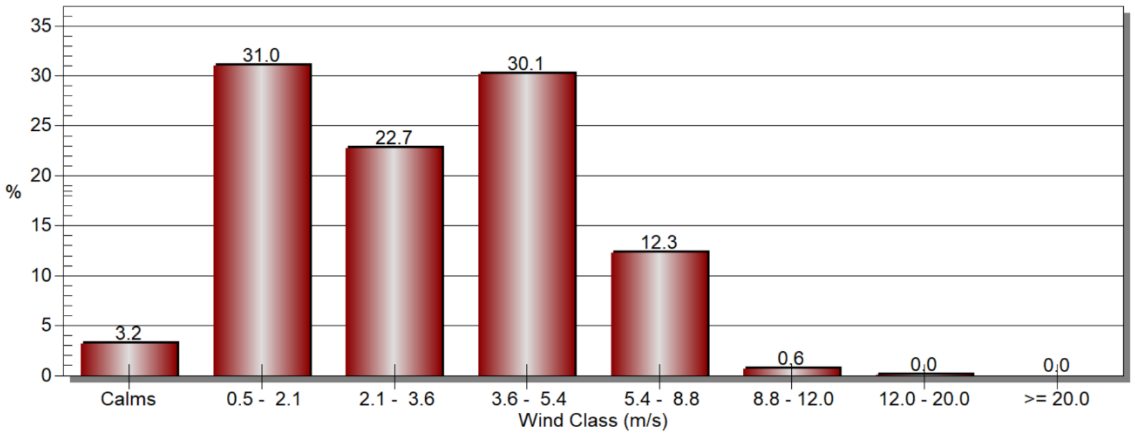

Figure 4.2 Wind Class Frequency Distribution for the Site-Specific Meteorological Data Set

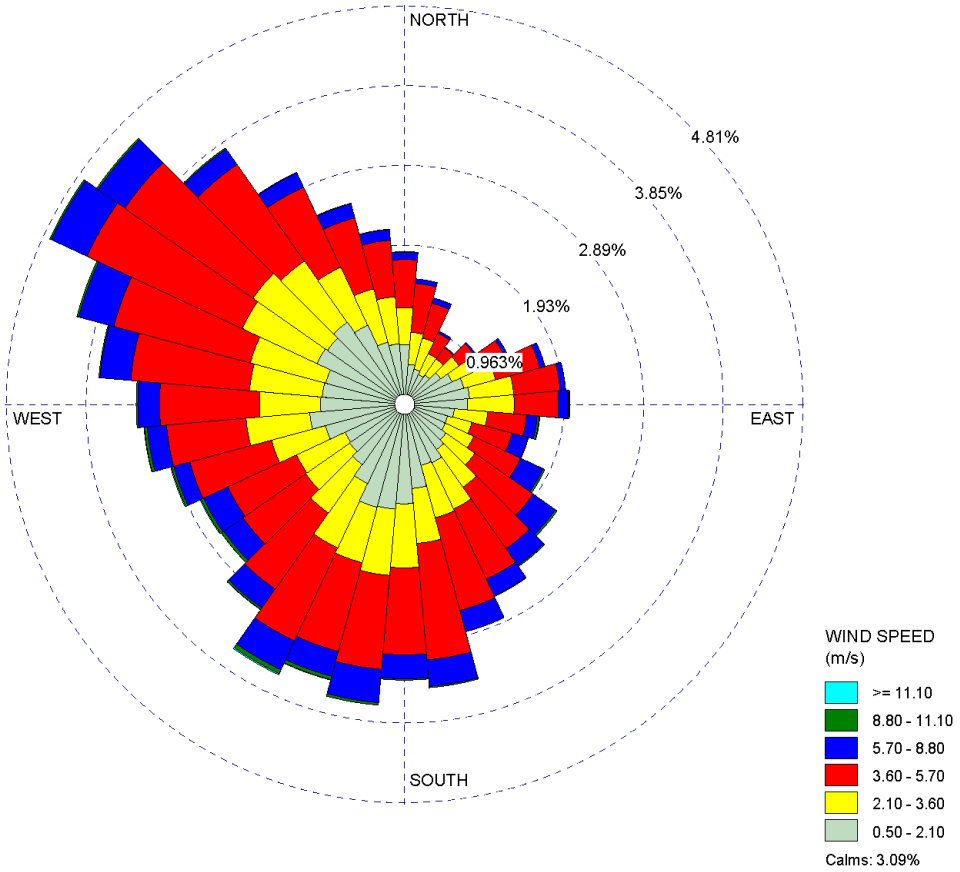

Figure 4.3 Wind Rose Plot for the Site-Specific Meteorological Data Set

4.3.3.4 Building Downwash

Wind dependent building/obstacle dimensions are an input to AERMOD for use in the building wake and building downwash calculations for point source emissions. Emissions sources that would be affected by building downwash were included in the AERMOD modelling, such as dust collector stacks.

4.3.3.5 Topographic Data

Canadian Digital Elevation Data (CDED) data for the LSA was evaluated using AERMOD's terrain processor (AERMAP) for use in the dispersion modelling.

4.3.3.6 Averaging Periods

The AERMOD model is capable of predicting concentrations for a variety of averaging times of 1-hour and greater than 1-hour. For this Project, the model was run for 1-hour, 24-hour, and annual averaging times to give results that can be directly compared to provincial and federal criteria.

Model predictions for averaging periods not mentioned above were converted to the required period following MELCCFP guidance provided in the Modelling Guide (MELCCFP, 2005).

4.3.4 Receptor Grid

An approximately 29 km by 30 km computational domain of gridded receptors was used in the modelling assessment, as well as receptors along the Modelled Mine Boundary. Receptors were placed around bounding boxes that encompassed the emission sources, with spacings following guidance in the Modelling Guide (MELCCFP, 2005).

A total of 4,787 receptors (3,316 gridded receptors, 1,446 Modelled Mine Boundary receptors and 25 special/discrete receptors) were utilized in the assessment.

The extended receptor grid around the Modelled Mine Boundary is shown in APPENDIX A of this assessment. The locations of the special receptors are shown in APPENDIX A Figure A.4 of this report.

4.3.5 Emission Source Data

The Project emissions sources were modelled generally following the protocols and procedures outlined in the Modelling Guide (MELCCFP, 2005). The emission estimation methodologies are described in detail in APPENDIX C of this assessment.

4.3.5.1 Construction Scenario

Detailed descriptions of the emissions sources for the Project construction are provided in APPENDIX C. A summary of the emission source parameters used in the AERMOD dispersion modelling is also provided in APPENDIX C. The locations of the emission sources are shown in APPENDIX A, Figure A.7 of this report.

4.3.5.1.1 Area Sources

The following emission sources were modelled as area sources to reflect the geometry and area of the sources they represent (storage area wind erosion).

- P_OB87: overburden storage area OB87 wind erosion (W1)
- P_WD87_1: waste rock storage area WD87 wind erosion (W2)
- P_CO: coarse ore storage area wind erosion (W3)

4.3.5.1.2 Volume Sources

The following emission sources were modelled as volume sources to reflect the geometry and area of the sources they represent (unloading particulate emissions, material movement, grading and mobile emissions).

- M1: unloading/loading ore at coarse ore storage area
- M2: unloading overburden at storage area OB87

- M3: unloading waste rock at TSF
- M4: unloading waste rock at storage area WD87
- M5: storage area WD87 material movement
- M6: storage area OB87 material movement
- M7: TSF construction
- CM1: coarse ore storage area - mobile equipment
- CM2: storage area OB87 - mobile equipment
- CM3: TSF - mobile equipment
- CM4: storage area WD87 - mobile equipment
- CPLANT: processing plant - mobile equipment and generator
- S4: mobile concrete batch plan

Emissions from unpaved haul routes were modelled as series of volume (line volume) sources with parameters determined based on the recommended approach by the US EPA Haul Road Workgroup Final Report (US EPA, 2012). The following sources were modelled as line volume sources:

- R1: main access road from processing plant to PA boundary
- R1B: main access road from PA boundary extending toward Route du Nord
- HR2: haul road from Pit 87 to processing plant
- HR3: haul road from Pit 87 to overburden storage area OB87
- HR4: haul road from Pit 87 to TSF
- HR5: haul road from Pit 87 to waste rock storage area WD87

4.3.5.1.3 Point Sources

Point sources representing stacks or vents were not used for this scenario as there are none present for construction.

4.3.5.1.4 Open Pit Sources

The dispersion of emissions sources in the Open Pit were modelled using the Pit Source algorithm in AERMOD. This methodology accounts for the portion of particulate matter emissions that would be retained in the Open Pit due to the generally lower wind speeds found in Open Pit relative to the surface above. For use of this algorithm, the dimensions of the Open Pit (width, length) and volume are required. An equivalent, effective volume was calculated based on the average pit volume over Year -1. The following sources were modelled as pit sources:

- P1: Pit 87 drilling (P1A), material movement (P1C), loading (P1D), and mobile crushing (S1-S3)
- P1_BLAST: Pit 87 blasting (P1B)

- CP1: Pit 87 mining - mobile equipment and generator

4.3.5.2 Operations Scenario

Detailed descriptions of the emissions sources for Project operations are provided in APPENDIX C. A summary of the emission source parameters used in the AERMOD dispersion modelling is also provided in APPENDIX C. The locations of the emission sources are shown on APPENDIX A, Figure A.8 of this report.

4.3.5.2.1 Area Sources

The following emission sources were modelled as area sources to reflect the geometry and area of the sources they represent (storage area and TSF wind erosion).

- P_OBNW: overburden storage area OBNW wind erosion (W1)
- P_OBW: overburden storage area OB West wind erosion (W2)
- P_WDSW: waste rock storage area WDSW wind erosion (W3)
- P_OBSW: overburden storage area OBSW wind erosion (W4)
- P_WD87_1: waste rock storage area WD87 wind erosion (W5)
- P_CO: coarse ore storage area wind erosion (W6)
- P_TSFW: TSF Wind Erosion (W9)

4.3.5.2.2 Volume Sources

The following emission sources were modelled as volume sources to reflect the geometry and area of the sources they represent (unloading particulate emissions, material movement, grading and mobile emissions).

- S1: primary crusher building
- S3: secondary crusher building
- S6: crushed ore stockpile
- S7: crushed ore stockpile reclaim tunnel
- S8: HPGR building
- S10A: mill building reagents
- S10B: mill building concentrate loadout
- S10C: mill building smelting
- M1: unloading/loading ore at coarse ore storage area
- M2: unloading overburden at storage area OBNW
- M3: unloading overburden at storage area OBW

- M4: unloading overburden at storage area OBSW
- M5: unloading waste rock at storage area WDSW
- M6: unloading waste rock at TSF
- M7: unloading waste rock at storage area WD87
- M8: storage area WD87 material movement
- M9: storage area WDSW material movement
- M10: TSF construction
- CM1: coarse ore storage area - mobile equipment
- CM2: storage area OBNW - mobile equipment
- CM3: storage area OBW - mobile equipment
- CM4: storage area OBSW - mobile equipment
- CM5: storage area WDSW - mobile equipment
- CM6: TSF - mobile equipment
- CM7: storage area WD87 - mobile equipment
- CPLANT: processing plant - mobile equipment

Emissions from paved and unpaved haul routes were modelled as a series of volume (line volume) sources with parameters determined based on the recommended approach by the US EPA Haul Road Workgroup Final Report (US EPA, 2012). The following sources were modelled as line volume sources:

- R1: main access road from processing plant to PA boundary
- R1B: main access road from PA boundary extending toward Route du Nord
- HR2: haul road from Pit 87 to processing plant
- HR3: haul road from Pit J to processing plant
- HR4: haul road from Pit SW to processing plant
- HR5: haul road from Pit J to overburden storage area OBNW
- HR6: haul road from Pit J to overburden storage area OB West
- HR7: haul road from Pit SW to overburden storage area OBSW
- HR8: haul road from Pit SW to waste rock storage area WDSW
- HR9: haul road from Pit 87 to TSF
- HR10: haul road from Pit 87 to WD87
- HR11: haul road from Pit SW to TSF

4.3.5.2.3 Point Sources

The following were modelled as point sources because they emit through a stack or vent:

- S2: primary crusher baghouse
- S4: secondary crusher baghouse
- S5: secondary crusher screen baghouse
- S9: HPGR baghouse
- S10D: mill building smelting baghouse

4.3.5.2.4 Open Pit Sources

The dispersion of emissions sources in the Open Pit were modelled using the Pit Source algorithm in AERMOD. This methodology accounts for the portion of particulate matter emissions that would be retained in the Open Pit due to the generally lower wind speeds found in Open Pit relative to the surface above. For use of this algorithm, the dimensions of the Open Pit (width, length) and volume are required. An equivalent, effective volume was calculated based on the average pit volume over Year 6. The following sources were modelled as pit sources:

- P1: Pit 87 drilling (P1A), material movement (P1C), and loading (P1D)
- P1_BLAST: Pit 87 blasting (P1B)
- CP1: Pit 87 mining - mobile equipment
- P2: Pit J drilling (P2A), material movement (P2C), and loading (P2D)
- P2_BLAST: Pit J blasting (P2B)
- CP2: Pit J mining - mobile equipment
- P3: Pit SW drilling (P3A), material movement (P3C), loading (P3D), and mobile crushing (S11-S13)
- P3_BLAST: Pit SW blasting (P3B)
- CP3: Pit SW mining - mobile equipment and generator

4.3.5.3 Particulate Deposition Data

Particulate deposition rates were predicted at special receptor locations for use in other technical data reports and for comparison to applicable criteria. The AERMOD dispersion model requires additional input data to predict deposition.

Particle size distribution data were defined for six types of sources: unpaved roads, storage area handling, wind erosion, material movement, blasting and crushing.

Utilizing the particle sizes defined by the values of the constant “k” in the US EPA emission factor algorithm for each source type, a cumulative mass distribution for each source type was determined and a second order polynomial best fit curve was applied to allow derivation of 7 particle size categories for

each source type. The representative mean aerodynamic diameter for each particle size category was calculated based on the US EPA HHRAP (US EPA, 2005). A summary of the particle size distributions used in the assessment is provided in Table 4-5.

Table 4-5 Summary of Particle Size Distributions used in the Assessment

Aerodynamic Diameter (um)			Mass Fraction					
Lower	Upper	Mean	Unpaved Roads	Handling Emissions	Wind Erosion	Material Movement	Blasting	Crushing
0.0	2.5	1.6	0.069	0.100	0.090	0.105	0.135	0.007
2.5	5.0	3.9	0.072	0.134	0.129	0.018	0.125	0.015
5.0	10.0	7.8	0.151	0.237	0.231	0.074	0.222	0.027
10.0	15.0	12.7	0.162	0.195	0.193	0.125	0.185	0.126
15.0	20.0	17.6	0.172	0.153	0.156	0.175	0.148	0.200
20.0	25.0	22.6	0.182	0.111	0.119	0.226	0.111	0.275
25.0	30.0	27.6	0.192	0.070	0.081	0.277	0.074	0.349
	Total		1.001	0.997	1.000	1.000	0.999	1.000

Particle densities of 1 g/cm^3 were used for all sources as the particle size distributions are aerodynamic diameters that assume, by definition, a unit density.

4.3.5.4 Conversion of Nitric Oxide to Nitrogen Dioxide

Nitrogen oxides or NOx is composed of nitric oxide (NO) and nitrogen dioxide (NO_2). However, only NO_2 has an ambient air quality criteria. In combustion emissions, typically most of the NOx emissions are NO and only a small percentage are NO_2. Once in the ambient air, NO is oxidized by ground level O_3 to produce NO_2 as follows:

$$NO + O_3 \rightarrow NO_2 + O_2$$

The following lists different conversion treatments recommended by the US EPA:

- Tier 1 - 100% of emitted NO_X converts to NO_2
- Tier 2 - Ambient Ratio Method (ARM2)
- Tier 3 - Ozone Limiting Method (OLM) or Plume Volume Molar Ratio Method (PVMRM)

In this assessment, the Ozone Limiting Method (OLM) was used to predict ambient NO_2 concentrations following the MELCCFP Modelling Guideline. The OLM method accounts for the oxidation of NO to NO_2 due to photochemical reactions in the atmosphere in the presence of ozone. According to the OLM method, the conversion of NO to NO_2 is limited by the ambient concentration of ozone (O_3) in the atmosphere. It is assumed that 10% (by volume) of the NO_X emission release from the source is in the form of NO_2 and the remaining 90% is converted to NO_2 as follows:

- If 90% of NO_X concentration is less than the ambient O_3 concentration, then

  $[NO_2] = [NO_X]$ (complete conversion)

- If 90% of NO_X concentration is greater than the ambient O_3 concentration, then

  $[NO_2] = 10\% [NO_X] + [O_3]$ (limited conversion).

In the application of the OLM, the above relationships assume that all concentrations are expressed in parts per million (ppm). The background ozone data presented in Table 3.6 was used in this assessment.

The NO_2/NOx ratios in this study were constrained to a maximum of 0.90 and a minimum value of 0.50 to maintain an appropriate level of conservatism in the results (based on current US EPA recommendations for maximum and minimum equilibrium ratios).

4.3.6 Model Options and Approaches

The following section provides additional detail on model inputs and modelling approaches used in the assessment.

4.3.6.1 Source and Receptor Base Elevations

Base elevations for all sources including special, gridded and Modelled Mine Boundary receptors were assigned using Natural Resource Canada Canadian Digital Elevation Data (CDED) data.

4.3.6.2 On-Site Haul Road Volume Source Setup

The on-site haul routes were modelled with a road width of 35 m in the assessment. The vehicle width and heights that were used for calculating plume dimensions were based on weighted average of the vehicle type anticipated to be used for the Project. Based on this data, the release height, plume height and width were calculated as per the US EPA Memorandum “Haul Road Workgroup Final Report Submissions”, March 2, 2012 (US EPA, 2012).

4.3.6.3 Modelling Particulate and Metals Concentrations

Modelling of ambient concentrations of particulates and metals in particulate was initially completed without accounting for deposition and depletion of particulate from the plume.

For selected CoPCs, refined modelling using the plume deposition and depletion algorithms in the AERMOD model was conducted to predict ambient concentrations accounting for a portion of the CoPCs being deposited on the ground between each source and receptor. This method is expected to provide a

refinement to the conservative dispersion assumptions in the initial method. The effects of particulate deposition and depletion on ambient air quality predictions was conducted for the following CoPCs:

- Particulate Matter (PM)
- Carbon
- Phosphorus
- Mica
- Quartz in PM_{10}
- Actinolite
- Muscovite
- Tremolite

4.3.6.4 Open Pit Source Algorithm

The open pit source algorithm used in AERMOD requires additional inputs including the dimensions and depth of the open pit. The parameters used in modelling are presented in Table 4-6.

Table 4-6 Open Pit Model Parameters

Parameter	Construction	Operations		
Pit ID	P1 – Pit 87	P1 – Pit 87	P2 – Pit J	P3 – Pit SW
Depth (m)	175	323	50	135
Width (m)	800	800	270	500
Length (m)	1400	1400	750	1050

4.3.6.5 Particulate Deposition Calculations

Particulate depositions (i.e., dustfall) at special and discrete receptor locations were predicted with AERMOD using the particle size distributions and densities provided in Section 4.3.5.3.

4.3.6.6 Modelling Approach

A staged modelling approach was used in the assessment due to the large number of CoPCs, emission sources and receptors to be assessed, that resulted in prohibitively long model run times

Dispersion modelling was conducted for all CoPCs and discrete/special and Modelled Mine Boundary receptors using the Multi-Chemical Utility tool in Lakes AERMOD View. The Multi-Chemical run does not provide results by source group other than Group All and does not allow for special pollutant processing options such as ARM2. The outputs from a Multi-Chemical run provides the maximum concentration at each receptor location. The emissions sources in mines are modelled as either at or slightly above ground level (e.g. on piles). For ground level (or near ground level) emissions sources, the maximum predicted concentration occurs close to the source and decreases with increasing distance from the source. Therefore, the maximum ground level concentration of each CoPC will occur at the Modelled

Mine Boundary (no special receptors inside the Modelled Mine Boundary). The results of the Multi-Chemical modelling were used to identify CoPCs that exceeded their relevant criteria at special receptors which were then assessed in individual model runs using the full receptor grid. Additionally, full grid runs were conducted for NO_2 using the OLM algorithm.

Gridded model runs were completed for PM, $PM_{2.5}$, NO_2, SO_2, elemental carbon, quartz, benzene, diesel particulate matter, B(a)P, 1,3-butadiene, and arsenic. The model outputs from the individual CoPC runs were utilized to analyze concentrations by source groups and develop concentration contour plots for selected CoPCs.

4.3.7 Prediction Confidence

The effects of Project releases of air CoPC's are based on calculated emission rates and the AERMOD dispersion modelling results. Prediction confidence is high because emission rates used in the modelling were estimated based on a combination of emission factors, engineering estimates and maximum emission levels. Actual emissions vary from hour to hour and day to day. Emissions from the Project employed a conservative, worst-case hourly emission approach which is expected to over-estimate longer-term averaging periods. Because of the approach, there is a high degree of confidence that emissions are over-estimated. Air quality dispersion models such as AERMOD also employ assumptions to simplify the random behaviour of the atmosphere into short periods of average behaviour. These assumptions limit the capacity of the model to replicate every meteorological event. To compensate for these simplifications, five years of meteorological data are applied to evaluate a wide range of possible conditions. Regulatory models, such as AERMOD, as also designed to have a bias toward over estimation of contaminant concentrations.

As noted, the majority of the CoPCs were assessed not accounting for particulate deposition and depletion from the plume, which is conservative.

5 Results and Discussion

This section presents the results of the dispersion modelling analyses. The results are presented for the Project Alone as well as the Project in conjunction with the background concentrations. Addition of background concentrations to the predicted values was done to assess the potential for cumulative effects.

5.1 Assessment of Project Construction on Air Quality

5.1.1 Construction – Mine Boundary Modelling Results

Table 5-1 presents the maximum predicted GLCs at the Modelled Mine Boundary due to the Project construction emissions. The location of each maximum predicted concentration for each averaging period is tabulated in APPENDIX E of this assessment. The values presented in this table are the maximum predicted values over all the Modelled Mine Boundary receptors.

Estimated background concentrations, as discussed in Section 3.4, were added to the maximum model-predicted values and compared to applicable regulatory limits to assess potential cumulative changes in air quality. Where no data are available to characterize background levels, the background concentration is noted as (-) and was considered to be zero in the assessment.

The maximum predicted cumulative GLCs at the Modelled Mine Boundary are above the applicable air quality criteria and screening levels for 6 of 126 CoPCs assessed for the construction phase. In accordance with the Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017), Troilus is applying the mitigation measures listed in Section 4.2.7.1 to reduce Project construction air emissions.

Table 5-1 Summary of Maximum Predicted CoPC Concentrations at Modelled Mine Boundary - Construction

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) (3)			
		Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration
Particulates													
PM	<<PM>>	-	-	1927.5	1927.5	120	40	245.5	285.5	-	11.6	8.9	20.5
PM_{10}	<<PM10>>	-	-	703.1	703.1	50	13.1	74.0	87.1	-	8.3	2.6	10.9
$PM_{2.5}$	<<PM2.5>>	-	-	91.6	91.6	30	15	9.8	24.8	-	6.2	0.5	6.7
Metals and Metallic Compounds													
Silver (Ag)	7440-22-4	-	-	1.92E-03	1.92E-03	-	2.60E-04	1.70E-04	4.30E-04	0.23	5.00E-03	5.96E-06	5.01E-03
Aluminum (Al)	7429-90-5	-	-	147.38	147.38	-	0.42	18.68	19.10	-	0.146	0.68	0.82
Arsenic (As)	7440-38-2	-	-	2.42E-02	2.42E-02	-	1.26E-03	2.16E-03	3.42E-03	3.00E-03	2.00E-03	7.57E-05	2.08E-03
Gold (Au)	7440-57-5	-	-	4.22E-04	4.22E-04	1.25	-	2.71E-05	2.71E-05	-	-	9.16E-07	9.16E-07
Boron (B)	7440-42-8	-	-	0.20	0.20	-	2.60E-02	2.51E-02	5.11E-02	-	2.60E-02	9.05E-04	2.69E-02
Barium (Ba)	7440-39-3	-	-	0.72	0.72	-	8.60E-03	9.14E-02	0.10	5.00E-02	2.00E-02	3.31E-03	2.33E-02
Beryllium (Be)	7440-41-7	-	-	2.28E-03	2.28E-03	-	-	2.89E-04	2.89E-04	4.00E-04	0	1.05E-05	1.05E-05
Bismuth (Bi)	7440-69-9	-	-	4.14E-03	4.14E-03	-	1.30E-03	5.20E-04	1.82E-03	-	1.30E-03	1.87E-05	1.32E-03
Carbon (C)	7440-44-0	1	0	1.8	1.8	-	-	0.23	0.23	0.3	0	8.20E-03	8.20E-03
Calcium (Ca)	7440-70-2	-	-	61.61	61.61	-	0.68	7.81	8.49	-	0.3	0.28	0.58
Cadmium (Cd)	7440-43-9	-	-	5.01E-03	5.01E-03	-	2.60E-04	3.53E-04	6.13E-04	3.60E-03	5.00E-04	1.21E-05	5.12E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	0.14	0.14	-	-	1.72E-02	1.72E-02	0.7	0	6.24E-04	6.24E-04
Cobalt (Co)	7440-48-4	-	-	3.46E-02	3.46E-02	-	-	4.39E-03	4.39E-03	0.1	0	1.59E-04	1.59E-04
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	0.17	0.17	-	6.00E-03	2.20E-02	2.80E-02	0.1	1.00E-02	7.96E-04	1.08E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	5.77E-03	5.77E-03	-	-	7.31E-04	7.31E-04	0.4	0	2.66E-05	2.66E-05
Copper (Cu)	7440-50-8	-	-	0.50	0.50	2.5	0.2	3.82E-02	0.24	-	3.20E-03	1.32E-03	4.52E-03
Iron (Fe)	7439-89-6	-	-	66.88	66.88	-	0.22	8.46	8.68	-	0.15	0.31	0.46
Gallium (Ga)	7440-55-3	-	-	3.84E-02	3.84E-02	-	-	4.87E-03	4.87E-03	-	-	1.77E-04	1.77E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	7.96E-03	7.96E-03	-	-	1.01E-03	1.01E-03	0.9	0	3.66E-05	3.66E-05
Mercury (Hg)	7439-97-6	-	-	4.81E-05	4.81E-05	-	6.40E-05	6.09E-06	7.01E-05	5.00E-03	2.00E-03	2.21E-07	2.00E-03
Indium (In)	7440-74-6	-	-	9.61E-06	9.61E-06	-	-	1.22E-06	1.22E-06	-	-	4.42E-08	4.42E-08
Potassium (K)	7440-09-7	-	-	28.78	28.78	-	0.126	3.64	3.76	-	0.13	0.13	0.26
Lanthanum (La)	7439-91-0	-	-	3.12E-02	3.12E-02	-	-	3.93E-03	3.93E-03	-	-	1.42E-04	1.42E-04
Lithium (Li)	7439-93-2	2	0	4.92E-02	4.92E-02	-	-	6.24E-03	6.24E-03	-	-	2.26E-04	2.26E-04
Lutetium (Lu)	7439-94-3	-	-	4.50E-04	4.50E-04	-	-	5.70E-05	5.70E-05	-	-	2.07E-06	2.07E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	26.7	32.7	-	0.19	3.39	3.58	-	9.60E-02	0.12	0.22
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	0.33	0.33	-	8.60E-03	3.29E-02	4.15E-02	8.00E-02	5.00E-03	1.16E-03	6.16E-03
Molybdenum (Mo)	7439-98-7	-	-	1.24E-02	1.24E-02	120	7.60E-04	1.57E-03	2.33E-03	-	7.80E-04	5.72E-05	8.37E-04
Sodium (Na)	7440-23-5	-	-	57.05	57.05	-	0.52	7.23	7.75	-	0.32	0.26	0.58

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) [3]			
		Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration
Niobium (Nb)	7440--03-1	-	-	1.12E-02	1.12E-02	-	-	1.42E-03	1.42E-03	-	-	5.16E-05	5.16E-05
Nickel (Ni)	7440-02-0	-	-	3.53E-02	3.53E-02	7.00E-02	5.00E-03	3.69E-03	8.69E-03	2.00E-02	2.00E-03	1.30E-04	2.13E-03
Phosphorus (P)	7723-14-0	-	-	1.20	1.20	0.5	-	0.15	0.15	-	-	5.52E-03	5.52E-03
Lead (Pb)	7439-92-1	-	-	3.89E-02	3.89E-02	-	3.40E-03	4.92E-03	8.32E-03	0.1	4.00E-03	1.78E-04	4.18E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	0.14	0.14	4	0	1.83E-02	1.83E-02	-	-	6.64E-04	6.64E-04
Sulphur (S)	7704-34-9	-	-	4.50	4.50	-	-	0.48	0.48	-	-	1.72E-02	1.72E-02
Antimony (Sb)	7440-36-0	-	-	1.03E-02	1.03E-02	-	1.26E-03	1.26E-03	2.52E-03	0.17	7.00E-03	4.51E-05	7.05E-03
Scandium (Sc)	7440-20-2	-	-	2.13E-02	2.13E-02	-	-	2.70E-03	2.70E-03	-	-	9.78E-05	9.78E-05
Selenium (Se)	7782-49-2	2	0.15	6.73E-04	0.15	-	2.60E-03	8.50E-05	2.69E-03	-	2.60E-03	3.09E-06	2.60E-03
Tin (Sn)	7440-31-5	-	-	1.65E-02	1.65E-02	-	-	2.09E-03	2.09E-03	0.1	0	7.57E-05	7.57E-05
Strontium (Sr)	7440-24-6	-	-	0.64	0.64	-	1.50E-03	8.12E-02	8.27E-02	-	1.48E-03	2.94E-03	4.42E-03
Tantalum (Ta)	7440-25-7	-	-	1.93E-03	1.93E-03	25	-	2.45E-04	2.45E-04	-	-	8.90E-06	8.90E-06
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.02E-03	1.02E-03	-	-	1.30E-04	1.30E-04	-	-	4.70E-06	4.70E-06
Tellurium (Te)	13494-80-9	1	0	3.36E-04	3.36E-04	-	-	4.26E-05	4.26E-05	-	-	1.55E-06	1.55E-06
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	2.22	2.22	2.5	0	0.23	0.23	-	-	8.20E-03	8.20E-03
Thallium (Tl)	7440-28-0	-	-	1.74E-03	1.74E-03	-	2.60E-04	2.20E-04	4.80E-04	0.25	5.00E-03	7.99E-06	5.01E-03
Uranium (U)	7440-61-1	-	-	2.58E-03	2.58E-03	0.3	2.60E-04	3.27E-04	5.87E-04	6.00E-02	2.60E-04	1.18E-05	2.72E-04
Vanadium (v)	7440-62-2	-	-	0.19	0.19	-	7.60E-04	2.40E-02	2.47E-02	1	1.00E-02	8.69E-04	1.09E-02
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	9.49E-02	9.49E-02	5.4	0	1.20E-02	1.20E-02	-	-	4.36E-04	4.36E-04
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	2.50E-02	2.50E-02	13	0	3.17E-03	3.17E-03	2.8	0	1.15E-04	1.15E-04
Ytterbium (Yb)	7440-64-4	-	-	2.88E-03	2.88E-03	-	-	3.65E-04	3.65E-04	-	-	1.32E-05	1.32E-05
Zinc (Zn)	7440-66-6	-	-	0.27	0.27	2.5	0.1	3.07E-02	0.13	-	1.40E-02	1.10E-03	1.51E-02
Zirconium (Zr)	7440-67-7	-	-	0.19	0.19	2.5	0	2.35E-02	2.35E-02	-	-	8.52E-04	8.52E-04
Silicon Dioxide (SiO_2)	7631-86-9	-	-	1256.11	1256.11	-	-	159.29	159.29	-	-	5.78	5.78
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	290.33	290.33	-	-	36.81	36.81	-	-	1.34	1.34
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	96.19	96.19	-	-	12.19	12.19	-	-	0.44	0.44
Magnesium Oxide (MgO)	1309-48-4	-	-	40.52	40.52	-	-	5.14	5.14	-	-	0.19	0.19
Calcium Oxide (CaO)	1305-78-8	-	-	69.32	69.32	-	-	8.79	8.79	-	-	0.32	0.32
Sodium Oxide (Na_2O)	1313-59-3	-	-	66.08	66.08	-	-	8.37	8.37	-	-	0.30	0.30
Potassium Oxide (K_2O)	12136-45-7	-	-	46.81	46.81	-	-	5.94	5.94	-	-	0.22	0.22
Titanium dioxide (TiO_2)	13463-67-7	-	-	3.42	3.42	-	-	0.36	0.36	-	-	1.26E-02	1.26E-02
Phosphorus Pentoxide (P_2O_5)	1314-56-3	-	-	2.26	2.26	1	-	0.29	0.29	-	-	1.04E-02	1.04E-02
Manganese Oxide (MnO)	1344-43-0	-	-	0.45	0.45	-	-	4.70E-02	4.70E-02	-	-	1.66E-03	1.66E-03
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	0.57	0.57	-	-	7.23E-02	7.23E-02	-	-	2.62E-03	2.62E-03
Vanadium Pentoxide (V_2O_5)	1314-62-1	-	-	0.42	0.42	1	-	5.36E-02	5.36E-02	-	-	1.94E-03	1.94E-03
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	4.23	4.23	-	-	0.54	0.54	-	-	1.94E-02	1.94E-02

CoPC	CAS Number	1-Hour Average (µg/m³)				24-Hour Average (µg/m³)				Annual Average (µg/m³) (3)			
		Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	9.61E-02	9.61E-02	-	-	1.22E-02	1.22E-02	-	-	4.42E-04	4.42E-04
Cuprite (CU_2O)	1317-39-1	-	-	9.61E-02	9.61E-02	-	-	1.22E-02	1.22E-02	-	-	4.42E-04	4.42E-04
Galena (PbS)	1314-87-0	-	-	0.38	0.38	-	-	4.87E-02	4.87E-02	-	-	1.77E-03	1.77E-03
Sphalerite (ZnS)	1314-98-3	-	-	0.77	0.77	1	-	9.75E-02	9.75E-02	-	-	3.54E-03	3.54E-03
Pyrite (Fe,S_2)	1309-36-0	-	-	11.54	11.54	120	-	1.5	1.5	-	-	5.30E-02	5.30E-02
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	5.38	5.38	-	-	0.68	0.68	-	-	2.47E-02	2.47E-02
Arsenopyrite (FeAsS)	1303-18-0	-	-	9.61E-02	9.61E-02	-	-	1.22E-02	1.22E-02	-	-	4.42E-04	4.42E-04
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	0.35	0.35	-	-	3.63E-02	3.63E-02	-	-	1.28E-03	1.28E-03
Quartz	14808-60-7	23	6	78.7	84.7	-	0.99	8.52	9.51	7.00E-02	4.00E-02	0.12	0.16
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	n/a	-	-	1044.93	1044.93	-	-	132.47	132.47	-	-	4.80	4.80
K-Feldspars ($KAlSi_3O_8$)	n/a	-	-	68.44	68.44	-	-	8.68	8.68	-	-	0.31	0.31
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	162.09	162.09	-	-	20.43	20.43	-	-	0.74	0.74
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	-	-	56.40	56.40	8.00E-05	-	4.85	4.85	-	-	0.17	0.17
Chlorite $(Fe,(Mg, Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	-	-	15.15	15.15	-	-	1.58	1.58	-	-	8.14E-02	8.14E-02
Muscovite $(KAl_2(Si_3Al)O_{10}(OH)_2)$	1318-94-1	-	-	46.61	46.61	1.5	-	3.20	3.20	-	-	0.11	0.11
Epidote $(Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	n/a	-	-	37.68	37.68	-	-	4.78	4.78	-	-	0.17	0.17
Augite $((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)_2O_6)$	n/a	-	-	0.56	0.56	-	-	5.81E-02	5.81E-02	-	-	2.05E-03	2.05E-03
Andradite $(Ca_3Fe_2(SiO_4)_3)$	15078-96-3	-	-	4.23	4.23	-	-	0.54	0.54	-	-	1.94E-02	1.94E-02
Kaolinite $(Al_2Si_2O_5(OH)_4)$	1318-74-7	-	-	0.96	0.96	-	-	0.12	0.12	-	-	4.42E-03	4.42E-03
Calcite $(CaCO_3)$	1317-65-3	-	-	9.57	9.57	-	-	1.20	1.20	-	-	4.32E-02	4.32E-02
Dolomite $(CaMg(CO_3)_2)$/Ankerite $(Ca(Fe,Mg,Mn)(CO_3)_2)$	16389-88-1, n/a	-	-	6.95E-02	6.95E-02	-	-	7.27E-03	7.27E-03	-	-	2.57E-04	2.57E-04
Titanite $(CaTiSiO_5)$	n/a	-	-	2.63	2.63	-	-	0.21	0.21	-	-	7.40E-03	7.40E-03
Apatite $(Ca_5(PO_4)_3)$	1306-05-4	-	-	4.23	4.23	-	-	0.54	0.54	-	-	1.94E-02	1.94E-02
Mica	12001-26-2	30	0	205.3	205.3	-	-	26.10	26.10	7	0	0.95	0.95
Tremolite $(Ca_2(Mg5.0-4.5Fe^{2+}0.0-0.5)Si_8O_{22}(OH)_2)$	77536-68-6	-	-	101.69	101.69	8.00E-05	-	12.89	12.89	-	-	0.47	0.47
Bytownite $(Ca,Na)(Si,Al)_4O_8$	n/a	-	-	83.06	83.06	-	-	10.53	10.53	-	-	0.38	0.38
Labradorite $(Na,Ca)_{1-2}Si_{3-2}\ O_8$	n/a	-	-	64.38	64.38	-	-	8.17	8.17	-	-	0.30	0.30
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	224.72	224.72	-	-	28.49	28.49	-	-	1.03	1.03
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	n/a	-	-	490.36	490.36	-	-	62.13	62.13	-	-	2.25	2.25
Albite $(NaAlSi_3O_8)$	n/a	-	-	182.80	182.80	-	-	23.18	23.18	-	-	0.84	0.84
Phlogopite $(KMg_3AlSi_3O_{10}(F,OH)_2)$	n/a	-	-	26.72	26.72	-	-	3.39	3.39	-	-	0.12	0.12
Sillimanite (Al_2SiO_5)	12141-45-6	-	-	8.46	8.46	-	-	1.07	1.07	-	-	3.89E-02	3.89E-02
Combustion Gases													
Carbon Monoxide (CO)	630-08-0	34000	600	1212.2	1812.2	-	-	15.97	15.97	-	-	0.89	0.89

CoPC	CAS Number	1-Hour Average (µg/m³)				24-Hour Average (µg/m³)				Annual Average (µg/m³) (3)			
		Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration
Sulphur Dioxide (SO_2)	7446-09-5	-	-	30.49	30.49	288	50	0.25	50.25	52	20	9.82E-03	20.01
Hydrocarbons	<<NMHC>>	-	-	23.71	23.71	-	-	2.45	2.45	-	-	0.19	0.19
Nitrogen Dioxide (NO_2) (2)	10102-44-0	414	150	475.2	625.2	207	100	68.51	168.51	103	30	8.19	38.19
1,3-butadiene	106-99-0	-	-	1.57E-02	1.57E-02	-	0.6	1.77E-03	0.60	0.5	0.14	1.02E-04	0.14
Acenaphthene	83-32-9	-	-	5.74E-03	5.74E-03	-	4.41E-03	6.45E-04	5.06E-03	-	8.46E-04	3.78E-05	8.84E-04
Acenaphthylene	208-96-8	-	-	1.13E-02	1.13E-02	-	8.15E-03	1.29E-03	9.44E-03	-	1.56E-03	7.60E-05	1.64E-03
Acetaldehyde	75-07-0	-	-	0.88	0.88	-	-	9.91E-02	9.91E-02	0.5	-	5.73E-03	5.73E-03
Acrolein	107-02-8	-	-	0.16	0.16	-	-	1.81E-02	1.81E-02	2.00E-02	-	1.04E-03	1.04E-03
Anthracene	120-12-7	-	-	1.06E-03	1.06E-03	-	1.61E-04	1.19E-04	2.80E-04	-	3.08E-05	7.21E-06	3.80E-05
Benzene	71-43-2	-	-	0.54	0.54	10	3	6.14E-02	3.06	-	0.4	3.85E-03	0.40
Benzo(a)anthracene	56-55-3	-	-	1.88E-04	1.88E-04	-	-	2.11E-05	2.11E-05	-	-	1.55E-06	1.55E-06
Benzo(a)pyrene	50-32-8	-	-	7.10E-05	7.10E-05	-	5.29E-05	7.79E-06	6.07E-05	9.00E-04	3.00E-04	5.84E-07	3.01E-04
Benzo(b+k) fluoranthene	205-99-2	-	-	2.73E-04	2.73E-04	-	2.79E-04	2.86E-05	3.08E-04	-	5.35E-05	2.20E-06	5.57E-05
Benzo(g,h,i)perylene	191-24-2	-	-	1.61E-04	1.61E-04	-	-	1.79E-05	1.79E-05	-	-	1.33E-06	1.33E-06
Chrysene	218-01-9	-	-	3.79E-04	3.79E-04	-	3.38E-04	3.94E-05	3.77E-04	-	6.49E-05	3.03E-06	6.79E-05
Fluoranthene	206-44-0	-	-	1.98E-03	1.98E-03	-	8.15E-04	2.27E-04	1.04E-03	-	1.56E-04	1.49E-05	1.71E-04
Fluorene	86-73-7	-	-	8.76E-03	8.76E-03	-	1.47E-03	9.89E-04	2.46E-03	-	2.82E-04	6.10E-05	3.43E-04
Formaldehyde	50-00-0	-	-	0.73	0.73	-	-	8.30E-02	8.30E-02	-	-	4.83E-03	4.83E-03
Phenanthrene	85-01-8	-	-	1.72E-02	1.72E-02	-	2.21E-03	1.96E-03	4.17E-03	-	4.24E-04	1.32E-04	5.56E-04
Pyrene	129-00-0	-	-	1.87E-03	1.87E-03	-	-	2.14E-04	2.14E-04	13	0	1.39E-05	1.39E-05
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	<<DPM>>	-	-	9.01	9.01	-	9.40E-02	1.02	1.11	-	1.82E-02	7.15E-02	8.97E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	5.9	5.9	-	-	0.66	0.66	0.3	0	4.65E-02	4.65E-02
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	1.72E-04	1.72E-04	-	-	1.97E-05	1.97E-05	2.40E-03	1.40E-03	1.41E-06	1.40E-03

Notes:

1. Model predictions for particulates include main access road within Project area using the base case modelling method.
2. Maximum predicted NO_2 concentrations using the OLM method.
3. Annual average concentrations for particulate and metals were adjusted for the number of precipitation days in a year.

5.1.2 Construction – Special and Discrete Receptor Modelling Results

This section presents the dispersion model predictions of ambient CoPC concentrations at special receptor locations relevant to human exposure. The discrete receptor results are utilized in other technical data reports and are not included in this section.

5.1.2.1 Construction – Project Alone

A summary of the maximum predicted CoPC GLCs over all assessed special receptors for the Project Alone (construction scenario) is presented in Table 5-3. The maximum predicted concentration of each CoPC at each special or discrete receptor is tabulated in APPENDIX F.

The maximum predicted Project Alone concentrations for 123 of 126 CoPCs assessed for the construction scenario are below the MELCCFP or MECP criteria for all six special receptors assessed.

Exceedances of 1-hour average elemental carbon (from diesel exhaust) criterion are predicted at all six special receptors, with the highest concentration predicted at the proposed Cree Camp CC2 which is located approximately 8 km north of the Project. The maximum predicted concentration of elemental carbon was 2.5 µg/m^3 which exceeds the Quebec criterion of 1 ug/m^3 by 150%.

The maximum predicted 24-hour average concentrations of actinolite and tremolite are above the Ontario Air Quality Screening Level which are based on health effects from asbestos. The MELCCFP does not have criteria for actinolite or tremolite. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level. As noted in Section 1.6, tremolite and actinolite in the Project ore or waste rock are non-asbestiform due to the unfavourable geological conditions. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

5.1.2.2 Construction – Cumulative Effects

A summary of the maximum predicted CoPC GLCs over all assessed special receptors for the Project Alone (construction scenario) cumulatively with background air quality levels is also presented in Table 5-3. The maximum predicted cumulative concentration of each CoPC at each special or discrete receptor is tabulated in APPENDIX F.

The maximum predicted concentrations of the construction CoPCs when considering the Project cumulatively with background air quality are below the MELCCFP or MECP criteria for all six special receptors other than:

- 1-hour average elemental carbon in diesel exhaust
- 1-hour average quartz in PM_{10}
- 24-hour average tremolite
- 24-hour average actinolite

Exceedances of cumulative 1-hour average elemental carbon are predicted at all six of the special receptors. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. The maximum predicted cumulative concentration of elemental carbon is 2.5 µg/m^3 which exceeds the Quebec criterion of 1 µg/m^3 by 150%. Exceedances are predicted to occur a maximum of 3 hours over a period of five years (0.007% of the time).

Cumulative 1-hour average quartz in PM_{10} exceedance are predicted at Cree Camp CC3 located approximately 9 km southwest of the Project and adjacent to the main access road. The maximum predicted 1-hour concentration from the Project Alone is 17.7 µg/m^3 which is below the Quebec criterion of 23 µg/m^3, but when combined with the generic Quebec background quartz concentration of 6 µg/m^3, an exceedance of 3% above the criterion is predicted. A frequency analysis was completed, and the exceedance is predicted to occur very infrequently - a maximum of 1 hour over a five-year period or about 0.002% of the time.

Similar to the Project Alone case, the maximum predicted cumulative 24-hour average actinolite and tremolite GLCs are above the Ontario Air Quality Screening Level. However, the MECP actinolite and tremolite screening levels are based on health effects of asbestos, while these CoPCs have been identified by Troilus to be non-asbestiform.

5.1.3 Construction – Full Grid Modelling Results

Contour plots of maximum predicted Construction Project Alone PM, $PM_{2.5}$, quartz, arsenic, NO_2, SO_2, B(a)P, benzene, DPM, and elemental carbon concentrations for averaging periods with air quality criteria are presented in Table 5-2. Elemental carbon is predicted to be above its MELCCFP 1-hour criterion for distances extending over 10 km from the Project, however, as noted in Section 5.1.2.2, exceedances are predicted to occur very infrequently.

A summary of the maximum predicted NO_2, $PM_{2.5}$ and SO_2 concentrations in the appropriate CAAQS metrics are compared to the relevant CAAQS in Table 5-2. Contour plot of the predicted NO_2, $PM_{2.5}$ and SO_2 CAAQS metrics are provided in APPENDIX I.

Table 5-2 Maximum Predicted Full Grid CAAQS Concentrations (µg/m^3) During Construction (Project Alone)

CoPC	Averaging Period	CAAQS	Special Receptors	Discrete Receptors	Fenceline Receptors	Gridded Receptors
NO_2 (Note 1)	1-Hour	83	75	156	257	242
	Annual	24	1.0	5.4	8.2	7.9
$PM_{2.5}$	24-Hr	27	0.5	1.5	2.0	2.0
	Annual	8.8	0.1	0.3	0.4	0.4
SO_2	1-Hour	179	0.9	4.2	8.2	8.0
	Annual	11	0.002	0.009	0.014	0.014

Notes:

1 - NO_2 predictions utilized the Ozone Limiting Method

2 - Full grid model runs conservatively do not include plume depletion in the predictions.

The maximum predicted 1-hour average NO_2 concentrations are below the CAAQS at special receptors, and above the CAAQS at discrete receptors and over the gridded receptors. Annual average NO_2 concentrations are well below the CAAQS. CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

Table 5-3 Summary of Maximum Predicted CoPC Concentrations at Special Receptors – Construction

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Particulates																
PM	<<PM>>	-	-	735.8	735.8	-	120	40	33.5 [8]	73.5 [8]	61%	-	11.6	2.1 [8]	13.7 [8]	-
PM_{10}	<<PM10>>	-	-	213.4	213.4	-	50	13.1	19.8	32.9	66%	-	8.3	0.7	9.0	-
$PM_{2.5}$	<<PM2.5>>	-	-	42.1	42.1	-	30	15	3.1	18.1	60%	-	6.2	0.1	6.3	-
$PM_{2.5}$ – CAAQS [2][4]	<<PM2.5>>	-	-	-	-	-	27	-	0.5	0.5	2%	8.8	-	0.1	0.1	2%
Metals and Metallic Compounds																
Silver (Ag)	7440-22-4	-	-	5.76E-04	5.76E-04	-	-	2.60E-04	4.80E-05	3.08E-04	-	0.23	5.00E-03	1.59E-06	5.00E-03	2%
Aluminum (Al)	7429-90-5	-	-	50.78	50.78	-	-	0.42	5.19	5.61	-	-	0.146	0.19	0.34	-
Arsenic (As)	7440-38-2	-	-	7.30E-03	7.30E-03	-	-	1.26E-03	6.09E-04	1.87E-03	-	3.00E-03	2.00E-03	2.01E-05	2.02E-03	67%
Gold (Au)	7440-57-5	-	-	1.10E-04	1.10E-04	-	1.25	-	7.75E-06	7.75E-06	BSL	-	-	2.32E-07	2.32E-07	-
Boron (B)	7440-42-8	-	-	6.96E-02	6.96E-02	-	-	2.60E-02	6.98E-03	3.30E-02	-	-	2.60E-02	2.52E-04	2.63E-02	-
Barium (Ba)	7440-39-3	-	-	0.25	0.25	-	-	8.60E-03	2.54E-02	3.40E-02	-	5.00E-02	2.00E-02	9.24E-04	2.09E-02	42%
Beryllium (Be)	7440-41-7	-	-	7.86E-04	7.86E-04	-	-	-	8.00E-05	8.00E-05	-	4.00E-04	0	2.93E-06	2.93E-06	1%
Bismuth (Bi)	7440-69-9	-	-	1.47E-03	1.47E-03	-	-	1.30E-03	1.45E-04	1.45E-03	-	-	1.30E-03	5.20E-06	1.31E-03	-
Carbon (C)	7440-44-0	1	0	0.26 [8]	0.26 [8]	26%	-	-	6.33E-02	6.33E-02	-	0.3	0	2.28E-03	2.28E-03	1%
Calcium (Ca)	7440-70-2	-	-	21.22	21.22	-	-	0.68	2.17	2.85	-	-	0.3	7.93E-02	0.38	-
Cadmium (Cd)	7440-43-9	-	-	1.36E-03	1.36E-03	-	-	2.60E-04	1.00E-04	3.60E-04	-	3.60E-03	5.00E-04	3.10E-06	5.03E-04	14%
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	4.68E-02	4.68E-02	0%	-	-	4.78E-03	4.78E-03	-	0.7	0	1.74E-04	1.74E-04	0%
Cobalt (Co)	7440-48-4	-	-	1.19E-02	1.19E-02	-	-	-	1.22E-03	1.22E-03	-	0.1	0	4.46E-05	4.46E-05	0%
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	6.00E-02	6.00E-02	-	-	6.00E-03	6.12E-03	1.21E-02	-	0.1	1.00E-02	2.23E-04	1.02E-02	10%
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	1.99E-03	1.99E-03	0%	-	-	2.03E-04	2.03E-04	-	0.4	0	7.42E-06	7.42E-06	0%
Copper (Cu)	7440-50-8	-	-	0.14	0.14	-	2.5	0.2	1.08E-02	0.21	8%	-	3.20E-03	3.45E-04	3.54E-03	-
Iron (Fe)	7439-89-6	-	-	23.07	23.07	-	-	0.22	2.35	2.57	-	-	0.15	8.56E-02	0.24	-
Gallium (Ga)	7440-55-3	-	-	1.32E-02	1.32E-02	-	-	-	1.35E-03	1.35E-03	-	-	-	4.96E-05	4.96E-05	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	2.74E-03	2.74E-03	0%	-	-	2.80E-04	2.80E-04	-	0.9	0	1.02E-05	1.02E-05	0%
Mercury (Hg)	7439-97-6	-	-	1.66E-05	1.66E-05	-	-	6.40E-05	1.69E-06	6.57E-05	-	5.00E-03	2.00E-03	6.19E-08	2.00E-03	40%
Indium (In)	7440-74-6	-	-	3.31E-06	3.31E-06	-	-	-	3.38E-07	3.38E-07	-	-	-	1.24E-08	1.24E-08	-
Potassium (K)	7440-09-7	-	-	9.95	9.95	-	-	0.126	1.01	1.14	-	-	0.13	3.67E-02	0.17	-
Lanthanum (La)	7439-91-0	-	-	1.09E-02	1.09E-02	-	-	-	1.10E-03	1.10E-03	-	-	-	3.96E-05	3.96E-05	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Lithium (Li)	7439-93-2	2	0	1.70E-02	1.70E-02	1%	-	-	1.73E-03	1.73E-03	-	-	-	6.32E-05	6.32E-05	-
Lutetium (Lu)	7439-94-3	-	-	1.55E-04	1.55E-04	-	-	-	1.58E-05	1.58E-05	-	-	-	5.79E-07	5.79E-07	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	9.2	15.2	63%	-	0.19	0.94	1.13	-	-	9.60E-02	3.44E-02	0.13	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	9.73E-02	9.73E-02	-	-	8.60E-03	8.76E-03	1.74E-02	-	8.00E-02	5.00E-03	2.94E-04	5.29E-03	7%
Molybdenum (Mo)	7439-98-7	-	-	4.27E-03	4.27E-03	-	120	7.60E-04	4.37E-04	1.20E-03	0%	-	7.80E-04	1.60E-05	7.96E-04	-
Sodium (Na)	7440-23-5	-	-	19.65	19.65	-	-	0.52	2.01	2.53	-	-	0.32	7.34E-02	0.39	-
Niobium (Nb)	7440--03-1	-	-	3.87E-03	3.87E-03	-	-	-	3.95E-04	3.95E-04	-	-	-	1.44E-05	1.44E-05	-
Nickel (Ni)	7440-02-0	-	-	1.07E-02	1.07E-02	-	7.00E-02	5.00E-03	9.81E-04	5.98E-03	9%	2.00E-02	2.00E-03	3.31E-05	2.03E-03	10%
Phosphorus (P)	7723-14-0	-	-	0.17 [8]	0.17 [8]	-	0.5	-	4.23E-02	4.23E-02	BSL	-	-	1.55E-03	1.55E-03	-
Lead (Pb)	7439-92-1	-	-	1.34E-02	1.34E-02	-	-	3.40E-03	1.37E-03	4.77E-03	-	0.1	4.00E-03	4.96E-05	4.05E-03	4%
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	4.98E-02	4.98E-02	-	4	0	5.09E-03	5.09E-03	0%	-	-	1.86E-04	1.86E-04	-
Sulphur (S)	7704-34-9	-	-	1.49	1.49	-	-	-	0.14	0.14	-	-	-	4.70E-03	4.70E-03	-
Antimony (Sb)	7440-36-0	-	-	3.64E-03	3.64E-03	-	-	1.26E-03	3.52E-04	1.61E-03	-	0.17	7.00E-03	1.25E-05	7.01E-03	4%
Scandium (Sc)	7440-20-2	-	-	7.34E-03	7.34E-03	-	-	-	7.51E-04	7.51E-04	-	-	-	2.76E-05	2.76E-05	-
Selenium (Se)	7782-49-2	2	0.15	2.32E-04	0.15	8%	-	2.60E-03	2.37E-05	2.62E-03	-	-	2.60E-03	8.66E-07	2.60E-03	-
Tin (Sn)	7440-31-5	-	-	5.67E-03	5.67E-03	-	-	-	5.80E-04	5.80E-04	-	0.1	0	2.11E-05	2.11E-05	0%
Strontium (Sr)	7440-24-6	-	-	0.22	0.22	-	-	1.50E-03	2.25E-02	2.40E-02	-	-	1.48E-03	8.24E-04	2.30E-03	-
Tantalum (Ta)	7440-25-7	-	-	6.66E-04	6.66E-04	-	25	-	6.80E-05	6.80E-05	BSL	-	-	2.49E-06	2.49E-06	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	3.52E-04	3.52E-04	-	-	-	3.60E-05	3.60E-05	-	-	-	1.32E-06	1.32E-06	-
Tellurium (Te)	13494-80-9	1	0	1.16E-04	1.16E-04	0%	-	-	1.18E-05	1.18E-05	-	-	-	4.33E-07	4.33E-07	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	0.68	0.68	-	2.5	0	6.18E-02	6.18E-02	2%	-	-	2.08E-03	2.08E-03	-
Thallium (Tl)	7440-28-0	-	-	5.99E-04	5.99E-04	-	-	2.60E-04	6.10E-05	3.21E-04	-	0.25	5.00E-03	2.24E-06	5.00E-03	2%
Uranium (U)	7440-61-1	-	-	8.88E-04	8.88E-04	-	0.3	2.60E-04	9.10E-05	3.51E-04	0%	6.00E-02	2.60E-04	3.31E-06	2.63E-04	0%
Vanadium (v)	7440-62-2	-	-	6.51E-02	6.51E-02	-	-	7.60E-04	6.66E-03	7.42E-03	-	1	1.00E-02	2.43E-04	1.02E-02	1%
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	3.27E-02	3.27E-02	-	5	0	3.34E-03	3.34E-03	0%	-	-	1.22E-04	1.22E-04	-
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	8.61E-03	8.61E-03	-	13	0	8.80E-04	8.80E-04	0%	2.8	0	3.21E-05	3.21E-05	0%
Ytterbium (Yb)	7440-64-4	-	-	9.92E-04	9.92E-04	-	-	-	1.01E-04	1.01E-04	-	-	-	3.70E-06	3.70E-06	-
Zinc (Zn)	7440-66-6	-	-	9.14E-02	9.14E-02	-	2.5	0.1	8.59E-03	0.11	4%	-	1.40E-02	3.01E-04	1.43E-02	-
Zirconium (Zr)	7440-67-7	-	-	6.38E-02	6.38E-02	-	2.5	0	6.53E-03	6.53E-03	0%	-	-	2.39E-04	2.39E-04	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Silicon Dioxide (SiO_2)	7631-86-9	-	-	432.87	432.87	-	-	-	44.26	44.26	-	-	-	1.62	1.62	-
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	100.03	100.03	-	-	-	10.23	10.23	-	-	-	0.37	0.37	-
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	33.15	33.15	-	-	-	3.39	3.39	-	-	-	0.12	0.12	-
Magnesium Oxide (MgO)	1309-48-4	-	-	13.96	13.96	-	-	-	1.43	1.43	-	-	-	5.22E-02	5.22E-02	-
Calcium Oxide (CaO)	1305-78-8	-	-	23.88	23.88	-	-	-	2.44	2.44	-	-	-	8.92E-02	8.92E-02	-
Sodium Oxide (Na_2O)	1313-59-3	-	-	22.77	22.77	-	-	-	2.33	2.33	-	-	-	8.50E-02	8.50E-02	-
Potassium Oxide (K_2O)	12136-45-7	-	-	16.14	16.14	-	-	-	1.65	1.65	-	-	-	6.03E-02	6.03E-02	-
Titanium dioxide (TiO_2)	13463-67-7	-	-	1.04	1.04	-	-	-	9.50E-02	9.50E-02	-	-	-	3.20E-03	3.20E-03	-
Phosphorus Pentoxide (P_2O_5)	1314-56-3	-	-	0.78	0.78	-	1	-	7.96E-02	7.96E-02	BSL	-	-	2.91E-03	2.91E-03	-
Manganese Oxide (MnO)	1344-43-0	-	-	0.14	0.14	-	-	-	1.25E-02	1.25E-02	-	-	-	4.21E-04	4.21E-04	-
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	0.20	0.20	-	-	-	2.01E-02	2.01E-02	-	-	-	7.34E-04	7.34E-04	-
Vanadium Pentoxide (V_2O_5)	1314-62-1	-	-	0.15	0.15	-	1	-	1.49E-02	1.49E-02	BSL	-	-	5.44E-04	5.44E-04	-
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	1.46	1.46	-	-	-	0.15	0.15	-	-	-	5.44E-03	5.44E-03	-
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	3.31E-02	3.31E-02	-	-	-	3.39E-03	3.39E-03	-	-	-	1.24E-04	1.24E-04	-
Cuprite (CU_2O)	1317-39-1	-	-	3.31E-02	3.31E-02	-	-	-	3.39E-03	3.39E-03	-	-	-	1.24E-04	1.24E-04	-
Galena (PbS)	1314-87-0	-	-	0.13	0.13	-	-	-	1.35E-02	1.35E-02	-	-	-	4.95E-04	4.95E-04	-
Sphalerite (ZnS)	1314-98-3	-	-	0.26	0.26	-	1	-	2.71E-02	2.71E-02	BSL	-	-	9.90E-04	9.90E-04	-
Pyrite (Fe,S_2)	1309-36-0	-	-	3.97	3.97	-	120	-	0.41	0.41	BSL	-	-	1.48E-02	1.48E-02	-
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	1.85	1.85	-	-	-	0.19	0.19	-	-	-	6.93E-03	6.93E-03	-
Arsenopyrite (FeAsS)	1303-18-0	-	-	3.31E-02	3.31E-02	-	-	-	3.39E-03	3.39E-03	-	-	-	1.24E-04	1.24E-04	-
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	0.11	0.11	-	-	-	9.66E-03	9.66E-03	-	-	-	3.25E-04	3.25E-04	-
Quartz	14808-60-7	23	6	17.7 [8]	23.7 [8]	**103%**	-	0.99	1.51 [8]	2.50 [8]	-	7.00E-02	4.00E-02	2.88E-02	6.88E-02	98%
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	n/a	-	-	359.99	359.99	-	-	-	36.80	36.80	-	-	-	1.34	1.34	-
K-Feldspars ($KAlSi_3O_8$)	n/a	-	-	23.58	23.58	-	-	-	2.41	2.41	-	-	-	8.81E-02	8.81E-02	-
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	56.82	56.82	-	-	-	5.69	5.69	-	-	-	0.21	0.21	-
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	-	-	16.72	16.72	-	8.00E-05	-	0.69 [8]	0.69 [8]	ASL	-	-	3.83E-02 [8]	3.83E-02 [8]	-
Chlorite ($Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	-	-	4.60	4.60	-	-	-	0.42	0.42	-	-	-	2.07E-02	2.07E-02	-
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	-	-	12.53	12.53	-	1.5	-	0.47 [8]	0.47 [8]	BSL	-	-	2.80E-02	2.80E-02	-
Epidote $(Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	n/a	-	-	12.98	12.98	-	-	-	1.33	1.33	-	-	-	4.85E-02	4.85E-02	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)$_2$O$_6$)	n/a	-	-	0.17	0.17	-	-	-	1.54E-02	1.54E-02	-	-	-	5.20E-04	5.20E-04	-
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	-	-	1.46	1.46	-	-	-	0.15	0.15	-	-	-	5.44E-03	5.44E-03	-
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	-	-	0.33	0.33	-	-	-	3.39E-02	3.39E-02	-	-	-	1.24E-03	1.24E-03	-
Calcite ($CaCO_3$)	1317-65-3	-	-	3.43	3.43	-	-	-	0.33	0.33	-	-	-	1.20E-02	1.20E-02	-
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, n/a	-	-	2.11E-02	2.11E-02	-	-	-	1.93E-03	1.93E-03	-	-	-	6.52E-05	6.52E-05	-
Titanite ($CaTiSiO_5$)	n/a	-	-	0.70	0.70	-	-	-	5.71E-02	5.71E-02	-	-	-	1.84E-03	1.84E-03	-
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	-	-	1.46	1.46	-	-	-	0.15	0.15	-	-	-	5.44E-03	5.44E-03	-
Mica	12001-26-2	30	0	29.8 [8]	29.8 [8]	99%	-	-	7.25	7.25	-	7	0	0.27	0.27	4%
Tremolite ($Ca_2(Mg5.0\text{-}4.5Fe^{2+}0.0\text{-}0.5)Si_8O_{22}(OH)_2$)	77536-68-6	-	-	35.04	35.04	-	8.00E-05	-	3.58 [8]	3.58 [8]	ASL	-	-	0.11 [8]	0.11 [8]	-
Bytownite ($(Ca,Na)(Si,Al)_4O_8$)	n/a	-	-	28.61	28.61	-	-	-	2.93	2.93	-	-	-	0.11	0.11	-
Labradorite ($(Na,Ca)_{1-2}Si_{3-2}O_8$)	n/a	-	-	22.19	22.19	-	-	-	2.27	2.27	-	-	-	8.29E-02	8.29E-02	-
Andesine ($(Na,Ca)Al_{1-2}Si_{3-2}O_8$)	96158-02-0	-	-	77.43	77.43	-	-	-	7.92	7.92	-	-	-	0.29	0.29	-
Oligoclase ($(Na,Ca)(Si,Al)_4O_8$)	n/a	-	-	168.91	168.91	-	-	-	17.26	17.26	-	-	-	0.63	0.63	-
Albite ($NaAlSi_3O_8$)	n/a	-	-	62.99	62.99	-	-	-	6.44	6.44	-	-	-	0.24	0.24	-
Phlogopite ($KMg_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	9.21	9.21	-	-	-	0.94	0.94	-	-	-	3.44E-02	3.44E-02	-
Sillimanite (Al_2SiO_5)	12141-45-6	-	-	2.91	2.91	-	-	-	0.30	0.30	-	-	-	1.09E-02	1.09E-02	-
Combustion Gases																
Carbon Monoxide (CO)	630-08-0	34000	600	243.0	843.0	2%	-	-	3.51	3.51	-	-	-	9.10E-02	9.10E-02	-
Sulphur Dioxide (SO_2)	7446-09-5	-	-	6.10	6.10	-	288	50	5.64E-02	50.1	17%	52	20	1.23E-03	20.0	38%
Sulphur Dioxide (SO_2) - CAAQS [2][5]	7446-09-5	179	-	0.85	0.85	0.5%	-	-	-	-	-	11	-	2.03E-03	2.03E-03	0%
Hydrocarbons	<<NMHC>>	-	-	8.49	8.49	-	-	-	0.48	0.48	-	-	-	1.63E-02	1.63E-02	-
Nitrogen Dioxide (NO_2) [6]	10102-44-0	414	150	255.8	405.8	98%	207	100	17.3	117.3	57%	103	30	1.0	31.0	30%
Nitrogen Dioxide (NO_2) - CAAQS [2][6][7]	10102-44-0	83	-	74.7	74.7	90%	-	-	-	-	-	24	-	1.0	1.0	4%
1,3-butadiene	106-99-0	-	-	6.89E-03	6.89E-03	-	-	0.6	4.01E-04	0.60	-	0.5	0.14	1.54E-05	0.14	28%
Acenaphthene	83-32-9	-	-	2.52E-03	2.52E-03	-	-	4.41E-03	1.44E-04	4.55E-03	-	-	8.46E-04	5.38E-06	8.51E-04	-
Acenaphthylene	208-96-8	-	-	4.95E-03	4.95E-03	-	-	8.15E-03	2.89E-04	8.44E-03	-	-	1.56E-03	1.09E-05	1.57E-03	-
Acetaldehyde	75-07-0	-	-	0.39	0.39	-	-	-	2.27E-02	2.27E-02	-	0.5	-	8.94E-04	8.94E-04	0%
Acrolein	107-02-8	-	-	7.14E-02	7.14E-02	-	-	-	4.11E-03	4.11E-03	-	2.00E-02	-	1.58E-04	1.58E-04	1%
Anthracene	120-12-7	-	-	4.64E-04	4.64E-04	-	-	1.61E-04	2.70E-05	1.88E-04	-	-	3.08E-05	9.91E-07	3.18E-05	-
Benzene	71-43-2	-	-	0.24	0.24	-	10	3	1.36E-02	3.0	30%	-	0.4	5.03E-04	0.4	-
Benzo(a)anthracene	56-55-3	-	-	8.00E-05	8.00E-05	-	-	-	4.51E-06	4.51E-06	-	-	-	1.59E-07	1.59E-07	-
Benzo(a)pyrene	50-32-8	-	-	2.90E-05	2.90E-05	-	-	5.29E-05	1.64E-06	5.45E-05	-	9.00E-04	3.00E-04	5.71E-08	3.00E-04	33%

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
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Benzo(b+k)fluoranthene	205-99-2	-	-	1.03E-04	1.03E-04	-	-	2.79E-04	5.83E-06	2.85E-04	-	-	5.35E-05	1.98E-07	5.37E-05	-
Benzo(g,h,i)perylene	191-24-2	-	-	6.70E-05	6.70E-05	-	-	-	3.79E-06	3.79E-06	-	-	-	1.31E-07	1.31E-07	-
Chrysene	218-01-9	-	-	1.40E-04	1.40E-04	-	-	3.38E-04	7.91E-06	3.46E-04	-	-	6.49E-05	2.69E-07	6.52E-05	-
Fluoranthene	206-44-0	-	-	8.64E-04	8.64E-04	-	-	8.15E-04	5.00E-05	8.65E-04	-	-	1.56E-04	1.82E-06	1.58E-04	-
Fluorene	86-73-7	-	-	3.83E-03	3.83E-03	-	-	1.47E-03	2.18E-04	1.69E-03	-	-	2.82E-04	7.99E-06	2.90E-04	-
Formaldehyde	50-00-0	-	-	0.32	0.32	-	-	-	1.89E-02	1.89E-02	-	-	-	7.32E-04	7.32E-04	-
Phenanthrene	85-01-8	-	-	7.52E-03	7.52E-03	-	-	2.21E-03	4.25E-04	2.64E-03	-	-	4.24E-04	1.51E-05	4.39E-04	-
Pyrene	129-00-0	-	-	8.18E-04	8.18E-04	-	-	-	4.70E-05	4.70E-05	-	13	0	1.70E-06	1.70E-06	0%
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	<<DPM>>	-	-	3.92	3.92	-	-	9.40E-02	0.22	0.31	-	-	1.82E-02	7.91E-03	2.61E-02	-
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	2.5	2.5	**255%**	-	-	0.14	0.14	-	0.3	0	5.14E-03	5.14E-03	2%
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	7.50E-05	7.50E-05	-	-	-	4.21E-06	4.21E-06	-	2.40E-03	1.40E-03	1.49E-07	1.40E-03	58%

Notes:

1. Model predictions include main access road within and outside the Project area.
2. Model predictions include main access road within the Project area.
3. Maximum Special Receptor Concentrations. Other discrete receptor locations used to assess deposition onto LSA waterbodies, fish habitat and terrestrial are not included.
4. Maximum predicted 24-hour and annual $PM_{2.5}$ concentrations are presented in the table and conservatively compared to the CAAQS.
5. Maximum predicted 1-hour and annual SO_2 concentrations expressed using the appropriate CAAQS methodology are presented in the table and conservatively compared to the CAAQS.
6. Maximum predicted 1-hour, 24-hour and annual NO_2 concentration using the OLM method.
7. Maximum predicted 3-year average of the annual 98th percentile of the daily maximum 1-hour average NO_2 concentrations using the OLM method for conservative comparison to the CAAQS.
8. Maximum predicted concentration with plume depletion is compared to the criteria.
9. Annual average concentrations for particulate and metals were adjusted for the number of precipitation days in a year.

5.2 Assessment of Project Operations on Air Quality

5.2.1 Operations - Mine Boundary Modelling Results

Table 5-4 presents the maximum predicted GLCs at the Modelled Mine Boundary due to Project operations emissions. The location of each maximum predicted concentration for each averaging period is tabulated in APPENDIX E of this assessment. The values presented in this table are the maximum predicted values over all the Modelled Mine Boundary receptors.

Estimated background concentrations, as discussed in Section 3.4, were added to the maximum model-predicted values and compared to applicable regulatory limits to assess potential cumulative changes in air quality. Where no data are available to characterize background levels, the background concentration is noted as (-) and was considered to be zero in the assessment.

The maximum predicted cumulative GLCs at the Modelled Mine Boundary are above the applicable air quality criteria and screening levels for 7 of 132 CoPCs assessed for the operations phase. In accordance with the Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017), Troilus is applying the mitigation measures listed in report Section 4.2.7.2 to reduce Project air emissions.

Table 5-4 Summary of Maximum Predicted CoPC Concentrations at Modelled Mine Boundary - Operations

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) (3)			
		Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration
Particulates													
PM	<<PM>>	-	-	2839.7	2839.7	120	40	329.4	369.4	-	11.6	18.3	29.9
PM_{10}	<<PM10>>	-	-	1370.3	1370.3	50	13.1	133.7	146.8	-	8.3	6.1	14.4
$PM_{2.5}$	<<PM2.5>>	-	-	202.5	202.5	30	15	20.0	35.0	-	6.2	0.8	7.0
Metals and Metallic Compounds													
Silver (Ag)	7440-22-4	-	-	2.78E-03	2.78E-03	-	2.60E-04	2.38E-04	4.98E-04	0.23	5.00E-03	1.17E-05	5.01E-03
Aluminum (Al)	7429-90-5	-	-	220.84	220.84	-	0.42	24.95	25.37	-	0.146	1.39	1.54
Arsenic (As)	7440-38-2	-	-	0.11	0.11	-	1.26E-03	7.78E-03	9.04E-03	3.00E-03	2.00E-03	3.82E-04	2.38E-03
Gold (Au)	7440-57-5	-	-	6.72E-04	6.72E-04	1.25	-	4.44E-05	4.44E-05	-	-	2.15E-06	2.15E-06
Boron (B)	7440-42-8	-	-	0.32	0.32	-	2.60E-02	3.34E-02	5.94E-02	-	2.60E-02	1.89E-03	2.79E-02
Barium (Ba)	7440-39-3	-	-	1.28	1.28	-	8.60E-03	0.12	0.13	5.00E-02	2.00E-02	6.96E-03	2.70E-02
Beryllium (Be)	7440-41-7	-	-	2.59E-03	2.59E-03	-	-	3.88E-04	3.88E-04	4.00E-04	0	2.04E-05	2.04E-05
Bismuth (Bi)	7440-69-9	-	-	5.84E-03	5.84E-03	-	1.30E-03	7.35E-04	2.04E-03	-	1.30E-03	3.45E-05	1.30E-02
Carbon (C)	7440-44-0	1	0	4.0	4.0	-	-	0.44	0.44	0.3	0	2.44E-02	2.44E-02
Calcium (Ca)	7440-70-2	-	-	75.67	75.67	-	0.68	10.77	11.45	-	0.3	0.58	0.88
Cadmium (Cd)	7440-43-9	-	-	8.31E-03	8.31E-03	-	2.60E-04	5.79E-04	8.39E-04	3.60E-03	5.00E-04	2.78E-05	5.28E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	0.2	0.2	-	-	2.39E-02	2.39E-02	0.7	0	1.33E-03	1.33E-03
Cobalt (Co)	7440-48-4	-	-	5.90E-02	5.90E-02	-	-	6.78E-03	6.78E-03	0.1	0	3.76E-04	3.76E-04
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	0.66	0.66	-	6.00E-03	6.47E-02	7.07E-02	0.1	1.00E-02	2.11E-03	1.21E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	9.68E-03	9.68E-03	-	-	1.12E-03	1.12E-03	0.4	0	6.22E-05	6.22E-05
Copper (Cu)	7440-50-8	-	-	0.76	0.76	2.5	0.2	5.93E-02	0.26	-	3.20E-03	2.86E-03	6.06E-03
Iron (Fe)	7439-89-6	-	-	134.69	134.69	-	0.22	13.73	13.95	-	0.15	0.78	0.93
Gallium (Ga)	7440-55-3	-	-	5.94E-02	5.94E-02	-	-	6.69E-03	6.69E-03	-	-	3.73E-04	3.73E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	1.21E-02	1.21E-02	-	-	1.40E-03	1.40E-03	0.9	0	7.78E-05	7.78E-05
Mercury (Hg)	7439-97-6	-	-	7.10E-05	7.10E-05	-	6.40E-05	8.22E-06	7.22E-05	5.00E-03	2.00E-03	4.56E-07	2.00E-03
Indium (In)	7440-74-6	-	-	4.89E-05	4.89E-05	-	-	5.67E-06	5.67E-06	-	-	3.14E-07	3.14E-07
Potassium (K)	7440-09-7	-	-	46.81	46.81	-	0.126	4.64	4.76	-	0.13	0.27	0.40
Lanthanum (La)	7439-91-0	-	-	9.63E-02	9.63E-02	-	-	9.42E-03	9.42E-03	-	-	4.13E-04	4.13E-04
Lithium (Li)	7439-93-2	2	0	7.32E-02	7.32E-02	-	-	8.47E-03	8.47E-03	-	-	4.70E-04	4.70E-04
Lutetium (Lu)	7439-94-3	-	-	7.55E-04	7.55E-04	-	-	8.70E-05	8.70E-05	-	-	4.85E-06	4.85E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	41.6	47.6	-	0.19	4.85	5.04	-	9.60E-02	0.27	0.37
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	0.64	0.64	-	8.60E-03	6.22E-02	7.08E-02	8.00E-02	5.00E-03	3.06E-03	8.06E-03
Molybdenum (Mo)	7439-98-7	-	-	1.39E-02	1.39E-02	120	7.60E-04	1.87E-03	2.63E-03	-	7.80E-04	9.21E-05	8.72E-04
Sodium (Na)	7440-23-5	-	-	85.15	85.15	-	0.52	9.48	10.00	-	0.32	0.53	0.85
Niobium (Nb)	7440--03-1	-	-	1.64E-02	1.64E-02	-	-	1.89E-03	1.89E-03	-	-	1.05E-04	1.05E-04

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) [3]			
		Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration
Nickel (Ni)	7440-02-0	-	-	8.68E-02	8.68E-02	7.00E-02	5.00E-03	8.47E-03	1.35E-02	2.00E-02	2.00E-03	3.30E-04	2.33E-03
Phosphorus (P)	7723-14-0	-	-	1.39	1.39	0.5	-	0.2	0.2	-	-	1.07E-02	1.07E-02
Lead (Pb)	7439-92-1	-	-	3.40E-02	3.40E-02	-	3.40E-03	4.79E-03	8.19E-03	0.1	4.00E-03	2.52E-04	4.25E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	0.22	0.22	4	0	2.51E-02	2.51E-02	-	-	1.39E-03	1.39E-03
Sulphur (S)	7704-34-9	-	-	13.39	13.39	-	-	1.31	1.31	-	-	5.79E-02	5.79E-02
Antimony (Sb)	7440-36-0	-	-	1.53E-02	1.53E-02	-	1.26E-03	1.76E-03	3.02E-03	0.17	7.00E-03	8.25E-05	7.08E-03
Scandium (Sc)	7440-20-2	-	-	5.08E-02	5.08E-02	-	-	4.97E-03	4.97E-03	-	-	2.59E-04	2.59E-04
Selenium (Se)	7782-49-2	2	0.15	9.94E-04	0.15	-	2.60E-03	1.15E-04	2.72E-03	-	2.60E-03	6.38E-06	2.61E-03
Tin (Sn)	7440-31-5	-	-	2.63E-02	2.63E-02	-	-	3.04E-03	3.04E-03	0.1	0	1.69E-04	1.69E-04
Strontium (Sr)	7440-24-6	-	-	0.67	0.67	-	1.50E-03	9.97E-02	0.10	-	1.48E-03	5.16E-03	6.64E-03
Tantalum (Ta)	7440-25-7	-	-	2.67E-03	2.67E-03	25	-	3.10E-04	3.10E-04	-	-	1.72E-05	1.72E-05
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.75E-03	1.75E-03	-	-	2.03E-04	2.03E-04	-	-	1.13E-05	1.13E-05
Tellurium (Te)	13494-80-9	1	0	5.78E-04	5.78E-04	-	-	6.69E-05	6.69E-05	-	-	3.71E-06	3.71E-06
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	5.36	5.36	2.5	0	0.5	0.5	-	-	2.28E-02	2.28E-02
Thallium (Tl)	7440-28-0	-	-	2.88E-03	2.88E-03	-	2.60E-04	3.33E-04	5.93E-04	0.25	5.00E-03	1.85E-05	5.02E-03
Uranium (U)	7440-61-1	-	-	4.03E-03	4.03E-03	0.3	2.60E-04	4.67E-04	7.27E-04	6.00E-02	2.60E-04	2.59E-05	2.86E-04
Vanadium (v)	7440-62-2	-	-	0.42	0.42	-	7.60E-04	4.09E-02	4.16E-02	1	1.00E-02	2.28E-03	1.23E-02
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	6.06E-02	6.06E-02	5.4	0	8.93E-03	8.93E-03	-	-	4.15E-04	4.15E-04
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	4.32E-02	4.32E-02	13	0	5.01E-03	5.01E-03	2.8	0	2.78E-04	2.78E-04
Ytterbium (Yb)	7440-64-4	-	-	4.99E-03	4.99E-03	-	-	5.78E-04	5.78E-04	-	-	3.20E-05	3.20E-05
Zinc (Zn)	7440-66-6	-	-	0.30	0.30	2.5	0.1	3.65E-02	0.14	-	1.40E-02	1.85E-03	1.58E-02
Zirconium (Zr)	7440-67-7	-	-	0.27	0.27	2.5	0	3.14E-02	3.14E-02	-	-	1.74E-03	1.74E-03
Silicon Dioxide (SiO_2)	7631-86-9	-	-	1822.65	1822.65	-	-	205.51	205.51	-	-	11.46	11.46
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	420.40	420.40	-	-	49.35	49.35	-	-	2.73	2.73
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	184.27	184.27	-	-	21.71	21.71	-	-	1.20	1.20
Magnesium Oxide (MgO)	1309-48-4	-	-	69.39	69.39	-	-	8.86	8.86	-	-	0.48	0.48
Calcium Oxide (CaO)	1305-78-8	-	-	118.35	118.35	-	-	19.83	19.83	-	-	0.95	0.95
Sodium Oxide (Na_2O)	1313-59-3	-	-	110.63	110.63	-	-	11.12	11.12	-	-	0.64	0.64
Potassium Oxide (K_2O)	12136-45-7	-	-	56.99	56.99	-	-	6.45	6.45	-	-	0.36	0.36
Titanium dioxide (TiO_2)	13463-67-7	-	-	9.61	9.61	-	-	0.94	0.94	-	-	3.87E-02	3.87E-02
Phosphorus Pentoxide (P_2O_5)	1314-56-3	-	-	3.10	3.10	1	-	0.4	0.4	-	-	2.27E-02	2.27E-02
Manganese Oxide (MnO)	1344-43-0	-	-	0.86	0.86	-	-	8.37E-02	8.37E-02	-	-	4.58E-03	4.58E-03
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	0.95	0.95	-	-	9.57E-02	9.57E-02	-	-	5.47E-03	5.47E-03
Vanadium Pentoxide (V_2O_5)	1314-62-1	-	-	0.78	0.78	1	-	8.79E-02	8.79E-02	-	-	4.91E-03	4.91E-03
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	7.28	7.28	-	-	0.84	0.84	-	-	4.68E-02	4.68E-02
Bornite (Cu_5FeS_4)	1308-82-3	-	-	0.26	0.26	-	-	3.04E-02	3.04E-02	-	-	1.69E-03	1.69E-03
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	0.20	0.20	-	-	2.34E-02	2.34E-02	-	-	1.30E-03	1.30E-03

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) (3)			
		Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) (1)	Cumulative Concentration
Tetrahedrite ($Cu_{12}Sb_4S_{13}$)/Tennantite ($Cu_{12}As_4S_{13}$)	n/a, 12178-49-3	-	-	8.16E-02	8.16E-02	-	-	9.45E-03	9.45E-03	-	-	5.24E-04	5.24E-04
Cuprite (CU_2O)	1317-39-1	-	-	0.14	0.14	-	-	1.64E-02	1.64E-02	-	-	9.12E-04	9.12E-04
Galena (PbS)	1314-87-0	-	-	0.57	0.57	-	-	6.65E-02	6.65E-02	-	-	3.69E-03	3.69E-03
Sphalerite (ZnS)	1314-98-3	-	-	1.18	1.18	1	-	0.1	0.1	-	-	7.57E-03	7.57E-03
Pyrite (Fe,S_2)	1309-36-0	-	-	21.40	21.40	120	-	2.1	2.1	-	-	0.12	0.12
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	17.94	17.94	-	-	2.08	2.08	-	-	0.12	0.12
Arsenopyrite (FeAsS)	1303-18-0	-	-	0.69	0.69	-	-	7.94E-02	7.94E-02	-	-	4.40E-03	4.40E-03
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	10.07	10.07	-	-	0.98	0.98	-	-	4.43E-02	4.43E-02
Quartz	14808-60-7	23	6	139.8	145.8	-	0.99	13.63	14.62	7.00E-02	4.00E-02	0.68	0.72
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	n/a	-	-	1206.69	1206.69	-	-	177.03	177.03	-	-	9.45	9.45
K-Feldspars ($KAlSi_3O_8$)	n/a	-	-	82.89	82.89	-	-	9.60	9.60	-	-	0.53	0.53
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	327.59	327.59	-	-	32.00	32.00	-	-	1.65	1.65
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	-	-	125.08	125.08	8.00E-05	-	12.23	12.23	-	-	0.44	0.44
Chlorite ($Fe,(Mg, Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$	14998-27-7	-	-	30.80	30.80	-	-	3.01	3.01	-	-	0.14	0.14
Muscovite ($KAl_2(Si_3Al)O_{10}(OH)_2$)	1318-94-1	-	-	148.04	148.04	1.5	-	14.5	14.5	-	-	0.45	0.45
Epidote ($Ca_2)(Al_2Fe^{3+})O[Si_2O_7][SiO_4](OH)$	n/a	-	-	47.77	47.77	-	-	5.53	5.53	-	-	0.31	0.31
Augite ($(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)_2O_6$)	n/a	-	-	0.70	0.70	-	-	6.85E-02	6.85E-02	-	-	3.09E-03	3.09E-03
Andradite ($Ca_3Fe_2(SiO_4)_3$)	15078-96-3	-	-	7.01	7.01	-	-	0.81	0.81	-	-	4.50E-02	4.50E-02
Kaolinite ($Al_2Si_2O_5(OH)_4$)	1318-74-7	-	-	1.70	1.70	-	-	0.20	0.20	-	-	1.09E-02	1.09E-02
Calcite ($CaCO_3$)	1317-65-3	-	-	29.63	29.63	-	-	2.90	2.90	-	-	0.11	0.11
Dolomite ($CaMg(CO_3)_2$)/Ankerite ($Ca(Fe,Mg,Mn)(CO_3)_2$)	16389-88-1, n/a	-	-	0.66	0.66	-	-	6.45E-02	6.45E-02	-	-	2.91E-03	2.91E-03
Titanite ($CaTiSiO_5$)	n/a	-	-	9.58	9.58	-	-	0.94	0.94	-	-	2.93E-02	2.93E-02
Apatite ($Ca_5(PO_4)_3$)	1306-05-4	-	-	7.60	7.60	-	-	0.88	0.88	-	-	4.88E-02	4.88E-02
Mica	12001-26-2	30	0	304.1	304.1	-	-	35.22	35.22	7	0	2.0	2.0
Tremolite ($Ca_2(Mg5.0-4.5Fe^{2+}0.0-0.5)Si_8O_{22}(OH)_2$)	77536-68-6	-	-	150.20	150.20	8.00E-05	-	17.39	17.39	-	-	0.97	0.97
Bytownite ($(Ca,Na)(Si,Al)_4O_8$	n/a	-	-	122.66	122.66	-	-	14.21	14.21	-	-	0.79	0.79
Labradorite $(Na,Ca)_{1-2}Si_{3-2}\ O_8$	n/a	-	-	95.12	95.12	-	-	11.02	11.02	-	-	0.61	0.61
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	331.91	331.91	-	-	38.44	38.44	-	-	2.13	2.13
Oligoclase $(Na,Ca)(Si,Al)_4O_8$	n/a	-	-	724.02	724.02	-	-	83.85	83.85	-	-	4.65	4.65
Albite ($NaAlSi_3O_8$)	n/a	-	-	270.02	270.02	-	-	31.27	31.27	-	-	1.73	1.73
Phlogopite ($KMg_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	39.47	39.47	-	-	4.57	4.57	-	-	0.25	0.25
Sillimanite (Al_2SiO_5)	12141-45-6	-	-	12.49	12.49	-	-	1.45	1.45	-	-	8.03E-02	8.03E-02
Combustion Gases													
Carbon Monoxide (CO)	630-08-0	34000	600	2380.1	2980.1	-	-	21.42	21.42	-	-	1.14	1.14
Sulphur Dioxide (SO_2)	7446-09-5	-	-	188.38	188.38	288	50	6.3	56.3	52	20	0.37	20.4

CoPC	CAS Number	1-Hour Average (µg/m^3)				24-Hour Average (µg/m^3)				Annual Average (µg/m^3) [3]			
		Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration	Criteria	Background	Max Predicted (Project Alone) [1]	Cumulative Concentration
Hydrocarbons	<<NMHC>>	-	-	30.23	30.23	-	-	2.59	2.59	-	-	0.16	0.16
Nitrogen Dioxide (NO_2) [2]	10102-44-0	414	150	667.7	817.7	207	100	80.3	180.3	103	30	9.0	39.0
1,3-butadiene	106-99-0	-	-	1.96E-02	1.96E-02	-	0.6	2.11E-03	0.60	0.5	0.14	1.50E-04	0.14
Acenaphthene	83-32-9	-	-	7.35E-03	7.35E-03	-	4.41E-03	6.87E-04	5.10E-03	-	8.46E-04	5.30E-05	8.99E-04
Acenaphthylene	208-96-8	-	-	1.45E-02	1.45E-02	-	8.15E-03	1.39E-03	9.54E-03	-	1.56E-03	1.07E-04	1.67E-03
Acetaldehyde	75-07-0	-	-	1.10	1.10	-	-	0.12	0.12	0.5	-	8.43E-03	8.43E-03
Acrolein	107-02-8	-	-	0.20	0.20	-	-	2.13E-02	2.13E-02	2.00E-02	-	1.53E-03	1.53E-03
Anthracene	120-12-7	-	-	1.38E-03	1.38E-03	-	1.61E-04	1.21E-04	2.82E-04	-	3.08E-05	9.73E-06	4.05E-05
Benzene	71-43-2	-	-	0.71	0.71	10	3	6.22E-02	3.1	-	0.4	4.99E-03	0.40
Benzo(a)anthracene	56-55-3	-	-	2.62E-04	2.62E-04	-	-	2.27E-05	2.27E-05	-	-	1.60E-06	1.60E-06
Benzo(a)pyrene	50-32-8	-	-	9.93E-05	9.93E-05	-	5.29E-05	8.56E-06	6.15E-05	9.00E-04	3.00E-04	5.82E-07	3.01E-04
Benzo(b+k)fluoranthene	205-99-2	-	-	3.64E-04	3.64E-04	-	2.79E-04	3.13E-05	3.10E-04	-	5.35E-05	1.99E-06	5.55E-05
Benzo(g,h,i)perylene	191-24-2	-	-	2.23E-04	2.23E-04	-	-	1.94E-05	1.94E-05	-	-	1.35E-06	1.35E-06
Chrysene	218-01-9	-	-	4.94E-04	4.94E-04	-	3.38E-04	4.25E-05	3.81E-04	-	6.49E-05	2.68E-06	6.76E-05
Fluoranthene	206-44-0	-	-	2.67E-03	2.67E-03	-	8.15E-04	2.30E-04	1.05E-03	-	1.56E-04	1.81E-05	1.74E-04
Fluorene	86-73-7	-	-	1.15E-02	1.15E-02	-	1.47E-03	9.98E-04	2.47E-03	-	2.82E-04	7.94E-05	3.61E-04
Formaldehyde	50-00-0	-	-	0.91	0.91	-	-	9.89E-02	9.89E-02	-	-	7.09E-03	7.09E-03
Phenanthrene	85-01-8	-	-	2.35E-02	2.35E-02	-	2.21E-03	2.00E-03	4.21E-03	-	4.24E-04	1.53E-04	5.77E-04
Pyrene	129-00-0	-	-	2.53E-03	2.53E-03	-	-	2.17E-04	2.17E-04	13	0	1.70E-05	1.70E-05
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	<<DPM>>	-	-	12.72	12.72	-	9.40E-02	1.09	1.18	-	1.82E-02	7.80E-02	9.62E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	8.3	8.3	-	-	0.71	0.71	0.3	0	5.07E-02	5.07E-02
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	2.43E-04	2.43E-04	-	-	2.09E-05	2.09E-05	2.40E-03	1.40E-03	1.51E-06	1.40E-03
Reagents													
Calcium Oxide	1305-78-8	-	-	118.35	118.35	-	-	19.83	19.83	-	-	0.95	0.95
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	0.72	0.72	-	-	9.71E-02	9.71E-02	-	-	2.85E-03	2.85E-03
Sodium sulphite	7757-83-7	-	-	5.13	5.13	0.14	-	0.69	0.69	-	-	2.03E-02	2.03E-02
Zinc sulphate	7733-02-0	-	-	0.25	0.25	1	-	3.33E-02	3.33E-02	-	-	9.78E-04	9.78E-04
Sodium trithiocarbonate	534-18-9	-	-	0.30	0.30	-	-	4.00E-02	4.00E-02	-	-	1.17E-03	1.17E-03
Magnafloc 10	N/A	-	-	0.99	0.99	-	-	0.13	0.13	-	-	3.91E-03	3.91E-03

Notes:

1. Model predictions include main access road within Project area using the base case modelling method.
2. Maximum predicted NO_2 concentrations using the OLM method.
3. Annual average concentrations for particulate and metals were adjusted for the number of precipitation days in a year.

5.2.2 Operations - Special and Discrete Receptor Modelling Results

This section presents the dispersion model predictions of ambient CoPC concentrations at special receptor locations relevant to human exposure. The discrete receptor results are utilized in other technical data reports and are not included in this section.

5.2.2.1 Operations – Project Alone

A summary of the maximum predicted CoPC GLCs over all assessed special receptors for the Project Alone, operations scenario is presented in Table 5-5. The maximum predicted concentration of each CoPC at each special or discrete receptor is tabulated in APPENDIX F of this assessment.

The maximum predicted Project Alone concentrations for 126 of 132 CoPCs are below the MELCCFP or MECP criteria for all six special receptors assessed. The following CoPCs are predicted to have Project Alone concentrations above the applicable criteria:

- 1-hour average elemental carbon in diesel exhaust
- 1-hour average quartz in PM_{10}
- 1-hour average period for mica
- 24-hour average muscovite
- 24-hour average tremolite
- 24-hour average actinolite

Exceedances of the 1-hour average elemental carbon criterion are predicted at all six special receptors. The maximum predicted concentration of elemental carbon was 2.5 µg/m^3 which exceeds the Quebec criterion by 150%.

Exceedances of the 1-hour average quartz in PM_{10} criterion are predicted at two special receptors: Cree Camps CC3 and CC4, which are both adjacent to the main access road. The maximum predicted concentration of quartz was 26.4 µg/m^3 which exceeds the Quebec criterion of 23 µg/m^3 by 15%.

Exceedances of the 1-hour average mica criterion are predicted at two special receptors: Cree Camps CC3 and CC4 (adjacent to the main access road). The maximum predicted concentration of mica was 35 µg/m^3 which exceeds the Quebec criterion of 30 µg/m^3 by 17%.

The maximum predicted 24-hour average concentration of muscovite is above the Ontario Air Quality Screening Level (the MELCCFP does not have a criterion for muscovite). The highest predicted muscovite concentration of 1.6 ug/m^3 is slightly above the screening level of 1.5 ug/m^3 at special receptor Cree Camp CC4. The Ontario screening levels are triggers for additional assessment to ensure that the predicted concentrations will not result in adverse effects, which is addressed in the Human Health and Ecological Risk Assessment.

The maximum predicted 24-hour average concentrations of actinolite and tremolite are above the Ontario Air Quality Screening Levels which are based on health effects from asbestos. The MELCCFP does not have criteria for actinolite or tremolite. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level. As noted in Section 1.6, tremolite and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

5.2.2.2 Operations – Cumulative Effects

A summary of the maximum predicted CoPC GLCs over all assessed special receptors for the Project Alone (operations scenario) cumulatively with background air quality levels is presented in Table 5-5. The maximum predicted concentration of each CoPC at each special or discrete is tabulated in APPENDIX F.

The maximum predicted concentrations of the operations CoPCs when considering the Project cumulatively with background air quality are below the MELCCFP or MECP criteria for all six special receptors assessed other than:

- 1-hour average elemental carbon in diesel exhaust
- 1-hour average quartz in PM_{10} and annual average quartz in PM_4
- 1-hour average mica
- 24-hour average muscovite
- 24-hour average tremolite
- 24-hour average actinolite

Exceedances of the 1-hour average elemental carbon criterion are predicted at all six special receptors when considering the Project cumulatively with background air quality. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. Background concentrations of elemental carbon from diesel exhaust are expected to be negligible since there are currently no significant industrial developments in the LSA. The maximum predicted 1-hour average cumulative concentration of elemental carbon is 2.5 $\mu g/m^3$ which exceeds the Quebec criterion by 150%. A frequency analysis was completed, and the exceedance is predicted to occur a maximum of 32 hours over a period of five years (0.073% of the time).

Exceedances of the 1-hour average quartz in PM_{10} criterion are predicted at two special receptors: Cree Camps CC3 and CC4, which are adjacent to the main access road. The maximum predicted 1-hour average cumulative concentration is predicted to exceed the Quebec criterion by 41%, however exceedances are predicted to occur a maximum of 5 hours over a period of five years (0.011% of the time). The background quartz in PM_{10} concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.

Exceedances of the annual average quartz in PM_4 criterion are predicted at two special receptors: Cree Camps CC3 and CC4 (adjacent to the main access road) when considering the Project cumulatively with and background air quality. The maximum predicted annual average concentration is 20% above the Quebec criterion of 0.07 µg/m^3 with the background concentration accounting for 48% of the total cumulative concentration. The background quartz in PM_4 concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.

Exceedances of the 1-hour average mica criterion are predicted at two special receptors, Cree Camps CC3 and CC4 (adjacent to the main access road). The cumulative results and frequency are consistent with the Project Alone scenario since the MELCCFP initial concentration is zero. The maximum predicted concentration of mica is 35 µg/m^3 which exceeds the Quebec criterion of 30 µg/m^3 by 17%. An exceedance is predicted to occur a maximum of 1 hour over a period of five years (0.002% of the time).

The maximum predicted 24-hour average muscovite concentration is above the Ontario Air Quality Screening Level (the MELCCFP does not have a criterion for muscovite) and is the same as the Project Alone scenario as no background muscovite concentration is available. The highest predicted muscovite concentration of 1.6 ug/m^3 is slightly above the screening level of 1.5 ug/m^3 at special receptor Cree Camp CC4. The Ontario screening levels are triggers for additional assessment to ensure that the predicted concentrations will not result in adverse effects, which is addressed in the Human Health and Ecological Risk Assessment.

The maximum predicted 24-hour average concentrations of actinolite and tremolite are above the Ontario Air Quality Screening Levels which are based on health effects from asbestos. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level. As noted in Section 1.6, tremolite and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

Table 5-5 Summary of Maximum Predicted CoPC Concentrations at Special Receptors – Operations

CoPC	CAS Number	1-Hour Average (µg/m³)					24-Hour Average (µg/m³)					Annual Average (µg/m³) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Particulates																
PM	<<PM>>	-	-	835.1	835.1	-	120	40	43.3 [8]	83.3 [8]	69%	-	11.6	2.8 [8]	14.4 [8]	-
PM_{10}	<<PM10>>	-	-	323.9	323.9	-	50	13.1	27.9	41.0	82%	-	8.3	1.0	9.3	-
$PM_{2.5}$	<<PM2.5>>	-	-	45.6	45.6	-	30	15	4.4	19.4	65%	-	6.2	0.2	6.4	-
$PM_{2.5}$ – CAAQS [2][4]	<<PM2.5>>	-	-	-	-	-	27	-	1.7	1.7	6%	8.8	-	0.1	0.1	1%
Metals and Metallic Compounds																
Silver (Ag)	7440-22-4	-	-	9.00E-04	9.00E-04	-	-	2.60E-04	6.60E-05	3.26E-04	-	0.23	5.00E-03	2.23E-06	5.00E-03	2%
Aluminum (Al)	7429-90-5	-	-	63.18	63.18	-	-	0.42	6.65	7.07	-	-	0.146	0.27	0.41	-
Arsenic (As)	7440-38-2	-	-	3.35E-02	3.35E-02	-	-	1.26E-03	2.10E-03	3.36E-03	-	3.00E-03	2.00E-03	6.42E-05	2.06E-03	69%
Gold (Au)	7440-57-5	-	-	2.01E-04	2.01E-04	-	1.25	-	1.19E-05	1.19E-05	BSL	-	-	3.40E-07	3.40E-07	-
Boron (B)	7440-42-8	-	-	8.79E-02	8.79E-02	-	-	2.60E-02	8.96E-03	3.50E-02	-	-	2.60E-02	3.57E-04	2.64E-02	-
Barium (Ba)	7440-39-3	-	-	0.31	0.31	-	-	8.60E-03	3.20E-02	4.06E-02	-	5.00E-02	2.00E-02	1.30E-03	2.13E-02	43%
Beryllium (Be)	7440-41-7	-	-	9.86E-04	9.86E-04	-	-	-	1.04E-04	1.04E-04	-	4.00E-04	0	4.05E-06	4.05E-06	1%
Bismuth (Bi)	7440-69-9	-	-	2.14E-03	2.14E-03	-	-	1.30E-03	2.02E-04	1.50E-03	-	-	1.30E-03	7.32E-06	1.30E-02	-
Carbon (C)	7440-44-0	1	0	0.4 [8]	0.4 [8]	44%	-	-	0.12	0.12	-	0.3	0	4.65E-03	4.65E-03	2%
Calcium (Ca)	7440-70-2	-	-	27.39	27.39	-	-	0.68	2.87	3.55	-	-	0.3	0.11	0.41	-
Cadmium (Cd)	7440-43-9	-	-	2.53E-03	2.53E-03	-	-	2.60E-04	1.56E-04	4.16E-04	-	3.60E-03	5.00E-04	4.63E-06	5.05E-04	14%
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	6.05E-02	6.05E-02	0%	-	-	6.37E-03	6.37E-03	-	0.7	0	2.54E-04	2.54E-04	0%
Cobalt (Co)	7440-48-4	-	-	1.97E-02	1.97E-02	-	-	-	1.86E-03	1.86E-03	-	0.1	0	7.17E-05	7.17E-05	0%
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	0.14	0.14	-	-	6.00E-03	1.20E-02	1.80E-02	-	0.1	1.00E-02	3.42E-04	1.03E-02	10%
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	2.84E-03	2.84E-03	0%	-	-	2.99E-04	2.99E-04	-	0.4	0	1.19E-05	1.19E-05	0%
Copper (Cu)	7440-50-8	-	-	0.24	0.24	-	2.5	0.2	1.62E-02	0.22	9%	-	3.20E-03	5.16E-04	3.72E-03	-
Iron (Fe)	7439-89-6	-	-	36.15	36.15	-	-	0.22	3.69	3.91	-	-	0.15	0.15	0.30	-
Gallium (Ga)	7440-55-3	-	-	1.71E-02	1.71E-02	-	-	-	1.79E-03	1.79E-03	-	-	-	7.12E-05	7.12E-05	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	3.55E-03	3.55E-03	0%	-	-	3.74E-04	3.74E-04	-	0.9	0	1.49E-05	1.49E-05	0%
Mercury (Hg)	7439-97-6	-	-	2.10E-05	2.10E-05	-	-	6.40E-05	2.19E-06	6.62E-05	-	5.00E-03	2.00E-03	8.75E-08	2.00E-03	40%
Indium (In)	7440-74-6	-	-	1.43E-05	1.43E-05	-	-	-	1.51E-06	1.51E-06	-	-	-	6.03E-08	6.03E-08	-
Potassium (K)	7440-09-7	-	-	12.21	12.21	-	-	0.126	1.25	1.37	-	-	0.13	4.99E-02	0.18	-
Lanthanum (La)	7439-91-0	-	-	2.12E-02	2.12E-02	-	-	-	1.93E-03	1.93E-03	-	-	-	7.32E-05	7.32E-05	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Lithium (Li)	7439-93-2	2	0	2.15E-02	2.15E-02	1%	-	-	2.26E-03	2.26E-03	-	-	-	9.02E-05	9.02E-05	-
Lutetium (Lu)	7439-94-3	-	-	2.21E-04	2.21E-04	-	-	-	2.33E-05	2.33E-05	-	-	-	9.31E-07	9.31E-07	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	12.3	18.3	76%	-	0.19	1.29	1.48	-	-	9.60E-02	0.05	0.15	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	0.17	0.17	-	-	8.60E-03	1.40E-02	2.26E-02	-	8.00E-02	5.00E-03	5.30E-04	5.53E-03	7%
Molybdenum (Mo)	7439-98-7	-	-	5.22E-03	5.22E-03	-	120	7.60E-04	5.07E-04	1.27E-03	0%	-	7.80E-04	1.91E-05	7.99E-04	-
Sodium (Na)	7440-23-5	-	-	24.06	24.06	-	-	0.52	2.53	3.05	-	-	0.32	0.10	0.42	-
Niobium (Nb)	7440--03-1	-	-	4.80E-03	4.80E-03	-	-	-	5.05E-04	5.05E-04	-	-	-	2.01E-05	2.01E-05	-
Nickel (Ni)	7440-02-0	-	-	1.91E-02	1.91E-02	-	7.00E-02	5.00E-03	1.67E-03	6.67E-03	10%	2.00E-02	2.00E-03	5.41E-05	2.05E-03	10%
Phosphorus (P)	7723-14-0	-	-	0.20 [8]	0.20 [8]	-	0.5	-	5.36E-02	5.36E-02	BSL	-	-	2.11E-03	2.11E-03	-
Lead (Pb)	7439-92-1	-	-	1.30E-02	1.30E-02	-	-	3.40E-03	1.29E-03	4.69E-03	-	0.1	4.00E-03	4.96E-05	4.05E-03	4%
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	6.34E-02	6.34E-02	-	4	0	6.68E-03	6.68E-03	0%	-	-	2.67E-04	2.67E-04	-
Sulphur (S)	7704-34-9	-	-	2.97	2.97	-	-	-	0.27	0.27	-	-	-	1.03E-02	1.03E-02	-
Antimony (Sb)	7440-36-0	-	-	5.47E-03	5.47E-03	-	-	1.26E-03	4.90E-04	1.75E-03	-	0.17	7.00E-03	1.75E-05	7.02E-03	4%
Scandium (Sc)	7440-20-2	-	-	1.16E-02	1.16E-02	-	-	-	1.18E-03	1.18E-03	-	-	-	4.76E-05	4.76E-05	-
Selenium (Se)	7782-49-2	2	0.15	2.91E-04	0.15	8%	-	2.60E-03	3.10E-05	2.63E-03	-	-	2.60E-03	1.23E-06	2.60E-03	-
Tin (Sn)	7440-31-5	-	-	7.70E-03	7.70E-03	-	-	-	8.11E-04	8.11E-04	-	0.1	0	3.26E-05	3.26E-05	0%
Strontium (Sr)	7440-24-6	-	-	0.25	0.25	-	-	1.50E-03	2.66E-02	2.81E-02	-	-	1.48E-03	1.04E-03	2.52E-03	-
Tantalum (Ta)	7440-25-7	-	-	7.84E-04	7.84E-04	-	25	-	8.30E-05	8.30E-05	BSL	-	-	3.30E-06	3.30E-06	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	5.13E-04	5.13E-04	-	-	-	5.40E-05	5.40E-05	-	-	-	2.16E-06	2.16E-06	-
Tellurium (Te)	13494-80-9	1	0	1.69E-04	1.69E-04	0%	-	-	1.78E-05	1.78E-05	-	-	-	7.13E-07	7.13E-07	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	1.28	1.28	-	2.5	0	0.11	0.11	4%	-	-	3.84E-03	3.84E-03	-
Thallium (Tl)	7440-28-0	-	-	8.44E-04	8.44E-04	-	-	2.60E-04	8.90E-05	3.49E-04	-	0.25	5.00E-03	3.55E-06	5.00E-03	2%
Uranium (U)	7440-61-1	-	-	1.18E-03	1.18E-03	-	0.3	2.60E-04	1.24E-04	3.84E-04	0%	6.00E-02	2.60E-04	4.97E-06	2.65E-04	0%
Vanadium (v)	7440-62-2	-	-	0.11	0.11	-	-	7.60E-04	1.06E-02	1.14E-02	-	1	1.00E-02	4.25E-04	1.04E-02	1%
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	2.35E-02	2.35E-02	-	5	0	2.40E-03	2.40E-03	0%	-	-	8.92E-05	8.92E-05	-
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	1.27E-02	1.27E-02	-	13	0	1.34E-03	1.34E-03	0%	2.8	0	5.31E-05	5.31E-05	0%
Ytterbium (Yb)	7440-64-4	-	-	1.46E-03	1.46E-03	-	-	-	1.54E-04	1.54E-04	-	-	-	6.15E-06	6.15E-06	-
Zinc (Zn)	7440-66-6	-	-	0.11	0.11	-	2.5	0.1	1.01E-02	0.11	4%	-	1.40E-02	3.73E-04	1.44E-02	-
Zirconium (Zr)	7440-67-7	-	-	7.94E-02	7.94E-02	-	2.5	0	8.36E-03	8.36E-03	0%	-	-	3.34E-04	3.34E-04	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Silicon Dioxide (SiO_2)	7631-86-9	-	-	521.34	521.34	-	-	-	54.81	54.81	-	-	-	2.19	2.19	-
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	124.98	124.98	-	-	-	13.16	13.16	-	-	-	0.52	0.52	-
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	54.99	54.99	-	-	-	5.79	5.79	-	-	-	0.23	0.23	-
Magnesium Oxide (MgO)	1309-48-4	-	-	22.45	22.45	-	-	-	2.36	2.36	-	-	-	9.37E-02	9.37E-02	-
Calcium Oxide (CaO)	1305-78-8	-	-	45.62	45.62	-	-	-	4.60	4.60	-	-	-	0.18	0.18	-
Sodium Oxide (Na_2O)	1313-59-3	-	-	28.37	28.37	-	-	-	2.97	2.97	-	-	-	0.12	0.12	-
Potassium Oxide (K_2O)	12136-45-7	-	-	16.35	16.35	-	-	-	1.72	1.72	-	-	-	6.88E-02	6.88E-02	-
Titanium dioxide (TiO_2)	13463-67-7	-	-	2.12	2.12	-	-	-	0.19	0.19	-	-	-	6.44E-03	6.44E-03	-
Phosphorus Pentoxide (P_2O_5)	1314-56-3	-	-	1.07	1.07	-	1	-	0.1	0.1	BSL	-	-	4.44E-03	4.44E-03	-
Manganese Oxide (MnO)	1344-43-0	-	-	0.26	0.26	-	-	-	2.16E-02	2.16E-02	-	-	-	8.09E-04	8.09E-04	-
Chromium Oxide (Cr_2O_3)	1308-38-9	-	-	0.24	0.24	-	-	-	2.55E-02	2.55E-02	-	-	-	1.03E-03	1.03E-03	-
Vanadium Pentoxide (V_2O_5)	1314-62-1	-	-	0.22	0.22	-	1	-	2.34E-02	2.34E-02	BSL	-	-	9.39E-04	9.39E-04	-
Chalcopyrite ($CuFeS_2$)	1308-56-1	-	-	2.14	2.14	-	-	-	0.22	0.22	-	-	-	8.98E-03	8.98E-03	-
Bornite (Cu_5FeS_4)	1308-82-3	-	-	7.70E-02	7.70E-02	-	-	-	8.11E-03	8.11E-03	-	-	-	3.24E-04	3.24E-04	-
Chalcocite (Cu_2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	5.93E-02	5.93E-02	-	-	-	6.25E-03	6.25E-03	-	-	-	2.50E-04	2.50E-04	-
Tetrahedrite ($Cu_{12}Sb_4S_{13}$)/Tennantite ($Cu_{12}As_4S_{13}$)	n/a, 12178-49-3	-	-	2.39E-02	2.39E-02	-	-	-	2.52E-03	2.52E-03	-	-	-	1.01E-04	1.01E-04	-
Cuprite (CU_2O)	1317-39-1	-	-	4.16E-02	4.16E-02	-	-	-	4.38E-03	4.38E-03	-	-	-	1.75E-04	1.75E-04	-
Galena (PbS)	1314-87-0	-	-	0.17	0.17	-	-	-	1.77E-02	1.77E-02	-	-	-	7.08E-04	7.08E-04	-
Sphalerite (ZnS)	1314-98-3	-	-	0.35	0.35	-	1	-	3.64E-02	3.64E-02	BSL	-	-	1.45E-03	1.45E-03	-
Pyrite (Fe,S_2)	1309-36-0	-	-	5.50	5.50	-	120	-	0.54	0.54	BSL	-	-	2.17E-02	2.17E-02	-
Pyrrhotite (Fe_7S_8)	12305-96-3	-	-	5.26	5.26	-	-	-	0.55	0.55	-	-	-	2.21E-02	2.21E-02	-
Arsenopyrite (FeAsS)	1303-18-0	-	-	0.20	0.20	-	-	-	2.12E-02	2.12E-02	-	-	-	8.45E-04	8.45E-04	-
Ilmenite $(Fe,Ti)_2O_3$	12168-52-4	-	-	2.36	2.36	-	-	-	0.20	0.20	-	-	-	7.54E-03	7.54E-03	-
Quartz	14808-60-7	23	6	26.4 [8]	32.4 [8]	**141%**	-	0.99	2.79 [8]	3.78 [8]	-	7.00E-02	4.00E-02	4.37E-02	8.37E-02	**120%**
Plagioclase ($NaAlSi_3O_8$ – $CaAl_2Si_2O_8$)	n/a	-	-	451.70	451.70	-	-	-	47.24	47.24	-	-	-	1.86	1.86	-
K-Feldspars ($KAlSi_3O_8$)	n/a	-	-	24.31	24.31	-	-	-	2.56	2.56	-	-	-	0.10	0.10	-
Biotite($K(Mg,Fe)_3AlSi_3O_{10}(F,OH)_2$)	n/a	-	-	79.57	79.57	-	-	-	7.61	7.61	-	-	-	0.30	0.30	-
Actinolite ($Ca_2(Mg4.5–2.5Fe^{2+}0.5–2.5)Si_8O_{22}(OH)_2$)	77536-66-4	-	-	27.71	27.71	-	8.00E-05	-	1.50 [8]	1.50 [8]	ASL	-	-	5.75E-02 [8]	5.75E-02 [8]	-

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Chlorite (Fe,(Mg, Mn)$_5$,Al)(Si$_3$Al)O$_{10}$(OH)$_8$	14998-27-7	-	-	7.22	7.22	-	-	-	0.63	0.63	-	-	-	2.31E-02	2.31E-02	-
Muscovite (KAl$_2$(Si$_3$Al)O$_{10}$(OH)$_2$)	1318-94-1	-	-	32.77	32.77	-	1.5	-	1.6 [8]	1.6 [8]	ASL	-	-	5.53E-02	5.53E-02	-
Epidote (Ca$_2$)(Al$_2$Fe^{3+})O[Si$_2$O$_7$][SiO$_4$](OH)	n/a	-	-	14.01	14.01	-	-	-	1.48	1.48	-	-	-	5.89E-02	5.89E-02	-
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)$_2$O$_6$)	n/a	-	-	0.16	0.16	-	-	-	1.43E-02	1.43E-02	-	-	-	5.26E-04	5.26E-04	-
Andradite (Ca$_3$Fe$_2$(SiO$_4$)$_3$)	15078-96-3	-	-	2.05	2.05	-	-	-	0.22	0.22	-	-	-	8.64E-03	8.64E-03	-
Kaolinite (Al$_2$Si$_2$O$_5$(OH)$_4$)	1318-74-7	-	-	0.50	0.50	-	-	-	5.24E-02	5.24E-02	-	-	-	2.09E-03	2.09E-03	-
Calcite (CaCO$_3$)	1317-65-3	-	-	6.57	6.57	-	-	-	0.57	0.57	-	-	-	1.92E-02	1.92E-02	-
Dolomite (CaMg(CO$_3$)$_2$)/Ankerite (Ca(Fe,Mg,Mn)(CO$_3$)$_2$)	16389-88-1, n/a	-	-	0.16	0.16	-	-	-	1.34E-02	1.34E-02	-	-	-	4.95E-04	4.95E-04	-
Titanite (CaTiSiO$_5$)	n/a	-	-	2.12	2.12	-	-	-	0.17	0.17	-	-	-	3.68E-03	3.68E-03	-
Apatite (Ca$_5$(PO$_4$)$_3$)	1306-05-4	-	-	2.23	2.23	-	-	-	0.23	0.23	-	-	-	9.37E-03	9.37E-03	-
Mica	12001-26-2	30	0	35.0 [8]	35.0 [8]	**117%**	-	-	9.39	9.39	-	7	0	0.4	0.4	5%
Tremolite (Ca$_2$(Mg5.0-4.5Fe^{2+}0.0-0.5)Si$_8$O$_{22}$(OH)$_2$)	77536-68-6	-	-	44.05	44.05	-	8.00E-05	-	4.64 [8]	4.64 [8]	ASL	-	-	0.15 [8]	0.15 [8]	-
Bytownite (Ca,Na)(Si,Al)$_4$O$_8$	n/a	-	-	35.97	35.97	-	-	-	3.79	3.79	-	-	-	0.15	0.15	-
Labradorite (Na,Ca)$_{1-2}$Si$_{3-2}$ O$_8$	n/a	-	-	27.89	27.89	-	-	-	2.94	2.94	-	-	-	0.12	0.12	-
Andesine (Na,Ca)Al$_{1-2}$Si$_{3-2}$O$_8$	96158-02-0	-	-	97.33	97.33	-	-	-	10.25	10.25	-	-	-	0.41	0.41	-
Oligoclase (Na,Ca)(Si,Al)$_4$O$_8$	n/a	-	-	212.32	212.32	-	-	-	22.36	22.36	-	-	-	0.89	0.89	-
Albite (NaAlSi$_3$O$_8$)	n/a	-	-	79.18	79.18	-	-	-	8.34	8.34	-	-	-	0.33	0.33	-
Phlogopite (KMg$_3$AlSi$_3$O$_{10}$(F,OH)$_2$)	n/a	-	-	11.57	11.57	-	-	-	1.22	1.22	-	-	-	4.87E-02	4.87E-02	-
Sillimanite (Al$_2$SiO$_5$)	12141-45-6	-	-	3.66	3.66	-	-	-	0.39	0.39	-	-	-	1.54E-02	1.54E-02	-
Combustion Gases																
Carbon Monoxide (CO)	630-08-0	34000	600	556.5	1156.5	3%	-	-	5.81	5.81	-	-	-	0.13	0.13	-
Sulphur Dioxide (SO$_2$)	7446-09-5	-	-	42.79	42.79	-	288	50	0.75	50.75	18%	52	20	2.14E-02	20.0	39%
Sulphur Dioxide (SO$_2$) - CAAQS [2][5]	7446-09-5	179	-	10.8	10.8	6%	-	-	-	-	-	11	-	3.61E-02	3.61E-02	0%
Hydrocarbons	<<NMHC>>	-	-	9.02	9.02	-	-	-	0.66	0.66	-	-	-	1.97E-02	1.97E-02	-
Nitrogen Dioxide (NO$_2$) [6]	10102-44-0	414	150	246.4	396.4	96%	207	100	24.37	124.37	60%	103	30	1.3	31.3	30%
Nitrogen Dioxide (NO$_2$) - CAAQS [2][6][7]	10102-44-0	83	-	122.1	122.1	**147%**	-	-	-	-	-	24	-	1.3	1.3	5%
1,3-butadiene	106-99-0	-	-	5.54E-03	5.54E-03	-	-	0.6	5.47E-04	5.47E-04	-	0.5	0.14	2.28E-05	0.14	28%
Acenaphthene	83-32-9	-	-	2.13E-03	2.13E-03	-	-	4.41E-03	1.98E-04	4.61E-03	-	-	8.46E-04	7.85E-06	8.54E-04	-
Acenaphthylene	208-96-8	-	-	4.16E-03	4.16E-03	-	-	8.15E-03	3.95E-04	8.55E-03	-	-	1.56E-03	1.59E-05	1.58E-03	-
Acetaldehyde	75-07-0	-	-	0.31	0.31	-	-	-	3.08E-02	3.08E-02	-	0.5	-	1.31E-03	1.31E-03	0%

CoPC	CAS Number	1-Hour Average (µg/m^3)					24-Hour Average (µg/m^3)					Annual Average (µg/m^3) [9]				
		Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)	Criteria	Background	Max Predicted (Project Alone) [1][3]	Cumulative Concentration	Percent of Criteria (%)
Acrolein	107-02-8	-	-	5.76E-02	5.76E-02	-	-	-	5.60E-03	5.60E-03	-	2.00E-02	-	2.34E-04	2.34E-04	1%
Anthracene	120-12-7	-	-	4.01E-04	4.01E-04	-	-	1.61E-04	3.70E-05	1.98E-04	-	-	3.08E-05	1.43E-06	3.22E-05	-
Benzene	71-43-2	-	-	0.21	0.21	-	10	3	1.87E-02	3.0	30%	-	0.4	7.22E-04	0.4	-
Benzo(a)anthracene	56-55-3	-	-	7.90E-05	7.90E-05	-	-	-	6.29E-06	6.29E-06	-	-	-	2.15E-07	2.15E-07	-
Benzo(a)pyrene	50-32-8	-	-	2.97E-05	2.97E-05	-	-	5.29E-05	2.32E-06	5.52E-05	-	9.00E-04	3.00E-04	7.65E-08	3.00E-04	33%
Benzo(b+k)fluoranthene	205-99-2	-	-	1.09E-04	1.09E-04	-	-	2.79E-04	8.05E-06	2.87E-04	-	-	5.35E-05	2.47E-07	5.37E-05	-
Benzo(g,h,i)perylene	191-24-2	-	-	6.70E-05	6.70E-05	-	-	-	5.31E-06	5.31E-06	-	-	-	1.77E-07	1.77E-07	-
Chrysene	218-01-9	-	-	1.46E-04	1.46E-04	-	-	3.38E-04	1.09E-05	3.49E-04	-	-	6.49E-05	3.28E-07	6.52E-05	-
Fluoranthene	206-44-0	-	-	7.84E-04	7.84E-04	-	-	8.15E-04	6.90E-05	6.90E-05	-	-	1.56E-04	2.56E-06	1.59E-04	-
Fluorene	86-73-7	-	-	3.37E-03	3.37E-03	-	-	1.47E-03	3.00E-04	1.77E-03	-	-	2.82E-04	1.15E-05	2.93E-04	-
Formaldehyde	50-00-0	-	-	0.26	0.26	-	-	-	2.58E-02	2.58E-02	-	-	-	1.08E-03	1.08E-03	-
Phenanthrene	85-01-8	-	-	6.99E-03	6.99E-03	-	-	2.21E-03	5.88E-04	2.80E-03	-	-	4.24E-04	2.11E-05	4.45E-04	-
Pyrene	129-00-0	-	-	7.44E-04	7.44E-04	-	-	-	6.50E-05	6.50E-05	-	13	0	2.41E-06	2.41E-06	0%
Diesel Particulate Matter ($PM_{2.5}$ from Diesel Combustion)	<<DPM>>	-	-	3.83	3.83	-	-	9.40E-02	0.31	0.40	-	-	1.82E-02	1.08E-02	2.90E-02	-
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	2.5	2.5	**251%**	-	-	0.20	0.20	-	0.3	0	7.02E-03	7.02E-03	2%
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	7.30E-05	7.30E-05	-	-	-	5.89E-06	5.89E-06	-	2.40E-03	1.40E-03	2.03E-07	1.40E-03	58%
Reagents																
Calcium Oxide	1305-78-8	-	-	45.62	45.62	-	-	-	4.60	4.60	-	-	-	0.18	0.18	-
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	0.17	0.17	-	-	-	1.16E-02	1.16E-02	-	-	-	1.54E-04	1.54E-04	-
Sodium sulphite	7757-83-7	-	-	1.18	1.18	-	0.14	-	8.27E-02	8.27E-02	BSL	-	-	1.10E-03	1.10E-03	-
Zinc sulphate	7733-02-0	-	-	5.70E-02	5.70E-02	-	1	-	3.97E-03	3.97E-03	BSL	-	-	5.26E-05	5.26E-05	-
Sodium trithiocarbonate	534-18-9	-	-	6.84E-02	6.84E-02	-	-	-	4.77E-03	4.77E-03	-	-	-	6.32E-05	6.32E-05	-
Magnafloc 10	N/A	-	-	0.23	0.23	-	-	-	1.59E-02	1.59E-02	-	-	-	2.12E-04	2.12E-04	-

Notes:

1. Model predictions include main access road within and outside the Project area.
2. Model predictions include main access road within the Project area.
3. Maximum Special Receptor Concentrations. Other discrete receptor locations used to assess deposition onto LSA waterbodies, fish habitat and terrestrial are not included.
4. Maximum predicted 24-hour and annual $PM_{2.5}$ concentrations are presented in the table and conservatively compared to the CAAQS.
5. Maximum predicted 1-hour and annual SO_2 concentrations expressed using the appropriate CAAQS methodology are presented in the table and conservatively compared to the CAAQS.
6. Maximum predicted 1-hour, 24-hour and annual NO_2 concentration using the OLM method.
7. Maximum predicted 3-year average of the annual 98th percentile of the daily maximum 1-hour average NO_2 concentrations using the OLM method for conservative comparison to the CAAQS.
8. Maximum predicted concentration with plume depletion is compared to the criteria.
9. Annual average concentrations for particulate and metals were adjusted for the number of precipitation days in a year.

5.2.3 Operations – Full Grid Modelling Results

Contour plots of maximum predicted Operations Project Alone PM, $PM_{2.5}$, quartz, arsenic, NO_2, SO_2, B(a)P, benzene, DPM, and elemental carbon concentrations for averaging periods with air quality criteria are presented in APPENDIX J.

Elemental Carbon is predicted to be above its MELCCFP 1-hour criterion for distances extending over 10 km from the Mine, however, as noted in Section 5.2.2.2, exceedances are predicted to occur very infrequently.

A summary of the maximum predicted NO_2, $PM_{2.5}$ and SO_2 concentrations in the appropriate CAAQS metrics are compared to the relevant CAAQS in Table 5-6. Contour plot of the predicted NO_2, $PM_{2.5}$ and SO_2 CAAQS metrics are provided in APPENDIX J.

Table 5-6 Maximum Predicted Full Grid CAAQS Concentrations (µg/m^3) During Operations (Project Alone)

CoPC	Averaging Period	CAAQS	Special Receptors	Discrete Receptors	Fenceline Receptors	Gridded Receptors
NO_2 (Note 1)	1-Hour	83	122	221	265	263
	Annual	24	1.3	5.6	9.0	8.9
$PM_{2.5}$	24-Hr	27	1.7	5.0	8.1	7.9
	Annual	8.8	0.1	1.3	1.6	1.6
SO_2	1-Hour	179	11	55	133	116
	Annual	11	0.04	0.31	0.54	0.52

Notes:

1 - NO_2 predictions utilized the Ozone Limiting Method

2 - Full grid model runs conservatively do not include plume depletion in the predictions.

The maximum predicted 1-hour average NO_2 concentrations are above the CAAQS at special and discrete receptors and over the gridded receptors. Annual average NO_2 concentrations are well below the CAAQS. Exceedances of the 1-hour NO_2 CAAQS are predicted at two special receptors, Cree Camps CC3 and CC4 (adjacent to the main access road). CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

5.3 Assessment of Air Quality at Indigenous Receptors

Air quality levels at special Indigenous receptors (See Section 3.3) were included in the assessment of potential air quality effects. Receptor locations were selected to represent potential areas of current use for traditional purposes by Indigenous nations and were identified based on engagement with Indigenous

nations. The dispersion modelling included five Cree camp locations which were considered special receptors. The modelling results are discussed from the construction and operational phases are discussed in report Section 5.1 and 5.2.

5.4 Deposition Results

Summaries of the maximum predicted 24-hour, monthly and total annual CoPC deposition at each special and discrete receptor are presented in APPENDIX G of this assessment for both the Construction and Operation phases.

Project Alone and Cumulative predicted maximum monthly particulate matter depositions at the special receptors are compared against the MECP (Ontario) monthly criterion for dustfall in Table 5-7 as the MELCCFP (Quebec) does not have a criterion for dustfall. Also presented in the table are maximum predicted total annual particulate deposition (which does not have an Ontario or Quebec criterion). The Ontario monthly deposition criterion is based on a nuisance (soiling) effect. Over the modelled special receptors, the highest predicted Project Alone particulate deposition relative to the regulatory criteria was 10% for construction and 14% for operations at a Cree Camp CC4 located approximately 8 km southwest along the main access road. The highest predicted cumulative particulate depositions were 31% for construction and 36% for operations.

Based on the maximum predicted deposition levels noted in Table 5-7, it is expected that the potential for visible soiling of surfaces due to the Project at the special receptors is low.

Contour plots of total PM maximum 24-hour, monthly and annual depositions over the LSA are presented in APPENDIX K, Figures K-1 to K-3 for construction and APPENDIX L, Figures L-1 to L-3 for operations. The maximum predicted monthly total PM depositions for construction and operations are below the MECP soiling criteria for all locations outside the Modelled Mine Boundary.

Table 5-7 Maximum Predicted Particulate Depositions

CoPC	Mill Phase	Averaging Period	Criteria	UTM Coordinates of Maximum Predicted Total Deposition		Receptor ID	Background Dustfall	Project Alone		Cumulative (Project + Background)	
								Maximum Predicted Deposition	% of Criteria	Maximum Predicted Cumulative Deposition	% of Criteria
			g/m^2	Easting (m)	Northing (m)		g/m^2	g/m^2		g/m^3	
Particulate Deposition (dustfall)	Construction	30 days	7	532176	5644751	CC4	1.5	0.7	10%	2.2	31%
		Annual (total)	NA	532176	5644751	CC4	-	5.3	NA	NA	NA
	Operation	30 days	7	532176	5644751	CC4	1.5	1.0	14%	2.5	36%
		Annual (total)	NA	532176	5644751	CC4	-	7.0	NA	NA	NA

5.5 Ozone Formation

Where a proposed facility emits NO_X and/or VOCs, there may be a potential for an increase in ozone concentrations, particularly in warmer months around mid-day. This occurs when the precursor compounds (NOx and VOCs) are present in conjunction with specific meteorological conditions (i.e., strong solar radiation, high temperatures and low wind speeds). In the immediate vicinity of NO_X emission sources, O_3 concentrations may be decreased due to the NO to NO_2 conversion reaction:

$NO + O_3 \rightarrow NO_2 + O_2$

NOx emissions from vehicle combustion (the primary NOx source for the Project) are primarily NO with only small proportion being NO_2. Therefore, available ambient ozone will be consumed in the conversion of the NO to NO_2 in the vicinity of the Project.

The chemical reactions for the ground level ozone formation do not take place instantaneously but can take hours or days. Ozone levels at a particular location may result from VOC and NOx emissions hundreds or even thousands of kilometres away. Maximum concentrations generally occur well downwind of the source areas of the precursor pollutant emissions (UK APIS 2024), therefore ambient ozone levels in the LSA are not expected to increase due to the Project.

5.6 Potential Acid Input

Potential Acid Input (PAI) is defined as the difference between deposited acidic anions and basic cations. It is expressed in terms of kiloequivalents of hydrogen ion per hectare per year (keq H^+ ha^{-1} y^{-1}). Anion deposition is comprised of total sulphate and nitrate equivalents which are calculated by considering the total deposition of all modelled sulphur and nitrogen species as follows:

$$\left[SO_4^{2-}\right]_{dep.equiv} = 1.5 \left[SO_2\right]_{dep} + 1.0 \left[SO_4^{2-}\right]_{dep}$$

$$\left[NO_3^{-}\right]_{dep.equiv} = 2.07 \left[NO\right]_{dep} + 1.35 \left[NO_2\right]_{dep} + 0.98\left[HNO_3\right]_{dep} + 1.0 \left[NO_3^{-}\right]_{dep}$$

The deposition equivalents in the above equations are expressed in units of kg ha^{-1} yr^{-1}, and the leading constants are the respective ratios of the molecular mass of sulphate/nitrate to that of the species associated with the constant.

The potential acid impact (PAI) can then be calculated from the sulphur and nitrogen deposition rates according to the following equation:

$$PAI = \frac{\left[SO_4^{2-}\right]_{dep.equiv}}{48} + \frac{\left[NO_3^{-}\right]_{dep.equiv}}{62}$$

For this study, PAI were calculated using yearly sulphur and nitrogen deposition fluxes conservatively predicted by AERMOD for each scenario. The sulphur deposition flux was estimated by assuming that either there was no chemical transformation of SO_2 to SO_4^{2-} or there was 100% transformation and the SO_4^{2-} deposition flux was predicted assuming that all SO_4^{2-} was particulate in the $PM_{2.5}$ size range. The larger of these two alternatives was used to conservatively estimate the SO_4^{2-} deposition equivalent. Likewise, the NO_3^- deposition equivalent was conservatively estimated by assuming no chemical transformation to nitrates (NO and NO_2 estimated by running AERMOD with and without the OLM option) or there was 100% transformation and the NO_3^- deposition flux was predicted assuming that all NO_3^- was particulate in the $PM_{2.5}$ size range. The larger of these two alternatives was used to conservatively estimate the NO_3^- deposition equivalent.

Background PAI, for the purposes of the study, was assumed to be insignificant due to the distance of the Project from other notable industrial sources of SO_2 and NO_x emissions. The PAI deposition modelling results demonstrate the incremental effects of the Project PAI deposition in the LSA. Acid deposition is discussed further in the Technical Data Report Surface Water Resources Assessment.

Maximum predicted annual PAI, total N and S loading over all discrete receptors is presented in Table 5-8. A listing of the predictions for individual discrete receptors is provided in APPENDIX H of this assessment. Contour plots of maximum predicted annual N, S and PAI over the LSA are provided in APPENDIX K, Figures K-6 to K-8 and APPENDIX L, Figures L-6 to L-8 for the construction and operations scenarios respectively.

Table 5-8 Maximum Predicted PAI, S and N Deposition Fluxes

Project Phase	Special Receptor ID	UTM Easting (m)	UTM Northing (m)	Max PAI (keq H^+ ha^{-1} y^{-1})	Max N (kg ha^{-1} y^{-1})	Max S (kg ha^{-1} y^{-1})
Construction	CC4	532176	5644751	7.5E-03	0.1	3.0E-04
Operations	CC4	532176	5644751	1.09E-02	0.15	5.05E-03

5.7 Model Sensitivity to Road Dust Mitigation Measures

This section examines the sensitivity of the model results for $PM_{2.5}$ to the haul road control efficiency assumed in the assessment.

As noted in Section 4.2.4.6, a summertime unpaved road control efficiency of 93% was used in the assessment. The 93% control efficiency was based on assuming a combination of water and/or chemical dust suppression and speed limitation which have been documented in the literature to reduce road dust resuspension and contribute to controlling fugitive dust emissions relative to uncontrolled levels.

To examine the potential air quality effects if this level of control efficiency cannot be continuously maintained, a modelling sensitivity study was conducted in which the haul road control efficiencies were varied from the baseline levels assumed in the assessment (93% in the summer and 95% in the winter) to 70%, 50% and 30% in the summer. Research has demonstrated that air quality models typically over-predict ambient air quality from these sources and that, in reality, air quality effects generally only extend

a few hundred metres from the source (Countess, 2001). Therefore, the model results presented in this section are expected to provide a conservative prediction (i.e. over-estimate) of ambient $PM_{2.5}$ levels with varying haul road control efficiency.

Four scenarios were examined for this sensitivity study, which were:

- Baseline – haul road control efficiency of 93% in the summer and 95% in the winter
- Haul road control efficiency of 70% in the summer and 95% in the winter
- Haul road control efficiency of 50% in the summer and 95% in the winter
- Haul road control efficiency of 30% in the summer and 95% in the winter

These scenarios were examined for the operations scenario (which has higher predicted concentrations than construction) and for 24-hour and annual averaging periods.

The maximum predicted $PM_{2.5}$ concentration over all special or discrete receptors for each control efficiency scenario and averaging period are presented in Table 5-8. The ratio of the maximum predicted $PM_{2.5}$ concentration for the haul road control efficiencies of 70%, 50% and 30% to the baseline (93%) case (over all special or discrete receptors) are also presented in this table. For a decrease in control efficiency from baseline to 70%, the maximum predicted special receptor $PM_{2.5}$ concentrations increase by factors of 1.8 and 1.4 for 24-hour and annual averaging periods respectively. For a control efficiency of 50%, the maximum predicted special receptor $PM_{2.5}$ concentrations relative to baseline increase by factors of 2.6 and 1.8 for 24-hour and annual averaging periods respectively. For a control efficiency of 30%, the maximum predicted special receptor $PM_{2.5}$ concentrations relative to baseline increase by factors of 3.5 and 2.3 for 24-hour and annual averaging periods respectively. A similar trend is seen in the discrete receptor predictions. At each receptor, the relative contribution of haul road $PM_{2.5}$ emissions to the overall Project emissions varies, therefore the change in $PM_{2.5}$ concentration for each control efficiency will vary for each receptor.

As noted previously, a 93% summertime control efficiency may be achieved through a combination of control measures. The 70% scenario was included in the assessment as an unlikely worst-case situation - a haul road control efficiency of greater than 70% would be expected to be consistently maintained, with proper fugitive dust management plan implementation.

It should be noted that these model predictions are expected to be conservative for a number of reasons including the following:

- The dispersion model is expected to over-predict the air quality effects of emissions from the haul roads (as noted above, research has demonstrated that air quality models typically over-predict ambient air quality from roads), and the presented model predictions do not include plume deposition or depletion.
- The emissions scenario for operations is based on the maximum material movements overall operating years.

- There are typically about 182 days a year with precipitation (rain or snow) in the LSA. For days with precipitation greater than 2.5 mm (0.1 inch), mitigation measures are normally not required as the rainfall and wet surface naturally mitigates emissions. The modelling for the 24-hour averaging period conservatively assumed that there were no precipitation days.

Table 5-9 Summary of Maximum Predicted Project Alone $PM_{2.5}$ Concentrations for Varying Haul Road Control Efficiencies

Averaging Period	Location	Maximum Predicted $PM_{2.5}$ Concentration				Ratio of Max Predicted Concentration to Max Baseline Prediction		
		Baseline (93% CE)	70% CE	50% CE	30% CE	70% CE	50% CE	30% CE
		µg/m³	µg/m³	µg/m³	µg/m³			
24	Max Over All Special Receptors	4.4	7.0	10.4	13.7	1.76	2.61	3.46
	Max Over All Discrete Receptors	12.2	12.8	18.8	25.8	1.68	2.51	3.35
Annual	Max Over All Special Receptors	0.21	0.21	0.28	0.36	1.37	1.82	2.27
	Max Over All Discrete Receptors	0.74	0.99	1.33	1.66	1.40	1.88	2.35

5.8 Follow-Up and Ambient Monitoring

5.8.1 Dust Management Plan

A Dust Management Plan will be developed for the Project that will include:

- Describing requirements for the routine management of sources of airborne dust during construction and operation
- Track air quality performance and provide feedback to the Environment Manager which may be used to refine the dust suppression program and other potentially significant air quality sources
- Identify complaint response procedures and notification requirements

5.8.2 Construction and Operations Air Quality Monitoring

An Air Quality Follow-up Monitoring Program Plan (AQFMP) will be developed to monitor selected CoPCs that may include dust (PM and/or $PM_{2.5}$), metals in PM, quartz and NO_2 at selected offsite locations during construction and operation. The AQFMP will specify the proposed ambient air quality monitoring program including the type of monitoring, the CoPCs to monitor and the frequency of monitoring.

5.8.3 Closure Air Quality Monitoring

No follow-up ambient air quality monitoring is proposed for Closure.

5.8.4 Emissions Reporting

Troilus will need to submit the required annual report under the federal government's NPRI program under the *Canadian Environmental Protection Act* (1999) and MELCCFP's Respecting mandatory reporting of certain emissions of contaminants into the atmosphere (RMRCECA) program.

6 Summary and Conclusions

The potential for Project-related emissions of air contaminants to cause adverse environmental effects on the atmospheric environment was assessed in this study. The ambient air quality assessment was done for the most part, by comparing the maximum model-predicted concentrations to ambient air quality criteria for each assessment case. As such, the assessment focused on a conservative scenario with the highest potential to cause environmental effects.

A summary of the key atmospheric findings relating to the Project follows.

6.1 Background Air Quality

Background (initial concentration) air quality data published by the MELCCFP in the following documents was used to conservatively characterize air quality in the LSA and to develop conservative background concentration levels to be used in the assessment.

- Quebec Air Quality Standards and Criteria, version 9, Quebec, Air Quality and Climate Branch (MELCCFP, 2025)
- Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017)

The predicted Project CoPCs were combined with background concentrations (where available) to assess cumulative impacts.

Where background concentrations for CoPCs were not available, representative ambient monitoring data from another proposed mining project, the Crawford Nickel Project (Stantec, 2024) was used to estimate background CoPC concentrations. The Crawford Nickel Project is located approximately 42 km north of the City of Timmins, Ontario in a remote area similar to that of the Project, and therefore the background levels are expected to be representative of the Troilus Project background levels. The background levels used in this assessment were the 90th percentile values for short-term averaging periods. For annual averages, an annual average value was used as the background level.

6.2 Mine Boundary Modelling Results

The Modelled Mine Boundary includes a 300 m buffer around the PA similar to those at other mines and industrial areas. The maximum predicted cumulative (Project Alone + Background) GLCs at the Modelled Mine Boundary are above the applicable air quality criteria and screening levels for 6 of 126 CoPCs during the construction phase and 7 of 132 CoPCs during the operation phase. In accordance with the Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects (MELCCFP, 2017), Troilus is applying the mitigation measures listed in Sections 4.2.7.1 and 4.2.7.2 to reduce Project air emissions.

6.3 Special Receptor Modelling Results

Predictions of CoPC concentrations from the Project (Project Alone) and cumulate effect (Project + Background) were completed at receptor locations relevant to human exposure, referred to as special receptors. Air quality levels at special receptors including locations of Indigenous traditional land use were included in the assessment of potential air quality effects.

6.3.1 Construction

Project Alone

The maximum predicted concentrations for 123 of 126 CoPCs assessed for the construction scenario were below the MELCCFP or MECP criteria for all special receptors assessed.

Exceedances of 1-hour average elemental carbon (from diesel exhaust) criterion are predicted at all six special receptors, with the highest concentration predicted at the proposed Cree Camp CC2 which is located approximately 8 km north of the Project. The maximum predicted concentration of elemental carbon is 150% of the MELCCFP criterion.

The maximum predicted 24-hour average concentrations of actinolite and tremolite are above the Ontario Air Quality Screening Level which are based on health effects from asbestos. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level. Tremolite and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

Cumulative

The maximum predicted concentrations of the construction CoPCs when considering the Project cumulatively with background air quality are below the MELCCFP or MECP criteria for all six special receptors assessed other than:

- 1-hour average elemental carbon in diesel exhaust
- 1-hour average quartz in PM_{10}
- 24-hour average tremolite
- 24-hour average actinolite

Exceedances of the 1-hour average elemental carbon criterion when considering cumulative air quality are predicted at all six of the special receptors (up to 150% of the Quebec criterion). The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. Exceedances are predicted to occur a maximum of 3 hours over a period of five years (0.007% of the time).

Cumulative 1-hour average quartz in PM_{10} criterion exceedances are predicted at Cree Camp CC3 located approximately 9 km southwest of the Project and adjacent to the main access road. The maximum predicted cumulative 1-hour concentration is 3% above the MELCCFP criterion. Exceedances are predicted to occur very infrequently - a maximum of 1 hour over a five-year period or about 0.002% of the time.

The maximum predicted cumulative 24-hour average actinolite and tremolite GLCs are above the Ontario Air Quality Screening Level. However, the MECP actinolite and tremolite screening levels are based on health effects of asbestos, while these CoPCs have been identified by Troilus to be non-asbestiform. The Ontario MECP screening levels are not criteria but rather provide an indicator that additional assessment is required for predictions above the screening level which is provided in the Human Heath and Ecological Risk Assessment.

CAAQS Comparisons

The maximum predicted 1-hour average NO_2 concentrations for construction are below the CAAQS at special receptors, and above the CAAQS at discrete receptors and over the gridded receptors. Annual average NO_2 concentrations are well below the CAAQS. Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

6.3.2 Operations

Project Alone

The maximum predicted Project Alone concentrations for 126 of 132 CoPCs are below the MELCCFP or MECP criteria for all six special receptors. The following CoPCs are predicted to have Project Alone concentrations above the applicable criteria:

- 1-hour average elemental carbon exceedance at all six special receptors. The maximum predicted concentration of elemental carbon exceeds the Quebec criterion by 150%.
- 1-hour average quartz in PM_{10} exceedance at two special receptors: Cree Camps CC3 and CC4, which are both adjacent to the main access road. The maximum predicted concentration of quartz exceeds the Quebec criterion by 15%.
- 1-hour average mica exceedance at two special receptors: Cree Camps CC3 and CC4. The maximum predicted concentration of mica exceeds the Quebec criterion by 17%.
- 24-hour average muscovite is above the Ontario Air Quality Screening Level. The Ontario screening levels are triggers for additional assessment to ensure that the predicted concentrations will not result in adverse effects, which is addressed in the Human Health and Ecological Risk Assessment.

- 24-hour average actinolite and tremolite above their Ontario Air Quality Screening Levels which are based on health effects from asbestos. Tremolite and actinolite in the Project ore or waste rock are non-asbestiform and additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

Cumulative

The maximum predicted concentrations (cumulative of Project Alone and Background) of all CoPCs were below the MELCCFP or MECP criteria for all six special receptors assessed other than the following:

- Exceedances of the 1-hour average elemental carbon criterion are predicted at all six special receptors when considering the Project cumulatively with background air quality. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration for elemental carbon is zero. Background concentrations of elemental carbon from diesel exhaust are expected to be negligible since there are currently no significant industrial developments in the LSA. The maximum predicted 1-hour average cumulative concentration of elemental carbon exceeds the Quebec criterion by 150% with the exceedance predicted to occur a maximum of 32 hours over a period of five years (0.073% of the time).
- Exceedances of the 1-hour average quartz in PM_{10} criterion are predicted at two special receptors: Cree Camps CC3 and CC4, which are adjacent to the main access road. The maximum predicted 1-hour average cumulative concentration is predicted to exceed the Quebec criterion by 41%, however exceedances are predicted to occur a maximum of 5 hours over a period of five years (0.011% of the time). The background quartz in PM_{10} concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.
- Exceedances of the annual average quartz in PM_4 criterion are predicted at the same two special receptors (CC3 and CC4) when considering the Project cumulatively with background air quality. The maximum predicted annual average concentration is 20% above the Quebec criterion with the background concentration accounting for 48% of the total cumulative concentration. The background quartz in PM_4 concentration used in the assessment is a MELCCFP initial concentration which is expected to provide a conservative estimate of background concentrations in the LSA.
- Exceedances of the 1-hour mica criterion are predicted at Cree Camps CC3 and CC4. The cumulative results are consistent with the Project Alone scenario since the MELCCFP initial concentration is zero. The maximum predicted concentration exceeds the Quebec criterion by 17%. An exceedance is predicted to occur a maximum of 1 hour over a period of five years (0.002% of the time).
- The maximum predicted 24-hour average muscovite concentration is above the Ontario Air Quality Screening Level and is the same as the Project Alone scenario as no background muscovite concentration is available. The Ontario screening levels are triggers for additional assessment, which is addressed in the Human Health and Ecological Risk Assessment.
- The maximum predicted 24-hour average concentrations of actinolite and tremolite are above their Ontario Air Quality Screening Levels which are based on health effects from asbestos while tremolite

and actinolite in the Project ore or waste rock are non-asbestiform. Additional assessment of actinolite and tremolite is provided in the Human Heath and Ecological Risk Assessment.

CAAQS Comparisons

The maximum predicted 1-hour average NO_2 concentrations for operations are above the CAAQS at special and discrete receptors and over the gridded receptors. However, annual average NO_2 concentrations are well below the CAAQS. Exceedances of the 1-hour NO_2 CAAQS are predicted at two special receptors, Cree Camps CC3 and CC4 adjacent to the main access road (up to 147% of the CAAQS criteria). Maximum predicted $PM_{2.5}$ and SO_2 concentrations are below their relevant CAAQS at all locations on or outside the Modelled Mine Boundary.

CAAQS were not developed as facility-level regulatory standards but rather are intended to be used in air zones as objectives for ambient air quality management – they are not legally binding or federally enforceable standards.

6.4 Deposition Results

Project Alone and cumulative predicted maximum monthly particulate matter depositions at the special receptors are compared against the MECP (Ontario) monthly criterion for dustfall. The Ontario monthly deposition criterion is based on a nuisance (soiling) effect. Over the modelled special receptors, the highest predicted Project Alone particulate deposition relative to the regulatory criteria is 10% for construction and 14% for operations at a Cree Camp CC4 adjacent to the main access road. The highest predicted cumulative particulate depositions are 31% for construction and 36% for operations. Based on the maximum predicted deposition levels, it is expected that the potential for visible soiling of surfaces near the special receptors due to the Project is low.

6.5 Dust Management Plan

A Dust Management Plan will be developed for the Project that will include:

- describing requirements for the routine management of sources of airborne dust during construction and operation.
- track air quality performance and provide feedback to the Environment Manager which may be used to refine the dust suppression program and other potentially significant air quality sources.
- Identify complaint response procedures and notification requirements

6.6 Construction and Operations Air Quality Monitoring

An Air Quality Follow-up Monitoring Program Plan (AQFMP) will be developed to monitor selected CoPCs that may include dust (PM and/or $PM_{2.5}$), metals in PM, quartz and NO_2 at selected offsite locations during construction and operation. The AQFMP will specify the proposed ambient air quality monitoring program including the type of monitoring, the CoPCs to monitor and the frequency of monitoring.

7 References

Australian Government National Pollutant Inventory (Australian NPI). 2012. Emission Estimation Technique Manual for Mining Version 3.1. January 2012. Available at: https://www.dcceew.gov.au/sites/default/files/documents/mining.pdf

Australian Government National Pollutant Inventory (Australian NPI). 2016. Emission Estimation Technique Manual for Explosives detonation and firing ranges Version 3.1. August 2016. Available at: https://www.dcceew.gov.au/sites/default/files/documents/explosives-detonation-and-firing-ranges.pdf

California Air Resources Board (CARB). 2020. A Review of Polycyclic Aromatic Hydrocarbon and Polycyclic Aromatic Hydrocarbon Derivative Emissions from Off-Road, Light-Duty, Heavy-Duty, and Stationary Sources.

CCME (Canadian Council of Ministers of the Environment). 2012. CCME Guidance Document on Achievement Determination Canadian Ambient Air Quality Standard for Fine Particulate Matter ($PM_{2.5}$) and Ozone.

CCME. 2020a. Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Sulphur Dioxide.

CCME. 2020b. Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Nitrogen Dioxide.

Countess, Richard, W. Barnard, C. Claborn,D. Gillette, D.Latimer, T. Pace, J Watson. 2001.*Methodology for Estimating Fugitive Windblown and Mechanically Resuspended Road Dust Emissions Applicable for Regional Air Quality Modelling.* EPA Emissions Inventory Conference, Denver Co.

ECCC (Environment and Climate Change Canada). 2025. Canadian Climate Normals (1991-2020). Available at https://climate.weather.gc.ca/climate_normals/

Genivar. 2009. Troilus site closure and restoration plan. November 2009. Geocon. 1993.

Golder Associates. 2010. Literature Review of Current Fugitive Dust Control Practices within the Mining Industry, prepared for the Centre for Excellence in Mining Innovation, Report Number 09-1192-0105.

Golder Associates. 2012. Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada.

Impact Assessment Agency of Canada. 2023. Tailored Impact Statement Guidelines. Troilus Mining Project.

National Research Council. 2005. Dust Control for Unpaved Roads.

OMSHR (Office of Mine Safety and Health Research). 2014. Best Practices for Controlling Respirable Dust in Coal Mines.

MELCCFP (Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs). 2025. Quebec Air Quality Standards and Criteria, version 8, Quebec, Air Quality and

Climate Branch. Available at: https://www.environnement.gouv.qc.ca/air/criteres/index-en.htm#:~:text=Atmospheric%20quality%20standards%20%28Sections%20197%20and%20198%20and,have%20been%20devised%20to%20facilitate%20air%20quality%20assessment.

MELCCFP. 2023. Influence of the Forest Fires of Summer 2023 on Air Quality in Quebec.

MELCCFP. 2005. Modelling Guide of Atmospheric Dispersion. Available at: https://www.environnement.gouv.qc.ca/air/atmosphere/guide-mod-dispersion.pdf

MELCCFP. 2017. Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects. Available at: https://www.environnement.gouv.qc.ca/air/criteres/secteur_minier.pdf

MELCCFP. 2022. Directive pour le projet minier de construction et d'exploitation d'un gisement cupro-aurifère sur le territoire d'Eeyou Istchee Baie-James par Troilus Gold Corp. N/Réf : 3214-14-025 Aout 2022

MECP (Ministry of the Environment, Conservation and Parks). 2023. Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants. Available at: https://www.ontario.ca/document/air-contaminants-benchmarks-list-standards-guidelines-and-screening-levels-assessing-point

MECP. 2018. Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Guideline A-10, Version 4.1, March 2018 (PIBs 3614e04.1)

Parvej, S.; Naik, D.L.; Sajid, H.U.; Kiran, R.; Huang, Y.; Thanki, N. 2021. Fugitive Dust Suppression in Unpaved Roads: State of the Art Research Review. Sustainability 2021, 13(4), 2399. https://doi.org/10.3390/su13042399

Richards J, T Brozell, C Rea, G Boraston, and J Hayden. 2009. "PM_4 crystalline silica emission factors and ambient concentrations at aggregate-producing sources in California." Journal of the Air and Waste Management Association 59: 1287–1295.

Succarieh, M. 1992. Control of Dust Emissions from Unpaved Roads. Transportation Research Centre, Institute of Northern Engineering, University of Alaska.

Stantec. 2024. Crawford Nickel Project. Impact Statement Chapter 12: Assessment of Potential Effects on the Atmospheric Environment. Available at https://iaac-aeic.gc.ca/050/evaluations/document/160391

Texas Commission on Environmental Quality (TCEQ). 2002. Rock Crushing Plants: Technical Guidance for Rock Crushing Plants. Air Permits Division, Austin TX.

United Kingdom (UK) Air Pollution Information System (APIS). 2024. Available online: https://www.apis.ac.uk/overview/pollutants/overview_O3.htm.

US EPA, Emission Factors & AP 42 (Fifth Edition) (US Environmental Protection Agency). 1982. Volume 1: Stationary Point and Area Sources, Chapter 11.24 Metallic Minerals Processing

US EPA, Emission Factors & AP 42 (Fifth Edition). 2006. Volume 1: Stationary Point and Area Sources, Chapter 11.12 Concrete Batching

US EPA. Emission Factors & AP 42 (Fifth Edition). 1998. Volume 1: Stationary Point and Area Sources, Chapter 11.17: Lime Manufacturing

US EPA, Emission Factors & AP 42 (Fifth Edition). 1998. Volume 1: Stationary Point and Area Sources, Chapter 11.9 Western Surface Coal Mining

US EPA, Emission Factors & AP 42 (Fifth Edition). 1986. Volume 1: Stationary Point and Area Sources, Chapter 12.3 Primary Copper Smelting

US EPA, Emission Factors & AP 42 (Fifth Edition). 2025. Volume 1: Stationary Point and Area Sources, Chapter 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines

US EPA. Emission Factors & AP 42. 1995. Appendix B-1 Particle Size Distribution Data and Sized Emission Factors for Selected Sources.

US EPA. 2005. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Available at: https://epa-prgs.ornl.gov/radionuclides/2005_HHRAP.pdf

US EPA, Emission Factors & AP 42 (Fifth Edition). 2006a. Volume 1: Stationary Point and Area Sources, Chapter 13.2.4 Aggregate Handling and Storage Piles

US EPA, Emission Factors & AP 42 (Fifth Edition). 2006c. Volume 1: Stationary Point and Area Sources, Chapter 13.2.2 Unpaved Roads

US EPA 2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS. Available at:https://www.epa.gov/sites/default/files/2020-10/documents/haul_road_workgroup-final_report_package-20120302.pdf

US EPA. 2016. Nonroad Compression-Ignition Engines: Exhaust Emission Standards March 2016. Available at: https://www.epa.gov/emission-standards-reference-guide/epa-emission-standards-nonroad-engines-and-vehicles

US EPA. 2021. Motor Vehicle Emission Simulator (MOVES3). Available at: https://github.com/USEPA/EPA_MOVES_Model/releases

US EPA. 2022a. Speciation Profiles for Toxic Emission Factors for Non-road Engines. Available at: https://www.epa.gov/system/files/documents/2022-07/420r22015.pdf

US EPA. 2024. AERMOD Modelling System version 24142. Available at: https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

WRAP (Western Regional Air Partnership). 2006. WRAP Fugitive Dust Handbook.

WSP. 2024. Tailings Management Feasibility Study, Troilus Feasibility Study. Reference No. 055-2257554003-Rev0

APPENDIX A Figures

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540000

5455000

5450000

OB-NW

J Zone Pit

OB1-87

WD-87

OB-West

87 Pit

X22 Pit

Coarse Ore Storage

OB-87

WD-West

Tailings Storage Facility (TSF)

SW Pit

WD-SW

OB-SW

N

Maxar

Stantec

Project Components

- Project Area
- Process Plant

Pit

- 87, J, X22 Pit
- SW Pit

Storage Area

- OB-87
- OB-NW
- OB-SW
- OB-West
- OB1-87
- WD-87
- WD-SW
- WD-West
- Coarse Ore Storage

TSF

- Tailings Storage Facility (TSF)

Road

- Access Road

0 500 1 000 metres

1:40 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Componants, Pit, Storage Area, TSF, Acces Road : Troilus Gold Corp., 2024
3. Road Network-Route du Nord : Adresses Québec, 2024
4. Imagery : Esri World Imagery, 2023.

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/06/11
Technical Review by M. Stachejczuk on 2025/06/11
Independent Review by G. Crooks on 2025/06/11

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.1

Title
Site Layout

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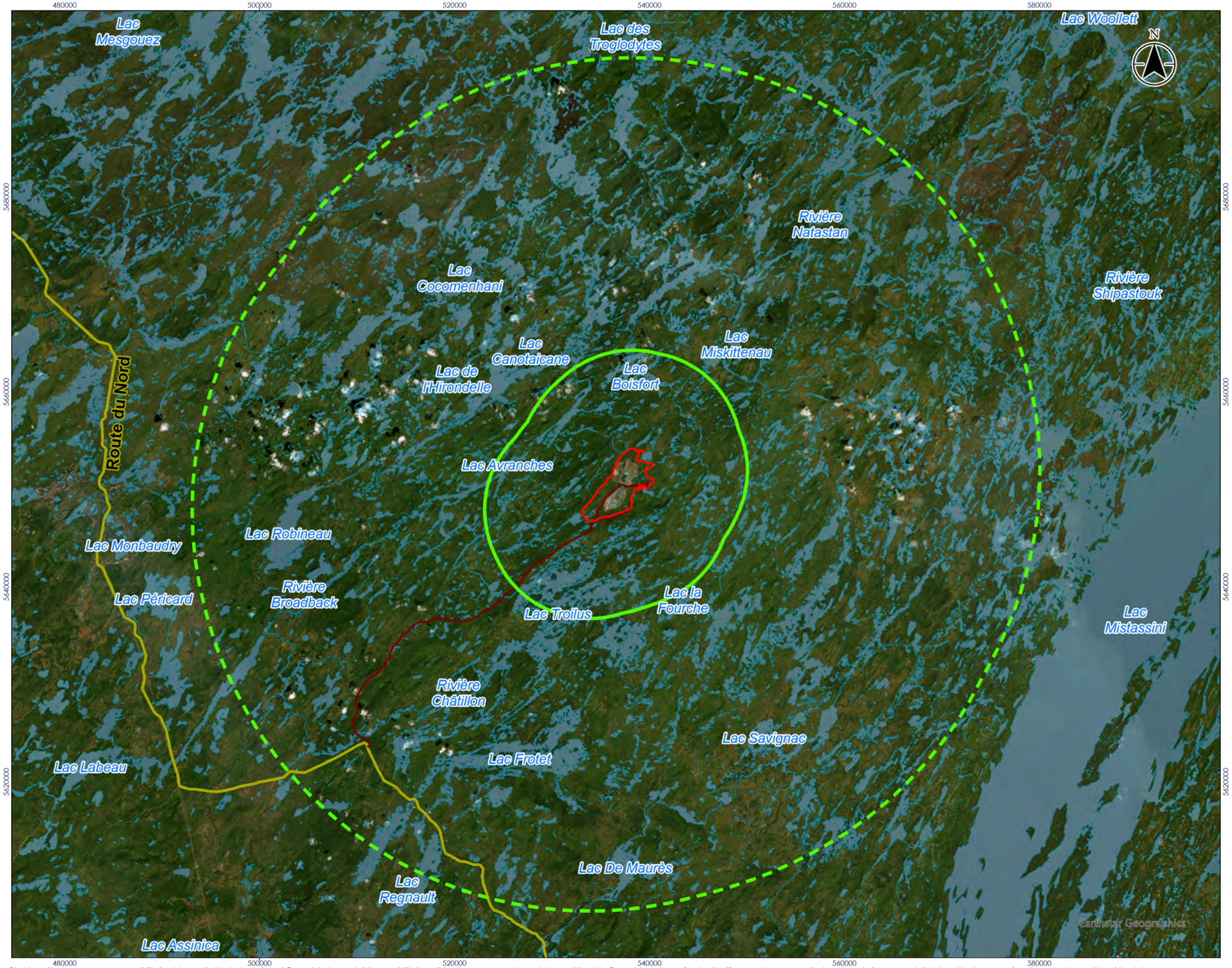

Project Components

- Project Area (PA)
- Locale Study Area (10km Buffer of PA)
- Regional Study Area (40km Buffer of PA)

Road

- Access Road
- Route du Nord

0 5 10 Kilometers
1:400 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Components, Acces Road : Troilus Gold Corp., 2024
3. Road Network-Route du Nord : Adresses Québec, 2024
4. Imagery : Esri World Imagery, 2023.

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/05/22
Technical Review by M. Stachejczuk on 2025/05/22
Independent Review by G. Crooks on 2025/05/22

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

A.2

Title

Project Area, Local Study Area and Regional Study Area

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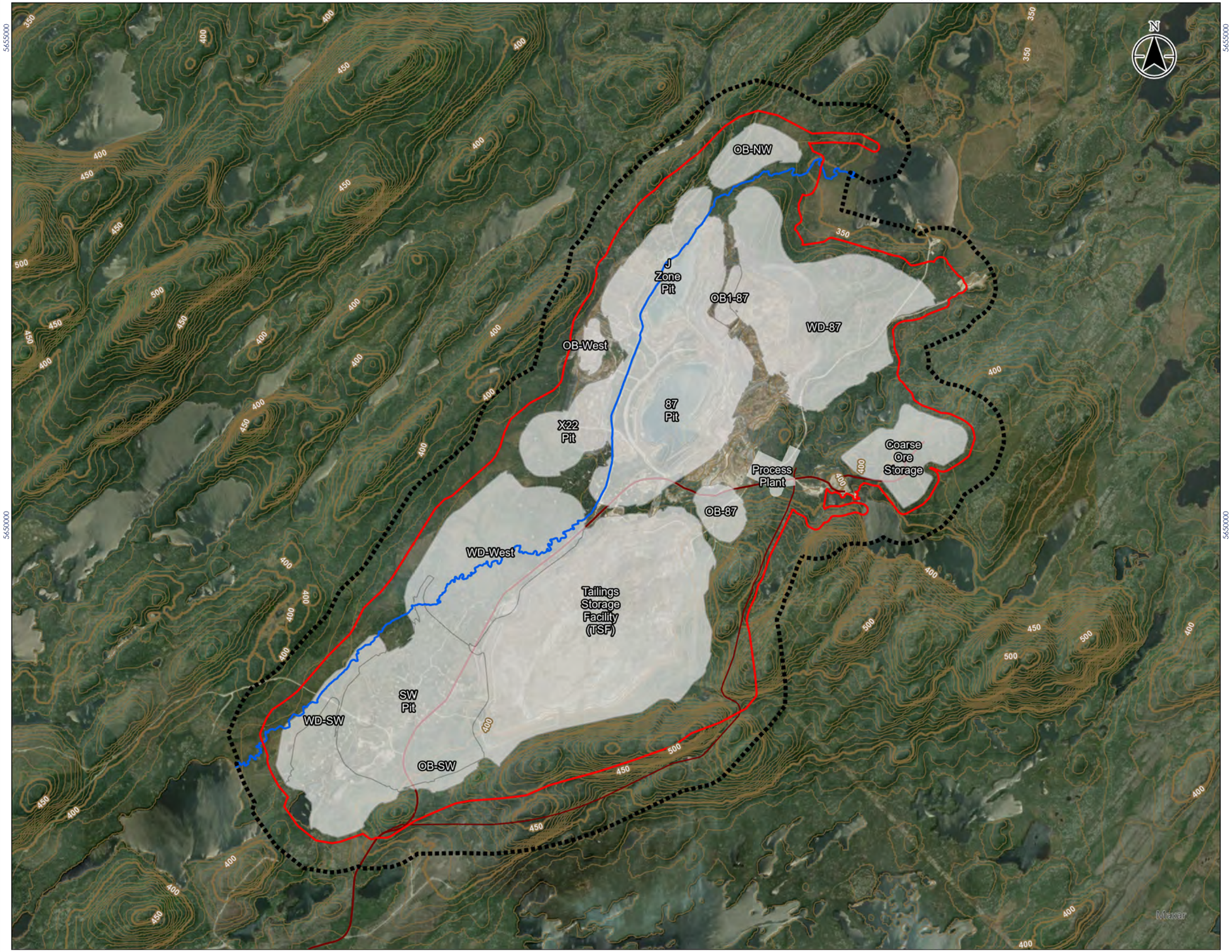

Stantec

Project Components
- Project Area (PA)
- Proposed Project Components
- Modelled Mine Boundary

Watercourse
- Bibou Watercourse (Wachiih)

Road
- Access Road

Topography
- Contour Line (50m)
- Contour Line (5m)

0 500 1 000 Meters
1:40 000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Componants, Acces Road, Topography : Troilus Gold Corp., 2024
3. Watercourse : Wachiih, 2024
4. Imagery : Esri World Imagery, 2023.

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/06/11
Technical Review by M. Stachejczuk on 2025/06/11
Independent Review by G. Crooks on 2025/06/11

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.3

Title
Extent of Modelled Mine Boundary Used in the Air Quality Assessment

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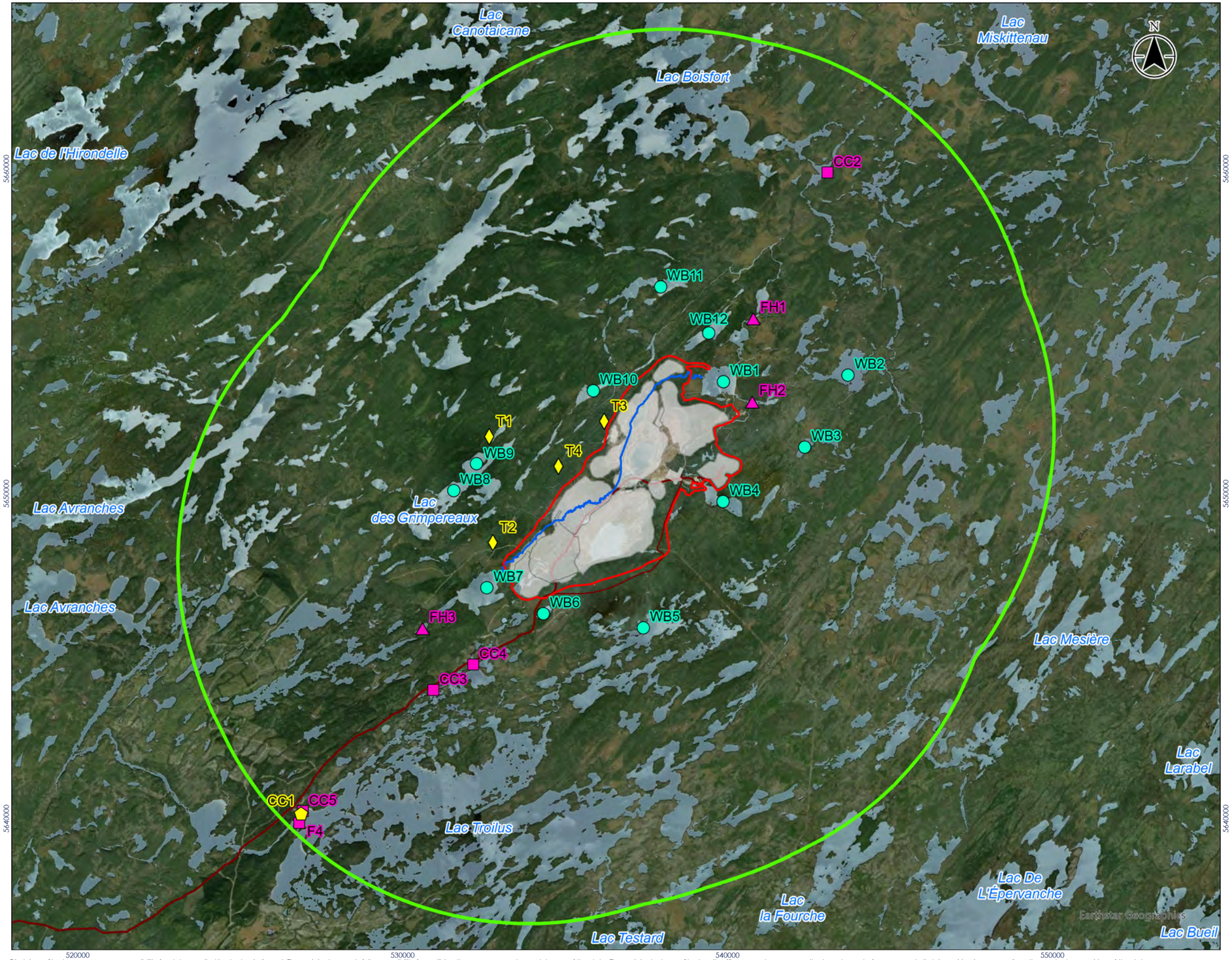

Project Components
- Project Area (PA)
- Proposed Project Components
- Local Study Area (10km Buffer of PA)

Receptor
- Cree Camps (CC)
- Fish Habitat (FH)
- Non Cree Activities (CC)
- Terrestrial (T)
- Water Body (WB)

Watercourse
- Bibou Watercourse (Wachiih)

Hydrography
- Waterbody (GRHQ)

Road
- Access Road

0 2,5 5 Kilometers
1:120 000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Components, Receptor : Troilus Gold Corp., 2024
3. Watercourse : Wachiih, 2024
4. Hydrography : GRHQ, 2020
5. Imagery : Esri World Imagery, 2023.

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/06/11
Technical Review by M. Stachejczuk on 2025/06/11
Independent Review by G. Crooks on 2025/06/11

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.4

Title
Special Receptor Locations

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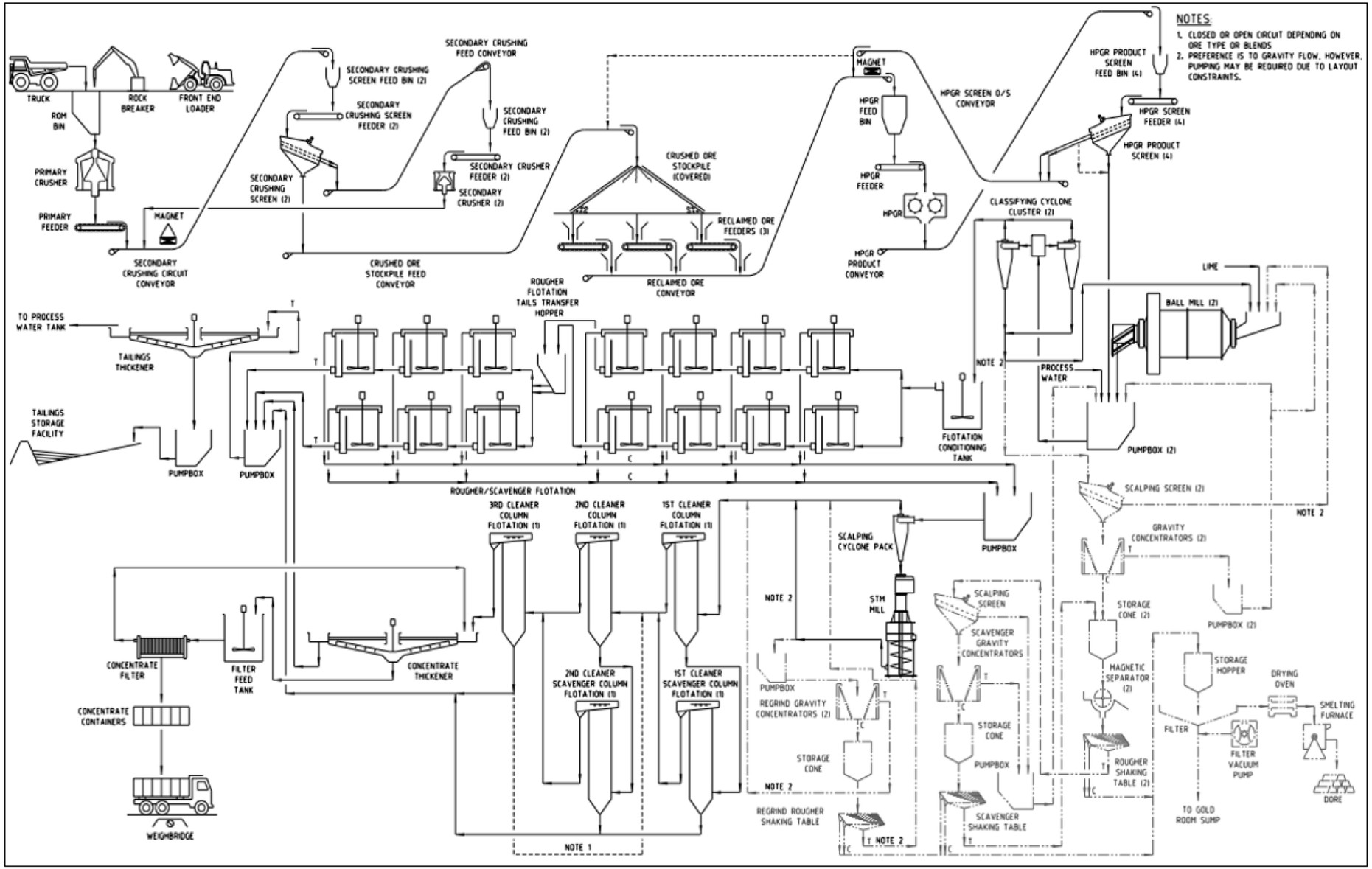

Notes

1. Diagram : Lycopodium, 2024

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/05/22
Technical Review by M. Stachejczuk on 2025/05/22
Independent Review by G. Crooks on 2025/05/22

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.5

Title
Process Flow Diagram

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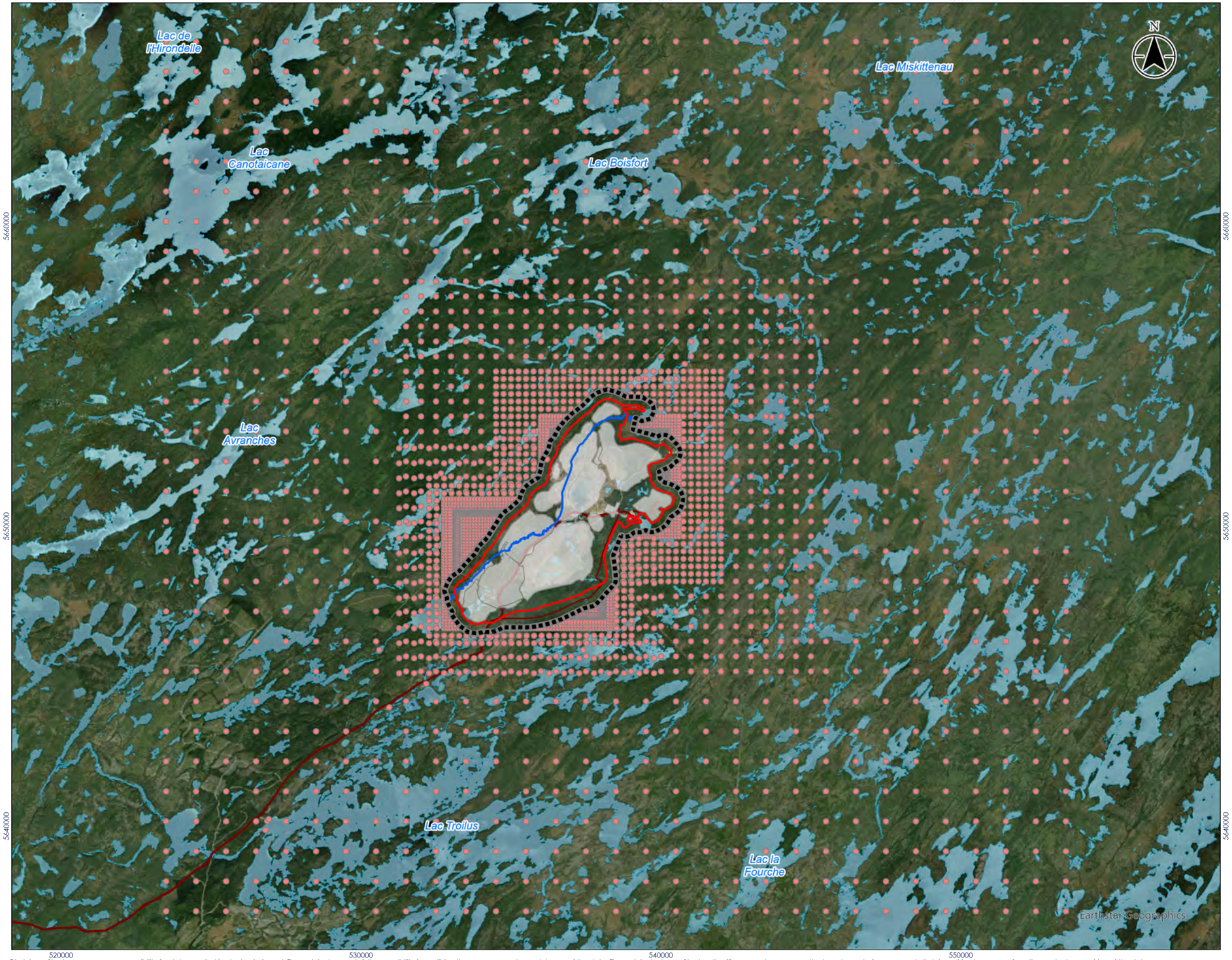

Stantec

Project Components
- Project Area (PA)
- Proposed Project Components
- Modelled Mine Boundary
- Receptor Grid

Watercourse
- Bibou Watercourse (Wachiih)

Hydrography - GRHQ
- Waterbody

Road
- Access Road

0 2,5 5 Kilometers
1:130 000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Components, Receptor Grid : Troilus Gold Corp., 2024
3. Watercourse : Wachiih, 2024
4. Hydrography : GRHQ, 2020
5. Imagery : Esri World Imagery, 2023.

Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/06/11
Technical Review by M. Stachejczuk on 2025/06/11
Independent Review by G. Crooks on 2025/06/11

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.6

Title
Extended Receptor Grid

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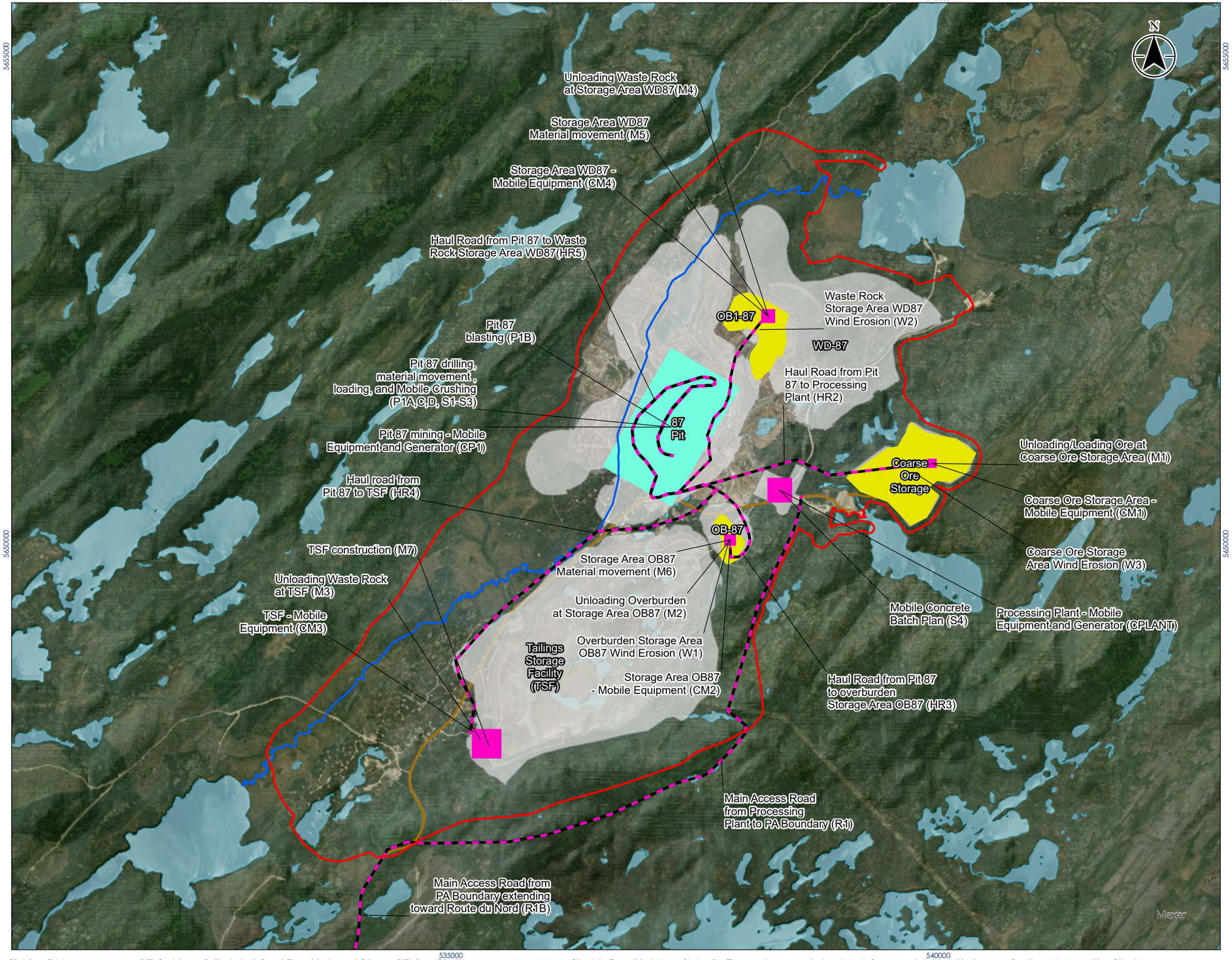


Stantec

Project Components
- Project Area (PA)
- Proposed Project Components

Air Emission Source
- Line Volume Source
- Volume Source
- Area Source
- Open Pit Source

Watercourse
- Bibou Watercourse (Wachiih)

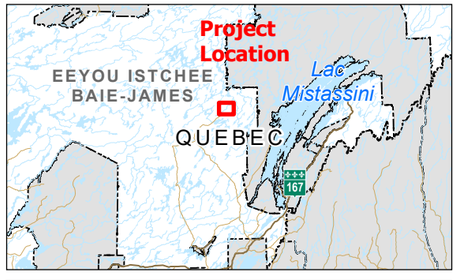
Hydrography - GRHQ
- Waterbody

Road
- Acces Road

0 1 2 Kilometers

1:40 000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Componants, Air Emission Source : Troilus Gold Corp., 2024
3. Watercourse : Wachiih, 2024
4. Hydrography : GRHQ, 2020
5. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485 REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project
Troilus Gold Corp
Troilus Mining Project

Figure No.
A.7

Title
Location of Air Emission Sources – Construction

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535000

540000

5655000

5650000

N

Storage Area OBNW - Mobile Equipment (CM2)

Unloading Overburden at Storage Area OBNW (M2)

Haul Road from Pit J to Overburden Storage Area OB West (HR6)

Haul Road from Pit J to Overburden Storage Area OBNW (HR5)

Overburden Storage Aea OBNW Wind Erosion (W1)

Waste Rock Storage Area WD87 wind erosion (W5)

OB-NW

Pit J mining - Mobile Equipment (CP2)

Storage Area WD87 material movement (M8)

Pit J drilling, material movement, and loading (P2A, C, D)

Pit J blasting (P2B)

Unloading Waste Rock at Storage Area WD87 (M7)

Haul Road from Pit J to Processing Plant (HR3)

J Zone Pit

Storage Area WD87 - Mobile Equipment (CM7)

Unloading overburden at Storage Area OBW (M3)

Primary Crusher Baghouse (S2)

Secondary Crusher Baghouse (S4)

Storage Area OBW - Mobile Equipment (CM3)

WD-87

Pit 87 mining - Mobile Equipment (CP1)

Secondary Crusher Building (S3)

Overburden Storage Area OBW Wind Erosion (W2)

OB-West

Primary Crusher Building (S1)

Secondary Crusher Screen Baghouse (S5)

Haul Road from Pit 87 to WD87 (HR10)

87 Pit

Coarse Ore Storage Area - Mobile Equipment (CM1)

Pit 87 drilling, material movement, and loading (P1A, C, D)

Haul Road from Pit 87 to TSF (HR9)

Pit 87 blasting (P1B)

Coarse Ore Storage

Unloading/Loading Ore at Coarse Ore Storage Area (M1)

Haul Road from Pit SW to Processing Plant (HR4)

TSF - mobile equipment (CM6)

Coarse Ore Storage Area Wind Erosion (W6)

TSF Construction (M10)

Haul Road from Pit 87 to Processing Plant (HR2)

HPGR Building (S8)

Haul Road from Pit SW to TSF (HR11)

Unloading Waste Rock at TSF (M6)

HPGR Baghouse (S9)

Haul Road from Pit SW to Waste Rock Storage Area WDSW (HR8)

TSF Wind Erosion (W9)

Haul Road from Pit SW to Overburden Storage Area OBSW (HR7)

Tailings Storage Facility (TSF)

Processing plant - mobile equipment (CPLANT)

Waste Rock Storage Area WDSW Wind erosion (W3)

SW Pit

Crushed Ore Stockpile Reclaim Tunnel (S7)

Storage Area WDSW material movement (M9)

WD-SW

Mill Building, Smelting Baghouse (S10D)

Storage Area WDSW - mobile equipment (CM5)

Main Access Road from Processing Plant to PA Boundary (R1)

OB-SW

Crushed Ore Stockpile (S6)

Unloading Waste Rock at Storage Area WDSW (M5)

Overburden Storage Area OBSW wind erosion (W4)

Mill building - reagents, concentrate loadout, smelting (S10A, B, C)

Storage Area OBSW - mobile equipment (CM4)

Pit SW mining - Mobile Equipment and Generator (CP3)

Main Access Road from PA boundary extending toward Route du Nord (R1B)

Unloading overburden at Storage Area OBSW (M4)

Pit SW blasting (P3B)

Pit SW drilling, Material movement, loading, and Mobile crushing (P3A, C, D, S11-S13)

Maxar

535000

540000

5655000

5650000

Stantec

Project Components

- Project Area (PA)

Air Emission Source

- Point Source
- Line Volume Source
- Area Source
- Open Pit Source
- Volume Source

Watercourse

- Bibou Watercourse (Wachiih)

Hydrography - GRHQ

- Waterbody

0 1 2 Kilometers

1:40 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 18N
2. Project Componants, Air Emission Source : Troilus Gold Corp., 2024
3. Watercourse : Wachiih, 2024
4. Hydrography : GRHQ, 2020
5. Imagery : Esri World Imagery, 2023.

Project Location

Mistissini
Québec

167040485 REV0

Prepared by P. Ravo on 2025/06/13
Technical Review by M. Stachejczuk on 2025/06/13
Independent Review by G. Crooks on 2025/06/13

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

A.8

Title

Location of Air Emission Sources – Operation

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APPENDIX B Special Receptors

Special Receptor ID	Type	Description	UTM E	UTM N
CC1	Non Cree Activities	Outfitting Camp	526877	5640176
CC2	Cree Camps	Projected Camp	543079	5659895
CC3	Cree Camps	Secondary Camp	530948	5643967
CC4	Cree Camps	Main Camp	532176	5644751
CC5	Cree Camps	Main Camp	526931	5640239
F4	Cree Camps	Main Camp	526820	5639873
WB1	Water Body	Lake NNE of PA	539876	5653454
WB2	Water Body	Lake NE of PA	543708	5653655
WB3	Water Body	Lake ENE of PA	542376	5651439
WB4	Water Body	Lake E of PA	539863	5649764
WB5	Water Body	Lake S of PA	537410	5645879
WB6	Water Body	Lake S of PA	534333	5646314
WB7	Water Body	Lake SSW of PA	532594	5647113
WB8	Water Body	Lac des Grimperaux (SW)	531576	5650103
WB9	Water Body	Lac des Grimperaux (NE)	532276	5650931
WB10	Water Body	Lake NW of PA	535871	5653175
WB11	Water Body	Lake NNW of PA	537944	5656373
WB12	Water Body	Lake N of PA	539424	5654952
FH1	Fish Habitat	Fish spawning area north of PA	540795	5655416
FH2	Fish Habitat	Fish habitat -Wachiih River	540763	5652852
FH3	Fish Habitat	Fish habitat -Wachiih River	530613	5645879
T1	Terrestrial	Refugee Biologique (nearest point to PA)	532667	5651765
T2	Terrestrial	Stand of phytosociological interest	532779	5648503
T3	Terrestrial	Stand of phytosociological interest	536205	5652236
T4	Terrestrial	Stand of phytosociological interest	534797	5650851

APPENDIX C Emission Inventory

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
S1	Mobile Primary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	3.16E-01	2.89E-01
			PM_{10}	[PM10]	1.26E-01	1.16E-01
			$PM_{2.5}$	[PM2.5]	2.34E-02	2.14E-02
			Silver (Ag)	7440-22-4	1.97E-07	1.80E-07
			Aluminum (Al)	7429-90-5	2.42E-02	2.22E-02
			Arsenic (As)	7440-38-2	2.50E-06	2.29E-06
			Gold (Au)	7440-57-5	2.77E-08	2.54E-08
			Boron (B)	7440-42-8	3.20E-05	2.93E-05
			Barium (Ba)	7440-39-3	1.18E-04	1.08E-04
			Beryllium (Be)	7440-41-7	3.75E-07	3.43E-07
			Bismuth (Bi)	7440-69-9	6.60E-07	6.05E-07
			Carbon (C)	7440-44-0	2.89E-04	2.65E-04
			Calcium (Ca)	7440-70-2	1.01E-02	9.27E-03
			Cadmium (Cd)	7440-43-9	3.76E-07	3.45E-07
			Cerium (Ce)	7440-45-1	2.23E-05	2.04E-05
			Cobalt (Co)	7440-48-4	5.69E-06	5.21E-06
			Chromium (Cr)	7440-47-3	2.83E-05	2.60E-05
			Cesium (Cs)	7440-46-2	9.47E-07	8.68E-07
			Copper (Cu)	7440-50-8	4.22E-05	3.87E-05
			Iron (Fe)	7439-89-6	1.09E-02	1.00E-02
			Gallium (Ga)	7440-55-3	6.31E-06	5.79E-06
			Hafnium (Hf)	7440-58-6	1.31E-06	1.20E-06
			Mercury (Hg)	7439-97-6	7.89E-09	7.23E-09
			Indium (In)	7440-74-6	1.58E-09	1.45E-09
			Potassium (K)	7440-09-7	4.67E-03	4.28E-03
			Lanthanum (La)	7439-91-0	5.02E-06	4.60E-06
			Lithium (Li)	7439-93-2	8.08E-06	7.41E-06
			Lutetium (Lu)	7439-94-3	7.39E-08	6.77E-08
			Magnesium (Mg)	7439-95-4	4.38E-03	4.02E-03
			Manganese (Mn)	7439-96-5	5.69E-05	5.22E-05
			Molybdenum (Mo)	7439-98-7	2.04E-06	1.87E-06
			Sodium (Na)	7440-23-5	9.37E-03	8.59E-03
			Niobium (Nb)	7440--03-1	1.84E-06	1.69E-06
			Nickel (Ni)	7440-02-0	6.42E-06	5.88E-06
			Phosphorus (P)	7723-14-0	1.97E-04	1.81E-04
			Lead (Pb)	7439-92-1	6.34E-06	5.81E-06
			Rubidium (Rb)	7440-17-7	2.37E-05	2.17E-05
			Sulphur (S)	7704-34-9	5.90E-04	5.41E-04
			Antimony (Sb)	7440-36-0	1.59E-06	1.45E-06
			Scandium (Sc)	7440-20-2	3.50E-06	3.21E-06
			Selenium (Se)	7782-49-2	1.10E-07	1.01E-07
			Tin (Sn)	7440-31-5	2.70E-06	2.48E-06
			Strontium (Sr)	7440-24-6	1.05E-04	9.63E-05
			Tantalum (Ta)	7440-25-7	3.18E-07	2.91E-07
			Terbium (Tb)	7440-27-9	1.68E-07	1.54E-07
			Tellurium (Te)	13494-80-9	5.52E-08	5.06E-08
			Titanium (Ti)	7440-32-6	4.04E-04	3.70E-04
			Thallium (Tl)	7440-28-0	2.85E-07	2.62E-07
			Uranium (U)	7440-61-1	4.23E-07	3.88E-07
			Vanadium (v)	7440-62-2	3.10E-05	2.84E-05
			Tungsten (W)	7440-33-7	1.56E-05	1.43E-05
			Yttrium (Y)	7440-65-5	4.10E-06	3.76E-06
			Ytterbium (Yb)	7440-64-4	4.73E-07	4.33E-07
			Zinc (Zn)	7440-66-6	3.80E-05	3.48E-05
			Zirconium (Zr)	7440-67-7	3.04E-05	2.79E-05
			Silicon Dioxide (SiO2)	7631-86-9	2.06E-01	1.89E-01
			Aluminum Oxide (Al2O3)	1344-28-1	4.77E-02	4.37E-02
			Iron Oxide (Fe2O3)	1309-37-1	1.58E-02	1.45E-02
			Magnesium Oxide (MgO)	1309-48-4	6.65E-03	6.10E-03
			Calcium Oxide (CaO)	1305-78-8	1.14E-02	1.04E-02
			Sodium Oxide (Na2O)	1313-59-3	1.08E-02	9.93E-03
			Potassium Oxide (K2O)	12136-45-7	7.69E-03	7.05E-03
			Titanium dioxide (TiO2)	13463-67-7	6.21E-04	5.69E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.71E-04	3.40E-04
			Manganese Oxide (MnO)	1344-43-0	8.16E-05	7.48E-05
			Chromium Oxide (Cr2O3)	1308-38-9	9.36E-05	8.58E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	6.94E-05	6.37E-05
			Chalcopyrite (CuFeS2)	1308-56-1	6.94E-04	6.37E-04
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.58E-05	1.45E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	1.58E-05	1.45E-05
			Galena (PbS)	1314-87-0	6.31E-05	5.79E-05
			Sphalerite (ZnS)	1314-98-3	1.26E-04	1.16E-04
			Pyrite (Fe, S2)	1309-36-0	1.89E-03	1.74E-03
			Pyrrhotite (Fe7S8)	12305-96-3	8.84E-04	8.10E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.58E-05	1.45E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	6.31E-05	5.79E-05
			Quartz	14808-60-7	1.48E-02	1.35E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.72E-01	1.57E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.12E-02	1.03E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.61E-02	2.39E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.56E-03	5.09E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.75E-03	2.52E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.38E-03	3.10E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	6.19E-03	5.67E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.01E-04	9.26E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	6.94E-04	6.37E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.58E-04	1.45E-04
			Calcite (CaCO3)	1317-65-3	1.52E-03	1.39E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.26E-05	1.16E-05
			Titanite (CaTiSiO5)	[TITAN]	3.54E-04	3.24E-04
			Apatite (Ca5(PO4)3)	1306-05-4	6.94E-04	6.37E-04
			Mica	12001-26-2	3.38E-02	3.10E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.67E-02	1.53E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.36E-02	1.25E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.06E-02	9.69E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.69E-02	3.38E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	8.05E-02	7.38E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	3.00E-02	2.75E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.39E-03	4.02E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.39E-03	1.27E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
S2	Mobile Secondary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	9.47E-01	8.68E-01
			PM_{10}	[PM10]	3.79E-01	3.47E-01
			$PM_{2.5}$	[PM2.5]	7.01E-02	6.43E-02
			Silver (Ag)	7440-22-4	5.90E-07	5.41E-07
			Aluminum (Al)	7429-90-5	7.26E-02	6.65E-02
			Arsenic (As)	7440-38-2	7.50E-06	6.88E-06
			Gold (Au)	7440-57-5	8.30E-08	7.61E-08
			Boron (B)	7440-42-8	9.60E-05	8.80E-05
			Barium (Ba)	7440-39-3	3.53E-04	3.24E-04
			Beryllium (Be)	7440-41-7	1.12E-06	1.03E-06
			Bismuth (Bi)	7440-69-9	1.98E-06	1.82E-06
			Carbon (C)	7440-44-0	8.68E-04	7.95E-04
			Calcium (Ca)	7440-70-2	3.03E-02	2.78E-02
			Cadmium (Cd)	7440-43-9	1.13E-06	1.03E-06
			Cerium (Ce)	7440-45-1	6.69E-05	6.13E-05
			Cobalt (Co)	7440-48-4	1.71E-05	1.56E-05
			Chromium (Cr)	7440-47-3	8.50E-05	7.79E-05
			Cesium (Cs)	7440-46-2	2.84E-06	2.60E-06
			Copper (Cu)	7440-50-8	1.27E-04	1.16E-04
			Iron (Fe)	7439-89-6	3.27E-02	3.00E-02
			Gallium (Ga)	7440-55-3	1.89E-05	1.74E-05
			Hafnium (Hf)	7440-58-6	3.92E-06	3.59E-06
			Mercury (Hg)	7439-97-6	2.37E-08	2.17E-08
			Indium (In)	7440-74-6	4.73E-09	4.34E-09
			Potassium (K)	7440-09-7	1.40E-02	1.29E-02
			Lanthanum (La)	7439-91-0	1.51E-05	1.38E-05
			Lithium (Li)	7439-93-2	2.42E-05	2.22E-05
			Lutetium (Lu)	7439-94-3	2.22E-07	2.03E-07
			Magnesium (Mg)	7439-95-4	1.32E-02	1.21E-02
			Manganese (Mn)	7439-96-5	1.71E-04	1.57E-04
			Molybdenum (Mo)	7439-98-7	6.11E-06	5.60E-06
			Sodium (Na)	7440-23-5	2.81E-02	2.58E-02
			Niobium (Nb)	7440--03-1	5.53E-06	5.07E-06
			Nickel (Ni)	7440-02-0	1.92E-05	1.76E-05
			Phosphorus (P)	7723-14-0	5.92E-04	5.43E-04
			Lead (Pb)	7439-92-1	1.90E-05	1.74E-05
			Rubidium (Rb)	7440-17-7	7.12E-05	6.52E-05
			Sulphur (S)	7704-34-9	1.77E-03	1.62E-03
			Antimony (Sb)	7440-36-0	4.76E-06	4.36E-06
			Scandium (Sc)	7440-20-2	1.05E-05	9.62E-06
			Selenium (Se)	7782-49-2	3.31E-07	3.04E-07
			Tin (Sn)	7440-31-5	8.11E-06	7.43E-06
			Strontium (Sr)	7440-24-6	3.15E-04	2.89E-04
			Tantalum (Ta)	7440-25-7	9.53E-07	8.73E-07
			Terbium (Tb)	7440-27-9	5.04E-07	4.62E-07
			Tellurium (Te)	13494-80-9	1.66E-07	1.52E-07
			Titanium (Ti)	7440-32-6	1.21E-03	1.11E-03
			Thallium (Tl)	7440-28-0	8.56E-07	7.85E-07
			Uranium (U)	7440-61-1	1.27E-06	1.16E-06
			Vanadium (v)	7440-62-2	9.31E-05	8.53E-05
			Tungsten (W)	7440-33-7	4.67E-05	4.29E-05
			Yttrium (Y)	7440-65-5	1.23E-05	1.13E-05
			Ytterbium (Yb)	7440-64-4	1.42E-06	1.30E-06
			Zinc (Zn)	7440-66-6	1.14E-04	1.05E-04
			Zirconium (Zr)	7440-67-7	9.13E-05	8.37E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.19E-01	5.67E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.43E-01	1.31E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.74E-02	4.34E-02
			Magnesium Oxide (MgO)	1309-48-4	2.00E-02	1.83E-02
			Calcium Oxide (CaO)	1305-78-8	3.41E-02	3.13E-02
			Sodium Oxide (Na2O)	1313-59-3	3.25E-02	2.98E-02
			Potassium Oxide (K2O)	12136-45-7	2.31E-02	2.12E-02
			Titanium dioxide (TiO2)	13463-67-7	1.86E-03	1.71E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.11E-03	1.02E-03
			Manganese Oxide (MnO)	1344-43-0	2.45E-04	2.24E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.81E-04	2.58E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.08E-04	1.91E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.08E-03	1.91E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.73E-05	4.34E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.73E-05	4.34E-05
			Galena (PbS)	1314-87-0	1.89E-04	1.74E-04
			Sphalerite (ZnS)	1314-98-3	3.79E-04	3.47E-04
			Pyrite (Fe, S2)	1309-36-0	5.68E-03	5.21E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.65E-03	2.43E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.73E-05	4.34E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.89E-04	1.74E-04
			Quartz	14808-60-7	4.43E-02	4.06E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.15E-01	4.72E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.37E-02	3.09E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.82E-02	7.17E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.67E-02	1.53E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	8.26E-03	7.57E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.01E-02	9.29E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.86E-02	1.70E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.03E-04	2.78E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.08E-03	1.91E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.73E-04	4.34E-04
			Calcite (CaCO3)	1317-65-3	4.55E-03	4.17E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.79E-05	3.47E-05
			Titanite (CaTiSiO5)	[TITAN]	1.06E-03	9.72E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.08E-03	1.91E-03
			Mica	12001-26-2	1.01E-01	9.30E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.01E-02	4.59E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.09E-02	3.75E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.17E-02	2.91E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E-01	1.01E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.41E-01	2.21E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.01E-02	8.26E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-02	1.21E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.17E-03	3.82E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
S3	Mobile Tertiary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	9.47E-01	8.68E-01
			PM_{10}	[PM10]	3.16E-01	2.89E-01
			$PM_{2.5}$	[PM2.5]	5.85E-02	5.36E-02
			Silver (Ag)	7440-22-4	5.90E-07	5.41E-07
			Aluminum (Al)	7429-90-5	7.26E-02	6.65E-02
			Arsenic (As)	7440-38-2	7.50E-06	6.88E-06
			Gold (Au)	7440-57-5	8.30E-08	7.61E-08
			Boron (B)	7440-42-8	9.60E-05	8.80E-05
			Barium (Ba)	7440-39-3	3.53E-04	3.24E-04
			Beryllium (Be)	7440-41-7	1.12E-06	1.03E-06
			Bismuth (Bi)	7440-69-9	1.98E-06	1.82E-06
			Carbon (C)	7440-44-0	8.68E-04	7.95E-04
			Calcium (Ca)	7440-70-2	3.03E-02	2.78E-02
			Cadmium (Cd)	7440-43-9	1.13E-06	1.03E-06
			Cerium (Ce)	7440-45-1	6.69E-05	6.13E-05
			Cobalt (Co)	7440-48-4	1.71E-05	1.56E-05
			Chromium (Cr)	7440-47-3	8.50E-05	7.79E-05
			Cesium (Cs)	7440-46-2	2.84E-06	2.60E-06
			Copper (Cu)	7440-50-8	1.27E-04	1.16E-04
			Iron (Fe)	7439-89-6	3.27E-02	3.00E-02
			Gallium (Ga)	7440-55-3	1.89E-05	1.74E-05
			Hafnium (Hf)	7440-58-6	3.92E-06	3.59E-06
			Mercury (Hg)	7439-97-6	2.37E-08	2.17E-08
			Indium (In)	7440-74-6	4.73E-09	4.34E-09
			Potassium (K)	7440-09-7	1.40E-02	1.29E-02
			Lanthanum (La)	7439-91-0	1.51E-05	1.38E-05
			Lithium (Li)	7439-93-2	2.42E-05	2.22E-05
			Lutetium (Lu)	7439-94-3	2.22E-07	2.03E-07
			Magnesium (Mg)	7439-95-4	1.32E-02	1.21E-02
			Manganese (Mn)	7439-96-5	1.42E-04	1.30E-04
			Molybdenum (Mo)	7439-98-7	6.11E-06	5.60E-06
			Sodium (Na)	7440-23-5	2.81E-02	2.58E-02
			Niobium (Nb)	7440--03-1	5.53E-06	5.07E-06
			Nickel (Ni)	7440-02-0	1.60E-05	1.47E-05
			Phosphorus (P)	7723-14-0	5.92E-04	5.43E-04
			Lead (Pb)	7439-92-1	1.90E-05	1.74E-05
			Rubidium (Rb)	7440-17-7	7.12E-05	6.52E-05
			Sulphur (S)	7704-34-9	1.77E-03	1.62E-03
			Antimony (Sb)	7440-36-0	4.76E-06	4.36E-06
			Scandium (Sc)	7440-20-2	1.05E-05	9.62E-06
			Selenium (Se)	7782-49-2	3.31E-07	3.04E-07
			Tin (Sn)	7440-31-5	8.11E-06	7.43E-06
			Strontium (Sr)	7440-24-6	3.15E-04	2.89E-04
			Tantalum (Ta)	7440-25-7	9.53E-07	8.73E-07
			Terbium (Tb)	7440-27-9	5.04E-07	4.62E-07
			Tellurium (Te)	13494-80-9	1.66E-07	1.52E-07
			Titanium (Ti)	7440-32-6	1.01E-03	9.25E-04
			Thallium (Tl)	7440-28-0	8.56E-07	7.85E-07
			Uranium (U)	7440-61-1	1.27E-06	1.16E-06
			Vanadium (v)	7440-62-2	9.31E-05	8.53E-05
			Tungsten (W)	7440-33-7	4.67E-05	4.29E-05
			Yttrium (Y)	7440-65-5	1.23E-05	1.13E-05
			Ytterbium (Yb)	7440-64-4	1.42E-06	1.30E-06
			Zinc (Zn)	7440-66-6	1.14E-04	1.05E-04
			Zirconium (Zr)	7440-67-7	9.13E-05	8.37E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.19E-01	5.67E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.43E-01	1.31E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.74E-02	4.34E-02
			Magnesium Oxide (MgO)	1309-48-4	2.00E-02	1.83E-02
			Calcium Oxide (CaO)	1305-78-8	3.41E-02	3.13E-02
			Sodium Oxide (Na2O)	1313-59-3	3.25E-02	2.98E-02
			Potassium Oxide (K2O)	12136-45-7	2.31E-02	2.12E-02
			Titanium dioxide (TiO2)	13463-67-7	1.55E-03	1.42E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.11E-03	1.02E-03
			Manganese Oxide (MnO)	1344-43-0	2.04E-04	1.87E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.81E-04	2.58E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.08E-04	1.91E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.08E-03	1.91E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.73E-05	4.34E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.73E-05	4.34E-05
			Galena (PbS)	1314-87-0	1.89E-04	1.74E-04
			Sphalerite (ZnS)	1314-98-3	3.79E-04	3.47E-04
			Pyrite (Fe, S2)	1309-36-0	5.68E-03	5.21E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.65E-03	2.43E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.73E-05	4.34E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.58E-04	1.45E-04
			Quartz	14808-60-7	3.69E-02	3.38E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.15E-01	4.72E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.37E-02	3.09E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.82E-02	7.17E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.67E-02	1.53E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.88E-03	6.31E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.01E-02	9.29E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.86E-02	1.70E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.53E-04	2.31E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.08E-03	1.91E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.73E-04	4.34E-04
			Calcite (CaCO3)	1317-65-3	4.55E-03	4.17E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.16E-05	2.89E-05
			Titanite (CaTiSiO5)	[TITAN]	8.84E-04	8.10E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.08E-03	1.91E-03
			Mica	12001-26-2	1.01E-01	9.30E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.01E-02	4.59E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.09E-02	3.75E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.17E-02	2.91E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E-01	1.01E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.41E-01	2.21E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.01E-02	8.26E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-02	1.21E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.17E-03	3.82E-03
S4	Concrete Batch Plant	US EPA AP-42 document Chapter 11.12 (Concrete Batching). Table 11.12-1 Emission Factors for Concrete Batching	TSP	[PM]	3.15E+00	1.37E+00
			PM_{10}	[PM10]	1.18E+00	5.18E-01
			$PM_{2.5}$	[PM2.5]	1.87E-01	8.31E-02
			Quartz	14808-60-7	5.88E-02	2.59E-02

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
P1A	Pit 87 Drilling	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.9-4 Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	1.35E-01	1.35E-01
			PM_{10}	[PM10]	7.10E-02	7.10E-02
			$PM_{2.5}$	[PM2.5]	1.31E-02	1.31E-02
			Silver (Ag)	7440-22-4	2.83E-07	2.83E-07
			Aluminum (Al)	7429-90-5	1.04E-02	1.04E-02
			Arsenic (As)	7440-38-2	3.58E-06	3.58E-06
			Gold (Au)	7440-57-5	7.47E-08	7.47E-08
			Boron (B)	7440-42-8	1.76E-05	1.76E-05
			Barium (Ba)	7440-39-3	5.57E-05	5.57E-05
			Beryllium (Be)	7440-41-7	1.60E-07	1.60E-07
			Bismuth (Bi)	7440-69-9	4.00E-07	4.00E-07
			Carbon (C)	7440-44-0	1.66E-04	1.66E-04
			Calcium (Ca)	7440-70-2	4.33E-03	4.33E-03
			Cadmium (Cd)	7440-43-9	8.47E-07	8.47E-07
			Cerium (Ce)	7440-45-1	9.55E-06	9.55E-06
			Cobalt (Co)	7440-48-4	2.44E-06	2.44E-06
			Chromium (Cr)	7440-47-3	1.35E-05	1.35E-05
			Cesium (Cs)	7440-46-2	4.06E-07	4.06E-07
			Copper (Cu)	7440-50-8	8.01E-05	8.01E-05
			Iron (Fe)	7439-89-6	5.14E-03	5.14E-03
			Gallium (Ga)	7440-55-3	2.70E-06	2.70E-06
			Hafnium (Hf)	7440-58-6	5.60E-07	5.60E-07
			Mercury (Hg)	7439-97-6	3.38E-09	3.38E-09
			Indium (In)	7440-74-6	6.76E-10	6.76E-10
			Potassium (K)	7440-09-7	2.31E-03	2.31E-03
			Lanthanum (La)	7439-91-0	2.80E-06	2.80E-06
			Lithium (Li)	7439-93-2	3.46E-06	3.46E-06
			Lutetium (Lu)	7439-94-3	3.16E-08	3.16E-08
			Magnesium (Mg)	7439-95-4	1.88E-03	1.88E-03
			Manganese (Mn)	7439-96-5	3.46E-05	3.46E-05
			Molybdenum (Mo)	7439-98-7	8.72E-07	8.72E-07
			Sodium (Na)	7440-23-5	4.01E-03	4.01E-03
			Niobium (Nb)	7440--03-1	7.90E-07	7.90E-07
			Nickel (Ni)	7440-02-0	3.61E-06	3.61E-06
			Phosphorus (P)	7723-14-0	8.45E-05	8.45E-05
			Lead (Pb)	7439-92-1	3.04E-06	3.04E-06
			Rubidium (Rb)	7440-17-7	1.02E-05	1.02E-05
			Sulphur (S)	7704-34-9	5.64E-04	5.64E-04
			Antimony (Sb)	7440-36-0	1.10E-06	1.10E-06
			Scandium (Sc)	7440-20-2	1.50E-06	1.50E-06
			Selenium (Se)	7782-49-2	4.73E-08	4.73E-08
			Tin (Sn)	7440-31-5	1.16E-06	1.16E-06
			Strontium (Sr)	7440-24-6	4.50E-05	4.50E-05
			Tantalum (Ta)	7440-25-7	1.36E-07	1.36E-07
			Terbium (Tb)	7440-27-9	7.19E-08	7.19E-08
			Tellurium (Te)	13494-80-9	2.37E-08	2.37E-08
			Titanium (Ti)	7440-32-6	2.27E-04	2.27E-04
			Thallium (Tl)	7440-28-0	1.22E-07	1.22E-07
			Uranium (U)	7440-61-1	1.81E-07	1.81E-07
			Vanadium (v)	7440-62-2	1.33E-05	1.33E-05
			Tungsten (W)	7440-33-7	6.67E-06	6.67E-06
			Yttrium (Y)	7440-65-5	1.76E-06	1.76E-06
			Ytterbium (Yb)	7440-64-4	2.03E-07	2.03E-07
			Zinc (Zn)	7440-66-6	3.12E-05	3.12E-05
			Zirconium (Zr)	7440-67-7	1.30E-05	1.30E-05
			Silicon Dioxide (SiO2)	7631-86-9	8.86E-02	8.86E-02
			Aluminum Oxide (Al2O3)	1344-28-1	2.04E-02	2.04E-02
			Iron Oxide (Fe2O3)	1309-37-1	6.84E-03	6.84E-03
			Magnesium Oxide (MgO)	1309-48-4	2.86E-03	2.86E-03
			Calcium Oxide (CaO)	1305-78-8	4.88E-03	4.88E-03
			Sodium Oxide (Na2O)	1313-59-3	4.75E-03	4.75E-03
			Potassium Oxide (K2O)	12136-45-7	3.29E-03	3.29E-03
			Titanium dioxide (TiO2)	13463-67-7	3.50E-04	3.50E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.59E-04	1.59E-04
			Manganese Oxide (MnO)	1344-43-0	4.59E-05	4.59E-05
			Chromium Oxide (Cr2O3)	1308-38-9	4.01E-05	4.01E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	2.97E-05	2.97E-05
			Chalcopyrite (CuFeS2)	1308-56-1	2.97E-04	2.97E-04
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.76E-06	6.76E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	6.76E-06	6.76E-06
			Galena (PbS)	1314-87-0	2.70E-05	2.70E-05
			Sphalerite (ZnS)	1314-98-3	5.41E-05	5.41E-05
			Pyrite (Fe, S2)	1309-36-0	8.11E-04	8.11E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.79E-04	3.79E-04
			Arsenopyrite (FeAsS)	1303-18-0	6.76E-06	6.76E-06
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.55E-05	3.55E-05
			Quartz	14808-60-7	8.30E-03	8.30E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.35E-02	7.35E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	4.81E-03	4.81E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.45E-02	1.45E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	8.53E-03	8.53E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.55E-03	1.55E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	7.99E-03	7.99E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.65E-03	2.65E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	5.68E-05	5.68E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.97E-04	2.97E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	6.76E-05	6.76E-05
			Calcite (CaCO3)	1317-65-3	9.87E-04	9.87E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.10E-06	7.10E-06
			Titanite (CaTiSiO5)	[TITAN]	3.34E-04	3.34E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.97E-04	2.97E-04
			Mica	12001-26-2	1.45E-02	1.45E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	7.15E-03	7.15E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	5.84E-03	5.84E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.53E-03	4.53E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.58E-02	1.58E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.45E-02	3.45E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.29E-02	1.29E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.88E-03	1.88E-03
			Sillimanite (Al2SiO5)	12141-45-6	5.95E-04	5.95E-04

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
P1B	Pit 87 Blasting	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 and Austrailia Government - NPI - Explosives Detonation and Firing Ranges	Nitrogen Oxides (NOx)	10102-44-0	1.57E+00	8.23E-02
			Sulphur Dioxide (SO_2)	7446-09--5	4.70E-01	2.47E-02
			Carbon Monoxide (CO)	630-08-0	1.80E+01	9.47E-01
			TSP	[PM]	9.50E+00	6.66E-01
			PM_{10}	[PM10]	4.94E+00	3.46E-01
			$PM_{2.5}$	[PM2.5]	2.85E-01	2.00E-02
			Silver (Ag)	7440-22-4	1.99E-05	1.39E-06
			Aluminum (Al)	7429-90-5	7.28E-01	5.10E-02
			Arsenic (As)	7440-38-2	2.51E-04	1.76E-05
			Gold (Au)	7440-57-5	5.25E-06	3.68E-07
			Boron (B)	7440-42-8	1.24E-03	8.66E-05
			Barium (Ba)	7440-39-3	3.91E-03	2.74E-04
			Beryllium (Be)	7440-41-7	1.13E-05	7.90E-07
			Bismuth (Bi)	7440-69-9	2.81E-05	1.97E-06
			Carbon (C)	7440-44-0	1.17E-02	8.19E-04
			Calcium (Ca)	7440-70-2	3.04E-01	2.13E-02
			Cadmium (Cd)	7440-43-9	5.95E-05	4.17E-06
			Cerium (Ce)	7440-45-1	6.71E-04	4.70E-05
			Cobalt (Co)	7440-48-4	1.71E-04	1.20E-05
			Chromium (Cr)	7440-47-3	9.50E-04	6.66E-05
			Cesium (Cs)	7440-46-2	2.85E-05	2.00E-06
			Copper (Cu)	7440-50-8	5.63E-03	3.94E-04
			Iron (Fe)	7439-89-6	3.61E-01	2.53E-02
			Gallium (Ga)	7440-55-3	1.90E-04	1.33E-05
			Hafnium (Hf)	7440-58-6	3.93E-05	2.76E-06
			Mercury (Hg)	7439-97-6	2.38E-07	1.66E-08
			Indium (In)	7440-74-6	4.75E-08	3.33E-09
			Potassium (K)	7440-09-7	1.62E-01	1.14E-02
			Lanthanum (La)	7439-91-0	1.97E-04	1.38E-05
			Lithium (Li)	7439-93-2	2.43E-04	1.70E-05
			Lutetium (Lu)	7439-94-3	2.22E-06	1.56E-07
			Magnesium (Mg)	7439-95-4	1.32E-01	9.25E-03
			Manganese (Mn)	7439-96-5	2.40E-03	1.68E-04
			Molybdenum (Mo)	7439-98-7	6.13E-05	4.29E-06
			Sodium (Na)	7440-23-5	2.82E-01	1.98E-02
			Niobium (Nb)	7440--03-1	5.55E-05	3.89E-06
			Nickel (Ni)	7440-02-0	2.51E-04	1.76E-05
			Phosphorus (P)	7723-14-0	5.94E-03	4.16E-04
			Lead (Pb)	7439-92-1	2.14E-04	1.50E-05
			Rubidium (Rb)	7440-17-7	7.14E-04	5.00E-05
			Sulphur (S)	7704-34-9	3.96E-02	2.78E-03
			Antimony (Sb)	7440-36-0	7.73E-05	5.42E-06
			Scandium (Sc)	7440-20-2	1.05E-04	7.38E-06
			Selenium (Se)	7782-49-2	3.33E-06	2.33E-07
			Tin (Sn)	7440-31-5	8.13E-05	5.70E-06
			Strontium (Sr)	7440-24-6	3.16E-03	2.22E-04
			Tantalum (Ta)	7440-25-7	9.56E-06	6.70E-07
			Terbium (Tb)	7440-27-9	5.05E-06	3.54E-07
			Tellurium (Te)	13494-80-9	1.66E-06	1.17E-07
			Titanium (Ti)	7440-32-6	1.58E-02	1.11E-03
			Thallium (Tl)	7440-28-0	8.59E-06	6.02E-07
			Uranium (U)	7440-61-1	1.27E-05	8.92E-07
			Vanadium (v)	7440-62-2	9.34E-04	6.55E-05
			Tungsten (W)	7440-33-7	4.69E-04	3.29E-05
			Yttrium (Y)	7440-65-5	1.24E-04	8.66E-06
			Ytterbium (Yb)	7440-64-4	1.42E-05	9.98E-07
			Zinc (Zn)	7440-66-6	2.19E-03	1.54E-04
			Zirconium (Zr)	7440-67-7	9.16E-04	6.42E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.23E+00	4.37E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.43E+00	1.01E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.80E-01	3.37E-02
			Magnesium Oxide (MgO)	1309-48-4	2.01E-01	1.41E-02
			Calcium Oxide (CaO)	1305-78-8	3.43E-01	2.40E-02
			Sodium Oxide (Na2O)	1313-59-3	3.34E-01	2.34E-02
			Potassium Oxide (K2O)	12136-45-7	2.31E-01	1.62E-02
			Titanium dioxide (TiO2)	13463-67-7	2.43E-02	1.70E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.12E-02	7.82E-04
			Manganese Oxide (MnO)	1344-43-0	3.19E-03	2.24E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.82E-03	1.98E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.09E-03	1.46E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.09E-02	1.46E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.75E-04	3.33E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.75E-04	3.33E-05
			Galena (PbS)	1314-87-0	1.90E-03	1.33E-04
			Sphalerite (ZnS)	1314-98-3	3.80E-03	2.66E-04
			Pyrite (Fe, S2)	1309-36-0	5.70E-02	4.00E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.66E-02	1.86E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.75E-04	3.33E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.47E-03	1.73E-04
			Quartz	14808-60-7	5.77E-01	4.05E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.16E+00	3.62E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.38E-01	2.37E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.02E+00	7.13E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.99E-01	4.20E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.08E-01	7.55E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.61E-01	3.94E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.86E-01	1.31E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.95E-03	2.77E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.09E-02	1.46E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.75E-03	3.33E-04
			Calcite (CaCO3)	1317-65-3	6.94E-02	4.86E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.94E-04	3.46E-05
			Titanite (CaTiSiO5)	[TITAN]	2.32E-02	1.63E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.09E-02	1.46E-03
			Mica	12001-26-2	1.02E+00	7.13E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.03E-01	3.52E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.10E-01	2.88E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.18E-01	2.23E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E+00	7.78E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.42E+00	1.70E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.04E-01	6.33E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-01	9.26E-03
			Sillimanite (Al2SiO5)	12141-45-6	4.18E-02	2.93E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
P1C	Pit 87 Material Movement	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	1.96E+00	1.96E+00
			PM_{10}	[PM10]	3.79E-01	3.79E-01
			$PM_{2.5}$	[PM2.5]	2.06E-01	2.06E-01
			Silver (Ag)	7440-22-4	4.11E-06	4.11E-06
			Aluminum (Al)	7429-90-5	1.51E-01	1.51E-01
			Arsenic (As)	7440-38-2	5.19E-05	5.19E-05
			Gold (Au)	7440-57-5	1.08E-06	1.08E-06
			Boron (B)	7440-42-8	2.56E-04	2.56E-04
			Barium (Ba)	7440-39-3	8.09E-04	8.09E-04
			Beryllium (Be)	7440-41-7	2.33E-06	2.33E-06
			Bismuth (Bi)	7440-69-9	5.81E-06	5.81E-06
			Carbon (C)	7440-44-0	2.42E-03	2.42E-03
			Calcium (Ca)	7440-70-2	6.29E-02	6.29E-02
			Cadmium (Cd)	7440-43-9	1.23E-05	1.23E-05
			Cerium (Ce)	7440-45-1	1.39E-04	1.39E-04
			Cobalt (Co)	7440-48-4	3.54E-05	3.54E-05
			Chromium (Cr)	7440-47-3	1.96E-04	1.96E-04
			Cesium (Cs)	7440-46-2	5.89E-06	5.89E-06
			Copper (Cu)	7440-50-8	1.16E-03	1.16E-03
			Iron (Fe)	7439-89-6	7.46E-02	7.46E-02
			Gallium (Ga)	7440-55-3	3.93E-05	3.93E-05
			Hafnium (Hf)	7440-58-6	8.13E-06	8.13E-06
			Mercury (Hg)	7439-97-6	4.91E-08	4.91E-08
			Indium (In)	7440-74-6	9.82E-09	9.82E-09
			Potassium (K)	7440-09-7	3.35E-02	3.35E-02
			Lanthanum (La)	7439-91-0	4.06E-05	4.06E-05
			Lithium (Li)	7439-93-2	5.03E-05	5.03E-05
			Lutetium (Lu)	7439-94-3	4.60E-07	4.60E-07
			Magnesium (Mg)	7439-95-4	2.73E-02	2.73E-02
			Manganese (Mn)	7439-96-5	1.84E-04	1.84E-04
			Molybdenum (Mo)	7439-98-7	1.27E-05	1.27E-05
			Sodium (Na)	7440-23-5	5.83E-02	5.83E-02
			Niobium (Nb)	7440--03-1	1.15E-05	1.15E-05
			Nickel (Ni)	7440-02-0	1.92E-05	1.92E-05
			Phosphorus (P)	7723-14-0	1.23E-03	1.23E-03
			Lead (Pb)	7439-92-1	4.41E-05	4.41E-05
			Rubidium (Rb)	7440-17-7	1.48E-04	1.48E-04
			Sulphur (S)	7704-34-9	8.19E-03	8.19E-03
			Antimony (Sb)	7440-36-0	1.60E-05	1.60E-05
			Scandium (Sc)	7440-20-2	2.18E-05	2.18E-05
			Selenium (Se)	7782-49-2	6.87E-07	6.87E-07
			Tin (Sn)	7440-31-5	1.68E-05	1.68E-05
			Strontium (Sr)	7440-24-6	6.54E-04	6.54E-04
			Tantalum (Ta)	7440-25-7	1.98E-06	1.98E-06
			Terbium (Tb)	7440-27-9	1.04E-06	1.04E-06
			Tellurium (Te)	13494-80-9	3.44E-07	3.44E-07
			Titanium (Ti)	7440-32-6	1.21E-03	1.21E-03
			Thallium (Tl)	7440-28-0	1.78E-06	1.78E-06
			Uranium (U)	7440-61-1	2.63E-06	2.63E-06
			Vanadium (v)	7440-62-2	1.93E-04	1.93E-04
			Tungsten (W)	7440-33-7	9.70E-05	9.70E-05
			Yttrium (Y)	7440-65-5	2.55E-05	2.55E-05
			Ytterbium (Yb)	7440-64-4	2.94E-06	2.94E-06
			Zinc (Zn)	7440-66-6	4.54E-04	4.54E-04
			Zirconium (Zr)	7440-67-7	1.89E-04	1.89E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.29E+00	1.29E+00
			Aluminum Oxide (Al2O3)	1344-28-1	2.97E-01	2.97E-01
			Iron Oxide (Fe2O3)	1309-37-1	9.93E-02	9.93E-02
			Magnesium Oxide (MgO)	1309-48-4	4.15E-02	4.15E-02
			Calcium Oxide (CaO)	1305-78-8	7.08E-02	7.08E-02
			Sodium Oxide (Na2O)	1313-59-3	6.90E-02	6.90E-02
			Potassium Oxide (K2O)	12136-45-7	4.79E-02	4.79E-02
			Titanium dioxide (TiO2)	13463-67-7	1.86E-03	1.86E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.31E-03	2.31E-03
			Manganese Oxide (MnO)	1344-43-0	2.45E-04	2.45E-04
			Chromium Oxide (Cr2O3)	1308-38-9	5.83E-04	5.83E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	4.32E-04	4.32E-04
			Chalcopyrite (CuFeS2)	1308-56-1	4.32E-03	4.32E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	9.82E-05	9.82E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	9.82E-05	9.82E-05
			Galena (PbS)	1314-87-0	3.93E-04	3.93E-04
			Sphalerite (ZnS)	1314-98-3	7.86E-04	7.86E-04
			Pyrite (Fe, S2)	1309-36-0	1.18E-02	1.18E-02
			Pyrrhotite (Fe7S8)	12305-96-3	5.50E-03	5.50E-03
			Arsenopyrite (FeAsS)	1303-18-0	9.82E-05	9.82E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.89E-04	1.89E-04
			Quartz	14808-60-7	4.43E-02	4.43E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.07E+00	1.07E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.99E-02	6.99E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.10E-01	2.10E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.24E-01	1.24E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	8.26E-03	8.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.16E-01	1.16E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.85E-02	3.85E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.03E-04	3.03E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	4.32E-03	4.32E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	9.82E-04	9.82E-04
			Calcite (CaCO3)	1317-65-3	1.43E-02	1.43E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.79E-05	3.79E-05
			Titanite (CaTiSiO5)	[TITAN]	1.78E-03	1.78E-03
			Apatite (Ca5(PO4)3)	1306-05-4	4.32E-03	4.32E-03
			Mica	12001-26-2	2.10E-01	2.10E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.04E-01	1.04E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.48E-02	8.48E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.58E-02	6.58E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.30E-01	2.30E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.01E-01	5.01E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.87E-01	1.87E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.73E-02	2.73E-02
			Sillimanite (Al2SiO5)	12141-45-6	8.64E-03	8.64E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
P1D	Pit 87 Loading	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	8.15E-01	8.15E-01
			PM_{10}	[PM10]	3.86E-01	3.86E-01
			$PM_{2.5}$	[PM2.5]	5.84E-02	5.84E-02
			Silver (Ag)	7440-22-4	1.71E-06	1.71E-06
			Aluminum (Al)	7429-90-5	6.25E-02	6.25E-02
			Arsenic (As)	7440-38-2	2.16E-05	2.16E-05
			Gold (Au)	7440-57-5	4.50E-07	4.50E-07
			Boron (B)	7440-42-8	1.06E-04	1.06E-04
			Barium (Ba)	7440-39-3	3.36E-04	3.36E-04
			Beryllium (Be)	7440-41-7	9.68E-07	9.68E-07
			Bismuth (Bi)	7440-69-9	2.41E-06	2.41E-06
			Carbon (C)	7440-44-0	1.00E-03	1.00E-03
			Calcium (Ca)	7440-70-2	2.61E-02	2.61E-02
			Cadmium (Cd)	7440-43-9	5.11E-06	5.11E-06
			Cerium (Ce)	7440-45-1	5.76E-05	5.76E-05
			Cobalt (Co)	7440-48-4	1.47E-05	1.47E-05
			Chromium (Cr)	7440-47-3	8.15E-05	8.15E-05
			Cesium (Cs)	7440-46-2	2.45E-06	2.45E-06
			Copper (Cu)	7440-50-8	4.83E-04	4.83E-04
			Iron (Fe)	7439-89-6	3.10E-02	3.10E-02
			Gallium (Ga)	7440-55-3	1.63E-05	1.63E-05
			Hafnium (Hf)	7440-58-6	3.38E-06	3.38E-06
			Mercury (Hg)	7439-97-6	2.04E-08	2.04E-08
			Indium (In)	7440-74-6	4.08E-09	4.08E-09
			Potassium (K)	7440-09-7	1.39E-02	1.39E-02
			Lanthanum (La)	7439-91-0	1.69E-05	1.69E-05
			Lithium (Li)	7439-93-2	2.09E-05	2.09E-05
			Lutetium (Lu)	7439-94-3	1.91E-07	1.91E-07
			Magnesium (Mg)	7439-95-4	1.13E-02	1.13E-02
			Manganese (Mn)	7439-96-5	1.88E-04	1.88E-04
			Molybdenum (Mo)	7439-98-7	5.26E-06	5.26E-06
			Sodium (Na)	7440-23-5	2.42E-02	2.42E-02
			Niobium (Nb)	7440--03-1	4.76E-06	4.76E-06
			Nickel (Ni)	7440-02-0	1.96E-05	1.96E-05
			Phosphorus (P)	7723-14-0	5.10E-04	5.10E-04
			Lead (Pb)	7439-92-1	1.83E-05	1.83E-05
			Rubidium (Rb)	7440-17-7	6.13E-05	6.13E-05
			Sulphur (S)	7704-34-9	3.40E-03	3.40E-03
			Antimony (Sb)	7440-36-0	6.63E-06	6.63E-06
			Scandium (Sc)	7440-20-2	9.04E-06	9.04E-06
			Selenium (Se)	7782-49-2	2.85E-07	2.85E-07
			Tin (Sn)	7440-31-5	6.98E-06	6.98E-06
			Strontium (Sr)	7440-24-6	2.71E-04	2.71E-04
			Tantalum (Ta)	7440-25-7	8.20E-07	8.20E-07
			Terbium (Tb)	7440-27-9	4.34E-07	4.34E-07
			Tellurium (Te)	13494-80-9	1.43E-07	1.43E-07
			Titanium (Ti)	7440-32-6	1.23E-03	1.23E-03
			Thallium (Tl)	7440-28-0	7.37E-07	7.37E-07
			Uranium (U)	7440-61-1	1.09E-06	1.09E-06
			Vanadium (v)	7440-62-2	8.02E-05	8.02E-05
			Tungsten (W)	7440-33-7	4.02E-05	4.02E-05
			Yttrium (Y)	7440-65-5	1.06E-05	1.06E-05
			Ytterbium (Yb)	7440-64-4	1.22E-06	1.22E-06
			Zinc (Zn)	7440-66-6	1.88E-04	1.88E-04
			Zirconium (Zr)	7440-67-7	7.86E-05	7.86E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.34E-01	5.34E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.23E-01	1.23E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.12E-02	4.12E-02
			Magnesium Oxide (MgO)	1309-48-4	1.72E-02	1.72E-02
			Calcium Oxide (CaO)	1305-78-8	2.94E-02	2.94E-02
			Sodium Oxide (Na2O)	1313-59-3	2.86E-02	2.86E-02
			Potassium Oxide (K2O)	12136-45-7	1.99E-02	1.99E-02
			Titanium dioxide (TiO2)	13463-67-7	1.90E-03	1.90E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	9.58E-04	9.58E-04
			Manganese Oxide (MnO)	1344-43-0	2.49E-04	2.49E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.42E-04	2.42E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.79E-04	1.79E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.79E-03	1.79E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.08E-05	4.08E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.08E-05	4.08E-05
			Galena (PbS)	1314-87-0	1.63E-04	1.63E-04
			Sphalerite (ZnS)	1314-98-3	3.26E-04	3.26E-04
			Pyrite (Fe, S2)	1309-36-0	4.89E-03	4.89E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.28E-03	2.28E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.08E-05	4.08E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.93E-04	1.93E-04
			Quartz	14808-60-7	4.51E-02	4.51E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.43E-01	4.43E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.90E-02	2.90E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.72E-02	8.72E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.14E-02	5.14E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	8.41E-03	8.41E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.82E-02	4.82E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.60E-02	1.60E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.08E-04	3.08E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.79E-03	1.79E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.08E-04	4.08E-04
			Calcite (CaCO3)	1317-65-3	5.95E-03	5.95E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.86E-05	3.86E-05
			Titanite (CaTiSiO5)	[TITAN]	1.81E-03	1.81E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.79E-03	1.79E-03
			Mica	12001-26-2	8.73E-02	8.73E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.31E-02	4.31E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.52E-02	3.52E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.73E-02	2.73E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	9.53E-02	9.53E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.08E-01	2.08E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	7.75E-02	7.75E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.13E-02	1.13E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.59E-03	3.59E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M1	Unloading/Loading Ore at Coarse Ore Storage Area	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	1.88E-01	1.88E-01
			PM_{10}	[PM10]	8.90E-02	8.90E-02
			$PM_{2.5}$	[PM2.5]	1.35E-02	1.35E-02
			Silver (Ag)	7440-22-4	3.94E-07	3.94E-07
			Aluminum (Al)	7429-90-5	1.41E-02	1.41E-02
			Arsenic (As)	7440-38-2	4.97E-06	4.97E-06
			Gold (Au)	7440-57-5	1.04E-07	1.04E-07
			Boron (B)	7440-42-8	2.45E-05	2.45E-05
			Barium (Ba)	7440-39-3	7.75E-05	7.75E-05
			Beryllium (Be)	7440-41-7	2.21E-07	2.21E-07
			Bismuth (Bi)	7440-69-9	5.57E-07	5.57E-07
			Carbon (C)	7440-44-0	2.31E-04	2.31E-04
			Calcium (Ca)	7440-70-2	4.93E-03	4.93E-03
			Cadmium (Cd)	7440-43-9	1.18E-06	1.18E-06
			Cerium (Ce)	7440-45-1	1.33E-05	1.33E-05
			Cobalt (Co)	7440-48-4	3.27E-06	3.27E-06
			Chromium (Cr)	7440-47-3	1.88E-05	1.88E-05
			Cesium (Cs)	7440-46-2	5.64E-07	5.64E-07
			Copper (Cu)	7440-50-8	1.11E-04	1.11E-04
			Iron (Fe)	7439-89-6	7.15E-03	7.15E-03
			Gallium (Ga)	7440-55-3	3.70E-06	3.70E-06
			Hafnium (Hf)	7440-58-6	7.79E-07	7.79E-07
			Mercury (Hg)	7439-97-6	4.70E-09	4.70E-09
			Indium (In)	7440-74-6	9.40E-10	9.40E-10
			Potassium (K)	7440-09-7	3.21E-03	3.21E-03
			Lanthanum (La)	7439-91-0	3.89E-06	3.89E-06
			Lithium (Li)	7439-93-2	4.81E-06	4.81E-06
			Lutetium (Lu)	7439-94-3	4.40E-08	4.40E-08
			Magnesium (Mg)	7439-95-4	2.30E-03	2.30E-03
			Manganese (Mn)	7439-96-5	4.33E-05	4.33E-05
			Molybdenum (Mo)	7439-98-7	1.18E-06	1.18E-06
			Sodium (Na)	7440-23-5	5.57E-03	5.57E-03
			Niobium (Nb)	7440--03-1	1.10E-06	1.10E-06
			Nickel (Ni)	7440-02-0	4.11E-06	4.11E-06
			Phosphorus (P)	7723-14-0	9.88E-05	9.88E-05
			Lead (Pb)	7439-92-1	4.23E-06	4.23E-06
			Rubidium (Rb)	7440-17-7	1.41E-05	1.41E-05
			Sulphur (S)	7704-34-9	7.84E-04	7.84E-04
			Antimony (Sb)	7440-36-0	1.53E-06	1.53E-06
			Scandium (Sc)	7440-20-2	2.08E-06	2.08E-06
			Selenium (Se)	7782-49-2	6.58E-08	6.58E-08
			Tin (Sn)	7440-31-5	1.61E-06	1.61E-06
			Strontium (Sr)	7440-24-6	4.64E-05	4.64E-05
			Tantalum (Ta)	7440-25-7	1.89E-07	1.89E-07
			Terbium (Tb)	7440-27-9	1.00E-07	1.00E-07
			Tellurium (Te)	13494-80-9	3.29E-08	3.29E-08
			Titanium (Ti)	7440-32-6	2.52E-04	2.52E-04
			Thallium (Tl)	7440-28-0	1.70E-07	1.70E-07
			Uranium (U)	7440-61-1	2.52E-07	2.52E-07
			Vanadium (v)	7440-62-2	1.70E-05	1.70E-05
			Tungsten (W)	7440-33-7	8.59E-06	8.59E-06
			Yttrium (Y)	7440-65-5	2.45E-06	2.45E-06
			Ytterbium (Yb)	7440-64-4	2.82E-07	2.82E-07
			Zinc (Zn)	7440-66-6	4.34E-05	4.34E-05
			Zirconium (Zr)	7440-67-7	1.81E-05	1.81E-05
			Silicon Dioxide (SiO2)	7631-86-9	1.23E-01	1.23E-01
			Aluminum Oxide (Al2O3)	1344-28-1	2.83E-02	2.83E-02
			Iron Oxide (Fe2O3)	1309-37-1	9.51E-03	9.51E-03
			Magnesium Oxide (MgO)	1309-48-4	3.98E-03	3.98E-03
			Calcium Oxide (CaO)	1305-78-8	6.64E-03	6.64E-03
			Sodium Oxide (Na2O)	1313-59-3	6.61E-03	6.61E-03
			Potassium Oxide (K2O)	12136-45-7	4.52E-03	4.52E-03
			Titanium dioxide (TiO2)	13463-67-7	4.29E-04	4.29E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.02E-04	2.02E-04
			Manganese Oxide (MnO)	1344-43-0	5.39E-05	5.39E-05
			Chromium Oxide (Cr2O3)	1308-38-9	5.48E-05	5.48E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	3.12E-05	3.12E-05
			Chalcopyrite (CuFeS2)	1308-56-1	4.14E-04	4.14E-04
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	9.40E-06	9.40E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	9.40E-06	9.40E-06
			Galena (PbS)	1314-87-0	3.76E-05	3.76E-05
			Sphalerite (ZnS)	1314-98-3	7.52E-05	7.52E-05
			Pyrite (Fe, S2)	1309-36-0	1.07E-03	1.07E-03
			Pyrrhotite (Fe7S8)	12305-96-3	5.27E-04	5.27E-04
			Arsenopyrite (FeAsS)	1303-18-0	9.40E-06	9.40E-06
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.45E-05	4.45E-05
			Quartz	14808-60-7	1.02E-02	1.02E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.50E-02	7.50E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.70E-03	6.70E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.01E-02	2.01E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.19E-02	1.19E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.94E-03	1.94E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.11E-02	1.11E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.69E-03	3.69E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.12E-05	7.12E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	4.14E-04	4.14E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	9.40E-05	9.40E-05
			Calcite (CaCO3)	1317-65-3	1.37E-03	1.37E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	8.90E-06	8.90E-06
			Titanite (CaTiSiO5)	[TITAN]	4.18E-04	4.18E-04
			Apatite (Ca5(PO4)3)	1306-05-4	4.14E-04	4.14E-04
			Mica	12001-26-2	2.01E-02	2.01E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	9.95E-03	9.95E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.13E-03	8.13E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.30E-03	6.30E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.20E-02	2.20E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	4.80E-02	4.80E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.79E-02	1.79E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.61E-03	2.61E-03
			Sillimanite (Al2SiO5)	12141-45-6	8.28E-04	8.28E-04

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M2	Unloading OVB at OB 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	3.14E-01	3.14E-01
			PM_{10}	[PM10]	1.49E-01	1.49E-01
			$PM_{2.5}$	[PM2.5]	2.25E-02	2.25E-02
			Silver (Ag)	7440-22-4	1.96E-07	1.96E-07
			Aluminum (Al)	7429-90-5	2.41E-02	2.41E-02
			Arsenic (As)	7440-38-2	2.49E-06	2.49E-06
			Gold (Au)	7440-57-5	2.75E-08	2.75E-08
			Boron (B)	7440-42-8	3.18E-05	3.18E-05
			Barium (Ba)	7440-39-3	1.17E-04	1.17E-04
			Beryllium (Be)	7440-41-7	3.73E-07	3.73E-07
			Bismuth (Bi)	7440-69-9	6.57E-07	6.57E-07
			Carbon (C)	7440-44-0	2.88E-04	2.88E-04
			Calcium (Ca)	7440-70-2	1.01E-02	1.01E-02
			Cadmium (Cd)	7440-43-9	3.74E-07	3.74E-07
			Cerium (Ce)	7440-45-1	2.22E-05	2.22E-05
			Cobalt (Co)	7440-48-4	5.66E-06	5.66E-06
			Chromium (Cr)	7440-47-3	2.82E-05	2.82E-05
			Cesium (Cs)	7440-46-2	9.42E-07	9.42E-07
			Copper (Cu)	7440-50-8	4.20E-05	4.20E-05
			Iron (Fe)	7439-89-6	1.09E-02	1.09E-02
			Gallium (Ga)	7440-55-3	6.28E-06	6.28E-06
			Hafnium (Hf)	7440-58-6	1.30E-06	1.30E-06
			Mercury (Hg)	7439-97-6	7.85E-09	7.85E-09
			Indium (In)	7440-74-6	1.57E-09	1.57E-09
			Potassium (K)	7440-09-7	4.65E-03	4.65E-03
			Lanthanum (La)	7439-91-0	4.99E-06	4.99E-06
			Lithium (Li)	7439-93-2	8.04E-06	8.04E-06
			Lutetium (Lu)	7439-94-3	7.35E-08	7.35E-08
			Magnesium (Mg)	7439-95-4	4.36E-03	4.36E-03
			Manganese (Mn)	7439-96-5	6.70E-05	6.70E-05
			Molybdenum (Mo)	7439-98-7	2.02E-06	2.02E-06
			Sodium (Na)	7440-23-5	9.32E-03	9.32E-03
			Niobium (Nb)	7440--03-1	1.83E-06	1.83E-06
			Nickel (Ni)	7440-02-0	7.55E-06	7.55E-06
			Phosphorus (P)	7723-14-0	1.96E-04	1.96E-04
			Lead (Pb)	7439-92-1	6.31E-06	6.31E-06
			Rubidium (Rb)	7440-17-7	2.36E-05	2.36E-05
			Sulphur (S)	7704-34-9	5.87E-04	5.87E-04
			Antimony (Sb)	7440-36-0	1.58E-06	1.58E-06
			Scandium (Sc)	7440-20-2	3.48E-06	3.48E-06
			Selenium (Se)	7782-49-2	1.10E-07	1.10E-07
			Tin (Sn)	7440-31-5	2.69E-06	2.69E-06
			Strontium (Sr)	7440-24-6	1.05E-04	1.05E-04
			Tantalum (Ta)	7440-25-7	3.16E-07	3.16E-07
			Terbium (Tb)	7440-27-9	1.67E-07	1.67E-07
			Tellurium (Te)	13494-80-9	5.50E-08	5.50E-08
			Titanium (Ti)	7440-32-6	4.75E-04	4.75E-04
			Thallium (Tl)	7440-28-0	2.84E-07	2.84E-07
			Uranium (U)	7440-61-1	4.21E-07	4.21E-07
			Vanadium (v)	7440-62-2	3.09E-05	3.09E-05
			Tungsten (W)	7440-33-7	1.55E-05	1.55E-05
			Yttrium (Y)	7440-65-5	4.08E-06	4.08E-06
			Ytterbium (Yb)	7440-64-4	4.70E-07	4.70E-07
			Zinc (Zn)	7440-66-6	3.78E-05	3.78E-05
			Zirconium (Zr)	7440-67-7	3.03E-05	3.03E-05
			Silicon Dioxide (SiO2)	7631-86-9	2.05E-01	2.05E-01
			Aluminum Oxide (Al2O3)	1344-28-1	4.74E-02	4.74E-02
			Iron Oxide (Fe2O3)	1309-37-1	1.57E-02	1.57E-02
			Magnesium Oxide (MgO)	1309-48-4	6.62E-03	6.62E-03
			Calcium Oxide (CaO)	1305-78-8	1.13E-02	1.13E-02
			Sodium Oxide (Na2O)	1313-59-3	1.08E-02	1.08E-02
			Potassium Oxide (K2O)	12136-45-7	7.65E-03	7.65E-03
			Titanium dioxide (TiO2)	13463-67-7	7.31E-04	7.31E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.69E-04	3.69E-04
			Manganese Oxide (MnO)	1344-43-0	9.60E-05	9.60E-05
			Chromium Oxide (Cr2O3)	1308-38-9	9.32E-05	9.32E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	6.91E-05	6.91E-05
			Chalcopyrite (CuFeS2)	1308-56-1	6.91E-04	6.91E-04
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.57E-05	1.57E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	1.57E-05	1.57E-05
			Galena (PbS)	1314-87-0	6.28E-05	6.28E-05
			Sphalerite (ZnS)	1314-98-3	1.26E-04	1.26E-04
			Pyrite (Fe, S2)	1309-36-0	1.88E-03	1.88E-03
			Pyrrhotite (Fe7S8)	12305-96-3	8.79E-04	8.79E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.57E-05	1.57E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	7.43E-05	7.43E-05
			Quartz	14808-60-7	1.74E-02	1.74E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.71E-01	1.71E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.12E-02	1.12E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.59E-02	2.59E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.53E-03	5.53E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.24E-03	3.24E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.36E-03	3.36E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	6.16E-03	6.16E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.19E-04	1.19E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	6.91E-04	6.91E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.57E-04	1.57E-04
			Calcite (CaCO3)	1317-65-3	1.51E-03	1.51E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.49E-05	1.49E-05
			Titanite (CaTiSiO5)	[TITAN]	4.16E-04	4.16E-04
			Apatite (Ca5(PO4)3)	1306-05-4	6.91E-04	6.91E-04
			Mica	12001-26-2	3.36E-02	3.36E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.66E-02	1.66E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.36E-02	1.36E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.05E-02	1.05E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.67E-02	3.67E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	8.01E-02	8.01E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	2.99E-02	2.99E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.37E-03	4.37E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.38E-03	1.38E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M3	Unloading WR at TSF	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.27E-01	5.27E-01
			PM_{10}	[PM10]	2.49E-01	2.49E-01
			$PM_{2.5}$	[PM2.5]	3.78E-02	3.78E-02
			Silver (Ag)	7440-22-4	3.29E-07	3.29E-07
			Aluminum (Al)	7429-90-5	4.04E-02	4.04E-02
			Arsenic (As)	7440-38-2	4.18E-06	4.18E-06
			Gold (Au)	7440-57-5	4.62E-08	4.62E-08
			Boron (B)	7440-42-8	5.35E-05	5.35E-05
			Barium (Ba)	7440-39-3	1.97E-04	1.97E-04
			Beryllium (Be)	7440-41-7	6.26E-07	6.26E-07
			Bismuth (Bi)	7440-69-9	1.10E-06	1.10E-06
			Carbon (C)	7440-44-0	4.83E-04	4.83E-04
			Calcium (Ca)	7440-70-2	1.69E-02	1.69E-02
			Cadmium (Cd)	7440-43-9	6.28E-07	6.28E-07
			Cerium (Ce)	7440-45-1	3.72E-05	3.72E-05
			Cobalt (Co)	7440-48-4	9.50E-06	9.50E-06
			Chromium (Cr)	7440-47-3	4.73E-05	4.73E-05
			Cesium (Cs)	7440-46-2	1.58E-06	1.58E-06
			Copper (Cu)	7440-50-8	7.04E-05	7.04E-05
			Iron (Fe)	7439-89-6	1.82E-02	1.82E-02
			Gallium (Ga)	7440-55-3	1.05E-05	1.05E-05
			Hafnium (Hf)	7440-58-6	2.18E-06	2.18E-06
			Mercury (Hg)	7439-97-6	1.32E-08	1.32E-08
			Indium (In)	7440-74-6	2.64E-09	2.64E-09
			Potassium (K)	7440-09-7	7.81E-03	7.81E-03
			Lanthanum (La)	7439-91-0	8.38E-06	8.38E-06
			Lithium (Li)	7439-93-2	1.35E-05	1.35E-05
			Lutetium (Lu)	7439-94-3	1.23E-07	1.23E-07
			Magnesium (Mg)	7439-95-4	7.33E-03	7.33E-03
			Manganese (Mn)	7439-96-5	1.12E-04	1.12E-04
			Molybdenum (Mo)	7439-98-7	3.40E-06	3.40E-06
			Sodium (Na)	7440-23-5	1.56E-02	1.56E-02
			Niobium (Nb)	7440--03-1	3.08E-06	3.08E-06
			Nickel (Ni)	7440-02-0	1.27E-05	1.27E-05
			Phosphorus (P)	7723-14-0	3.30E-04	3.30E-04
			Lead (Pb)	7439-92-1	1.06E-05	1.06E-05
			Rubidium (Rb)	7440-17-7	3.96E-05	3.96E-05
			Sulphur (S)	7704-34-9	9.86E-04	9.86E-04
			Antimony (Sb)	7440-36-0	2.65E-06	2.65E-06
			Scandium (Sc)	7440-20-2	5.84E-06	5.84E-06
			Selenium (Se)	7782-49-2	1.85E-07	1.85E-07
			Tin (Sn)	7440-31-5	4.51E-06	4.51E-06
			Strontium (Sr)	7440-24-6	1.76E-04	1.76E-04
			Tantalum (Ta)	7440-25-7	5.31E-07	5.31E-07
			Terbium (Tb)	7440-27-9	2.81E-07	2.81E-07
			Tellurium (Te)	13494-80-9	9.23E-08	9.23E-08
			Titanium (Ti)	7440-32-6	7.98E-04	7.98E-04
			Thallium (Tl)	7440-28-0	4.77E-07	4.77E-07
			Uranium (U)	7440-61-1	7.07E-07	7.07E-07
			Vanadium (v)	7440-62-2	5.18E-05	5.18E-05
			Tungsten (W)	7440-33-7	2.60E-05	2.60E-05
			Yttrium (Y)	7440-65-5	6.86E-06	6.86E-06
			Ytterbium (Yb)	7440-64-4	7.90E-07	7.90E-07
			Zinc (Zn)	7440-66-6	6.35E-05	6.35E-05
			Zirconium (Zr)	7440-67-7	5.08E-05	5.08E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.45E-01	3.45E-01
			Aluminum Oxide (Al2O3)	1344-28-1	7.96E-02	7.96E-02
			Iron Oxide (Fe2O3)	1309-37-1	2.64E-02	2.64E-02
			Magnesium Oxide (MgO)	1309-48-4	1.11E-02	1.11E-02
			Calcium Oxide (CaO)	1305-78-8	1.90E-02	1.90E-02
			Sodium Oxide (Na2O)	1313-59-3	1.81E-02	1.81E-02
			Potassium Oxide (K2O)	12136-45-7	1.28E-02	1.28E-02
			Titanium dioxide (TiO2)	13463-67-7	1.23E-03	1.23E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.20E-04	6.20E-04
			Manganese Oxide (MnO)	1344-43-0	1.61E-04	1.61E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.56E-04	1.56E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.16E-04	1.16E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.16E-03	1.16E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.64E-05	2.64E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	2.64E-05	2.64E-05
			Galena (PbS)	1314-87-0	1.05E-04	1.05E-04
			Sphalerite (ZnS)	1314-98-3	2.11E-04	2.11E-04
			Pyrite (Fe, S2)	1309-36-0	3.16E-03	3.16E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.48E-03	1.48E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.64E-05	2.64E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.25E-04	1.25E-04
			Quartz	14808-60-7	2.91E-02	2.91E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.87E-01	2.87E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.88E-02	1.88E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.36E-02	4.36E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.28E-03	9.28E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.44E-03	5.44E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.64E-03	5.64E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.03E-02	1.03E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.00E-04	2.00E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.16E-03	1.16E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.64E-04	2.64E-04
			Calcite (CaCO3)	1317-65-3	2.53E-03	2.53E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.49E-05	2.49E-05
			Titanite (CaTiSiO5)	[TITAN]	6.98E-04	6.98E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.16E-03	1.16E-03
			Mica	12001-26-2	5.65E-02	5.65E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.79E-02	2.79E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.28E-02	2.28E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.77E-02	1.77E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.16E-02	6.16E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.34E-01	1.34E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.02E-02	5.02E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.33E-03	7.33E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.32E-03	2.32E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M4	Unloading WR at WD 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	4.35E-01	4.35E-01
			PM_{10}	[PM10]	2.06E-01	2.06E-01
			$PM_{2.5}$	[PM2.5]	3.12E-02	3.12E-02
			Silver (Ag)	7440-22-4	2.71E-07	2.71E-07
			Aluminum (Al)	7429-90-5	3.34E-02	3.34E-02
			Arsenic (As)	7440-38-2	3.45E-06	3.45E-06
			Gold (Au)	7440-57-5	3.81E-08	3.81E-08
			Boron (B)	7440-42-8	4.41E-05	4.41E-05
			Barium (Ba)	7440-39-3	1.62E-04	1.62E-04
			Beryllium (Be)	7440-41-7	5.17E-07	5.17E-07
			Bismuth (Bi)	7440-69-9	9.10E-07	9.10E-07
			Carbon (C)	7440-44-0	3.99E-04	3.99E-04
			Calcium (Ca)	7440-70-2	1.39E-02	1.39E-02
			Cadmium (Cd)	7440-43-9	5.18E-07	5.18E-07
			Cerium (Ce)	7440-45-1	3.07E-05	3.07E-05
			Cobalt (Co)	7440-48-4	7.84E-06	7.84E-06
			Chromium (Cr)	7440-47-3	3.91E-05	3.91E-05
			Cesium (Cs)	7440-46-2	1.31E-06	1.31E-06
			Copper (Cu)	7440-50-8	5.81E-05	5.81E-05
			Iron (Fe)	7439-89-6	1.50E-02	1.50E-02
			Gallium (Ga)	7440-55-3	8.71E-06	8.71E-06
			Hafnium (Hf)	7440-58-6	1.80E-06	1.80E-06
			Mercury (Hg)	7439-97-6	1.09E-08	1.09E-08
			Indium (In)	7440-74-6	2.18E-09	2.18E-09
			Potassium (K)	7440-09-7	6.45E-03	6.45E-03
			Lanthanum (La)	7439-91-0	6.92E-06	6.92E-06
			Lithium (Li)	7439-93-2	1.11E-05	1.11E-05
			Lutetium (Lu)	7439-94-3	1.02E-07	1.02E-07
			Magnesium (Mg)	7439-95-4	6.05E-03	6.05E-03
			Manganese (Mn)	7439-96-5	9.28E-05	9.28E-05
			Molybdenum (Mo)	7439-98-7	2.81E-06	2.81E-06
			Sodium (Na)	7440-23-5	1.29E-02	1.29E-02
			Niobium (Nb)	7440--03-1	2.54E-06	2.54E-06
			Nickel (Ni)	7440-02-0	1.05E-05	1.05E-05
			Phosphorus (P)	7723-14-0	2.72E-04	2.72E-04
			Lead (Pb)	7439-92-1	8.74E-06	8.74E-06
			Rubidium (Rb)	7440-17-7	3.27E-05	3.27E-05
			Sulphur (S)	7704-34-9	8.14E-04	8.14E-04
			Antimony (Sb)	7440-36-0	2.19E-06	2.19E-06
			Scandium (Sc)	7440-20-2	4.82E-06	4.82E-06
			Selenium (Se)	7782-49-2	1.52E-07	1.52E-07
			Tin (Sn)	7440-31-5	3.73E-06	3.73E-06
			Strontium (Sr)	7440-24-6	1.45E-04	1.45E-04
			Tantalum (Ta)	7440-25-7	4.38E-07	4.38E-07
			Terbium (Tb)	7440-27-9	2.32E-07	2.32E-07
			Tellurium (Te)	13494-80-9	7.62E-08	7.62E-08
			Titanium (Ti)	7440-32-6	6.58E-04	6.58E-04
			Thallium (Tl)	7440-28-0	3.93E-07	3.93E-07
			Uranium (U)	7440-61-1	5.83E-07	5.83E-07
			Vanadium (v)	7440-62-2	4.28E-05	4.28E-05
			Tungsten (W)	7440-33-7	2.15E-05	2.15E-05
			Yttrium (Y)	7440-65-5	5.66E-06	5.66E-06
			Ytterbium (Yb)	7440-64-4	6.52E-07	6.52E-07
			Zinc (Zn)	7440-66-6	5.24E-05	5.24E-05
			Zirconium (Zr)	7440-67-7	4.20E-05	4.20E-05
			Silicon Dioxide (SiO2)	7631-86-9	2.84E-01	2.84E-01
			Aluminum Oxide (Al2O3)	1344-28-1	6.57E-02	6.57E-02
			Iron Oxide (Fe2O3)	1309-37-1	2.18E-02	2.18E-02
			Magnesium Oxide (MgO)	1309-48-4	9.17E-03	9.17E-03
			Calcium Oxide (CaO)	1305-78-8	1.57E-02	1.57E-02
			Sodium Oxide (Na2O)	1313-59-3	1.49E-02	1.49E-02
			Potassium Oxide (K2O)	12136-45-7	1.06E-02	1.06E-02
			Titanium dioxide (TiO2)	13463-67-7	1.01E-03	1.01E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	5.11E-04	5.11E-04
			Manganese Oxide (MnO)	1344-43-0	1.33E-04	1.33E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.29E-04	1.29E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	9.58E-05	9.58E-05
			Chalcopyrite (CuFeS2)	1308-56-1	9.58E-04	9.58E-04
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.18E-05	2.18E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	2.18E-05	2.18E-05
			Galena (PbS)	1314-87-0	8.71E-05	8.71E-05
			Sphalerite (ZnS)	1314-98-3	1.74E-04	1.74E-04
			Pyrite (Fe, S2)	1309-36-0	2.61E-03	2.61E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.22E-03	1.22E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.18E-05	2.18E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.03E-04	1.03E-04
			Quartz	14808-60-7	2.41E-02	2.41E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.37E-01	2.37E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.55E-02	1.55E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	3.60E-02	3.60E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	7.66E-03	7.66E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.49E-03	4.49E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.66E-03	4.66E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	8.53E-03	8.53E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.65E-04	1.65E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	9.58E-04	9.58E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.18E-04	2.18E-04
			Calcite (CaCO3)	1317-65-3	2.09E-03	2.09E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.06E-05	2.06E-05
			Titanite (CaTiSiO5)	[TITAN]	5.76E-04	5.76E-04
			Apatite (Ca5(PO4)3)	1306-05-4	9.58E-04	9.58E-04
			Mica	12001-26-2	4.66E-02	4.66E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.30E-02	2.30E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.88E-02	1.88E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.46E-02	1.46E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.09E-02	5.09E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.11E-01	1.11E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	4.14E-02	4.14E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	6.05E-03	6.05E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.92E-03	1.92E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M5	WD 87 Material Movement	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	6.12E-07	6.12E-07
			Aluminum (Al)	7429-90-5	7.53E-02	7.53E-02
			Arsenic (As)	7440-38-2	7.78E-06	7.78E-06
			Gold (Au)	7440-57-5	8.61E-08	8.61E-08
			Boron (B)	7440-42-8	9.96E-05	9.96E-05
			Barium (Ba)	7440-39-3	3.66E-04	3.66E-04
			Beryllium (Be)	7440-41-7	1.17E-06	1.17E-06
			Bismuth (Bi)	7440-69-9	2.05E-06	2.05E-06
			Carbon (C)	7440-44-0	9.00E-04	9.00E-04
			Calcium (Ca)	7440-70-2	3.15E-02	3.15E-02
			Cadmium (Cd)	7440-43-9	1.17E-06	1.17E-06
			Cerium (Ce)	7440-45-1	6.93E-05	6.93E-05
			Cobalt (Co)	7440-48-4	1.77E-05	1.77E-05
			Chromium (Cr)	7440-47-3	8.81E-05	8.81E-05
			Cesium (Cs)	7440-46-2	2.95E-06	2.95E-06
			Copper (Cu)	7440-50-8	1.31E-04	1.31E-04
			Iron (Fe)	7439-89-6	3.39E-02	3.39E-02
			Gallium (Ga)	7440-55-3	1.96E-05	1.96E-05
			Hafnium (Hf)	7440-58-6	4.07E-06	4.07E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	4.91E-09	4.91E-09
			Potassium (K)	7440-09-7	1.45E-02	1.45E-02
			Lanthanum (La)	7439-91-0	1.56E-05	1.56E-05
			Lithium (Li)	7439-93-2	2.51E-05	2.51E-05
			Lutetium (Lu)	7439-94-3	2.30E-07	2.30E-07
			Magnesium (Mg)	7439-95-4	1.36E-02	1.36E-02
			Manganese (Mn)	7439-96-5	8.54E-05	8.54E-05
			Molybdenum (Mo)	7439-98-7	6.33E-06	6.33E-06
			Sodium (Na)	7440-23-5	2.91E-02	2.91E-02
			Niobium (Nb)	7440--03-1	5.73E-06	5.73E-06
			Nickel (Ni)	7440-02-0	9.62E-06	9.62E-06
			Phosphorus (P)	7723-14-0	6.14E-04	6.14E-04
			Lead (Pb)	7439-92-1	1.97E-05	1.97E-05
			Rubidium (Rb)	7440-17-7	7.38E-05	7.38E-05
			Sulphur (S)	7704-34-9	1.84E-03	1.84E-03
			Antimony (Sb)	7440-36-0	4.93E-06	4.93E-06
			Scandium (Sc)	7440-20-2	1.09E-05	1.09E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	8.41E-06	8.41E-06
			Strontium (Sr)	7440-24-6	3.27E-04	3.27E-04
			Tantalum (Ta)	7440-25-7	9.88E-07	9.88E-07
			Terbium (Tb)	7440-27-9	5.22E-07	5.22E-07
			Tellurium (Te)	13494-80-9	1.72E-07	1.72E-07
			Titanium (Ti)	7440-32-6	6.06E-04	6.06E-04
			Thallium (Tl)	7440-28-0	8.88E-07	8.88E-07
			Uranium (U)	7440-61-1	1.32E-06	1.32E-06
			Vanadium (v)	7440-62-2	9.65E-05	9.65E-05
			Tungsten (W)	7440-33-7	4.85E-05	4.85E-05
			Yttrium (Y)	7440-65-5	1.28E-05	1.28E-05
			Ytterbium (Yb)	7440-64-4	1.47E-06	1.47E-06
			Zinc (Zn)	7440-66-6	1.18E-04	1.18E-04
			Zirconium (Zr)	7440-67-7	9.47E-05	9.47E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.42E-01	6.42E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.48E-01	1.48E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.91E-02	4.91E-02
			Magnesium Oxide (MgO)	1309-48-4	2.07E-02	2.07E-02
			Calcium Oxide (CaO)	1305-78-8	3.54E-02	3.54E-02
			Sodium Oxide (Na2O)	1313-59-3	3.37E-02	3.37E-02
			Potassium Oxide (K2O)	12136-45-7	2.39E-02	2.39E-02
			Titanium dioxide (TiO2)	13463-67-7	9.32E-04	9.32E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.15E-03	1.15E-03
			Manganese Oxide (MnO)	1344-43-0	1.22E-04	1.22E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.91E-04	2.91E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.16E-04	2.16E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.16E-03	2.16E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.91E-05	4.91E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.96E-04	1.96E-04
			Sphalerite (ZnS)	1314-98-3	3.93E-04	3.93E-04
			Pyrite (Fe, S2)	1309-36-0	5.89E-03	5.89E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.75E-03	2.75E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.91E-05	4.91E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	9.47E-05	9.47E-05
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.50E-02	3.50E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.11E-02	8.11E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.73E-02	1.73E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.13E-03	4.13E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.05E-02	1.05E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.92E-02	1.92E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.52E-04	1.52E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.16E-03	2.16E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.91E-04	4.91E-04
			Calcite (CaCO3)	1317-65-3	4.71E-03	4.71E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.89E-05	1.89E-05
			Titanite (CaTiSiO5)	[TITAN]	5.30E-04	5.30E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.16E-03	2.16E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M6	OB 87 Material Movement	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	6.12E-07	6.12E-07
			Aluminum (Al)	7429-90-5	7.53E-02	7.53E-02
			Arsenic (As)	7440-38-2	7.78E-06	7.78E-06
			Gold (Au)	7440-57-5	8.61E-08	8.61E-08
			Boron (B)	7440-42-8	9.96E-05	9.96E-05
			Barium (Ba)	7440-39-3	3.66E-04	3.66E-04
			Beryllium (Be)	7440-41-7	1.17E-06	1.17E-06
			Bismuth (Bi)	7440-69-9	2.05E-06	2.05E-06
			Carbon (C)	7440-44-0	9.00E-04	9.00E-04
			Calcium (Ca)	7440-70-2	3.15E-02	3.15E-02
			Cadmium (Cd)	7440-43-9	1.17E-06	1.17E-06
			Cerium (Ce)	7440-45-1	6.93E-05	6.93E-05
			Cobalt (Co)	7440-48-4	1.77E-05	1.77E-05
			Chromium (Cr)	7440-47-3	8.81E-05	8.81E-05
			Cesium (Cs)	7440-46-2	2.95E-06	2.95E-06
			Copper (Cu)	7440-50-8	1.31E-04	1.31E-04
			Iron (Fe)	7439-89-6	3.39E-02	3.39E-02
			Gallium (Ga)	7440-55-3	1.96E-05	1.96E-05
			Hafnium (Hf)	7440-58-6	4.07E-06	4.07E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	4.91E-09	4.91E-09
			Potassium (K)	7440-09-7	1.45E-02	1.45E-02
			Lanthanum (La)	7439-91-0	1.56E-05	1.56E-05
			Lithium (Li)	7439-93-2	2.51E-05	2.51E-05
			Lutetium (Lu)	7439-94-3	2.30E-07	2.30E-07
			Magnesium (Mg)	7439-95-4	1.36E-02	1.36E-02
			Manganese (Mn)	7439-96-5	8.54E-05	8.54E-05
			Molybdenum (Mo)	7439-98-7	6.33E-06	6.33E-06
			Sodium (Na)	7440-23-5	2.91E-02	2.91E-02
			Niobium (Nb)	7440--03-1	5.73E-06	5.73E-06
			Nickel (Ni)	7440-02-0	9.62E-06	9.62E-06
			Phosphorus (P)	7723-14-0	6.14E-04	6.14E-04
			Lead (Pb)	7439-92-1	1.97E-05	1.97E-05
			Rubidium (Rb)	7440-17-7	7.38E-05	7.38E-05
			Sulphur (S)	7704-34-9	1.84E-03	1.84E-03
			Antimony (Sb)	7440-36-0	4.93E-06	4.93E-06
			Scandium (Sc)	7440-20-2	1.09E-05	1.09E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	8.41E-06	8.41E-06
			Strontium (Sr)	7440-24-6	3.27E-04	3.27E-04
			Tantalum (Ta)	7440-25-7	9.88E-07	9.88E-07
			Terbium (Tb)	7440-27-9	5.22E-07	5.22E-07
			Tellurium (Te)	13494-80-9	1.72E-07	1.72E-07
			Titanium (Ti)	7440-32-6	6.06E-04	6.06E-04
			Thallium (Tl)	7440-28-0	8.88E-07	8.88E-07
			Uranium (U)	7440-61-1	1.32E-06	1.32E-06
			Vanadium (v)	7440-62-2	9.65E-05	9.65E-05
			Tungsten (W)	7440-33-7	4.85E-05	4.85E-05
			Yttrium (Y)	7440-65-5	1.28E-05	1.28E-05
			Ytterbium (Yb)	7440-64-4	1.47E-06	1.47E-06
			Zinc (Zn)	7440-66-6	1.18E-04	1.18E-04
			Zirconium (Zr)	7440-67-7	9.47E-05	9.47E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.42E-01	6.42E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.48E-01	1.48E-01
			Iron Oxide (Fe2O3)	1309-37-1	4.91E-02	4.91E-02
			Magnesium Oxide (MgO)	1309-48-4	2.07E-02	2.07E-02
			Calcium Oxide (CaO)	1305-78-8	3.54E-02	3.54E-02
			Sodium Oxide (Na2O)	1313-59-3	3.37E-02	3.37E-02
			Potassium Oxide (K2O)	12136-45-7	2.39E-02	2.39E-02
			Titanium dioxide (TiO2)	13463-67-7	9.32E-04	9.32E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.15E-03	1.15E-03
			Manganese Oxide (MnO)	1344-43-0	1.22E-04	1.22E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.91E-04	2.91E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.16E-04	2.16E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.16E-03	2.16E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.91E-05	4.91E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.96E-04	1.96E-04
			Sphalerite (ZnS)	1314-98-3	3.93E-04	3.93E-04
			Pyrite (Fe, S2)	1309-36-0	5.89E-03	5.89E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.75E-03	2.75E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.91E-05	4.91E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	9.47E-05	9.47E-05
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.50E-02	3.50E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.11E-02	8.11E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.73E-02	1.73E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.13E-03	4.13E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.05E-02	1.05E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.92E-02	1.92E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.52E-04	1.52E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.16E-03	2.16E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.91E-04	4.91E-04
			Calcite (CaCO3)	1317-65-3	4.71E-03	4.71E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.89E-05	1.89E-05
			Titanite (CaTiSiO5)	[TITAN]	5.30E-04	5.30E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.16E-03	2.16E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
M7	TSF Construction	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	4.91E+00	4.91E+00
			PM_{10}	[PM10]	9.47E-01	9.47E-01
			$PM_{2.5}$	[PM2.5]	5.16E-01	5.16E-01
			Silver (Ag)	7440-22-4	3.06E-06	3.06E-06
			Aluminum (Al)	7429-90-5	3.76E-01	3.76E-01
			Arsenic (As)	7440-38-2	3.89E-05	3.89E-05
			Gold (Au)	7440-57-5	4.30E-07	4.30E-07
			Boron (B)	7440-42-8	4.98E-04	4.98E-04
			Barium (Ba)	7440-39-3	1.83E-03	1.83E-03
			Beryllium (Be)	7440-41-7	5.83E-06	5.83E-06
			Bismuth (Bi)	7440-69-9	1.03E-05	1.03E-05
			Carbon (C)	7440-44-0	4.50E-03	4.50E-03
			Calcium (Ca)	7440-70-2	1.57E-01	1.57E-01
			Cadmium (Cd)	7440-43-9	5.85E-06	5.85E-06
			Cerium (Ce)	7440-45-1	3.47E-04	3.47E-04
			Cobalt (Co)	7440-48-4	8.84E-05	8.84E-05
			Chromium (Cr)	7440-47-3	4.41E-04	4.41E-04
			Cesium (Cs)	7440-46-2	1.47E-05	1.47E-05
			Copper (Cu)	7440-50-8	6.56E-04	6.56E-04
			Iron (Fe)	7439-89-6	1.70E-01	1.70E-01
			Gallium (Ga)	7440-55-3	9.82E-05	9.82E-05
			Hafnium (Hf)	7440-58-6	2.03E-05	2.03E-05
			Mercury (Hg)	7439-97-6	1.23E-07	1.23E-07
			Indium (In)	7440-74-6	2.45E-08	2.45E-08
			Potassium (K)	7440-09-7	7.27E-02	7.27E-02
			Lanthanum (La)	7439-91-0	7.80E-05	7.80E-05
			Lithium (Li)	7439-93-2	1.26E-04	1.26E-04
			Lutetium (Lu)	7439-94-3	1.15E-06	1.15E-06
			Magnesium (Mg)	7439-95-4	6.82E-02	6.82E-02
			Manganese (Mn)	7439-96-5	4.27E-04	4.27E-04
			Molybdenum (Mo)	7439-98-7	3.17E-05	3.17E-05
			Sodium (Na)	7440-23-5	1.46E-01	1.46E-01
			Niobium (Nb)	7440--03-1	2.87E-05	2.87E-05
			Nickel (Ni)	7440-02-0	4.81E-05	4.81E-05
			Phosphorus (P)	7723-14-0	3.07E-03	3.07E-03
			Lead (Pb)	7439-92-1	9.86E-05	9.86E-05
			Rubidium (Rb)	7440-17-7	3.69E-04	3.69E-04
			Sulphur (S)	7704-34-9	9.18E-03	9.18E-03
			Antimony (Sb)	7440-36-0	2.47E-05	2.47E-05
			Scandium (Sc)	7440-20-2	5.44E-05	5.44E-05
			Selenium (Se)	7782-49-2	1.72E-06	1.72E-06
			Tin (Sn)	7440-31-5	4.20E-05	4.20E-05
			Strontium (Sr)	7440-24-6	1.63E-03	1.63E-03
			Tantalum (Ta)	7440-25-7	4.94E-06	4.94E-06
			Terbium (Tb)	7440-27-9	2.61E-06	2.61E-06
			Tellurium (Te)	13494-80-9	8.59E-07	8.59E-07
			Titanium (Ti)	7440-32-6	3.03E-03	3.03E-03
			Thallium (Tl)	7440-28-0	4.44E-06	4.44E-06
			Uranium (U)	7440-61-1	6.58E-06	6.58E-06
			Vanadium (v)	7440-62-2	4.83E-04	4.83E-04
			Tungsten (W)	7440-33-7	2.42E-04	2.42E-04
			Yttrium (Y)	7440-65-5	6.38E-05	6.38E-05
			Ytterbium (Yb)	7440-64-4	7.36E-06	7.36E-06
			Zinc (Zn)	7440-66-6	5.91E-04	5.91E-04
			Zirconium (Zr)	7440-67-7	4.73E-04	4.73E-04
			Silicon Dioxide (SiO2)	7631-86-9	3.21E+00	3.21E+00
			Aluminum Oxide (Al2O3)	1344-28-1	7.42E-01	7.42E-01
			Iron Oxide (Fe2O3)	1309-37-1	2.46E-01	2.46E-01
			Magnesium Oxide (MgO)	1309-48-4	1.03E-01	1.03E-01
			Calcium Oxide (CaO)	1305-78-8	1.77E-01	1.77E-01
			Sodium Oxide (Na2O)	1313-59-3	1.69E-01	1.69E-01
			Potassium Oxide (K2O)	12136-45-7	1.20E-01	1.20E-01
			Titanium dioxide (TiO2)	13463-67-7	4.66E-03	4.66E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	5.77E-03	5.77E-03
			Manganese Oxide (MnO)	1344-43-0	6.12E-04	6.12E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.46E-03	1.46E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	1.08E-03	1.08E-03
			Chalcopyrite (CuFeS2)	1308-56-1	1.08E-02	1.08E-02
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.45E-04	2.45E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	2.45E-04	2.45E-04
			Galena (PbS)	1314-87-0	9.82E-04	9.82E-04
			Sphalerite (ZnS)	1314-98-3	1.96E-03	1.96E-03
			Pyrite (Fe, S2)	1309-36-0	2.95E-02	2.95E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.37E-02	1.37E-02
			Arsenopyrite (FeAsS)	1303-18-0	2.45E-04	2.45E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.74E-04	4.74E-04
			Quartz	14808-60-7	1.11E-01	1.11E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.67E+00	2.67E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.75E-01	1.75E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.06E-01	4.06E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	8.64E-02	8.64E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.06E-02	2.06E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.25E-02	5.25E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.62E-02	9.62E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.58E-04	7.58E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.08E-02	1.08E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.45E-03	2.45E-03
			Calcite (CaCO3)	1317-65-3	2.36E-02	2.36E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.47E-05	9.47E-05
			Titanite (CaTiSiO5)	[TITAN]	2.65E-03	2.65E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.08E-02	1.08E-02
			Mica	12001-26-2	5.26E-01	5.26E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.60E-01	2.60E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.12E-01	2.12E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.64E-01	1.64E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.74E-01	5.74E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.25E+00	1.25E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	4.67E-01	4.67E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	6.82E-02	6.82E-02
			Sillimanite (Al2SiO5)	12141-45-6	2.16E-02	2.16E-02

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
R1	Main Access Road	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	3.56E+00	9.68E-01
			PM_{10}	[PM10]	8.93E-01	2.41E-01
			$PM_{2.5}$	[PM2.5]	8.94E-02	2.42E-02
			Silver (Ag)	7440-22-4	2.21E-06	6.03E-07
			Aluminum (Al)	7429-90-5	2.72E-01	7.42E-02
			Arsenic (As)	7440-38-2	2.81E-05	7.67E-06
			Gold (Au)	7440-57-5	3.11E-07	8.48E-08
			Boron (B)	7440-42-8	3.60E-04	9.81E-05
			Barium (Ba)	7440-39-3	1.32E-03	3.61E-04
			Beryllium (Be)	7440-41-7	4.22E-06	1.15E-06
			Bismuth (Bi)	7440-69-9	7.43E-06	2.02E-06
			Carbon (C)	7440-44-0	3.25E-03	8.87E-04
			Calcium (Ca)	7440-70-2	1.14E-01	3.10E-02
			Cadmium (Cd)	7440-43-9	4.23E-06	1.15E-06
			Cerium (Ce)	7440-45-1	2.51E-04	6.83E-05
			Cobalt (Co)	7440-48-4	6.40E-05	1.74E-05
			Chromium (Cr)	7440-47-3	3.19E-04	8.68E-05
			Cesium (Cs)	7440-46-2	1.07E-05	2.90E-06
			Copper (Cu)	7440-50-8	4.74E-04	1.29E-04
			Iron (Fe)	7439-89-6	1.23E-01	3.34E-02
			Gallium (Ga)	7440-55-3	7.10E-05	1.94E-05
			Hafnium (Hf)	7440-58-6	1.47E-05	4.01E-06
			Mercury (Hg)	7439-97-6	8.88E-08	2.42E-08
			Indium (In)	7440-74-6	1.78E-08	4.84E-09
			Potassium (K)	7440-09-7	5.26E-02	1.43E-02
			Lanthanum (La)	7439-91-0	5.64E-05	1.54E-05
			Lithium (Li)	7439-93-2	9.09E-05	2.48E-05
			Lutetium (Lu)	7439-94-3	8.31E-07	2.26E-07
			Magnesium (Mg)	7439-95-4	4.93E-02	1.34E-02
			Manganese (Mn)	7439-96-5	3.99E-04	1.09E-04
			Molybdenum (Mo)	7439-98-7	2.29E-05	6.24E-06
			Sodium (Na)	7440-23-5	1.05E-01	2.87E-02
			Niobium (Nb)	7440--03-1	2.07E-05	5.65E-06
			Nickel (Ni)	7440-02-0	4.50E-05	1.22E-05
			Phosphorus (P)	7723-14-0	2.22E-03	6.05E-04
			Lead (Pb)	7439-92-1	7.13E-05	1.94E-05
			Rubidium (Rb)	7440-17-7	2.67E-04	7.27E-05
			Sulphur (S)	7704-34-9	6.64E-03	1.81E-03
			Antimony (Sb)	7440-36-0	1.78E-05	4.86E-06
			Scandium (Sc)	7440-20-2	3.94E-05	1.07E-05
			Selenium (Se)	7782-49-2	1.24E-06	3.39E-07
			Tin (Sn)	7440-31-5	3.04E-05	8.28E-06
			Strontium (Sr)	7440-24-6	1.18E-03	3.22E-04
			Tantalum (Ta)	7440-25-7	3.57E-06	9.74E-07
			Terbium (Tb)	7440-27-9	1.89E-06	5.15E-07
			Tellurium (Te)	13494-80-9	6.22E-07	1.69E-07
			Titanium (Ti)	7440-32-6	2.83E-03	7.71E-04
			Thallium (Tl)	7440-28-0	3.21E-06	8.75E-07
			Uranium (U)	7440-61-1	4.76E-06	1.30E-06
			Vanadium (v)	7440-62-2	3.49E-04	9.51E-05
			Tungsten (W)	7440-33-7	1.75E-04	4.78E-05
			Yttrium (Y)	7440-65-5	4.62E-05	1.26E-05
			Ytterbium (Yb)	7440-64-4	5.32E-06	1.45E-06
			Zinc (Zn)	7440-66-6	4.28E-04	1.17E-04
			Zirconium (Zr)	7440-67-7	3.42E-04	9.33E-05
			Silicon Dioxide (SiO2)	7631-86-9	2.32E+00	6.32E-01
			Aluminum Oxide (Al2O3)	1344-28-1	5.36E-01	1.46E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.78E-01	4.84E-02
			Magnesium Oxide (MgO)	1309-48-4	7.49E-02	2.04E-02
			Calcium Oxide (CaO)	1305-78-8	1.28E-01	3.49E-02
			Sodium Oxide (Na2O)	1313-59-3	1.22E-01	3.32E-02
			Potassium Oxide (K2O)	12136-45-7	8.65E-02	2.36E-02
			Titanium dioxide (TiO2)	13463-67-7	4.35E-03	1.19E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	4.17E-03	1.14E-03
			Manganese Oxide (MnO)	1344-43-0	5.72E-04	1.56E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.05E-03	2.87E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	7.81E-04	2.13E-04
			Chalcopyrite (CuFeS2)	1308-56-1	7.81E-03	2.13E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.78E-04	4.84E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	1.78E-04	4.84E-05
			Galena (PbS)	1314-87-0	7.10E-04	1.94E-04
			Sphalerite (ZnS)	1314-98-3	1.42E-03	3.87E-04
			Pyrite (Fe, S2)	1309-36-0	2.13E-02	5.81E-03
			Pyrrhotite (Fe7S8)	12305-96-3	9.94E-03	2.71E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.78E-04	4.84E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.42E-04	1.21E-04
			Quartz	14808-60-7	1.03E-01	2.82E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.93E+00	5.26E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.26E-01	3.45E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.93E-01	7.99E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	6.25E-02	1.70E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.93E-02	5.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.80E-02	1.04E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	6.96E-02	1.90E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.08E-04	1.93E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.81E-03	2.13E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.78E-03	4.84E-04
			Calcite (CaCO3)	1317-65-3	1.70E-02	4.65E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	8.85E-05	2.41E-05
			Titanite (CaTiSiO5)	[TITAN]	2.48E-03	6.75E-04
			Apatite (Ca5(PO4)3)	1306-05-4	7.81E-03	2.13E-03
			Mica	12001-26-2	3.80E-01	1.04E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.88E-01	5.12E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.53E-01	4.18E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.19E-01	3.24E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	4.15E-01	1.13E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	9.06E-01	2.47E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	3.38E-01	9.20E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.94E-02	1.35E-02
			Sillimanite (Al2SiO5)	12141-45-6	1.56E-02	4.26E-03
			Carbon Monoxide (CO)	630-08-0	3.52E-03	8.59E-04
			Sulphur Dioxide (SO2)	7446-09-5	2.08E-04	5.27E-05
			Hydrocarbons	[NMHC]	1.32E-03	3.37E-04
			Nitrogen Oxides (NOx)	10102-44-0	1.77E-02	4.43E-03
			1,3-butadiene	106-99-0	1.19E-06	2.98E-07
			Acenaphthene	83-32-9	4.00E-07	1.00E-07
			Acenaphthylene	208-96-8	8.06E-07	2.02E-07
			Acetaldehyde	75-07-0	9.68E-05	2.44E-05
			Acrolein	107-02-8	1.46E-05	3.67E-06
			Anthracene	120-12-7	8.63E-08	2.15E-08
			Benzene	71-43-2	3.47E-05	8.67E-06
			Benzo(a)anthracene	56-55-3	1.51E-08	3.76E-09
			Benzo(a)pyrene	50-32-8	5.66E-09	1.39E-09
			Benzo(b+k)fluoranthene	205-99-2	1.59E-08	3.91E-09
			Benzo(g,h,i)perylene	191-24-2	1.01E-08	2.48E-09
			Chrysene	218-01-9	1.70E-08	4.21E-09
			Fluoranthene	206-44-0	1.46E-07	3.63E-08
			Fluorene	86-73-7	5.98E-07	1.49E-07
			Formaldehyde	50-00-0	5.82E-05	1.45E-05
			Phenanthrene	85-01-8	1.10E-06	2.74E-07
			Pyrene	129-00-0	1.40E-07	3.47E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.00E-03	2.48E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	6.51E-04	1.61E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.31E-08	3.23E-09

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
R1B	Main Access Road Toward Route du Nord	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	6.48E+00	1.77E+00
			PM_{10}	[PM10]	1.62E+00	4.40E-01
			$PM_{2.5}$	[PM2.5]	1.63E-01	4.42E-02
			Silver (Ag)	7440-22-4	4.04E-06	1.10E-06
			Aluminum (Al)	7429-90-5	4.96E-01	1.35E-01
			Arsenic (As)	7440-38-2	5.13E-05	1.40E-05
			Gold (Au)	7440-57-5	5.68E-07	1.55E-07
			Boron (B)	7440-42-8	6.57E-04	1.79E-04
			Barium (Ba)	7440-39-3	2.42E-03	6.58E-04
			Beryllium (Be)	7440-41-7	7.69E-06	2.09E-06
			Bismuth (Bi)	7440-69-9	1.35E-05	3.69E-06
			Carbon (C)	7440-44-0	5.93E-03	1.62E-03
			Calcium (Ca)	7440-70-2	2.08E-01	5.65E-02
			Cadmium (Cd)	7440-43-9	7.71E-06	2.10E-06
			Cerium (Ce)	7440-45-1	4.57E-04	1.25E-04
			Cobalt (Co)	7440-48-4	1.17E-04	3.18E-05
			Chromium (Cr)	7440-47-3	5.81E-04	1.58E-04
			Cesium (Cs)	7440-46-2	1.94E-05	5.29E-06
			Copper (Cu)	7440-50-8	8.65E-04	2.36E-04
			Iron (Fe)	7439-89-6	2.24E-01	6.10E-02
			Gallium (Ga)	7440-55-3	1.30E-04	3.53E-05
			Hafnium (Hf)	7440-58-6	2.68E-05	7.31E-06
			Mercury (Hg)	7439-97-6	1.62E-07	4.41E-08
			Indium (In)	7440-74-6	3.24E-08	8.82E-09
			Potassium (K)	7440-09-7	9.59E-02	2.61E-02
			Lanthanum (La)	7439-91-0	1.03E-04	2.80E-05
			Lithium (Li)	7439-93-2	1.66E-04	4.52E-05
			Lutetium (Lu)	7439-94-3	1.52E-06	4.13E-07
			Magnesium (Mg)	7439-95-4	9.00E-02	2.45E-02
			Manganese (Mn)	7439-96-5	7.27E-04	1.98E-04
			Molybdenum (Mo)	7439-98-7	4.18E-05	1.14E-05
			Sodium (Na)	7440-23-5	1.92E-01	5.24E-02
			Niobium (Nb)	7440--03-1	3.78E-05	1.03E-05
			Nickel (Ni)	7440-02-0	8.20E-05	2.23E-05
			Phosphorus (P)	7723-14-0	4.05E-03	1.10E-03
			Lead (Pb)	7439-92-1	1.30E-04	3.54E-05
			Rubidium (Rb)	7440-17-7	4.87E-04	1.33E-04
			Sulphur (S)	7704-34-9	1.21E-02	3.30E-03
			Antimony (Sb)	7440-36-0	3.25E-05	8.87E-06
			Scandium (Sc)	7440-20-2	7.18E-05	1.96E-05
			Selenium (Se)	7782-49-2	2.27E-06	6.18E-07
			Tin (Sn)	7440-31-5	5.54E-05	1.51E-05
			Strontium (Sr)	7440-24-6	2.16E-03	5.88E-04
			Tantalum (Ta)	7440-25-7	6.52E-06	1.78E-06
			Terbium (Tb)	7440-27-9	3.45E-06	9.39E-07
			Tellurium (Te)	13494-80-9	1.13E-06	3.09E-07
			Titanium (Ti)	7440-32-6	5.16E-03	1.41E-03
			Thallium (Tl)	7440-28-0	5.85E-06	1.60E-06
			Uranium (U)	7440-61-1	8.68E-06	2.36E-06
			Vanadium (v)	7440-62-2	6.37E-04	1.74E-04
			Tungsten (W)	7440-33-7	3.20E-04	8.71E-05
			Yttrium (Y)	7440-65-5	8.42E-05	2.29E-05
			Ytterbium (Yb)	7440-64-4	9.70E-06	2.64E-06
			Zinc (Zn)	7440-66-6	7.80E-04	2.13E-04
			Zirconium (Zr)	7440-67-7	6.24E-04	1.70E-04
			Silicon Dioxide (SiO2)	7631-86-9	4.23E+00	1.15E+00
			Aluminum Oxide (Al2O3)	1344-28-1	9.78E-01	2.67E-01
			Iron Oxide (Fe2O3)	1309-37-1	3.24E-01	8.82E-02
			Magnesium Oxide (MgO)	1309-48-4	1.37E-01	3.72E-02
			Calcium Oxide (CaO)	1305-78-8	2.34E-01	6.36E-02
			Sodium Oxide (Na2O)	1313-59-3	2.22E-01	6.06E-02
			Potassium Oxide (K2O)	12136-45-7	1.58E-01	4.30E-02
			Titanium dioxide (TiO2)	13463-67-7	7.94E-03	2.16E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.61E-03	2.07E-03
			Manganese Oxide (MnO)	1344-43-0	1.04E-03	2.84E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.92E-03	5.24E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.42E-03	3.88E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.42E-02	3.88E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.24E-04	8.82E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	3.24E-04	8.82E-05
			Galena (PbS)	1314-87-0	1.30E-03	3.53E-04
			Sphalerite (ZnS)	1314-98-3	2.59E-03	7.06E-04
			Pyrite (Fe, S2)	1309-36-0	3.89E-02	1.06E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.81E-02	4.94E-03
			Arsenopyrite (FeAsS)	1303-18-0	3.24E-04	8.82E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	8.07E-04	2.20E-04
			Quartz	14808-60-7	1.89E-01	5.14E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	3.52E+00	9.59E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.31E-01	6.28E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	5.35E-01	1.46E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.14E-01	3.11E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.52E-02	9.58E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	6.93E-02	1.89E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.27E-01	3.46E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.29E-03	3.52E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.42E-02	3.88E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.24E-03	8.82E-04
			Calcite (CaCO3)	1317-65-3	3.11E-02	8.47E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.61E-04	4.40E-05
			Titanite (CaTiSiO5)	[TITAN]	4.52E-03	1.23E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.42E-02	3.88E-03
			Mica	12001-26-2	6.94E-01	1.89E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.43E-01	9.34E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.80E-01	7.62E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.17E-01	5.91E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	7.57E-01	2.06E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.65E+00	4.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	6.16E-01	1.68E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	9.00E-02	2.45E-02
			Sillimanite (Al2SiO5)	12141-45-6	2.85E-02	7.76E-03
			Carbon Monoxide (CO)	630-08-0	6.42E-03	1.57E-03
			Sulphur Dioxide (SO2)	7446-09-5	3.79E-04	9.61E-05
			Hydrocarbons	[NMHC]	2.42E-03	6.15E-04
			Nitrogen Oxides (NOx)	10102-44-0	3.23E-02	8.08E-03
			1,3-butadiene	106-99-0	2.18E-06	5.44E-07
			Acenaphthene	83-32-9	7.29E-07	1.82E-07
			Acenaphthylene	208-96-8	1.47E-06	3.67E-07
			Acetaldehyde	75-07-0	1.76E-04	4.46E-05
			Acrolein	107-02-8	2.66E-05	6.69E-06
			Anthracene	120-12-7	1.57E-07	3.92E-08
			Benzene	71-43-2	6.33E-05	1.58E-05
			Benzo(a)anthracene	56-55-3	2.74E-08	6.86E-09
			Benzo(a)pyrene	50-32-8	1.03E-08	2.53E-09
			Benzo(b+k)fluoranthene	205-99-2	2.91E-08	7.14E-09
			Benzo(g,h,i)perylene	191-24-2	1.83E-08	4.53E-09
			Chrysene	218-01-9	3.10E-08	7.69E-09
			Fluoranthene	206-44-0	2.66E-07	6.63E-08
			Fluorene	86-73-7	1.09E-06	2.73E-07
			Formaldehyde	50-00-0	1.06E-04	2.65E-05
			Phenanthrene	85-01-8	2.00E-06	4.99E-07
			Pyrene	129-00-0	2.55E-07	6.33E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.83E-03	4.52E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.19E-03	2.94E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.38E-08	5.90E-09

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
HR2	Road from Pit 87 to Plant	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	2.08E+01	8.98E+00
			PM_{10}	[PM10]	6.01E+00	2.60E+00
			$PM_{2.5}$	[PM2.5]	6.11E-01	2.69E-01
			Silver (Ag)	7440-22-4	1.30E-05	5.59E-06
			Aluminum (Al)	7429-90-5	1.59E+00	6.88E-01
			Arsenic (As)	7440-38-2	1.65E-04	7.11E-05
			Gold (Au)	7440-57-5	1.82E-06	7.86E-07
			Boron (B)	7440-42-8	2.11E-03	9.10E-04
			Barium (Ba)	7440-39-3	7.76E-03	3.35E-03
			Beryllium (Be)	7440-41-7	2.47E-05	1.06E-05
			Bismuth (Bi)	7440-69-9	4.35E-05	1.88E-05
			Carbon (C)	7440-44-0	1.91E-02	8.22E-03
			Calcium (Ca)	7440-70-2	6.66E-01	2.87E-01
			Cadmium (Cd)	7440-43-9	2.48E-05	1.07E-05
			Cerium (Ce)	7440-45-1	1.47E-03	6.34E-04
			Cobalt (Co)	7440-48-4	3.75E-04	1.62E-04
			Chromium (Cr)	7440-47-3	1.87E-03	8.05E-04
			Cesium (Cs)	7440-46-2	6.24E-05	2.69E-05
			Copper (Cu)	7440-50-8	2.78E-03	1.20E-03
			Iron (Fe)	7439-89-6	7.19E-01	3.10E-01
			Gallium (Ga)	7440-55-3	4.16E-04	1.79E-04
			Hafnium (Hf)	7440-58-6	8.61E-05	3.71E-05
			Mercury (Hg)	7439-97-6	5.20E-07	2.24E-07
			Indium (In)	7440-74-6	1.04E-07	4.49E-08
			Potassium (K)	7440-09-7	3.08E-01	1.33E-01
			Lanthanum (La)	7439-91-0	3.31E-04	1.43E-04
			Lithium (Li)	7439-93-2	5.32E-04	2.30E-04
			Lutetium (Lu)	7439-94-3	4.87E-06	2.10E-06
			Magnesium (Mg)	7439-95-4	2.89E-01	1.25E-01
			Manganese (Mn)	7439-96-5	2.70E-03	1.17E-03
			Molybdenum (Mo)	7439-98-7	1.34E-04	5.79E-05
			Sodium (Na)	7440-23-5	6.17E-01	2.66E-01
			Niobium (Nb)	7440--03-1	1.21E-04	5.24E-05
			Nickel (Ni)	7440-02-0	3.05E-04	1.31E-04
			Phosphorus (P)	7723-14-0	1.30E-02	5.61E-03
			Lead (Pb)	7439-92-1	4.18E-04	1.80E-04
			Rubidium (Rb)	7440-17-7	1.56E-03	6.74E-04
			Sulphur (S)	7704-34-9	3.89E-02	1.68E-02
			Antimony (Sb)	7440-36-0	1.04E-04	4.51E-05
			Scandium (Sc)	7440-20-2	2.30E-04	9.94E-05
			Selenium (Se)	7782-49-2	7.28E-06	3.14E-06
			Tin (Sn)	7440-31-5	1.78E-04	7.68E-05
			Strontium (Sr)	7440-24-6	6.93E-03	2.99E-03
			Tantalum (Ta)	7440-25-7	2.09E-05	9.03E-06
			Terbium (Tb)	7440-27-9	1.11E-05	4.77E-06
			Tellurium (Te)	13494-80-9	3.64E-06	1.57E-06
			Titanium (Ti)	7440-32-6	1.92E-02	8.27E-03
			Thallium (Tl)	7440-28-0	1.88E-05	8.11E-06
			Uranium (U)	7440-61-1	2.79E-05	1.20E-05
			Vanadium (v)	7440-62-2	2.04E-03	8.82E-04
			Tungsten (W)	7440-33-7	1.03E-03	4.43E-04
			Yttrium (Y)	7440-65-5	2.70E-04	1.17E-04
			Ytterbium (Yb)	7440-64-4	3.12E-05	1.34E-05
			Zinc (Zn)	7440-66-6	2.50E-03	1.08E-03
			Zirconium (Zr)	7440-67-7	2.00E-03	8.65E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.36E+01	5.86E+00
			Aluminum Oxide (Al2O3)	1344-28-1	3.14E+00	1.36E+00
			Iron Oxide (Fe2O3)	1309-37-1	1.04E+00	4.49E-01
			Magnesium Oxide (MgO)	1309-48-4	4.38E-01	1.89E-01
			Calcium Oxide (CaO)	1305-78-8	7.50E-01	3.24E-01
			Sodium Oxide (Na2O)	1313-59-3	7.14E-01	3.08E-01
			Potassium Oxide (K2O)	12136-45-7	5.07E-01	2.19E-01
			Titanium dioxide (TiO2)	13463-67-7	2.95E-02	1.27E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.44E-02	1.05E-02
			Manganese Oxide (MnO)	1344-43-0	3.88E-03	1.67E-03
			Chromium Oxide (Cr2O3)	1308-38-9	6.17E-03	2.66E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	4.58E-03	1.97E-03
			Chalcopyrite (CuFeS2)	1308-56-1	4.58E-02	1.97E-02
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.04E-03	4.49E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	1.04E-03	4.49E-04
			Galena (PbS)	1314-87-0	4.16E-03	1.79E-03
			Sphalerite (ZnS)	1314-98-3	8.32E-03	3.59E-03
			Pyrite (Fe, S2)	1309-36-0	1.25E-01	5.38E-02
			Pyrrhotite (Fe7S8)	12305-96-3	5.82E-02	2.51E-02
			Arsenopyrite (FeAsS)	1303-18-0	1.04E-03	4.49E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.00E-03	1.29E-03
			Quartz	14808-60-7	7.01E-01	3.02E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.13E+01	4.88E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	7.40E-01	3.19E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.72E+00	7.41E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	3.66E-01	1.58E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.31E-01	5.64E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.23E-01	9.60E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	4.08E-01	1.76E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	4.80E-03	2.07E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	4.58E-02	1.97E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.04E-02	4.49E-03
			Calcite (CaCO3)	1317-65-3	9.98E-02	4.31E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	5.99E-04	2.59E-04
			Titanite (CaTiSiO5)	[TITAN]	1.68E-02	7.24E-03
			Apatite (Ca5(PO4)3)	1306-05-4	4.58E-02	1.97E-02
			Mica	12001-26-2	2.23E+00	9.61E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.10E+00	4.75E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.98E-01	3.88E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.97E-01	3.01E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.43E+00	1.05E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.30E+00	2.29E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	1.98E+00	8.53E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.89E-01	1.25E-01
			Sillimanite (Al2SiO5)	12141-45-6	9.15E-02	3.95E-02
			Carbon Monoxide (CO)	630-08-0	3.68E-02	3.20E-02
			Sulphur Dioxide (SO2)	7446-09-5	9.21E-04	6.40E-04
			Hydrocarbons	[NMHC]	1.57E-02	1.39E-02
			Nitrogen Oxides (NOx)	10102-44-0	9.85E-01	9.61E-01
			1,3-butadiene	106-99-0	3.01E-05	2.85E-05
			Acenaphthene	83-32-9	9.83E-06	9.29E-06
			Acenaphthylene	208-96-8	2.01E-05	1.90E-05
			Acetaldehyde	75-07-0	1.73E-03	1.60E-03
			Acrolein	107-02-8	3.07E-04	2.87E-04
			Anthracene	120-12-7	1.76E-06	1.64E-06
			Benzene	71-43-2	8.77E-04	8.30E-04
			Benzo(a)anthracene	56-55-3	2.18E-07	1.97E-07
			Benzo(a)pyrene	50-32-8	7.40E-08	6.62E-08
			Benzo(b+k)fluoranthene	205-99-2	2.08E-07	1.87E-07
			Benzo(g,h,i)perylene	191-24-2	1.76E-07	1.62E-07
			Chrysene	218-01-9	2.71E-07	2.48E-07
			Fluoranthene	206-44-0	2.98E-06	2.78E-06
			Fluorene	86-73-7	1.37E-05	1.29E-05
			Formaldehyde	50-00-0	1.44E-03	1.36E-03
			Phenanthrene	85-01-8	2.35E-05	2.20E-05
			Pyrene	129-00-0	2.79E-06	2.60E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.13E-02	9.94E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	7.35E-03	6.46E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.12E-07	1.94E-07

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
HR3	Road from Pit 87 to OB 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	9.68E+00	9.68E+00
			PM_{10}	[PM10]	2.80E+00	2.80E+00
			$PM_{2.5}$	[PM2.5]	2.92E-01	2.92E-01
			Silver (Ag)	7440-22-4	6.03E-06	6.03E-06
			Aluminum (Al)	7429-90-5	7.41E-01	7.41E-01
			Arsenic (As)	7440-38-2	7.66E-05	7.66E-05
			Gold (Au)	7440-57-5	8.47E-07	8.47E-07
			Boron (B)	7440-42-8	9.81E-04	9.81E-04
			Barium (Ba)	7440-39-3	3.61E-03	3.61E-03
			Beryllium (Be)	7440-41-7	1.15E-05	1.15E-05
			Bismuth (Bi)	7440-69-9	2.02E-05	2.02E-05
			Carbon (C)	7440-44-0	8.86E-03	8.86E-03
			Calcium (Ca)	7440-70-2	3.10E-01	3.10E-01
			Cadmium (Cd)	7440-43-9	1.15E-05	1.15E-05
			Cerium (Ce)	7440-45-1	6.83E-04	6.83E-04
			Cobalt (Co)	7440-48-4	1.74E-04	1.74E-04
			Chromium (Cr)	7440-47-3	8.68E-04	8.68E-04
			Cesium (Cs)	7440-46-2	2.90E-05	2.90E-05
			Copper (Cu)	7440-50-8	1.29E-03	1.29E-03
			Iron (Fe)	7439-89-6	3.34E-01	3.34E-01
			Gallium (Ga)	7440-55-3	1.93E-04	1.93E-04
			Hafnium (Hf)	7440-58-6	4.00E-05	4.00E-05
			Mercury (Hg)	7439-97-6	2.42E-07	2.42E-07
			Indium (In)	7440-74-6	4.84E-08	4.84E-08
			Potassium (K)	7440-09-7	1.43E-01	1.43E-01
			Lanthanum (La)	7439-91-0	1.54E-04	1.54E-04
			Lithium (Li)	7439-93-2	2.48E-04	2.48E-04
			Lutetium (Lu)	7439-94-3	2.26E-06	2.26E-06
			Magnesium (Mg)	7439-95-4	1.34E-01	1.34E-01
			Manganese (Mn)	7439-96-5	1.26E-03	1.26E-03
			Molybdenum (Mo)	7439-98-7	6.24E-05	6.24E-05
			Sodium (Na)	7440-23-5	2.87E-01	2.87E-01
			Niobium (Nb)	7440--03-1	5.65E-05	5.65E-05
			Nickel (Ni)	7440-02-0	1.42E-04	1.42E-04
			Phosphorus (P)	7723-14-0	6.04E-03	6.04E-03
			Lead (Pb)	7439-92-1	1.94E-04	1.94E-04
			Rubidium (Rb)	7440-17-7	7.27E-04	7.27E-04
			Sulphur (S)	7704-34-9	1.81E-02	1.81E-02
			Antimony (Sb)	7440-36-0	4.86E-05	4.86E-05
			Scandium (Sc)	7440-20-2	1.07E-04	1.07E-04
			Selenium (Se)	7782-49-2	3.38E-06	3.38E-06
			Tin (Sn)	7440-31-5	8.28E-05	8.28E-05
			Strontium (Sr)	7440-24-6	3.22E-03	3.22E-03
			Tantalum (Ta)	7440-25-7	9.73E-06	9.73E-06
			Terbium (Tb)	7440-27-9	5.15E-06	5.15E-06
			Tellurium (Te)	13494-80-9	1.69E-06	1.69E-06
			Titanium (Ti)	7440-32-6	8.91E-03	8.91E-03
			Thallium (Tl)	7440-28-0	8.74E-06	8.74E-06
			Uranium (U)	7440-61-1	1.30E-05	1.30E-05
			Vanadium (v)	7440-62-2	9.51E-04	9.51E-04
			Tungsten (W)	7440-33-7	4.77E-04	4.77E-04
			Yttrium (Y)	7440-65-5	1.26E-04	1.26E-04
			Ytterbium (Yb)	7440-64-4	1.45E-05	1.45E-05
			Zinc (Zn)	7440-66-6	1.16E-03	1.16E-03
			Zirconium (Zr)	7440-67-7	9.32E-04	9.32E-04
			Silicon Dioxide (SiO2)	7631-86-9	6.32E+00	6.32E+00
			Aluminum Oxide (Al2O3)	1344-28-1	1.46E+00	1.46E+00
			Iron Oxide (Fe2O3)	1309-37-1	4.84E-01	4.84E-01
			Magnesium Oxide (MgO)	1309-48-4	2.04E-01	2.04E-01
			Calcium Oxide (CaO)	1305-78-8	3.49E-01	3.49E-01
			Sodium Oxide (Na2O)	1313-59-3	3.32E-01	3.32E-01
			Potassium Oxide (K2O)	12136-45-7	2.36E-01	2.36E-01
			Titanium dioxide (TiO2)	13463-67-7	1.37E-02	1.37E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.14E-02	1.14E-02
			Manganese Oxide (MnO)	1344-43-0	1.80E-03	1.80E-03
			Chromium Oxide (Cr2O3)	1308-38-9	2.87E-03	2.87E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	2.13E-03	2.13E-03
			Chalcopyrite (CuFeS2)	1308-56-1	2.13E-02	2.13E-02
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.84E-04	4.84E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	4.84E-04	4.84E-04
			Galena (PbS)	1314-87-0	1.93E-03	1.93E-03
			Sphalerite (ZnS)	1314-98-3	3.87E-03	3.87E-03
			Pyrite (Fe, S2)	1309-36-0	5.80E-02	5.80E-02
			Pyrrhotite (Fe7S8)	12305-96-3	2.71E-02	2.71E-02
			Arsenopyrite (FeAsS)	1303-18-0	4.84E-04	4.84E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	3.26E-01	3.26E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.26E+00	5.26E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.44E-01	3.44E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.99E-01	7.99E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.70E-01	1.70E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.08E-02	6.08E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.03E-01	1.03E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.90E-01	1.90E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.23E-03	2.23E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.13E-02	2.13E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.84E-03	4.84E-03
			Calcite (CaCO3)	1317-65-3	4.64E-02	4.64E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.79E-04	2.79E-04
			Titanite (CaTiSiO5)	[TITAN]	7.80E-03	7.80E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.13E-02	2.13E-02
			Mica	12001-26-2	1.04E+00	1.04E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.12E-01	5.12E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.18E-01	4.18E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.24E-01	3.24E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.13E+00	1.13E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.47E+00	2.47E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	9.20E-01	9.20E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.34E-01	1.34E-01
			Sillimanite (Al2SiO5)	12141-45-6	4.26E-02	4.26E-02
			Carbon Monoxide (CO)	630-08-0	4.13E-02	4.13E-02
			Sulphur Dioxide (SO2)	7446-09-5	8.04E-04	8.04E-04
			Hydrocarbons	[NMHC]	1.80E-02	1.80E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.25E+00	1.25E+00
			1,3-butadiene	106-99-0	3.71E-05	3.71E-05
			Acenaphthene	83-32-9	1.21E-05	1.21E-05
			Acenaphthylene	208-96-8	2.47E-05	2.47E-05
			Acetaldehyde	75-07-0	2.08E-03	2.08E-03
			Acrolein	107-02-8	3.73E-04	3.73E-04
			Anthracene	120-12-7	2.13E-06	2.13E-06
			Benzene	71-43-2	1.08E-03	1.08E-03
			Benzo(a)anthracene	56-55-3	2.56E-07	2.56E-07
			Benzo(a)pyrene	50-32-8	8.57E-08	8.57E-08
			Benzo(b+k)fluoranthene	205-99-2	2.41E-07	2.41E-07
			Benzo(g,h,i)perylene	191-24-2	2.11E-07	2.11E-07
			Chrysene	218-01-9	3.22E-07	3.22E-07
			Fluoranthene	206-44-0	3.61E-06	3.61E-06
			Fluorene	86-73-7	1.68E-05	1.68E-05
			Formaldehyde	50-00-0	1.77E-03	1.77E-03
			Phenanthrene	85-01-8	2.86E-05	2.86E-05
			Pyrene	129-00-0	3.38E-06	3.38E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.28E-02	1.28E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	8.35E-03	8.35E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.51E-07	2.51E-07

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
HR4	Road from Pit 87 to TSF	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	2.79E+01	2.79E+01
			PM_{10}	[PM10]	8.07E+00	8.06E+00
			$PM_{2.5}$	[PM2.5]	8.36E-01	8.35E-01
			Silver (Ag)	7440-22-4	1.74E-05	1.74E-05
			Aluminum (Al)	7429-90-5	2.13E+00	2.13E+00
			Arsenic (As)	7440-38-2	2.20E-04	2.20E-04
			Gold (Au)	7440-57-5	2.44E-06	2.44E-06
			Boron (B)	7440-42-8	2.82E-03	2.82E-03
			Barium (Ba)	7440-39-3	1.04E-02	1.04E-02
			Beryllium (Be)	7440-41-7	3.30E-05	3.30E-05
			Bismuth (Bi)	7440-69-9	5.82E-05	5.82E-05
			Carbon (C)	7440-44-0	2.55E-02	2.55E-02
			Calcium (Ca)	7440-70-2	8.92E-01	8.92E-01
			Cadmium (Cd)	7440-43-9	3.31E-05	3.31E-05
			Cerium (Ce)	7440-45-1	1.97E-03	1.97E-03
			Cobalt (Co)	7440-48-4	5.01E-04	5.01E-04
			Chromium (Cr)	7440-47-3	2.50E-03	2.50E-03
			Cesium (Cs)	7440-46-2	8.35E-05	8.35E-05
			Copper (Cu)	7440-50-8	3.72E-03	3.72E-03
			Iron (Fe)	7439-89-6	9.62E-01	9.62E-01
			Gallium (Ga)	7440-55-3	5.57E-04	5.57E-04
			Hafnium (Hf)	7440-58-6	1.15E-04	1.15E-04
			Mercury (Hg)	7439-97-6	6.96E-07	6.96E-07
			Indium (In)	7440-74-6	1.39E-07	1.39E-07
			Potassium (K)	7440-09-7	4.12E-01	4.12E-01
			Lanthanum (La)	7439-91-0	4.42E-04	4.42E-04
			Lithium (Li)	7439-93-2	7.13E-04	7.13E-04
			Lutetium (Lu)	7439-94-3	6.51E-06	6.51E-06
			Magnesium (Mg)	7439-95-4	3.87E-01	3.87E-01
			Manganese (Mn)	7439-96-5	3.62E-03	3.62E-03
			Molybdenum (Mo)	7439-98-7	1.79E-04	1.79E-04
			Sodium (Na)	7440-23-5	8.26E-01	8.26E-01
			Niobium (Nb)	7440--03-1	1.63E-04	1.63E-04
			Nickel (Ni)	7440-02-0	4.08E-04	4.08E-04
			Phosphorus (P)	7723-14-0	1.74E-02	1.74E-02
			Lead (Pb)	7439-92-1	5.59E-04	5.59E-04
			Rubidium (Rb)	7440-17-7	2.09E-03	2.09E-03
			Sulphur (S)	7704-34-9	5.21E-02	5.21E-02
			Antimony (Sb)	7440-36-0	1.40E-04	1.40E-04
			Scandium (Sc)	7440-20-2	3.08E-04	3.08E-04
			Selenium (Se)	7782-49-2	9.74E-06	9.74E-06
			Tin (Sn)	7440-31-5	2.38E-04	2.38E-04
			Strontium (Sr)	7440-24-6	9.27E-03	9.27E-03
			Tantalum (Ta)	7440-25-7	2.80E-05	2.80E-05
			Terbium (Tb)	7440-27-9	1.48E-05	1.48E-05
			Tellurium (Te)	13494-80-9	4.87E-06	4.87E-06
			Titanium (Ti)	7440-32-6	2.57E-02	2.57E-02
			Thallium (Tl)	7440-28-0	2.52E-05	2.52E-05
			Uranium (U)	7440-61-1	3.73E-05	3.73E-05
			Vanadium (v)	7440-62-2	2.74E-03	2.74E-03
			Tungsten (W)	7440-33-7	1.37E-03	1.37E-03
			Yttrium (Y)	7440-65-5	3.62E-04	3.62E-04
			Ytterbium (Yb)	7440-64-4	4.17E-05	4.17E-05
			Zinc (Zn)	7440-66-6	3.35E-03	3.35E-03
			Zirconium (Zr)	7440-67-7	2.68E-03	2.68E-03
			Silicon Dioxide (SiO2)	7631-86-9	1.82E+01	1.82E+01
			Aluminum Oxide (Al2O3)	1344-28-1	4.20E+00	4.20E+00
			Iron Oxide (Fe2O3)	1309-37-1	1.39E+00	1.39E+00
			Magnesium Oxide (MgO)	1309-48-4	5.87E-01	5.87E-01
			Calcium Oxide (CaO)	1305-78-8	1.00E+00	1.00E+00
			Sodium Oxide (Na2O)	1313-59-3	9.55E-01	9.55E-01
			Potassium Oxide (K2O)	12136-45-7	6.78E-01	6.78E-01
			Titanium dioxide (TiO2)	13463-67-7	3.95E-02	3.95E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.27E-02	3.27E-02
			Manganese Oxide (MnO)	1344-43-0	5.19E-03	5.19E-03
			Chromium Oxide (Cr2O3)	1308-38-9	8.26E-03	8.26E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	6.12E-03	6.12E-03
			Chalcopyrite (CuFeS2)	1308-56-1	6.12E-02	6.12E-02
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.39E-03	1.39E-03
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	1.39E-03	1.39E-03
			Galena (PbS)	1314-87-0	5.57E-03	5.57E-03
			Sphalerite (ZnS)	1314-98-3	1.11E-02	1.11E-02
			Pyrite (Fe, S2)	1309-36-0	1.67E-01	1.67E-01
			Pyrrhotite (Fe7S8)	12305-96-3	7.79E-02	7.79E-02
			Arsenopyrite (FeAsS)	1303-18-0	1.39E-03	1.39E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.01E-03	4.01E-03
			Quartz	14808-60-7	9.38E-01	9.38E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.51E+01	1.51E+01
			K-Feldspars (KAlSi3O8)	[K-FELD]	9.91E-01	9.91E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.30E+00	2.30E+00
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.90E-01	4.90E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.75E-01	1.75E-01
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.98E-01	2.98E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	5.46E-01	5.46E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.42E-03	6.42E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	6.12E-02	6.12E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.39E-02	1.39E-02
			Calcite (CaCO3)	1317-65-3	1.34E-01	1.34E-01
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	8.02E-04	8.02E-04
			Titanite (CaTiSiO5)	[TITAN]	2.25E-02	2.25E-02
			Apatite (Ca5(PO4)3)	1306-05-4	6.12E-02	6.12E-02
			Mica	12001-26-2	2.98E+00	2.98E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.47E+00	1.47E+00
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.20E+00	1.20E+00
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	9.33E-01	9.33E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.25E+00	3.25E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	7.10E+00	7.10E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	2.65E+00	2.65E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	3.87E-01	3.87E-01
			Sillimanite (Al2SiO5)	12141-45-6	1.22E-01	1.22E-01
			Carbon Monoxide (CO)	630-08-0	1.06E-01	1.06E-01
			Sulphur Dioxide (SO2)	7446-09-5	2.14E-03	2.14E-03
			Hydrocarbons	[NMHC]	4.63E-02	4.63E-02
			Nitrogen Oxides (NOx)	10102-44-0	3.20E+00	3.20E+00
			1,3-butadiene	106-99-0	9.50E-05	9.50E-05
			Acenaphthene	83-32-9	3.10E-05	3.10E-05
			Acenaphthylene	208-96-8	6.33E-05	6.33E-05
			Acetaldehyde	75-07-0	5.33E-03	5.33E-03
			Acrolein	107-02-8	9.57E-04	9.57E-04
			Anthracene	120-12-7	5.46E-06	5.46E-06
			Benzene	71-43-2	2.76E-03	2.76E-03
			Benzo(a)anthracene	56-55-3	6.57E-07	6.57E-07
			Benzo(a)pyrene	50-32-8	2.20E-07	2.20E-07
			Benzo(b+k)fluoranthene	205-99-2	6.21E-07	6.21E-07
			Benzo(g,h,i)perylene	191-24-2	5.41E-07	5.41E-07
			Chrysene	218-01-9	8.26E-07	8.26E-07
			Fluoranthene	206-44-0	9.26E-06	9.26E-06
			Fluorene	86-73-7	4.30E-05	4.30E-05
			Formaldehyde	50-00-0	4.53E-03	4.53E-03
			Phenanthrene	85-01-8	7.33E-05	7.33E-05
			Pyrene	129-00-0	8.67E-06	8.67E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	3.31E-02	3.31E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	2.15E-02	2.15E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	6.45E-07	6.45E-07

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
HR5	Road from Pit 87 to WD 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.62E+01	1.52E+01
			PM_{10}	[PM10]	4.70E+00	4.39E+00
			$PM_{2.5}$	[PM2.5]	4.87E-01	4.57E-01
			Silver (Ag)	7440-22-4	1.01E-05	9.46E-06
			Aluminum (Al)	7429-90-5	1.24E+00	1.16E+00
			Arsenic (As)	7440-38-2	1.28E-04	1.20E-04
			Gold (Au)	7440-57-5	1.42E-06	1.33E-06
			Boron (B)	7440-42-8	1.64E-03	1.54E-03
			Barium (Ba)	7440-39-3	6.04E-03	5.66E-03
			Beryllium (Be)	7440-41-7	1.92E-05	1.80E-05
			Bismuth (Bi)	7440-69-9	3.39E-05	3.17E-05
			Carbon (C)	7440-44-0	1.48E-02	1.39E-02
			Calcium (Ca)	7440-70-2	5.19E-01	4.86E-01
			Cadmium (Cd)	7440-43-9	1.93E-05	1.81E-05
			Cerium (Ce)	7440-45-1	1.14E-03	1.07E-03
			Cobalt (Co)	7440-48-4	2.92E-04	2.73E-04
			Chromium (Cr)	7440-47-3	1.45E-03	1.36E-03
			Cesium (Cs)	7440-46-2	4.86E-05	4.55E-05
			Copper (Cu)	7440-50-8	2.16E-03	2.03E-03
			Iron (Fe)	7439-89-6	5.59E-01	5.24E-01
			Gallium (Ga)	7440-55-3	3.24E-04	3.03E-04
			Hafnium (Hf)	7440-58-6	6.70E-05	6.28E-05
			Mercury (Hg)	7439-97-6	4.05E-07	3.79E-07
			Indium (In)	7440-74-6	8.09E-08	7.59E-08
			Potassium (K)	7440-09-7	2.40E-01	2.25E-01
			Lanthanum (La)	7439-91-0	2.57E-04	2.41E-04
			Lithium (Li)	7439-93-2	4.14E-04	3.88E-04
			Lutetium (Lu)	7439-94-3	3.79E-06	3.55E-06
			Magnesium (Mg)	7439-95-4	2.25E-01	2.11E-01
			Manganese (Mn)	7439-96-5	2.10E-03	1.97E-03
			Molybdenum (Mo)	7439-98-7	1.04E-04	9.78E-05
			Sodium (Na)	7440-23-5	4.80E-01	4.50E-01
			Niobium (Nb)	7440--03-1	9.45E-05	8.86E-05
			Nickel (Ni)	7440-02-0	2.37E-04	2.22E-04
			Phosphorus (P)	7723-14-0	1.01E-02	9.48E-03
			Lead (Pb)	7439-92-1	3.25E-04	3.05E-04
			Rubidium (Rb)	7440-17-7	1.22E-03	1.14E-03
			Sulphur (S)	7704-34-9	3.03E-02	2.84E-02
			Antimony (Sb)	7440-36-0	8.13E-05	7.62E-05
			Scandium (Sc)	7440-20-2	1.79E-04	1.68E-04
			Selenium (Se)	7782-49-2	5.67E-06	5.31E-06
			Tin (Sn)	7440-31-5	1.39E-04	1.30E-04
			Strontium (Sr)	7440-24-6	5.39E-03	5.05E-03
			Tantalum (Ta)	7440-25-7	1.63E-05	1.53E-05
			Terbium (Tb)	7440-27-9	8.61E-06	8.07E-06
			Tellurium (Te)	13494-80-9	2.83E-06	2.65E-06
			Titanium (Ti)	7440-32-6	1.49E-02	1.40E-02
			Thallium (Tl)	7440-28-0	1.46E-05	1.37E-05
			Uranium (U)	7440-61-1	2.17E-05	2.03E-05
			Vanadium (v)	7440-62-2	1.59E-03	1.49E-03
			Tungsten (W)	7440-33-7	7.99E-04	7.49E-04
			Yttrium (Y)	7440-65-5	2.10E-04	1.97E-04
			Ytterbium (Yb)	7440-64-4	2.42E-05	2.27E-05
			Zinc (Zn)	7440-66-6	1.95E-03	1.83E-03
			Zirconium (Zr)	7440-67-7	1.56E-03	1.46E-03
			Silicon Dioxide (SiO2)	7631-86-9	1.06E+01	9.91E+00
			Aluminum Oxide (Al2O3)	1344-28-1	2.44E+00	2.29E+00
			Iron Oxide (Fe2O3)	1309-37-1	8.09E-01	7.59E-01
			Magnesium Oxide (MgO)	1309-48-4	3.41E-01	3.20E-01
			Calcium Oxide (CaO)	1305-78-8	5.84E-01	5.47E-01
			Sodium Oxide (Na2O)	1313-59-3	5.56E-01	5.21E-01
			Potassium Oxide (K2O)	12136-45-7	3.94E-01	3.70E-01
			Titanium dioxide (TiO2)	13463-67-7	2.29E-02	2.15E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.90E-02	1.78E-02
			Manganese Oxide (MnO)	1344-43-0	3.01E-03	2.82E-03
			Chromium Oxide (Cr2O3)	1308-38-9	4.80E-03	4.50E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	3.56E-03	3.34E-03
			Chalcopyrite (CuFeS2)	1308-56-1	3.56E-02	3.34E-02
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	8.09E-04	7.59E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	8.09E-04	7.59E-04
			Galena (PbS)	1314-87-0	3.24E-03	3.03E-03
			Sphalerite (ZnS)	1314-98-3	6.48E-03	6.07E-03
			Pyrite (Fe, S2)	1309-36-0	9.71E-02	9.10E-02
			Pyrrhotite (Fe7S8)	12305-96-3	4.53E-02	4.25E-02
			Arsenopyrite (FeAsS)	1303-18-0	8.09E-04	7.59E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.33E-03	2.18E-03
			Quartz	14808-60-7	5.45E-01	5.11E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	8.80E+00	8.25E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	5.76E-01	5.40E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.34E+00	1.25E+00
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.85E-01	2.67E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.02E-01	9.52E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.73E-01	1.62E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.17E-01	2.97E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.73E-03	3.50E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.56E-02	3.34E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.09E-03	7.59E-03
			Calcite (CaCO3)	1317-65-3	7.77E-02	7.28E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.66E-04	4.37E-04
			Titanite (CaTiSiO5)	[TITAN]	1.31E-02	1.22E-02
			Apatite (Ca5(PO4)3)	1306-05-4	3.56E-02	3.34E-02
			Mica	12001-26-2	1.73E+00	1.62E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	8.56E-01	8.03E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.99E-01	6.55E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	5.42E-01	5.08E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.89E+00	1.77E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	4.13E+00	3.87E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	1.54E+00	1.44E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.25E-01	2.11E-01
			Sillimanite (Al2SiO5)	12141-45-6	7.12E-02	6.67E-02
			Carbon Monoxide (CO)	630-08-0	6.50E-02	6.44E-02
			Sulphur Dioxide (SO2)	7446-09-5	1.30E-03	1.26E-03
			Hydrocarbons	[NMHC]	2.83E-02	2.80E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.96E+00	1.95E+00
			1,3-butadiene	106-99-0	5.81E-05	5.78E-05
			Acenaphthene	83-32-9	1.89E-05	1.88E-05
			Acenaphthylene	208-96-8	3.87E-05	3.85E-05
			Acetaldehyde	75-07-0	3.26E-03	3.23E-03
			Acrolein	107-02-8	5.85E-04	5.81E-04
			Anthracene	120-12-7	3.34E-06	3.32E-06
			Benzene	71-43-2	1.69E-03	1.68E-03
			Benzo(a)anthracene	56-55-3	4.01E-07	3.98E-07
			Benzo(a)pyrene	50-32-8	1.35E-07	1.34E-07
			Benzo(b+k)fluoranthene	205-99-2	3.79E-07	3.76E-07
			Benzo(g,h,i)perylene	191-24-2	3.30E-07	3.28E-07
			Chrysene	218-01-9	5.04E-07	5.01E-07
			Fluoranthene	206-44-0	5.66E-06	5.63E-06
			Fluorene	86-73-7	2.63E-05	2.62E-05
			Formaldehyde	50-00-0	2.77E-03	2.75E-03
			Phenanthrene	85-01-8	4.48E-05	4.45E-05
			Pyrene	129-00-0	5.30E-06	5.27E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	2.02E-02	2.00E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.31E-02	1.30E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.94E-07	3.91E-07

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
W1	OB 87 Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	1.57E+00	1.57E+00
			PM_{10}	[PM10]	7.87E-01	7.87E-01
			$PM_{2.5}$	[PM2.5]	1.18E-01	1.18E-01
			Silver (Ag)	7440-22-4	9.81E-07	9.81E-07
			Aluminum (Al)	7429-90-5	1.21E-01	1.21E-01
			Arsenic (As)	7440-38-2	1.25E-05	1.25E-05
			Gold (Au)	7440-57-5	1.38E-07	1.38E-07
			Boron (B)	7440-42-8	1.60E-04	1.60E-04
			Barium (Ba)	7440-39-3	5.87E-04	5.87E-04
			Beryllium (Be)	7440-41-7	1.87E-06	1.87E-06
			Bismuth (Bi)	7440-69-9	3.29E-06	3.29E-06
			Carbon (C)	7440-44-0	1.44E-03	1.44E-03
			Calcium (Ca)	7440-70-2	5.04E-02	5.04E-02
			Cadmium (Cd)	7440-43-9	1.87E-06	1.87E-06
			Cerium (Ce)	7440-45-1	1.11E-04	1.11E-04
			Cobalt (Co)	7440-48-4	2.83E-05	2.83E-05
			Chromium (Cr)	7440-47-3	1.41E-04	1.41E-04
			Cesium (Cs)	7440-46-2	4.72E-06	4.72E-06
			Copper (Cu)	7440-50-8	2.10E-04	2.10E-04
			Iron (Fe)	7439-89-6	5.44E-02	5.44E-02
			Gallium (Ga)	7440-55-3	3.15E-05	3.15E-05
			Hafnium (Hf)	7440-58-6	6.51E-06	6.51E-06
			Mercury (Hg)	7439-97-6	3.93E-08	3.93E-08
			Indium (In)	7440-74-6	7.87E-09	7.87E-09
			Potassium (K)	7440-09-7	2.33E-02	2.33E-02
			Lanthanum (La)	7439-91-0	2.50E-05	2.50E-05
			Lithium (Li)	7439-93-2	4.03E-05	4.03E-05
			Lutetium (Lu)	7439-94-3	3.68E-07	3.68E-07
			Magnesium (Mg)	7439-95-4	2.19E-02	2.19E-02
			Manganese (Mn)	7439-96-5	3.55E-04	3.55E-04
			Molybdenum (Mo)	7439-98-7	1.01E-05	1.01E-05
			Sodium (Na)	7440-23-5	4.67E-02	4.67E-02
			Niobium (Nb)	7440--03-1	9.19E-06	9.19E-06
			Nickel (Ni)	7440-02-0	4.00E-05	4.00E-05
			Phosphorus (P)	7723-14-0	9.83E-04	9.83E-04
			Lead (Pb)	7439-92-1	3.16E-05	3.16E-05
			Rubidium (Rb)	7440-17-7	1.18E-04	1.18E-04
			Sulphur (S)	7704-34-9	2.94E-03	2.94E-03
			Antimony (Sb)	7440-36-0	7.90E-06	7.90E-06
			Scandium (Sc)	7440-20-2	1.74E-05	1.74E-05
			Selenium (Se)	7782-49-2	5.51E-07	5.51E-07
			Tin (Sn)	7440-31-5	1.35E-05	1.35E-05
			Strontium (Sr)	7440-24-6	5.24E-04	5.24E-04
			Tantalum (Ta)	7440-25-7	1.58E-06	1.58E-06
			Terbium (Tb)	7440-27-9	8.37E-07	8.37E-07
			Tellurium (Te)	13494-80-9	2.75E-07	2.75E-07
			Titanium (Ti)	7440-32-6	2.52E-03	2.52E-03
			Thallium (Tl)	7440-28-0	1.42E-06	1.42E-06
			Uranium (U)	7440-61-1	2.11E-06	2.11E-06
			Vanadium (v)	7440-62-2	1.55E-04	1.55E-04
			Tungsten (W)	7440-33-7	7.77E-05	7.77E-05
			Yttrium (Y)	7440-65-5	2.05E-05	2.05E-05
			Ytterbium (Yb)	7440-64-4	2.36E-06	2.36E-06
			Zinc (Zn)	7440-66-6	1.89E-04	1.89E-04
			Zirconium (Zr)	7440-67-7	1.52E-04	1.52E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.03E+00	1.03E+00
			Aluminum Oxide (Al2O3)	1344-28-1	2.38E-01	2.38E-01
			Iron Oxide (Fe2O3)	1309-37-1	7.87E-02	7.87E-02
			Magnesium Oxide (MgO)	1309-48-4	3.32E-02	3.32E-02
			Calcium Oxide (CaO)	1305-78-8	5.67E-02	5.67E-02
			Sodium Oxide (Na2O)	1313-59-3	5.40E-02	5.40E-02
			Potassium Oxide (K2O)	12136-45-7	3.83E-02	3.83E-02
			Titanium dioxide (TiO2)	13463-67-7	3.87E-03	3.87E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.85E-03	1.85E-03
			Manganese Oxide (MnO)	1344-43-0	5.08E-04	5.08E-04
			Chromium Oxide (Cr2O3)	1308-38-9	4.67E-04	4.67E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	3.46E-04	3.46E-04
			Chalcopyrite (CuFeS2)	1308-56-1	3.46E-03	3.46E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.87E-05	7.87E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	7.87E-05	7.87E-05
			Galena (PbS)	1314-87-0	3.15E-04	3.15E-04
			Sphalerite (ZnS)	1314-98-3	6.29E-04	6.29E-04
			Pyrite (Fe, S2)	1309-36-0	9.44E-03	9.44E-03
			Pyrrhotite (Fe7S8)	12305-96-3	4.40E-03	4.40E-03
			Arsenopyrite (FeAsS)	1303-18-0	7.87E-05	7.87E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.93E-04	3.93E-04
			Quartz	14808-60-7	9.19E-02	9.19E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	8.55E-01	8.55E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	5.60E-02	5.60E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.30E-01	1.30E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.77E-02	2.77E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.71E-02	1.71E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.68E-02	1.68E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.08E-02	3.08E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.29E-04	6.29E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.46E-03	3.46E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	7.87E-04	7.87E-04
			Calcite (CaCO3)	1317-65-3	7.55E-03	7.55E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.87E-05	7.87E-05
			Titanite (CaTiSiO5)	[TITAN]	2.20E-03	2.20E-03
			Apatite (Ca5(PO4)3)	1306-05-4	3.46E-03	3.46E-03
			Mica	12001-26-2	1.68E-01	1.68E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	8.32E-02	8.32E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.80E-02	6.80E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	5.27E-02	5.27E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.84E-01	1.84E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	4.01E-01	4.01E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.50E-01	1.50E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.19E-02	2.19E-02
			Sillimanite (Al2SiO5)	12141-45-6	6.92E-03	6.92E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
W2	WD 87 Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	1.68E+00	1.68E+00
			PM_{10}	[PM10]	8.42E-01	8.42E-01
			$PM_{2.5}$	[PM2.5]	1.26E-01	1.26E-01
			Silver (Ag)	7440-22-4	1.05E-06	1.05E-06
			Aluminum (Al)	7429-90-5	1.29E-01	1.29E-01
			Arsenic (As)	7440-38-2	1.33E-05	1.33E-05
			Gold (Au)	7440-57-5	1.48E-07	1.48E-07
			Boron (B)	7440-42-8	1.71E-04	1.71E-04
			Barium (Ba)	7440-39-3	6.28E-04	6.28E-04
			Beryllium (Be)	7440-41-7	2.00E-06	2.00E-06
			Bismuth (Bi)	7440-69-9	3.52E-06	3.52E-06
			Carbon (C)	7440-44-0	1.54E-03	1.54E-03
			Calcium (Ca)	7440-70-2	5.39E-02	5.39E-02
			Cadmium (Cd)	7440-43-9	2.00E-06	2.00E-06
			Cerium (Ce)	7440-45-1	1.19E-04	1.19E-04
			Cobalt (Co)	7440-48-4	3.03E-05	3.03E-05
			Chromium (Cr)	7440-47-3	1.51E-04	1.51E-04
			Cesium (Cs)	7440-46-2	5.05E-06	5.05E-06
			Copper (Cu)	7440-50-8	2.25E-04	2.25E-04
			Iron (Fe)	7439-89-6	5.82E-02	5.82E-02
			Gallium (Ga)	7440-55-3	3.37E-05	3.37E-05
			Hafnium (Hf)	7440-58-6	6.97E-06	6.97E-06
			Mercury (Hg)	7439-97-6	4.21E-08	4.21E-08
			Indium (In)	7440-74-6	8.42E-09	8.42E-09
			Potassium (K)	7440-09-7	2.49E-02	2.49E-02
			Lanthanum (La)	7439-91-0	2.68E-05	2.68E-05
			Lithium (Li)	7439-93-2	4.31E-05	4.31E-05
			Lutetium (Lu)	7439-94-3	3.94E-07	3.94E-07
			Magnesium (Mg)	7439-95-4	2.34E-02	2.34E-02
			Manganese (Mn)	7439-96-5	3.79E-04	3.79E-04
			Molybdenum (Mo)	7439-98-7	1.09E-05	1.09E-05
			Sodium (Na)	7440-23-5	5.00E-02	5.00E-02
			Niobium (Nb)	7440--03-1	9.83E-06	9.83E-06
			Nickel (Ni)	7440-02-0	4.28E-05	4.28E-05
			Phosphorus (P)	7723-14-0	1.05E-03	1.05E-03
			Lead (Pb)	7439-92-1	3.38E-05	3.38E-05
			Rubidium (Rb)	7440-17-7	1.27E-04	1.27E-04
			Sulphur (S)	7704-34-9	3.15E-03	3.15E-03
			Antimony (Sb)	7440-36-0	8.46E-06	8.46E-06
			Scandium (Sc)	7440-20-2	1.87E-05	1.87E-05
			Selenium (Se)	7782-49-2	5.89E-07	5.89E-07
			Tin (Sn)	7440-31-5	1.44E-05	1.44E-05
			Strontium (Sr)	7440-24-6	5.61E-04	5.61E-04
			Tantalum (Ta)	7440-25-7	1.69E-06	1.69E-06
			Terbium (Tb)	7440-27-9	8.96E-07	8.96E-07
			Tellurium (Te)	13494-80-9	2.95E-07	2.95E-07
			Titanium (Ti)	7440-32-6	2.69E-03	2.69E-03
			Thallium (Tl)	7440-28-0	1.52E-06	1.52E-06
			Uranium (U)	7440-61-1	2.26E-06	2.26E-06
			Vanadium (v)	7440-62-2	1.66E-04	1.66E-04
			Tungsten (W)	7440-33-7	8.31E-05	8.31E-05
			Yttrium (Y)	7440-65-5	2.19E-05	2.19E-05
			Ytterbium (Yb)	7440-64-4	2.52E-06	2.52E-06
			Zinc (Zn)	7440-66-6	2.03E-04	2.03E-04
			Zirconium (Zr)	7440-67-7	1.62E-04	1.62E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.10E+00	1.10E+00
			Aluminum Oxide (Al2O3)	1344-28-1	2.54E-01	2.54E-01
			Iron Oxide (Fe2O3)	1309-37-1	8.42E-02	8.42E-02
			Magnesium Oxide (MgO)	1309-48-4	3.55E-02	3.55E-02
			Calcium Oxide (CaO)	1305-78-8	6.07E-02	6.07E-02
			Sodium Oxide (Na2O)	1313-59-3	5.78E-02	5.78E-02
			Potassium Oxide (K2O)	12136-45-7	4.10E-02	4.10E-02
			Titanium dioxide (TiO2)	13463-67-7	4.14E-03	4.14E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.98E-03	1.98E-03
			Manganese Oxide (MnO)	1344-43-0	5.44E-04	5.44E-04
			Chromium Oxide (Cr2O3)	1308-38-9	5.00E-04	5.00E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	3.70E-04	3.70E-04
			Chalcopyrite (CuFeS2)	1308-56-1	3.70E-03	3.70E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	8.42E-05	8.42E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	8.42E-05	8.42E-05
			Galena (PbS)	1314-87-0	3.37E-04	3.37E-04
			Sphalerite (ZnS)	1314-98-3	6.74E-04	6.74E-04
			Pyrite (Fe, S2)	1309-36-0	1.01E-02	1.01E-02
			Pyrrhotite (Fe7S8)	12305-96-3	4.71E-03	4.71E-03
			Arsenopyrite (FeAsS)	1303-18-0	8.42E-05	8.42E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.21E-04	4.21E-04
			Quartz	14808-60-7	9.84E-02	9.84E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	9.15E-01	9.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	5.99E-02	5.99E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.39E-01	1.39E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.96E-02	2.96E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.84E-02	1.84E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.80E-02	1.80E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.30E-02	3.30E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.74E-04	6.74E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.70E-03	3.70E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.42E-04	8.42E-04
			Calcite (CaCO3)	1317-65-3	8.08E-03	8.08E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	8.42E-05	8.42E-05
			Titanite (CaTiSiO5)	[TITAN]	2.36E-03	2.36E-03
			Apatite (Ca5(PO4)3)	1306-05-4	3.70E-03	3.70E-03
			Mica	12001-26-2	1.80E-01	1.80E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	8.91E-02	8.91E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	7.27E-02	7.27E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	5.64E-02	5.64E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.97E-01	1.97E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	4.29E-01	4.29E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.60E-01	1.60E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.34E-02	2.34E-02
			Sillimanite (Al2SiO5)	12141-45-6	7.41E-03	7.41E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
W3	Coarse Ore Storage Area Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	7.32E-01	7.32E-01
			PM_{10}	[PM10]	3.66E-01	3.66E-01
			$PM_{2.5}$	[PM2.5]	5.49E-02	5.49E-02
			Silver (Ag)	7440-22-4	1.53E-06	1.53E-06
			Aluminum (Al)	7429-90-5	5.47E-02	5.47E-02
			Arsenic (As)	7440-38-2	1.94E-05	1.94E-05
			Gold (Au)	7440-57-5	4.04E-07	4.04E-07
			Boron (B)	7440-42-8	9.52E-05	9.52E-05
			Barium (Ba)	7440-39-3	3.01E-04	3.01E-04
			Beryllium (Be)	7440-41-7	8.60E-07	8.60E-07
			Bismuth (Bi)	7440-69-9	2.17E-06	2.17E-06
			Carbon (C)	7440-44-0	9.00E-04	9.00E-04
			Calcium (Ca)	7440-70-2	1.92E-02	1.92E-02
			Cadmium (Cd)	7440-43-9	4.59E-06	4.59E-06
			Cerium (Ce)	7440-45-1	5.17E-05	5.17E-05
			Cobalt (Co)	7440-48-4	1.27E-05	1.27E-05
			Chromium (Cr)	7440-47-3	7.32E-05	7.32E-05
			Cesium (Cs)	7440-46-2	2.20E-06	2.20E-06
			Copper (Cu)	7440-50-8	4.33E-04	4.33E-04
			Iron (Fe)	7439-89-6	2.78E-02	2.78E-02
			Gallium (Ga)	7440-55-3	1.44E-05	1.44E-05
			Hafnium (Hf)	7440-58-6	3.03E-06	3.03E-06
			Mercury (Hg)	7439-97-6	1.83E-08	1.83E-08
			Indium (In)	7440-74-6	3.66E-09	3.66E-09
			Potassium (K)	7440-09-7	1.25E-02	1.25E-02
			Lanthanum (La)	7439-91-0	1.51E-05	1.51E-05
			Lithium (Li)	7439-93-2	1.87E-05	1.87E-05
			Lutetium (Lu)	7439-94-3	1.71E-07	1.71E-07
			Magnesium (Mg)	7439-95-4	8.95E-03	8.95E-03
			Manganese (Mn)	7439-96-5	1.78E-04	1.78E-04
			Molybdenum (Mo)	7439-98-7	4.58E-06	4.58E-06
			Sodium (Na)	7440-23-5	2.17E-02	2.17E-02
			Niobium (Nb)	7440--03-1	4.27E-06	4.27E-06
			Nickel (Ni)	7440-02-0	1.69E-05	1.69E-05
			Phosphorus (P)	7723-14-0	3.84E-04	3.84E-04
			Lead (Pb)	7439-92-1	1.64E-05	1.64E-05
			Rubidium (Rb)	7440-17-7	5.50E-05	5.50E-05
			Sulphur (S)	7704-34-9	3.05E-03	3.05E-03
			Antimony (Sb)	7440-36-0	5.95E-06	5.95E-06
			Scandium (Sc)	7440-20-2	8.08E-06	8.08E-06
			Selenium (Se)	7782-49-2	2.56E-07	2.56E-07
			Tin (Sn)	7440-31-5	6.26E-06	6.26E-06
			Strontium (Sr)	7440-24-6	1.80E-04	1.80E-04
			Tantalum (Ta)	7440-25-7	7.36E-07	7.36E-07
			Terbium (Tb)	7440-27-9	3.89E-07	3.89E-07
			Tellurium (Te)	13494-80-9	1.28E-07	1.28E-07
			Titanium (Ti)	7440-32-6	1.04E-03	1.04E-03
			Thallium (Tl)	7440-28-0	6.61E-07	6.61E-07
			Uranium (U)	7440-61-1	9.81E-07	9.81E-07
			Vanadium (v)	7440-62-2	6.61E-05	6.61E-05
			Tungsten (W)	7440-33-7	3.34E-05	3.34E-05
			Yttrium (Y)	7440-65-5	9.51E-06	9.51E-06
			Ytterbium (Yb)	7440-64-4	1.10E-06	1.10E-06
			Zinc (Zn)	7440-66-6	1.69E-04	1.69E-04
			Zirconium (Zr)	7440-67-7	7.05E-05	7.05E-05
			Silicon Dioxide (SiO2)	7631-86-9	4.80E-01	4.80E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.10E-01	1.10E-01
			Iron Oxide (Fe2O3)	1309-37-1	3.70E-02	3.70E-02
			Magnesium Oxide (MgO)	1309-48-4	1.55E-02	1.55E-02
			Calcium Oxide (CaO)	1305-78-8	2.58E-02	2.58E-02
			Sodium Oxide (Na2O)	1313-59-3	2.57E-02	2.57E-02
			Potassium Oxide (K2O)	12136-45-7	1.76E-02	1.76E-02
			Titanium dioxide (TiO2)	13463-67-7	1.76E-03	1.76E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.84E-04	7.84E-04
			Manganese Oxide (MnO)	1344-43-0	2.22E-04	2.22E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.13E-04	2.13E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.21E-04	1.21E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.61E-03	1.61E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.66E-05	3.66E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	3.66E-05	3.66E-05
			Galena (PbS)	1314-87-0	1.46E-04	1.46E-04
			Sphalerite (ZnS)	1314-98-3	2.93E-04	2.93E-04
			Pyrite (Fe, S2)	1309-36-0	4.17E-03	4.17E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.05E-03	2.05E-03
			Arsenopyrite (FeAsS)	1303-18-0	3.66E-05	3.66E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.83E-04	1.83E-04
			Quartz	14808-60-7	4.19E-02	4.19E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.92E-01	2.92E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.60E-02	2.60E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.83E-02	7.83E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.62E-02	4.62E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.98E-03	7.98E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.32E-02	4.32E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.43E-02	1.43E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.93E-04	2.93E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.61E-03	1.61E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.66E-04	3.66E-04
			Calcite (CaCO3)	1317-65-3	5.34E-03	5.34E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.66E-05	3.66E-05
			Titanite (CaTiSiO5)	[TITAN]	1.72E-03	1.72E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.61E-03	1.61E-03
			Mica	12001-26-2	7.84E-02	7.84E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.87E-02	3.87E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.16E-02	3.16E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.45E-02	2.45E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	8.55E-02	8.55E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.87E-01	1.87E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	6.96E-02	6.96E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.02E-02	1.02E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.22E-03	3.22E-03

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
W4A-D	Mobile Crusher Piles Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	5.16E-01	5.16E-01
			PM_{10}	[PM10]	2.58E-01	2.58E-01
			$PM_{2.5}$	[PM2.5]	3.87E-02	3.87E-02
			Silver (Ag)	7440-22-4	3.22E-07	3.22E-07
			Aluminum (Al)	7429-90-5	3.96E-02	3.96E-02
			Arsenic (As)	7440-38-2	4.09E-06	4.09E-06
			Gold (Au)	7440-57-5	4.52E-08	4.52E-08
			Boron (B)	7440-42-8	5.23E-05	5.23E-05
			Barium (Ba)	7440-39-3	1.92E-04	1.92E-04
			Beryllium (Be)	7440-41-7	6.12E-07	6.12E-07
			Bismuth (Bi)	7440-69-9	1.08E-06	1.08E-06
			Carbon (C)	7440-44-0	4.73E-04	4.73E-04
			Calcium (Ca)	7440-70-2	1.65E-02	1.65E-02
			Cadmium (Cd)	7440-43-9	6.14E-07	6.14E-07
			Cerium (Ce)	7440-45-1	3.64E-05	3.64E-05
			Cobalt (Co)	7440-48-4	9.29E-06	9.29E-06
			Chromium (Cr)	7440-47-3	4.63E-05	4.63E-05
			Cesium (Cs)	7440-46-2	1.55E-06	1.55E-06
			Copper (Cu)	7440-50-8	6.89E-05	6.89E-05
			Iron (Fe)	7439-89-6	1.78E-02	1.78E-02
			Gallium (Ga)	7440-55-3	1.03E-05	1.03E-05
			Hafnium (Hf)	7440-58-6	2.14E-06	2.14E-06
			Mercury (Hg)	7439-97-6	1.29E-08	1.29E-08
			Indium (In)	7440-74-6	2.58E-09	2.58E-09
			Potassium (K)	7440-09-7	7.64E-03	7.64E-03
			Lanthanum (La)	7439-91-0	8.20E-06	8.20E-06
			Lithium (Li)	7439-93-2	1.32E-05	1.32E-05
			Lutetium (Lu)	7439-94-3	1.21E-07	1.21E-07
			Magnesium (Mg)	7439-95-4	7.17E-03	7.17E-03
			Manganese (Mn)	7439-96-5	1.16E-04	1.16E-04
			Molybdenum (Mo)	7439-98-7	3.33E-06	3.33E-06
			Sodium (Na)	7440-23-5	1.53E-02	1.53E-02
			Niobium (Nb)	7440--03-1	3.01E-06	3.01E-06
			Nickel (Ni)	7440-02-0	1.31E-05	1.31E-05
			Phosphorus (P)	7723-14-0	3.22E-04	3.22E-04
			Lead (Pb)	7439-92-1	1.04E-05	1.04E-05
			Rubidium (Rb)	7440-17-7	3.88E-05	3.88E-05
			Sulphur (S)	7704-34-9	9.65E-04	9.65E-04
			Antimony (Sb)	7440-36-0	2.59E-06	2.59E-06
			Scandium (Sc)	7440-20-2	5.72E-06	5.72E-06
			Selenium (Se)	7782-49-2	1.81E-07	1.81E-07
			Tin (Sn)	7440-31-5	4.42E-06	4.42E-06
			Strontium (Sr)	7440-24-6	1.72E-04	1.72E-04
			Tantalum (Ta)	7440-25-7	5.19E-07	5.19E-07
			Terbium (Tb)	7440-27-9	2.74E-07	2.74E-07
			Tellurium (Te)	13494-80-9	9.03E-08	9.03E-08
			Titanium (Ti)	7440-32-6	8.25E-04	8.25E-04
			Thallium (Tl)	7440-28-0	4.66E-07	4.66E-07
			Uranium (U)	7440-61-1	6.91E-07	6.91E-07
			Vanadium (v)	7440-62-2	5.07E-05	5.07E-05
			Tungsten (W)	7440-33-7	2.55E-05	2.55E-05
			Yttrium (Y)	7440-65-5	6.71E-06	6.71E-06
			Ytterbium (Yb)	7440-64-4	7.73E-07	7.73E-07
			Zinc (Zn)	7440-66-6	6.21E-05	6.21E-05
			Zirconium (Zr)	7440-67-7	4.97E-05	4.97E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.37E-01	3.37E-01
			Aluminum Oxide (Al2O3)	1344-28-1	7.79E-02	7.79E-02
			Iron Oxide (Fe2O3)	1309-37-1	2.58E-02	2.58E-02
			Magnesium Oxide (MgO)	1309-48-4	1.09E-02	1.09E-02
			Calcium Oxide (CaO)	1305-78-8	1.86E-02	1.86E-02
			Sodium Oxide (Na2O)	1313-59-3	1.77E-02	1.77E-02
			Potassium Oxide (K2O)	12136-45-7	1.26E-02	1.26E-02
			Titanium dioxide (TiO2)	13463-67-7	1.27E-03	1.27E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.06E-04	6.06E-04
			Manganese Oxide (MnO)	1344-43-0	1.67E-04	1.67E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.53E-04	1.53E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.14E-04	1.14E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.14E-03	1.14E-03
			Bornite (Cu5FeS4)	1308-82-3	0.00E+00	0.00E+00
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.58E-05	2.58E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	0.00E+00	0.00E+00
			Cuprite (CU_2O)	1317-39-1	2.58E-05	2.58E-05
			Galena (PbS)	1314-87-0	1.03E-04	1.03E-04
			Sphalerite (ZnS)	1314-98-3	2.06E-04	2.06E-04
			Pyrite (Fe, S2)	1309-36-0	3.10E-03	3.10E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.44E-03	1.44E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.58E-05	2.58E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.29E-04	1.29E-04
			Quartz	14808-60-7	3.01E-02	3.01E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.80E-01	2.80E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.84E-02	1.84E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.26E-02	4.26E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.08E-03	9.08E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.62E-03	5.62E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.52E-03	5.52E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.01E-02	1.01E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.06E-04	2.06E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.14E-03	1.14E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.58E-04	2.58E-04
			Calcite (CaCO3)	1317-65-3	2.48E-03	2.48E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.58E-05	2.58E-05
			Titanite (CaTiSiO5)	[TITAN]	7.22E-04	7.22E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.14E-03	1.14E-03
			Mica	12001-26-2	5.53E-02	5.53E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.73E-02	2.73E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.23E-02	2.23E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.73E-02	1.73E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.03E-02	6.03E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.32E-01	1.32E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	4.91E-02	4.91E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.17E-03	7.17E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.27E-03	2.27E-03

Source Emission Inventory Summary						
Construction Phase - Year -1						
Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year -1	
					1 hr	24 hr
W5	Concrete Plant Sand Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide – Mining Projects	TSP	[PM]	3.77E-02	3.77E-02
			PM_{10}	[PM10]	1.88E-02	1.88E-02
			$PM_{2.5}$	[PM2.5]	2.83E-03	2.83E-03
CP1	Pit 87 Mining - Mobile Equipment and Generator	MOVES	PM_{10}	[PM10]	9.37E-02	8.62E-02
			$PM_{2.5}$	[PM2.5]	9.21E-02	8.49E-02
			Carbon Monoxide (CO)	630-08-0	9.00E-01	8.62E-01
			Sulphur Dioxide (SO2)	7446-09-5	5.29E-03	4.85E-03
			Hydrocarbons	[NMHC]	2.19E-01	2.09E-01
			Nitrogen Oxides (NOx)	10102-44-0	7.67E+00	7.35E+00
			1,3-butadiene	106-99-0	1.32E-04	1.14E-04
			Acenaphthene	83-32-9	5.13E-05	4.51E-05
			Acenaphthylene	208-96-8	9.88E-05	8.77E-05
			Acetaldehyde	75-07-0	7.40E-03	6.38E-03
			Acrolein	107-02-8	1.39E-03	1.19E-03
			Anthracene	120-12-7	9.64E-06	8.56E-06
			Benzene	71-43-2	4.90E-03	4.42E-03
			Benzo(a)anthracene	56-55-3	1.89E-06	1.77E-06
			Benzo(a)pyrene	50-32-8	7.16E-07	6.74E-07
			Benzo(b+k)fluoranthene	205-99-2	2.62E-06	2.51E-06
			Benzo(g,h,i)perylene	191-24-2	1.61E-06	1.51E-06
			Chrysene	218-01-9	3.57E-06	3.41E-06
			Fluoranthene	206-44-0	1.87E-05	1.71E-05
			Fluorene	86-73-7	8.16E-05	7.28E-05
			Formaldehyde	50-00-0	6.02E-03	5.26E-03
			Phenanthrene	85-01-8	1.69E-04	1.54E-04
			Pyrene	129-00-0	1.79E-05	1.62E-05
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	9.21E-02	8.49E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	5.99E-02	5.52E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.75E-06	1.63E-06
CM1	Coarse Ore Pile - Mobile Equipment	MOVES	PM_{10}	[PM10]	2.05E-03	2.05E-03
			$PM_{2.5}$	[PM2.5]	1.99E-03	1.99E-03
			Carbon Monoxide (CO)	630-08-0	6.41E-03	6.41E-03
			Sulphur Dioxide (SO2)	7446-09-5	1.25E-04	1.25E-04
			Hydrocarbons	[NMHC]	2.79E-03	2.79E-03
			Nitrogen Oxides (NOx)	10102-44-0	1.95E-01	1.95E-01
			1,3-butadiene	106-99-0	5.76E-06	5.76E-06
			Acenaphthene	83-32-9	1.88E-06	1.88E-06
			Acenaphthylene	208-96-8	3.84E-06	3.84E-06
			Acetaldehyde	75-07-0	3.22E-04	3.22E-04
			Acrolein	107-02-8	5.79E-05	5.79E-05
			Anthracene	120-12-7	3.30E-07	3.30E-07
			Benzene	71-43-2	1.67E-04	1.67E-04
			Benzo(a)anthracene	56-55-3	3.96E-08	3.96E-08
			Benzo(a)pyrene	50-32-8	1.33E-08	1.33E-08
			Benzo(b+k)fluoranthene	205-99-2	3.75E-08	3.75E-08
			Benzo(g,h,i)perylene	191-24-2	3.27E-08	3.27E-08
			Chrysene	218-01-9	4.99E-08	4.99E-08
			Fluoranthene	206-44-0	5.60E-07	5.60E-07
			Fluorene	86-73-7	2.60E-06	2.60E-06
			Formaldehyde	50-00-0	2.74E-04	2.74E-04
			Phenanthrene	85-01-8	4.44E-06	4.44E-06
			Pyrene	129-00-0	5.25E-07	5.25E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.99E-03	1.99E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.30E-03	1.30E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.90E-08	3.90E-08
CM2	OB 87 - Mobile Equipment	MOVES	PM_{10}	[PM10]	4.62E-03	4.27E-03
			$PM_{2.5}$	[PM2.5]	4.48E-03	4.14E-03
			Carbon Monoxide (CO)	630-08-0	1.51E-02	1.38E-02
			Sulphur Dioxide (SO2)	7446-09-5	4.19E-04	3.57E-04
			Hydrocarbons	[NMHC]	6.20E-03	5.75E-03
			Nitrogen Oxides (NOx)	10102-44-0	3.44E-01	3.39E-01
			1,3-butadiene	106-99-0	1.11E-05	1.07E-05
			Acenaphthene	83-32-9	3.63E-06	3.48E-06
			Acenaphthylene	208-96-8	7.41E-06	7.12E-06
			Acetaldehyde	75-07-0	6.54E-04	6.20E-04
			Acrolein	107-02-8	1.15E-04	1.09E-04
			Anthracene	120-12-7	6.57E-07	6.26E-07
			Benzene	71-43-2	3.23E-04	3.10E-04
			Benzo(a)anthracene	56-55-3	8.39E-08	7.87E-08
			Benzo(a)pyrene	50-32-8	2.87E-08	2.68E-08
			Benzo(b+k)fluoranthene	205-99-2	8.09E-08	7.55E-08
			Benzo(g,h,i)perylene	191-24-2	6.65E-08	6.30E-08
			Chrysene	218-01-9	1.03E-07	9.74E-08
			Fluoranthene	206-44-0	1.11E-06	1.06E-06
			Fluorene	86-73-7	5.09E-06	4.87E-06
			Formaldehyde	50-00-0	5.32E-04	5.10E-04
			Phenanthrene	85-01-8	8.75E-06	8.35E-06
			Pyrene	129-00-0	1.05E-06	9.96E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	4.48E-03	4.14E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	2.91E-03	2.69E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	8.05E-08	7.60E-08

Source Emission Inventory Summary

Construction Phase - Year -1

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year -1	
					1 hr	24 hr
CM3	TSF - Mobile Equipment	MOVES	PM_{10}	[PM10]	2.05E-02	1.83E-02
			$PM_{2.5}$	[PM2.5]	1.98E-02	1.78E-02
			Carbon Monoxide (CO)	630-08-0	7.93E-02	6.52E-02
			Sulphur Dioxide (SO2)	7446-09-5	1.66E-03	1.45E-03
			Hydrocarbons	[NMHC]	3.09E-02	2.66E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.47E+00	1.44E+00
			1,3-butadiene	106-99-0	5.79E-05	5.04E-05
			Acenaphthene	83-32-9	1.89E-05	1.64E-05
			Acenaphthylene	208-96-8	3.86E-05	3.36E-05
			Acetaldehyde	75-07-0	3.35E-03	2.90E-03
			Acrolein	107-02-8	5.92E-04	5.14E-04
			Anthracene	120-12-7	3.32E-06	2.90E-06
			Benzene	71-43-2	1.68E-03	1.46E-03
			Benzo(a)anthracene	56-55-3	4.06E-07	3.56E-07
			Benzo(a)pyrene	50-32-8	1.28E-07	1.16E-07
			Benzo(b+k)fluoranthene	205-99-2	3.62E-07	3.26E-07
			Benzo(g,h,i)perylene	191-24-2	3.23E-07	2.85E-07
			Chrysene	218-01-9	4.95E-07	4.38E-07
			Fluoranthene	206-44-0	5.61E-06	4.91E-06
			Fluorene	86-73-7	2.62E-05	2.28E-05
			Formaldehyde	50-00-0	2.76E-03	2.40E-03
			Phenanthrene	85-01-8	4.47E-05	3.90E-05
			Pyrene	129-00-0	5.25E-06	4.60E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.98E-02	1.78E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.29E-02	1.16E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.86E-07	3.42E-07
CM4	WD 87 - Mobile Equipment	MOVES	PM_{10}	[PM10]	5.94E-03	5.59E-03
			$PM_{2.5}$	[PM2.5]	5.76E-03	5.42E-03
			Carbon Monoxide (CO)	630-08-0	1.92E-02	1.79E-02
			Sulphur Dioxide (SO2)	7446-09-5	5.00E-04	4.37E-04
			Hydrocarbons	[NMHC]	8.00E-03	7.54E-03
			Nitrogen Oxides (NOx)	10102-44-0	4.70E-01	4.64E-01
			1,3-butadiene	106-99-0	1.48E-05	1.44E-05
			Acenaphthene	83-32-9	4.84E-06	4.69E-06
			Acenaphthylene	208-96-8	9.89E-06	9.59E-06
			Acetaldehyde	75-07-0	8.62E-04	8.28E-04
			Acrolein	107-02-8	1.52E-04	1.47E-04
			Anthracene	120-12-7	8.70E-07	8.39E-07
			Benzene	71-43-2	4.31E-04	4.18E-04
			Benzo(a)anthracene	56-55-3	1.09E-07	1.04E-07
			Benzo(a)pyrene	50-32-8	3.73E-08	3.54E-08
			Benzo(b+k)fluoranthene	205-99-2	1.05E-07	9.97E-08
			Benzo(g,h,i)perylene	191-24-2	8.76E-08	8.41E-08
			Chrysene	218-01-9	1.36E-07	1.30E-07
			Fluoranthene	206-44-0	1.47E-06	1.42E-06
			Fluorene	86-73-7	6.77E-06	6.55E-06
			Formaldehyde	50-00-0	7.08E-04	6.87E-04
			Phenanthrene	85-01-8	1.16E-05	1.12E-05
			Pyrene	129-00-0	1.38E-06	1.33E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	5.76E-03	5.42E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	3.75E-03	3.52E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.06E-07	1.01E-07
CPLANT	Mill Area - Mobile Equipment and Generator	MOVES	PM_{10}	[PM10]	5.46E-02	5.00E-02
			$PM_{2.5}$	[PM2.5]	5.43E-02	4.97E-02
			Carbon Monoxide (CO)	630-08-0	7.68E-01	7.32E-01
			Sulphur Dioxide (SO2)	7446-09-5	2.95E-03	2.77E-03
			Hydrocarbons	[NMHC]	1.75E-01	1.65E-01
			Nitrogen Oxides (NOx)	10102-44-0	4.45E+00	4.36E+00
			1,3-butadiene	106-99-0	4.35E-05	2.39E-05
			Acenaphthene	83-32-9	2.15E-05	1.51E-05
			Acenaphthylene	208-96-8	4.31E-05	3.02E-05
			Acetaldehyde	75-07-0	2.51E-03	1.40E-03
			Acrolein	107-02-8	4.54E-04	2.55E-04
			Anthracene	120-12-7	4.32E-06	3.26E-06
			Benzene	71-43-2	2.47E-03	1.91E-03
			Benzo(a)anthracene	56-55-3	1.26E-06	1.14E-06
			Benzo(a)pyrene	50-32-8	4.80E-07	4.51E-07
			Benzo(b+k)fluoranthene	205-99-2	1.96E-06	1.88E-06
			Benzo(g,h,i)perylene	191-24-2	1.09E-06	1.00E-06
			Chrysene	218-01-9	2.75E-06	2.61E-06
			Fluoranthene	206-44-0	1.03E-05	8.58E-06
			Fluorene	86-73-7	3.95E-05	3.09E-05
			Formaldehyde	50-00-0	2.14E-03	1.23E-03
			Phenanthrene	85-01-8	9.73E-05	8.28E-05
			Pyrene	129-00-0	9.57E-06	7.93E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	5.43E-02	4.97E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	3.53E-02	3.23E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.10E-06	9.98E-07

Source: Mobile Combustion Emissions Sources

Equipment	Example Make/Model	Engine Emissions Tier Level	Average Power (kW) = Max Power x Load Factor	Average Power (HP)	Utilization	Utilization - Operating Hours per Day	MOVES hpID	MOVES Fuel ID	Moves Equipment ID	Emission Factors (g/hp-hr)																						
										PM_{10}	$PM_{2.5}$	CO	SO_2	Hydrocarbons	NOx	1,3-butadiene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Fluorene	Formaldehyde	Phenanthrene	Pyrene	Diesel Particulate Matter (PM2.5 from Diesel Combustion)
										100	110	2	31	1	3	24	70+170	71+171	26	27	72+172	20	73+173	74+174	75+77+175+177	76+176	78+178	69+169	81+181	5	83+183	84+184	110
Drill (165 mm)	SmartROC D65	Tier 4	282	378	71%	17	600	23	14	4.18E-02	4.05E-02	2.50E-01	1.50E-03	5.29E-02	8.02E-01	9.82E-05	3.65E-05	4.91E-05	5.06E-03	1.17E-03	5.97E-06	2.13E-03	5.74E-07	1.94E-07	5.23E-07	4.04E-07	7.29E-07	6.88E-06	5.13E-05	2.99E-03	8.53E-05	8.20E-06	4.05E-02
Drill (203 mm)	PV-235	Electric	449	602	71%	17	750																										
Loader (23 m3)	Cat 995XL Loader-23m3 (200-240 t)	Tier 4	976	1309	85%	20	2000	23	20	3.07E-02	2.98E-02	1.30E-01	1.44E-03	3.92E-02	2.29E+00	8.11E-05	2.62E-05	5.33E-05	4.51E-03	8.12E-04	4.65E-06	2.32E-03	5.63E-07	1.95E-07	5.49E-07	4.64E-07	7.16E-07	7.86E-06	3.65E-05	3.78E-03	6.26E-05	7.41E-06	2.98E-02
Hydraulic Shovel (34 m3)	Cat 6060 shovel - 34 m3 (240t +)	Electric	1260	1690	85%	20	2000																										
Hydraulic Excav (6.5m3)	Cat 395	Tier 4	284	380	85%	20	600	23	77	6.73E-03	6.53E-03	2.23E-02	1.41E-03	9.63E-03	1.18E-01	8.30E-06	2.79E-06	5.61E-06	6.90E-04	1.03E-04	5.87E-07	2.41E-04	1.03E-07	3.57E-08	1.01E-07	6.59E-08	1.12E-07	9.89E-07	4.13E-06	4.03E-04	7.54E-06	9.41E-07	6.53E-03
Truck (229t)	Cat 793	Tier 4	1383	1855	85%	20	2000	23	79	2.33E-02	2.26E-02	7.26E-02	1.41E-03	3.16E-02	2.21E+00	6.53E-05	2.13E-05	4.35E-05	3.65E-03	6.56E-04	3.75E-06	1.90E-03	4.49E-07	1.51E-07	4.25E-07	3.70E-07	5.65E-07	6.35E-06	2.95E-05	3.11E-03	5.03E-05	5.95E-06	2.26E-02
Truck (91t)	Cat 777	Tier 4	536	718	85%	20	750	23	79	6.23E-03	6.04E-03	1.90E-02	1.41E-03	9.26E-03	1.11E-01	7.49E-06	2.52E-06	5.07E-06	6.45E-04	9.49E-05	5.34E-07	2.18E-04	9.59E-08	3.23E-08	9.11E-08	5.95E-08	1.02E-07	8.97E-07	3.75E-06	3.61E-04	6.86E-06	8.53E-07	6.04E-03
Truck (40t)	Cat 740GC	Tier 4	236	316	85%	20	600	23	79	6.23E-03	6.04E-03	1.90E-02	1.41E-03	9.26E-03	1.11E-01	7.49E-06	2.52E-06	5.07E-06	6.45E-04	9.49E-05	5.34E-07	2.18E-04	9.59E-08	3.23E-08	9.11E-08	5.95E-08	1.02E-07	8.97E-07	3.75E-06	3.61E-04	6.86E-06	8.53E-07	6.04E-03
Track Dozer	Track Dozer - D10	Tier 4	400	536	71%	17	600	23	81	7.97E-03	7.73E-03	2.94E-02	1.42E-03	1.04E-02	1.32E-01	1.00E-05	3.35E-06	6.76E-06	7.85E-04	1.20E-04	7.04E-07	2.91E-04	1.19E-07	4.39E-08	1.24E-07	8.03E-08	1.35E-07	1.19E-06	4.96E-06	4.95E-04	9.01E-06	1.14E-06	7.73E-03
Grader	Grader - Cat 16	Tier 4	190	255	71%	17	300	23	78	6.24E-03	6.06E-03	1.90E-02	1.41E-03	9.26E-03	1.11E-01	7.49E-06	2.52E-06	5.07E-06	6.46E-04	9.49E-05	5.35E-07	2.18E-04	9.61E-08	3.24E-08	9.14E-08	5.96E-08	1.02E-07	8.98E-07	3.75E-06	3.61E-04	6.86E-06	8.54E-07	6.06E-03
Crawler Loader	Cat 992K HL	Tier 4	470	630	71%	17	750	23	20	1.60E-02	1.55E-02	1.06E-02	1.43E-03	1.56E-02	2.13E-01	2.10E-05	6.90E-06	1.40E-05	1.39E-03	2.30E-04	1.44E-06	6.08E-04	2.24E-07	9.56E-08	2.69E-07	1.72E-07	2.81E-07	2.47E-06	1.02E-05	1.03E-03	1.84E-05	2.37E-06	1.55E-02
Support Backhoe	Cat 336	Tier 4	158	211	71%	17	300	23	21	4.76E-02	4.62E-02	2.10E-01	1.71E-03	5.25E-02	4.20E-01	9.77E-05	2.99E-05	5.77E-05	5.41E-03	9.79E-04	5.51E-06	2.52E-03	7.04E-07	2.67E-07	7.42E-07	5.51E-07	9.11E-07	8.95E-06	4.25E-05	3.97E-03	7.60E-05	8.79E-06	4.62E-02
Water Truck	N/A	Tier 4	134	180	71%	17	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Lube/Fuel Truck	N/A	Tier 4	157	211	33%	8	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Mechanic's Truck	N/A	Tier 4	101	135	58%	14	175	23	79	1.10E-02	1.07E-02	4.92E-02	1.41E-03	7.69E-03	1.68E-01	1.13E-05	3.72E-06	7.57E-06	7.21E-04	1.21E-04	8.54E-07	3.29E-04	1.34E-07	6.96E-08	1.96E-07	1.13E-07	1.85E-07	1.48E-06	5.71E-06	5.71E-04	1.05E-05	1.44E-06	1.07E-02
Welding Truck	N/A	Tier 4	101	135	33%	8	175	23	79	1.10E-02	1.07E-02	4.92E-02	1.41E-03	7.69E-03	1.68E-01	1.13E-05	3.72E-06	7.57E-06	7.21E-04	1.21E-04	8.54E-07	3.29E-04	1.34E-07	6.96E-08	1.96E-07	1.13E-07	1.85E-07	1.48E-06	5.71E-06	5.71E-04	1.05E-05	1.44E-06	1.07E-02
Blasting Loader	N/A	Tier 4	101	135	33%	8	175	23	79	1.10E-02	1.07E-02	4.92E-02	1.41E-03	7.69E-03	1.68E-01	1.13E-05	3.72E-06	7.57E-06	7.21E-04	1.21E-04	8.54E-07	3.29E-04	1.34E-07	6.96E-08	1.96E-07	1.13E-07	1.85E-07	1.48E-06	5.71E-06	5.71E-04	1.05E-05	1.44E-06	1.07E-02
Blaster's Truck	N/A	Tier 4	101	135	33%	8	175	23	79	1.10E-02	1.07E-02	4.92E-02	1.41E-03	7.69E-03	1.68E-01	1.13E-05	3.72E-06	7.57E-06	7.21E-04	1.21E-04	8.54E-07	3.29E-04	1.34E-07	6.96E-08	1.96E-07	1.13E-07	1.85E-07	1.48E-06	5.71E-06	5.71E-04	1.05E-05	1.44E-06	1.07E-02
Integrated Tool Carrier	WA200-7	Tier 4	67	89	17%	4	100	23	20	1.27E-02	1.23E-02	5.64E-02	1.57E-03	7.25E-03	8.61E-01	1.21E-05	3.95E-06	8.06E-06	7.32E-04	1.26E-04	9.30E-07	3.51E-04	1.26E-07	7.18E-08	1.82E-07	1.07E-07	1.79E-07	1.62E-06	6.07E-06	5.75E-04	1.20E-05	1.56E-06	1.23E-02
Compactor	Hamm 16i P	Tier 4	81	108	17%	4	175	23	9	1.14E-02	1.10E-02	5.12E-02	1.41E-03	7.99E-03	1.74E-01	1.29E-05	3.92E-06	7.99E-06	7.56E-04	1.28E-04	8.94E-07	3.47E-04	1.39E-07	7.21E-08	2.03E-07	1.18E-07	1.92E-07	1.55E-06	6.01E-06	6.02E-04	1.10E-05	1.51E-06	1.10E-02
Lighting Plants	N/A	Tier 4	7	9	50%	12	11	23	12	2.35E-01	2.28E-01	2.44E+00	2.16E-03	7.52E-01	4.18E+00	1.56E-03	5.07E-04	1.04E-03	8.70E-02	1.56E-02	8.03E-05	4.53E-02	8.30E-06	1.52E-06	4.28E-06	6.49E-06	9.41E-06	1.34E-04	6.79E-04	7.37E-02	1.12E-03	1.23E-04	2.28E-01
Pickup Trucks	Tier 4	Tier 4	153	203	42%	10	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Dump Truck	N/A	Tier 4	249	333	71%	17	600	23	79	6.23E-03	6.04E-03	1.90E-02	1.41E-03	9.26E-03	1.11E-01	7.49E-06	2.52E-06	5.07E-06	6.45E-04	9.49E-05	5.34E-07	2.18E-04	9.59E-08	3.23E-08	9.11E-08	5.95E-08	1.02E-07	8.97E-07	3.75E-06	3.61E-04	6.86E-06	8.53E-07	6.04E-03
Tire Manipulator	WA500-7	Tier 4	186	250	71%	17	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Road Maint Loader	Cat 988	Tier 4	238	319	71%	17	600	23	24	2.86E-02	2.78E-02	1.52E-01	1.44E-03	2.44E-02	3.72E-01	3.99E-05	1.28E-05	2.53E-05	2.39E-03	4.17E-04	2.62E-06	1.02E-03	3.81E-07	1.69E-07	4.74E-07	3.04E-07	5.00E-07	4.39E-06	1.88E-05	1.79E-03	3.39E-05	4.29E-06	2.78E-02
Crane - 60T	N/A	Tier 4	122	163	71%	17	175	23	17	1.13E-02	1.10E-02	5.12E-02	1.40E-03	8.14E-03	1.79E-01	1.23E-05	4.03E-06	8.20E-06	7.74E-04	1.31E-04	9.08E-07	3.57E-04	1.40E-07	7.18E-08	2.02E-07	1.19E-07	1.93E-07	1.57E-06	6.14E-06	6.20E-04	1.12E-05	1.53E-06	1.10E-02
Crane - 30T	N/A	Tier 4	96	129	71%	17	175	23	17	1.13E-02	1.10E-02	5.12E-02	1.40E-03	8.14E-03	1.79E-01	1.23E-05	4.03E-06	8.20E-06	7.74E-04	1.31E-04	9.08E-07	3.57E-04	1.40E-07	7.18E-08	2.02E-07	1.19E-07	1.93E-07	1.57E-06	6.14E-06	6.20E-04	1.12E-05	1.53E-06	1.10E-02
Man Bus	N/A	Tier 4	136	182	71%	17	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Pump Truck	N/A	Tier 4	183	245	71%	17	300	23	79	6.32E-03	6.13E-03	1.91E-02	1.41E-03	9.27E-03	1.11E-01	7.50E-06	2.53E-06	5.08E-06	6.46E-04	9.50E-05	5.37E-07	2.18E-04	9.69E-08	3.28E-08	9.24E-08	6.01E-08	1.03E-07	9.02E-07	3.76E-06	3.62E-04	6.88E-06	8.58E-07	6.13E-03
Lowboy and tractor	N/A	Tier 4	128	171	71%	17	175	23	31	1.08E-02	1.05E-02	4.90E-02	1.41E-03	7.68E-03	1.68E-01	1.13E-05	3.71E-06	7.56E-06	7.21E-04	1.21E-04	8.49E-07	3.29E-04	1.32E-07	6.87E-08	1.93E-07	1.12E-07	1.83E-07	1.47E-06	5.69E-06	5.71E-04	1.05E-05	1.44E-06	1.05E-02
Concentrate Truck	Cat 740B	Tier 4	253	339	71%	17	600	23	79	6.23E-03	6.04E-03	1.90E-02	1.41E-03	9.26E-03	1.11E-01	7.49E-06	2.52E-06	5.07E-06	6.45E-04	9.49E-05	5.34E-07	2.18E-04	9.59E-08	3.23E-08	9.11E-08	5.95E-08	1.02E-07	8.97E-07	3.75E-06	3.61E-04	6.86E-06	8.53E-07	6.04E-03

Source			CPI														CM2																
Description			Pit 87 Mining (Year -1)														CB87												Tailings Construction				
Equipment			Drill (165 mm)		Truck (229t)		Loader (23 m3)		Track Dozer		Blasting Loader		Lighting Plants		Diesel Genset		Total		Track Dozer		Truck (229t)		Total		Track Dozer		Truck (229t)		Hydraulic Excav (6.5m3)		Compactor		Lighting Plants		Total	
Averaging Period			1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h
Equipment #			2	2	7	7	4	4	10	10	18	18	22	22	Emissions from generator emission calculation spreadsheet				10	10	7	7			10	10	7	7	6	6	21	21	22	22	
Average Horsepower			378	378	1855	1855	1309	1309	536	536	135	135	9	9					536	536	1855	1855			536	536	1855	1855	380	380	108	108	9	9	
Equipment Operating Time			17	17	20	20	20	20	17	17	8	8	12	12					17	17	20	20			17	17	20	20	20	20	4	4	12	12	
Source Operating Time			24	24	24	24	24	24	24	24	24	24	24	24					24	24	24	24			24	24	24	24	24	24	24	24	24	24	
Number of Equipment			2	2			2	2	2	2	2	2	1	1					1	1					2	2			2	2	1	1	3	3
Other Parameters																																	
Pit Depth																																	
Ramp Grade																																	
Number of Trips					640	640															137	137					580	580						
Average Speed (km/hr)																																	
Idling Time (hr/truck)					0.03	0.03															0.03	0.03					0.03	0.03						
Loading/Unloading Time (hr/truck)					0.02	0.02															0.02	0.02					0.02	0.02						
Travel time in Pit or Storage (hr)					32.0	32.0															6.9	6.9					29.0	29.0						
COPC	**CAS**	**MOVES ID**																															
PM_{10}	[PM10]	100	8.78E-03	6.19E-03	1.60E-02	1.60E-02	2.23E-02	1.90E-02	2.37E-03	1.67E-03	8.25E-04	2.75E-04	6.12E-04	3.06E-04	4.27E-02	4.27E-02	**9.37E-02**	**8.62E-02**	1.19E-03	8.37E-04	3.43E-03	3.43E-03	**4.62E-03**	**4.27E-03**	2.37E-03	1.67E-03	1.45E-02	1.45E-02	1.42E-03	1.21E-03	3.41E-04	5.68E-05	1.84E-03	9.18E-04	**2.05E-02**	**1.83E-02**
$PM_{2.5}$	[PM2.5]	110	8.52E-03	6.01E-03	1.55E-02	1.55E-02	2.17E-02	1.84E-02	2.30E-03	1.62E-03	8.00E-04	2.67E-04	5.93E-04	2.97E-04	4.27E-02	4.27E-02	**9.21E-02**	**8.49E-02**	1.15E-03	8.12E-04	3.33E-03	3.33E-03	**4.48E-03**	**4.14E-03**	2.30E-03	1.62E-03	1.41E-02	1.41E-02	1.38E-03	1.17E-03	3.31E-04	5.51E-05	1.78E-03	8.90E-04	**1.98E-02**	**1.78E-02**
CO	630-08-0	2	5.25E-02	3.70E-02	4.99E-02	4.99E-02	9.49E-02	8.06E-02	8.76E-03	6.18E-03	3.70E-03	1.23E-03	6.37E-03	3.19E-03	6.84E-01	6.84E-01	**9.00E-01**	**8.62E-01**	4.38E-03	3.09E-03	1.07E-02	1.07E-02	**1.51E-02**	**1.38E-02**	8.76E-03	6.18E-03	4.52E-02	4.52E-02	4.71E-03	4.00E-03	1.53E-03	2.56E-04	1.91E-02	9.56E-03	**7.93E-02**	**6.52E-02**
SO_2	7446-09-5	31	3.15E-04	2.22E-04	9.71E-04	9.71E-04	1.05E-03	8.89E-04	4.22E-04	2.98E-04	1.06E-04	3.54E-05	5.64E-06	2.82E-06	2.43E-03	2.43E-03	**5.29E-03**	**4.85E-03**	2.11E-04	1.49E-04	2.08E-04	2.08E-04	**4.19E-04**	**3.57E-04**	4.22E-04	2.98E-04	8.80E-04	8.80E-04	2.99E-04	2.54E-04	4.24E-05	7.07E-06	1.69E-03	8.46E-06	**1.66E-03**	**1.45E-03**
Hydrocarbons	[NMHC]	1	1.31E-02	7.83E-03	2.17E-02	2.17E-02	2.85E-02	2.42E-02	3.31E-03	2.86E-03	5.78E-04	1.58E-04	1.96E-03	9.81E-04	1.52E-01	1.52E-01	**2.19E-01**	**2.09E-01**	1.55E-03	1.06E-03	4.65E-03	4.65E-03	**6.20E-03**	**5.75E-03**	3.31E-03	2.18E-03	1.97E-02	1.97E-02	2.03E-03	1.73E-03	3.39E-04	3.99E-05	5.88E-03	2.94E-03	**3.09E-02**	**2.66E-02**
NOx	10102-44-0	3	1.68E-01	1.19E-01	1.51E+00	1.51E+00	1.67E+00	1.42E+00	3.92E-02	2.76E-02	1.26E-02	4.21E-03	1.09E-02	5.45E-03	4.26E+00	4.26E+00	**7.67E+00**	**7.35E+00**	1.96E-02	1.38E-02	3.25E-01	3.25E-01	**3.44E-01**	**3.39E-01**	3.92E-02	2.76E-02	1.37E+00	1.37E+00	2.48E-02	2.11E-02	5.22E-03	8.69E-04	3.27E-02	1.64E-02	**1.47E+00**	**1.44E+00**
1,3-butadiene	106-99-0	24	2.06E-05	1.45E-05	4.48E-05	4.48E-05	5.89E-05	5.01E-05	2.99E-06	2.11E-06	8.51E-07	2.84E-07	4.04E-06	2.03E-06	0.00E+00	0.00E+00	**1.32E-04**	**1.14E-04**	1.49E-06	1.05E-06	9.61E-06	9.61E-06	**1.11E-05**	**1.07E-05**	2.99E-06	2.11E-06	4.06E-05	4.06E-05	1.75E-06	1.49E-06	3.59E-07	5.98E-08	1.22E-05	6.09E-06	**1.79E-05**	**5.04E-05**
Acenaphthene	83-32-9	70+170	7.68E-06	5.42E-06	1.46E-05	1.46E-05	1.90E-05	1.62E-05	9.96E-07	7.03E-07	2.79E-07	9.30E-08	1.32E-06	6.61E-07	7.43E-04	7.43E-04	**5.13E-05**	**4.51E-05**	4.98E-07	3.51E-07	3.13E-06	3.13E-06	**3.63E-06**	**3.48E-06**	9.96E-07	7.03E-07	1.32E-05	1.32E-05	5.89E-07	5.00E-07	1.18E-07	1.96E-08	3.97E-06	1.98E-06	**1.89E-05**	**1.64E-05**
Acenaphthylene	208-96-8	71+171	1.03E-05	7.27E-06	2.99E-05	2.99E-05	3.87E-05	3.29E-05	2.01E-06	1.42E-06	5.68E-07	1.89E-07	2.71E-06	1.35E-06	1.46E-03	1.46E-03	**9.88E-05**	**8.77E-05**	1.01E-06	7.09E-07	6.41E-06	6.41E-06	**7.41E-06**	**7.12E-06**	2.01E-06	1.42E-06	2.71E-05	2.71E-05	1.19E-06	1.01E-06	2.40E-07	3.99E-08	8.12E-06	4.06E-06	**3.86E-05**	**3.36E-05**
Acetaldehyde	75-07-0	26	1.06E-03	7.50E-04	2.51E-03	2.51E-03	3.28E-03	2.78E-03	2.34E-04	1.65E-04	5.42E-05	1.81E-05	2.27E-04	1.13E-04	4.00E-01	4.00E-01	**7.40E-03**	**6.38E-03**	1.17E-04	8.24E-05	3.58E-05	3.58E-05	**6.54E-04**	**6.20E-04**	2.34E-04	1.65E-04	2.27E-03	2.27E-03	1.46E-04	1.24E-04	2.27E-05	3.78E-06	6.81E-04	3.40E-04	**3.35E-03**	**2.90E-03**
Acrolein	107-02-8	27	2.47E-04	1.74E-04	4.51E-04	4.51E-04	5.90E-04	5.02E-04	8.58E-05	2.52E-05	9.12E-06	3.04E-06	4.08E-05	2.04E-05	1.25E-04	1.25E-04	**1.39E-03**	**1.19E-03**	1.79E-05	1.26E-05	9.67E-05	9.67E-05	**1.15E-04**	**1.09E-04**	3.58E-05	2.52E-05	4.08E-04	4.08E-04	2.17E-05	1.85E-05	3.83E-06	6.39E-07	1.22E-04	6.12E-05	**5.92E-04**	**5.14E-04**
Anthracene	120-12-7	72+172	1.25E-06	8.84E-07	2.57E-06	2.57E-06	3.38E-06	2.87E-06	2.10E-07	1.48E-07	6.41E-08	2.14E-08	2.09E-07	1.05E-07	1.95E-06	1.95E-06	**9.64E-06**	**8.56E-06**	1.05E-07	7.39E-08	5.52E-07	5.52E-07	**6.57E-07**	**6.26E-07**	2.10E-07	1.48E-07	2.33E-06	2.33E-06	1.24E-07	1.05E-07	2.68E-08	4.47E-09	6.28E-07	3.14E-07	**3.32E-06**	**2.90E-06**
Benzene	71-43-2	20	4.48E-04	3.16E-04	1.30E-03	1.30E-03	1.69E-03	1.44E-03	8.68E-05	6.12E-05	2.47E-05	8.24E-06	1.18E-04	5.90E-05	1.23E-02	1.23E-02	**4.42E-03**	**3.88E-03**	4.34E-05	3.06E-05	2.80E-04	2.80E-04	**3.23E-04**	**3.10E-04**	8.68E-05	6.12E-05	1.18E-03	1.18E-03	5.10E-05	4.33E-05	1.04E-05	1.77E-06	3.54E-04	1.77E-04	**1.68E-03**	**1.46E-03**
Benzo(a)anthracene	56-55-3	73+173	1.21E-07	8.50E-08	3.09E-07	3.09E-07	4.09E-07	3.48E-07	3.55E-08	2.50E-08	1.00E-08	3.34E-09	2.16E-08	1.08E-08	9.87E-07	9.87E-07	**1.89E-06**	**1.77E-06**	1.77E-08	1.25E-08	6.62E-08	6.62E-08	**8.89E-08**	**7.87E-08**	3.55E-08	2.50E-08	2.80E-07	2.80E-07	2.17E-08	1.85E-08	4.17E-09	6.95E-10	6.49E-08	3.25E-08	**4.06E-07**	**3.56E-07**
Benzo(a)pyrene	50-32-8	74+174	4.07E-08	2.87E-08	1.03E-07	1.03E-07	1.42E-07	1.21E-07	1.31E-08	9.21E-09	5.23E-09	1.74E-09	3.96E-09	1.98E-09	4.08E-07	4.08E-07	**7.16E-07**	**6.74E-07**	6.53E-09	4.61E-09	2.22E-08	2.22E-08	**2.87E-08**	**2.68E-08**	1.31E-08	9.21E-09	9.38E-08	9.38E-08	7.55E-09	6.42E-09	2.16E-09	3.61E-10	1.19E-08	5.94E-09	**1.28E-07**	**1.16E-07**
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	1.10E-07	7.75E-08	2.92E-07	2.92E-07	3.99E-07	3.16E-07	3.68E-08	2.60E-08	1.47E-08	4.91E-09	1.12E-08	5.58E-09	1.76E-06	1.76E-06	**2.62E-06**	**2.51E-06**	1.84E-08	1.30E-08	6.25E-08	6.25E-08	**8.09E-08**	**7.55E-08**	3.68E-08	2.60E-08	2.64E-07	2.64E-07	2.13E-08	1.81E-08	6.09E-09	1.01E-09	3.35E-08	1.67E-08	**3.62E-07**	**3.26E-07**
Benzo(g,h,i)perylene	191-24-2	76+176	8.49E-08	5.99E-08	2.55E-07	2.55E-07	3.37E-07	2.87E-07	2.39E-08	1.69E-08	8.51E-09	2.84E-09	1.69E-08	8.46E-09	8.82E-07	8.82E-07	**1.61E-06**	**1.51E-06**	1.20E-08	8.43E-09	5.46E-08	5.46E-08	**6.65E-08**	**6.30E-08**	2.39E-08	1.69E-08	2.31E-07	2.31E-07	1.39E-08	1.18E-08	3.54E-09	5.90E-10	5.07E-08	2.54E-08	**3.23E-07**	**2.85E-07**
Chrysene	218-01-9	78+178	1.53E-07	1.08E-07	3.88E-07	3.88E-07	5.20E-07	4.42E-07	4.02E-08	2.83E-08	1.39E-08	4.63E-09	2.45E-08	1.23E-08	2.43E-06	2.43E-06	**3.57E-06**	**3.41E-06**	2.01E-08	1.42E-08	8.33E-08	8.33E-08	**1.03E-

Source: Mobile Combustion Emissions Sources

Source	CM4						CM1		CPLANT																	
Description	Waste Dump 87						Unloading Ore at Coarse Ore		Processing Plant Mobile Equipment																	
Equipment	Track Dozer		Truck (229t)		Total		Truck (229t)		Integrated Tool Carrier		Tire Manipulator		Road Maint Loader		Crane - 60T		Crane - 30T		Lighting Plants		Support Backhoe		Diesel Genset		Total	
Averaging Period	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h
Equipment #	10	10	7	7			7	7	20	20	25	25	26	26	27	27	28	28	22	22	13	13	Emissions from generator emission calculation spreadsheet			
Average Horsepower	536	536	1855	1855			1855	1855	89	89	250	250	319	319	163	163	129	129	9	9	211	211				
Equipment Operating Time	17	17	20	20			20	20	4	4	17	17	17	17	17	17	17	17	12	12	17	17				
Source Operating Time	24	24	24	24			24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24				
Number of Equipment	1	1							1	1	1	1	1	1	1	1	1	1	8	8	1	1				
Other Parameters																										
Pit Depth																										
Ramp Grade																										
Number of Trips			190	190			82	82																		
Average Speed (km/hr)																										
Idling Time (hr/truck)			0.03	0.03			0.03	0.03																		
Loading/Unloading Time (hr/truck)			0.02	0.02			0.02	0.02																		
Travel time in Pit or Storage (hr)			9.5	9.5			4.1	4.1																		
COPC																										
PM_{10}	1.19E-03	8.37E-04	4.75E-03	4.75E-03	**5.94E-03**	**5.59E-03**	**2.05E-03**	**2.05E-03**	3.15E-04	5.25E-05	4.38E-04	3.09E-04	2.54E-03	1.79E-03	5.12E-04	3.61E-04	4.04E-04	2.85E-04	4.89E-03	2.45E-03	2.79E-03	1.97E-03	4.27E-02	4.27E-02	**5.46E-02**	**5.00E-02**
$PM_{2.5}$	1.15E-03	8.12E-04	4.61E-03	4.61E-03	**5.76E-03**	**5.42E-03**	**1.99E-03**	**1.99E-03**	3.05E-04	5.09E-05	4.25E-04	3.00E-04	2.46E-03	1.74E-03	4.97E-04	3.51E-04	3.92E-04	2.77E-04	4.75E-03	2.37E-03	2.71E-03	1.91E-03	4.27E-02	4.27E-02	**5.43E-02**	**4.97E-02**
CO	4.38E-03	3.09E-03	1.48E-02	1.48E-02	**1.92E-02**	**1.79E-02**	**6.41E-03**	**6.41E-03**	1.40E-03	2.33E-04	1.33E-03	9.35E-04	1.35E-02	9.53E-03	2.32E-03	1.63E-03	1.83E-03	1.29E-03	5.10E-02	2.55E-02	1.23E-02	8.69E-03	6.84E-01	6.84E-01	**7.68E-01**	**7.32E-01**
SO_2	2.11E-04	1.49E-04	2.89E-04	2.89E-04	**5.00E-04**	**4.37E-04**	**1.25E-04**	**1.25E-04**	3.89E-05	6.48E-06	9.80E-05	6.91E-05	1.30E-04	9.14E-05	6.33E-05	4.47E-05	5.00E-05	3.52E-05	4.51E-05	2.25E-05	1.00E-04	7.06E-05	2.43E-03	2.43E-03	**2.95E-03**	**2.77E-03**
Hydrocarbons	1.55E-03	1.09E-03	6.45E-03	6.45E-03	**8.00E-03**	**7.54E-03**	**2.79E-03**	**2.79E-03**	1.79E-04	2.99E-05	6.43E-04	4.53E-04	2.16E-03	1.53E-03	3.68E-04	2.60E-04	2.91E-04	2.05E-04	1.57E-02	7.85E-03	3.08E-03	2.17E-03	3.52E-01	3.52E-01	**1.75E-01**	**1.65E-01**
NOx	1.96E-02	1.38E-02	4.50E-01	4.50E-01	**4.70E-01**	**4.64E-01**	**1.95E-01**	**1.95E-01**	2.13E-02	3.56E-03	7.72E-03	5.45E-03	3.30E-02	2.33E-02	8.10E-03	5.71E-03	6.39E-03	4.51E-03	8.72E-02	4.36E-02	2.47E-02	1.74E-02	4.26E+00	4.26E+00	**4.45E+00**	**4.36E+00**
1,3-butadiene	1.49E-06	1.05E-06	1.33E-05	1.33E-05	**1.48E-05**	**1.44E-05**	**5.76E-06**	**5.76E-06**	2.99E-07	4.98E-08	5.20E-07	3.67E-07	3.54E-06	2.49E-06	5.56E-07	3.92E-07	4.38E-07	3.09E-07	3.25E-05	1.62E-05	5.73E-06	4.04E-06	0.00E+00	0.00E+00	**4.35E-05**	**2.39E-05**
Acenaphthene	4.98E-07	3.51E-07	4.34E-06	4.34E-06	**4.84E-06**	**4.69E-06**	**1.88E-06**	**1.88E-06**	9.79E-08	1.63E-08	1.75E-07	1.24E-07	1.13E-06	7.98E-07	1.82E-07	1.28E-07	1.44E-07	1.01E-07	1.06E-05	5.29E-06	1.75E-06	1.24E-06	7.43E-06	7.43E-06	**2.15E-05**	**1.51E-05**
Acenaphthylene	1.01E-06	7.09E-07	8.88E-06	8.88E-06	**9.89E-06**	**9.59E-06**	**3.84E-06**	**3.84E-06**	2.00E-07	3.33E-08	3.52E-07	2.48E-07	2.24E-06	1.58E-06	3.71E-07	2.62E-07	2.93E-07	2.06E-07	2.16E-05	1.08E-05	3.39E-06	2.39E-06	1.46E-05	1.46E-05	**4.31E-05**	**3.02E-05**
Acetaldehyde	1.17E-04	8.24E-05	7.45E-04	7.45E-04	**8.62E-04**	**8.28E-04**	**3.22E-04**	**3.22E-04**	1.81E-05	3.02E-06	4.48E-05	3.16E-05	2.12E-04	1.49E-04	3.50E-05	2.47E-05	2.76E-05	1.95E-05	1.82E-03	9.08E-04	3.17E-04	2.24E-04	4.00E-05	4.00E-05	**2.51E-03**	**1.40E-03**
Acrolein	1.79E-05	1.26E-05	1.34E-04	1.34E-04	**1.52E-04**	**1.47E-04**	**5.79E-05**	**5.79E-05**	3.13E-06	5.21E-07	6.59E-06	4.65E-06	3.69E-05	2.60E-05	5.93E-06	4.18E-06	4.68E-06	3.30E-06	3.26E-04	1.63E-04	5.74E-05	4.05E-05	1.25E-05	1.25E-05	**4.54E-04**	**2.55E-04**
Anthracene	1.05E-07	7.39E-08	7.65E-07	7.65E-07	**8.70E-07**	**8.39E-07**	**3.30E-07**	**3.30E-07**	2.30E-08	3.84E-09	3.72E-08	2.63E-08	2.32E-07	1.64E-07	4.11E-08	2.90E-08	3.24E-08	2.29E-08	1.68E-06	8.38E-07	3.23E-07	2.28E-07	1.95E-06	1.95E-06	**4.32E-06**	**3.26E-06**
Benzene	4.34E-05	3.06E-05	3.88E-04	3.88E-04	**4.31E-04**	**4.18E-04**	**1.67E-04**	**1.67E-04**	8.69E-06	1.45E-06	1.51E-05	1.07E-05	9.76E-05	6.88E-05	1.61E-05	1.14E-05	1.27E-05	8.98E-06	9.44E-04	4.72E-04	1.48E-04	1.04E-04	1.23E-03	1.23E-03	**2.47E-03**	**1.91E-03**
Benzo(a)anthracene	1.77E-08	1.25E-08	9.17E-08	9.17E-08	**1.09E-07**	**1.04E-07**	**3.96E-08**	**3.96E-08**	3.11E-09	5.19E-10	6.72E-09	4.74E-09	3.38E-08	2.38E-08	6.33E-09	4.47E-09	5.00E-09	3.52E-09	1.73E-07	8.66E-08	4.13E-08	2.91E-08	9.87E-07	9.87E-07	**1.26E-06**	**1.14E-06**
Benzo(a)pyrene	6.53E-09	4.61E-09	3.08E-08	3.08E-08	**3.73E-08**	**3.54E-08**	**1.33E-08**	**1.33E-08**	1.78E-09	2.96E-10	2.27E-09	1.60E-09	1.50E-08	1.06E-08	3.25E-09	2.29E-09	2.56E-09	1.81E-09	3.17E-08	1.58E-08	1.57E-08	1.10E-08	4.08E-07	4.08E-07	**4.80E-07**	**4.51E-07**
Benzo(b+k)fluoranthene	1.84E-08	1.30E-08	8.67E-08	8.67E-08	**1.05E-07**	**9.97E-08**	**3.75E-08**	**3.75E-08**	4.51E-09	7.52E-10	6.41E-09	4.52E-09	4.20E-08	2.96E-08	9.15E-09	6.45E-09	7.22E-09	5.09E-09	8.93E-08	4.46E-08	4.36E-08	3.07E-08	1.76E-06	1.76E-06	**1.96E-06**	**1.88E-06**
Benzo(g,h,i)perylene	1.20E-08	8.43E-09	7.56E-08	7.56E-08	**8.76E-08**	**8.41E-08**	**3.27E-08**	**3.27E-08**	2.66E-09	4.43E-10	4.17E-09	2.94E-09	2.69E-08	1.90E-08	5.37E-09	3.79E-09	4.24E-09	2.99E-09	1.35E-07	6.77E-08	3.23E-08	2.28E-08	8.82E-07	8.82E-07	**1.09E-06**	**1.00E-06**
Chrysene	2.01E-08	1.42E-08	1.15E-07	1.15E-07	**1.36E-07**	**1.30E-07**	**4.99E-08**	**4.99E-08**	4.43E-09	7.38E-10	7.16E-09	5.05E-09	4.44E-08	3.13E-08	8.73E-09	6.16E-09	6.89E-09	4.86E-09	1.96E-07	9.81E-08	5.35E-08	3.77E-08	2.43E-06	2.43E-06	**2.75E-06**	**2.61E-06**
Fluoranthene	1.77E-07	1.25E-07	1.30E-06	1.30E-06	**1.47E-06**	**1.42E-06**	**5.60E-07**	**5.60E-07**	4.00E-08	6.67E-09	6.26E-08	4.41E-08	3.89E-07	2.74E-07	7.12E-08	5.02E-08	5.62E-08	3.96E-08	2.80E-06	1.40E-06	5.25E-07	3.70E-07	6.39E-06	6.39E-06	**1.03E-05**	**8.58E-06**
Fluorene	7.38E-07	5.21E-07	6.03E-06	6.03E-06	**6.77E-06**	**6.55E-06**	**2.60E-06**	**2.60E-06**	1.50E-07	2.51E-08	2.61E-07	1.84E-07	1.67E-06	1.18E-06	2.78E-07	1.96E-07	2.19E-07	1.55E-07	1.42E-05	7.08E-06	2.49E-06	1.76E-06	2.03E-05	2.03E-05	**3.95E-05**	**3.09E-05**
Formaldehyde	7.37E-05	5.20E-05	6.35E-04	6.35E-04	**7.08E-04**	**6.87E-04**	**2.74E-04**	**2.74E-04**	1.42E-05	2.37E-06	2.51E-05	1.77E-05	1.59E-04	1.12E-04	2.81E-05	1.98E-05	2.21E-05	1.56E-05	1.54E-03	7.69E-04	2.33E-04	1.64E-04	1.25E-04	1.25E-04	**2.14E-03**	**1.23E-03**
Phenanthrene	1.34E-06	9.46E-07	1.03E-05	1.03E-05	**1.16E-05**	**1.12E-05**	**4.44E-06**	**4.44E-06**	2.96E-07	4.93E-08	4.77E-07	3.37E-07	3.01E-06	2.12E-06	5.08E-07	3.59E-07	4.01E-07	2.83E-07	2.35E-05	1.17E-05	4.46E-06	3.15E-06	6.47E-05	6.47E-05	**9.73E-05**	**8.28E-05**
Pyrene	1.69E-07	1.19E-07	1.21E-06	1.21E-06	**1.38E-06**	**1.33E-06**	**5.25E-07**	**5.25E-07**	3.87E-08	6.45E-09	5.95E-08	4.20E-08	3.80E-07	2.68E-07	6.93E-08	4.89E-08	5.47E-08	3.86E-08	2.56E-06	1.28E-06	5.16E-07	3.64E-07	5.89E-06	5.89E-06	**9.57E-06**	**7.93E-06**
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	1.15E-03	8.12E-04	4.61E-03	4.61E-03	**5.76E-03**	**5.42E-03**	**1.99E-03**	**1.99E-03**	3.05E-04	5.09E-05	4.25E-04	3.00E-04	2.46E-03	1.74E-03	4.97E-04	3.51E-04	3.92E-04	2.77E-04	4.75E-03	2.37E-03	2.71E-03	1.91E-03	4.27E-02	4.27E-02	**5.43E-02**	**4.97E-02**
Elemental Carbon (from diesel exhaust)	7.48E-04	5.28E-04	3.00E-03	3.00E-03	**3.75E-03**	**3.52E-03**	**1.30E-03**	**1.30E-03**	1.98E-04	3.31E-05	2.76E-04	1.95E-04	1.60E-03	1.13E-03	3.23E-04	2.28E-04	2.55E-04	1.80E-04	3.09E-03	1.54E-03	1.76E-03	1.24E-03	2.78E-02	2.78E-02	**3.53E-02**	**3.23E-02**

Source: Mobile Crushing in Pit 87
Source ID: S1, S2, S3

Description:
Mobile crushing using jaw and cone crushers

Methodology: Emission Factor (EF)
Emission factors for mobile crushing were based on US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing (high-moisture ore). Emission factor is for a typical crusher unit operation including hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems. Emission factors for high moisture content ore (>= 4%) used.

Equipment	Model	Value	Units	Source
Working Hours	n/a	22	hours/day	Troilus
Primary Crusher - Jaw Crusher Throughput	n/a	2500	tonnes/day	Troilus
Secondary Crusher - Cone Throughput	n/a	2500	tonnes/day	Troilus
Tertiary Crusher - Cone Throughput	n/a	2500	tonnes/day	Troilus

CoPC	Emission Factor (kg/MT)			Emission Rate (g/s)						Notes
	Primary Crushing	Secondary Crushing	Tertiary Crushing	Primary Crusher - Jaw Crusher Throughput		Secondary Crusher - Cone Throughput		Tertiary Crusher - Cone Throughput		
				1h	24h	1h	24h	1h	24h	
PM	0.01	0.03	0.03	3.16E-01	2.89E-01	9.47E-01	8.68E-01	9.47E-01	8.68E-01	AP-42, Table 11.24-1
PM10	0.004	0.012	0.01	1.26E-01	1.16E-01	3.79E-01	3.47E-01	3.16E-01	2.89E-01	AP-42, Table 11.24-1
PM2.5	0.001	0.002	0.002	2.34E-02	2.14E-02	7.01E-02	6.43E-02	5.85E-02	5.36E-02	PM2.5/PM10 for tertiary crushing, USEPA Crushed Stone Processing, Table 11.19.2-1

Source: Concrete Batch Plant
Source ID: S4

Description:
Particulate emissions from concrete batch plant.

Methodology: Emission Factor (EF)
Emission factors for the concrete batch plant were based on US EPA AP-42 document Chapter 11.12 (Concrete Batching) Table 11.12-1 Emission Factors for Concrete Batching

Input Data	Value	Units	Source
Concrete			
Plant Output	250	m3/hr	Troilus
Concrete Density	2400	kg/m3	https://www.engineeringtoolbox.com/concrete-properties-d_1223.html
Operating Hours of Plant	12	hr/day	Assumption
Silo Filling	1	hr/day	Assumption
Batch Recipe			
Gravel	43	%	Typical Concrete Recipe
Stone	35	%	Typical Concrete Recipe
Air	2	%	Typical Concrete Recipe
Cement	15	%	Typical Concrete Recipe
Water	5	%	Typical Concrete Recipe
Aggregate Delivery			
Stone	258	MT/hr	Calculated
Sand	210	MT/hr	Calculated
Aggregate Bin Loading			
Stone	258	MT/hr	Calculated
Sand	210	MT/hr	Calculated
Radial Stack Drop into Bins			
Stone	258	MT/hr	Calculated
Sand	210	MT/hr	Calculated
Conveying			
Loading amount (combination of sand and gravel)	468	MT/hr	Calculated
Weigh Hopper Loading			
Loading amount (combination of sand and gravel)	468	MT/hr	Calculated
Concrete Truck Loading			
Cement	90	MT/hr	Calculated
Cement Silo Loading (Dust Collector)			
Cement	3240	MT/hr	Troilus

CoPC	Aggregate Delivery, Bin Loading, Radial Stack						Comments
	Emission Factor (kg/Mg)	Hourly Average Emission Rates (g/s)	Emission Factor (kg/Mg)	Hourly Average Emission Rate (g/s)	Total - 1h (g/s)	Total - 24h (g/s)	
		Loading Sand		Loading Stone			
PM	0.0011	6.42E-02	0.0035	2.51E-01	0.95	0.47	Emission factors for Concrete Batching from AP-42, Table 11.12-1.
PM10	0.00051	2.98E-02	0.0017	1.22E-01	0.45	0.23	
PM2.5	0.00008	4.51E-03	0.0003	1.84E-02	0.07	0.03	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for aggregate handling

CoPC	Conveying		Weigh Hopper Loading		Total - 1h (g/s)	Total - 24h (g/s)	Comments
	Emission Factor (kg/Mg)	Emission Rates (g/s)	Emission Factor (kg/Mg)	Emission Rates (g/s)			
PM	0.0015	1.95E-01	0.0026	3.38E-01	0.53	0.27	Emission factors for conyeving from Table 11.19.2-1 and weigh hopper from AP-42, Table 11.12-1.
PM10	0.00055	7.15E-02	0.0013	1.69E-01	0.24	0.12	
PM2.5	0.0002	2.02E-02	0.0002	2.56E-02	0.05	0.02	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for aggregate handling

CoPC	Concrete Truck Loading		Cement Silo Loading		Total - 1h (g/s)	Total - 24h (g/s)	Comments
	Emission Factor (kg/Mg)	Hourly Average Emission Rates (g/s)	Emission Factor (kg/Mg)	Emission Rates (g/s)			
PM	0.049	1.23	0.0005	4.50E-01	1.68	0.63	Emission factors for Concrete Batching from AP-42, Table 11.12-1. Assume dust collector on loadout
PM10	0.0131	0.33	0.00017	1.53E-01	0.48	0.17	
PM2.5	0.0020	0.05	0.00003	2.32E-02	0.07	0.03	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for aggregate handling

Source: Mobile Generators for Concrete and Crushing Plant
Source IDs: included in CP1, CPLANT

Description:
Combustion emissions from generators. Emissions are calcualted per generator.

Methodology: Emission Factor (EF) and Mass Balance (MB)
The emissions were estimated using the emission factors for large stationary diesel engine provided in US EPA AP-42 Chap 3.4 (Large Stationary Diesel And All Stationary Dual-fuel Engines), Tables 3.4-1, 3.4-3 and 3.4-4, manufacturer specifications and applicable sulphur regulations

Inputs	Value	Units	Source
Number of units	1	ea.	Troilus
Capacity	1.275	MW	Equipment Specs
Power Output:	1709.8	hp	Specs
Fuel Input:	12.57	MMBTU/hour	Calculation
Max Fuel Flow	91.7	USG/hr	Equipment Specs
Heating Value (Diesel)	137,030	BTU/USG	U.S.EPA
Running in 1 hr - Mobile Crusher	60	min/hr	Troilus
Running in 24 hr - Mobile Crusher	24	hr/day	Troilus
Exhaust Temp	459.9	C	Equipment Specs
Exhaust Gas Flow Rate	300.7	m3/min	Equipment Specs
Exhaust flange size	0.2	m	Assumption

Estimated Emission Rates (per Generator)

Contaminant	CAS	EF (USEPA AP-42 Section 3.4)	EF (USEPA AP-42 Section 3.4)	EF (Equipment specs)	Rating	Emission Rate (g/s)	Comments
		(lb/hp-hr) Power Output	(lb/MMBTU) Power Input	(g/hp-hr) or (g SO2/gal)		1 hr	
NOx	10102-44-0	0.024	3.2	8.97	D	4.26E+00	
CO	630-08-0	5.50E-03	0.85	1.44	D	6.84E-01	
SOx	7446-09-5			0.0953	D	2.43E-03	Mass balance based on max S content in diesel regualation and max diesel consumption. EF Factor calculated below.
TSP						4.27E-02	
PM10	[PM10]	0.0007	0.1	0.09	D	4.27E-02	
PM2.5	[PM2.5]					4.27E-02	Assumed PM2.5 = PM10 = TSP
CO2		1.16	165		B	2.50E+02	
Aldehydes		0.000463	0.07		D	1.00E-01	
TOC (Methane)	[NMHC]	7.05E-04	0.09		D	1.52E-01	
Benzene	71-43-2		7.76E-04		E	1.23E-03	
Toluene			2.81E-04		E	4.46E-04	
Xylenes			1.93E-04		E	3.06E-04	
Propylene			2.79E-03		E	4.43E-03	
1,3-Butadiene	106-99-0				E	0.00E+00	
Formaldehyde	50-00-0		7.89E-05		E	1.25E-04	
Acetaldehyde	75-07-0		2.52E-05		E	4.00E-05	
Acrolein	107-02-8		7.88E-06		E	1.25E-05	
Naphthalene			1.30E-04		E	2.06E-04	
Acenaphthylene	208-96-8		9.23E-06		E	1.46E-05	
Acenaphthene	83-32-9		4.68E-06		E	7.43E-06	
Fluorene	86-73-7		1.28E-05		E	2.03E-05	
Phenanthrene	85-01-8		4.08E-05		E	6.47E-05	
Anthracene	120-12-7		1.23E-06		E	1.95E-06	
Fluoranthene	206-44-0		4.03E-06		E	6.39E-06	
Pyrene	129-00-0		3.71E-06		E	5.89E-06	
Benzo(a)anthracene	56-55-3		6.22E-07		E	9.87E-07	
Chrysene	218-01-9		1.53E-06		E	2.43E-06	
Benzo(b)fluoranthene	205-99-2		1.11E-06		E	1.76E-06	
Benzo(k)fluoranthene			2.18E-07		E	3.46E-07	
Benzo(a)pyrene	50-32-8		2.57E-07		E	4.08E-07	
Indeno(1,2,3-cd)pyrene			4.14E-07		E	6.57E-07	
Dibenz(a,h)perylene			3.46E-07		E	5.49E-07	
Benzo(g,h,i)perylene	191-24-2		5.56E-07		E	8.82E-07	
Total PAH			2.12E-04		E	3.36E-04	

SO_2 emission is based on the maximum allowable sulfur content in diesel and fuel consumption of the equipment. SO emission factor is calculated below.

SO2 Emission Factor Calculation:

Data	Value	Unit	Reference
Sulphur content in diesel	15	ppm	Highway, Nonroad, Locomotive, and Marine Diesel Fuel Sulfur Standards
Lower Heating Value	137,030	BTU/gal	U.S.EPA
Unit Conversion	0.00029	kWh/BTU	-
	454	g/lb	-
Density of diesel	7.00	lb/gal	-
SO_2/ gallon of diesel	0.0953	g SO_2/gal	A factor of 2 is applied to convert sulfur to SO_2 assuming all the sulfur will be oxidized to SO_2

Source: Pit Drilling - Pit 87
Source ID: P1A

Description:
Explosives are placed in various holes for blasting. The blast holes are drilled continuously.

Methodology: Emission Factor (EF)

Drilling emissions were estimated using emission factors for particulates from US EPA AP-42, Chapter 11.9, Table 11.9-4 (Western Surface Coal Mining).

E = EF (kg/hole) x Number of holes drilled /day
Where E = kg of emissions /day

Inputs	Value	Units	Source
Pit 87 drill holes	132.0	holes/day	Troilus
Mitigation	85	%	US Office of Mine Safety and Health Research (2014) estimates wet drilling eliminates up to 97% of respirable dust. Control of 85% equivalent to a moderate water flow rate of 0.6 gpm assumed for control efficiency.
Operating Hours	24	hrs/day	Troilus

Contaminant	EF (kg/hole)	Rating	Emission Rate (g/s) Pit 87 Drill (P1A)
PM	0.59	C	1.35E-01
PM10	0.31	C	7.10E-02
PM2.5	0.06	PM2.5/PM10	1.31E-02

Source: Pit Blasting - Pit 87
Source ID: P1B

Description:

Blasting is used to loosen ore and waste rock. These emissions are intermittent and non-continuous.

Methodology: Emission Factor (EF)

Emission factors for blasting from US EPA AP-42, Chapter 11.9, Table 11.9-2 (Western Surface Coal Mining) were used to estimate particulate emissions from blasting. Emission factors for blasting from the Australia Government NPI Guide "Explosives Detonation and Firing Ranges" (Australian NPI 2016) were used to estimate combustion products (CO, NOX, SO2) emissions.

$E = 0.00022(A)^{1.5}$

where:

E=Emissions of TSP (kg/blast) (<=30um)

A=horizontal area (m^2)

Input	Value	Unit	Source
Type of Explosive:	100% Emulsion		Troilus
Blasting Explosive (Year -1)	21.1	tonnes/blast	Troilus
Maximum Blasting Explosive	28.2	tonnes/blast	Troilus
Pit 87 Blasting	1.0	blast/h	Troilus
Pit 87 Blasting	1.7	blast/day	Troilus
Blast Area	3,355	m2	Troilus
Control	20	%	A 20% emission reduction was considered since particulate emissions are controlled by optimizing each blast through techniques (e.g. type, timing sequence and blast patterns). The USEPA blasting data is outdated and primarily based on measurements of blasting coal and current blasting practices and technologies are improved.

CoPC	Emission Rate (kg/blast)	Emission Factor (kg/tonne explosive)	Pit 87 (P1B)		Reference
			Emission Rate in 1-Hour (g/s)	Emission Rate in 24-Hour (g/s)	
PM	42.75	--	9.50E+00	6.66E-01	U.S.EPA AP-42, Ch. 11.9 "Western Surface Coal Mining" Table 11.9-2
PM10	22.23	--	4.94E+00	3.46E-01	
PM2.5	1.28	--	2.85E-01	2.00E-02	
CO	--	2.3	1.80E+01	9.47E-01	Austrailia Government - NPI - Explosives Detonation and Firing Ranges Appendix C. EFs for CO and NOx are for emulsion explosives. EF for SO2 is for ANFO (on site mix) and was used as being the most representative of the data available.
NOx	--	0.2	1.57E+00	8.23E-02	
SO2	--	0.06	4.70E-01	2.47E-02	

Source: Material Movement
Source IDs: P1C, M5, M6, M7

Description:
Ore, Overburden, and Waste Rock is moved with various bulldozers.

Methodology: Emission Factor (EF)
Emission factor for bulldozing of material other than coal in the US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining) Table 11.9-2 was used to estimate the dust emissions.

$E = 2.6 \times s^{1.2} / M^{1.3}$ $E (PM10) = 0.34 \times s^{1.5} / M^{1.4}$

where:

E = emission factor (kg/h)

s = material silt content (%)
M = material moisture content (%)
The emission calculation for each unit is listed in the following table.

Exponents for Equations	TSP	PM10
k	2.6	0.34
a	1.2	1.5
b	1.3	1.4

Input	Value	Units	Source
Ore/WR Silt Content	5.8	%	Taconite mining and processing, haul road to and from pit - USEPA AP42 Section 13.2 - Table 13.2.2-1
Overburden Silt Content	7.5	%	Typical Silt and Moisture Contents of Materials at Various Industries (Overburden), USEPA AP42 Section 13.2 Table 13.2.4-1
Moisture Content	4	%	Troilus
Open Pit (Pit 87)			
Operating Hrs	24	hrs/day	Troilus
Number of dozers	2	unit	Troilus
Waste Dump (WD87)			
Operating Hrs	24	hr/day	Troilus
Number of dozers	1	unit	Troilus
Overburden (OB87)			
Operating Hrs	24	hr/day	Troilus
Number of Dozers	1	unit	Troilus
Tailings Construction			
Operating Hrs	24	hr/day	Troilus
Number of Dozers	2	unit	Troilus
Number of Excavators	2	unit	Troilus
Number of Compactors	1	unit	Troilus

CoPC	OVB Emission Factor (kg/hr-vehicle)	Ore/WR Emission Factor (kg/hr-vehicle)	Emission Rate (g/s)				Notes
			Open Pit (P1C)	WD 87 (M5)	OB87 (M6)	Tailings Construction (M7)	
TSP	4.812	3.535	1.96E+00	9.82E-01	9.82E-01	4.91E+00	
PM10	1.003	0.682	3.79E-01	1.89E-01	1.89E-01	9.47E-01	
PM2.5	0.105	0.105	2.06E-01	1.03E-01	1.03E-01	5.16E-01	EF is scaling factor for PM2.5/TSP from AP-42 Table 11.9-2

Source: Pit Loading
Source IDs: P1D

Methodology: Emission Factor (EF)
Emission factor for material unloading/dropping was calculated using Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles).

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])}$$

where:
E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s)
M = material moisture content (%)
The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1 (US EPA AP-42 document Chapter 13.2.4)			
	< 30 µm	0.74	Note: It is assumed that k=0.74 for total particulate matter (<30 µm) consistent with the assumption in U.S. EPA AP-42 Chapter 13.2.2.
	< 10 µm	0.35	
	< 2.5 µm	0.053	

Inputs	Value	Units	Source
Moisture Content	4	%	Troilus
Mean Wind Speed	2.32	m/s	WS at 2-m height assumed to account for lower wind speeds in the pit.
Mean Wind Speed	3.64	m/s	ECCC Climate Normals
Loading amount	146,575	MT/day	Troilus

CoPC	Emission Factor (kg/MT)	Pit 87 (P1D) Emission Rate (g/s)
TSP	4.81E-04	8.15E-01
PM10	2.27E-04	3.86E-01
PM2.5	3.44E-05	5.84E-02

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Emission Factor (kg/MT)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	2.82E-04	0.327
3.09	6.98E-04	0.808
5.14	1.35E-03	1.566
8.23	2.49E-03	2.888
10.8	3.55E-03	4.112
Mean Wind Speed		
3.64	8.63E-04	1.000

Source: Ore/Waste Rock/Overburden UnLoading
Source ID: M1, M2, M3, M4

Methodology: Emission Factor (EF)

Emission factor for material unloading/dropping was calculated using Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles).

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])}$$

where:
E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s)
M = material moisture content (%)
The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1 (US EPA AP-42 document Chapter 13.2.4)			
	< 30 µm	0.74	Note: It is assumed that k=0.74 for total particulate matter (<30 µm) consistent with the assumption in U.S. EPA AP-42 Chapter 13.2.2
	< 10 µm	0.35	
	< 2.5 µm	0.053	

Inputs	Value	Units	Source
Moisture Content	4	%	Troilus
Mean Wind Speed	3.64	m/s	ECCC Climate Normals
Unloading Ore at Coarse Ore Pile	18,822	tonnes/day	Troilus
Unloading OVB at OB87	31,429	tonnes/day	Troilus
Unloading WR at TSF	52,774	tonnes/day	Troilus
Unloading WR at WD87	43,560	tonnes/day	Troilus

CoPC	Emission Factor (kg/MT)	Emission Rate (g/s)			
		Unloading/Loading Ore at Coarse Ore Pile (M1)	Unloading OVB at OB87 (M2)	Unloading WR at TSF (M3)	Unloading WR at WD87 (M4)
TSP	8.63E-04	1.88E-01	3.14E-01	5.27E-01	4.35E-01
PM10	4.08E-04	8.90E-02	1.49E-01	2.49E-01	2.06E-01
PM2.5	6.18E-05	1.35E-02	2.25E-02	3.78E-02	3.12E-02

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Emission Factor (kg/MT)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	2.82E-04	0.327
3.09	6.98E-04	0.808
5.14	1.35E-03	1.566
8.23	2.49E-03	2.888
10.8	3.55E-03	4.112
Mean Wind Speed		
3.64	8.63E-04	1.000

Source: Wind Erosion
Source IDs: W1, W2, W3, W4A-C, W5

Waste Rock, Overburden, Ore, and Sand Erosion due to High Winds

W1	OB87 Wind Erosion
W2	WD87 Wind Erosion
W3	Coarse Ore Storage Area Wind Erosion
W4A-D	Mobile Crusher Piles Wind Erosion
W5	Concrete Plant Sand Wind Erosion

Description:
Storage areas will be exposed - high winds can erode and entrain dust from these piles causing particulate emissions.

Methodology: Emission Factor (EF)

The calculation is based on emission estimation methodology from Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects

The particle size multiplier (J) varies with aerodynamic particle size, listed as follows:

J for Equation		
TPM	<10 um	<2.5 um
1	0.5	0.075

EF (g/m 2.s) = 1.52 x 10-5 x J x s; when the wind speed is greater than 19.3 km/h and EF = 0; when the wind speed is less than 19.3 km/h

Inputs	Value	Unit	Reference
Operating hours	24	hrs/day	Daily operating hours
Ore/WR Silt Content	5.8	%	Taconite mining and processing, haul road to and from pit - USEPA AP42 Section 13.2 - Table 13.2.2-1
Overburden Silt Content	7.5	%	Typical Silt and Moisture Contents of Materials at Various Industries (Overburden), USEPA AP42 Section 13.2 Table 13.2.4-1
Sand Silt Content	2.6	%	Typical Silt and Moisture Contents of Materials at Various Industries (Sand), USEPA AP42 Section 13.2 Table 13.2.4-1
OB 87 Wind Erosion	13,800	m2	Calculated
WD 87 Wind Erosion	19,100	m2	Calculated
Coarse Ore Storage Area Wind Erosion	8,300	m2	Calculated
Mobile Crusher Piles Wind Erosion	5,852	m2	Calculated
Concrete Plant Sand Wind Erosion	954	m2	Calculated

Wind Erosion emissions summary (wind speed category > 5.36 m/s)

Source	Contaminant	Emission Rate (g/s)	Unit
OB 87 Wind Erosion (W1)	TSP	1.57E+00	g/s
	PM10	7.87E-01	
	PM2.5	1.18E-01	
WD 87 Wind Erosion (W2)	TSP	1.68E+00	
	PM10	8.42E-01	
	PM2.5	1.26E-01	
Coarse Ore Storage Area Wind Erosion (W3)	TSP	7.32E-01	
	PM10	3.66E-01	
	PM2.5	5.49E-02	
Mobile Crusher Piles Wind Erosion (W4)	TSP	5.16E-01	
	PM10	2.58E-01	
	PM2.5	3.87E-02	
Concrete Plant Sand Wind Erosion (W5)	TSP	3.77E-02	
	PM10	1.88E-02	
	PM2.5	2.83E-03	

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	0
3.09	0
5.14	1
8.23	1
10.8	1

Source: Grading
Source IDs: R1, R4, R5

Description:
A Grader maintains haul roads for efficient operation of trucks moving on the roads.

Methodology: Emission Factor (EF)
Particulate emissions were estimated using emission factors for grading of material other than coal in US EPA AP-42, Chapter 11.9 (Western Surface Coal Mining), Table 11.9-2

$E=0.0034(S)^{2.5}$ (TSP<=30um)

where:
S = mean vehicle speed (km/hr)
E = emission factor (kg/VKT)

Grading Roads Source: USEPA AP42 Section 11.9-1

$$EF = 0.0034 * S^{a}$$

a(TSP)=	2.5	K(TSP)	0.0034
a(PM10)=	2	K(PM10)	0.0056
PM2.5/TSP	0.031		

Input	Value	Units	Source
Main Road Mitigation	90	%	Use of surfactants
Haul Road Migitation	90	%	Use of surfactants
Grader Speed	4.5	km/h	Manufacturer
Main Access Road within Project Area	13.6	km	Troilus
Main Access Road Toward Route du Nord	24.8	km	Troilus
Road from Pit 87 to TSF	14.6	km	Troilus
Road from Pit 87 to WD 87	10.8	km	Troilus

CoPC	Emission Factor (Kg/VKT)
TSP	1.46E-01
PM10	1.13E-01
PM2.5	4.53E-03

Average Emissions per Road Segment

Segment	ID	TSP (g/s)		PM10 (g/s)		PM2.5 (g/s)	
		1 hr	24 h	1 hr	24 h	1 hr	24 h
Main Access Road within Project Area	R1	1.83E-02	2.30E-03	1.42E-02	1.79E-03	5.66E-04	7.13E-05
Main Access Road Toward Route du Nord	R1B	1.83E-02	4.19E-03	1.42E-02	3.26E-03	5.66E-04	1.30E-04
Road from Pit 87 to TSF	R4	1.83E-02	2.47E-03	1.42E-02	1.92E-03	5.66E-04	7.65E-05
Road from Pit 87 to WD 87	R5	1.83E-02	1.74E-02	1.42E-02	1.42E-03	5.66E-04	5.66E-05

Source: Road Dust **R1** **Main Access Road Within Project Area**

Input	Value	Units	Source
Silt Content (%)	4.3	%	US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Table 13.2.2-1, Taconite mining and processing, service road
Round Trip Road Length (m)	13.6	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	0	trips/hour	Troilus
Trips per day	0	trips/day	Troilus
Speed	50	km/h	Troilus
Transport			
Trips per hour	1	trips/hour	Troilus
Trips per day	5	trips/day	Troilus
Speed	50	km/h	Troilus
Bus			
Trips per hour	2	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus
Dump Truck			
Trips per hour	2	trips/hour	Troilus
Trips per day	25	trips/day	Troilus
Speed	50	km/h	Troilus
Water Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	2	trips/day	Troilus
Speed	15	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

Heavy Duty Vehicle: $EF = k\left(\frac{s(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b}\ \left\{\frac{kg}{VKT}\right.$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight (kg)	Empty Weight (kg)	Average Weight (kg)	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	0.0	93.1	0	0	0.000	0.000	-	-	0.0	0.0
Transport	Various	Various	Diesel	350	62,000	30,000	46,000	50	1.4	93.1	1	5	0.167	0.139	7,667	6,389	13.6	68.0
Bus	Various	Various	Diesel	540	29,000	29,000	29,000	50	1.1	93.1	2	4	0.333	0.111	9,667	3,222.2	27.2	54.4
Dump Truck	Various	Various	Diesel	490	74,000	34,400	54,200	50	6.8	93.1	2	25	0.333	0.694	18,067	37,638.9	27.2	340.0
Water Truck			Diesel	350	30,000	30,000	30,000	15	1.8	97.9	1	2	0.167	0.056	5,000	1,667	13.6	27.2
TOTAL											**6**	**36**	**1.000**	**1.000**	**40,400**	**48,917**	**81.6**	**489.6**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										2.27	2.47							
Uncontrolled PM10 Emission Factor (kg/VKT)										0.56	0.61							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.06	0.06							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										3.54	0.97	2.57	0.70					
Controlled Emission Rate PM10 (g/s)										0.88	0.24	0.64	0.17					
Controlled Emission Rate PM2.5 (g/s)										0.09	0.02	0.06	0.02					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)						Emissions (g/s)									
			Pick up trucks	Transport	Bus	Dump Truck	Water Truck		Pick up trucks (1h)	Pick up trucks (24h)	Transport (1h)	Transport (24h)	Bus (1h)	Bus (24h)	Dump Truck (1h)	Dump Truck (24h)	Water Truck (1h)	Water Truck (24h)	Total (1h)	Total (24h)
								Operating Time (hours)	0.00	0.00	0.27	1.36	0.54	1.09	0.54	6.80	0.91	1.81		
								Horsepower (hp)	203	203	316	316	182	182	333	333	180	180		
PM_{10}	[PM10]	100	6.32E-03	1.08E-02	6.32E-03	6.23E-03	6.32E-03		0.00E+00	0.00E+00	2.59E-04	5.40E-05	1.74E-04	1.45E-05	3.14E-04	1.63E-04	2.86E-04	2.39E-05	1.03E-03	2.56E-04
$PM_{2.5}$	[PM2.5]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.13E-03		0.00E+00	0.00E+00	2.51E-04	5.24E-05	1.69E-04	1.41E-05	3.04E-04	1.58E-04	2.78E-04	2.31E-05	1.00E-03	2.48E-04
CO	630-08-0	2	1.91E-02	4.90E-02	1.91E-02	1.90E-02	1.91E-02		0.00E+00	0.00E+00	1.17E-03	2.44E-04	5.26E-04	4.38E-05	9.58E-04	4.99E-04	8.66E-04	7.22E-05	3.52E-03	8.59E-04
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03		0.00E+00	0.00E+00	3.38E-05	7.04E-06	3.89E-05	3.24E-06	7.12E-05	3.71E-05	6.40E-05	5.33E-06	2.08E-04	5.27E-05
Hydrocarbons	[NMHC]	1	9.27E-03	7.68E-03	9.27E-03	9.26E-03	9.27E-03		0.00E+00	0.00E+00	1.84E-04	3.83E-05	2.55E-04	2.13E-05	4.66E-04	2.43E-04	4.20E-04	3.50E-05	1.32E-03	3.37E-04
NOx	10102-44-0	3	1.11E-01	1.68E-01	1.11E-01	1.11E-01	1.11E-01		0.00E+00	0.00E+00	4.02E-03	8.38E-04	3.06E-03	2.55E-04	5.61E-03	2.92E-03	5.04E-03	4.20E-04	1.77E-02	4.43E-03
1,3-butadiene	106-99-0	24	7.50E-06	1.13E-05	7.50E-06	7.49E-06	7.50E-06		0.00E+00	0.00E+00	2.70E-07	5.63E-08	2.06E-07	1.72E-08	3.77E-07	1.96E-07	3.40E-07	2.83E-08	1.19E-06	2.98E-07
Acenaphthene	83-32-9	70+170	2.53E-06	3.71E-06	2.53E-06	2.52E-06	2.53E-06		0.00E+00	0.00E+00	8.87E-08	1.85E-08	6.95E-08	5.79E-09	1.27E-07	6.62E-08	1.14E-07	9.53E-09	4.00E-07	1.00E-07
Acenaphthylene	208-96-8	71+171	5.08E-06	7.56E-06	5.08E-06	5.07E-06	5.08E-06		0.00E+00	0.00E+00	1.81E-07	3.76E-08	1.40E-07	1.16E-08	2.55E-07	1.33E-07	2.30E-07	1.92E-08	8.06E-07	2.02E-07
Acetaldehyde	75-07-0	26	6.46E-04	7.21E-04	6.46E-04	6.45E-04	6.46E-04		0.00E+00	0.00E+00	1.72E-05	3.59E-06	1.78E-05	1.48E-06	3.25E-05	1.69E-05	2.93E-05	2.44E-06	9.68E-05	2.44E-05
Acrolein	107-02-8	27	9.50E-05	1.21E-04	9.50E-05	9.49E-05	9.50E-05		0.00E+00	0.00E+00	2.90E-06	6.04E-07	2.61E-06	2.18E-07	4.78E-06	2.49E-06	4.30E-06	3.58E-07	1.46E-05	3.67E-06
Anthracene	120-12-7	72+172	5.37E-07	8.49E-07	5.37E-07	5.34E-07	5.37E-07		0.00E+00	0.00E+00	2.03E-08	4.23E-09	1.48E-08	1.23E-09	2.69E-08	1.40E-08	2.43E-08	2.03E-09	8.63E-08	2.15E-08
Benzene	71-43-2	20	2.18E-04	3.29E-04	2.18E-04	2.18E-04	2.18E-04		0.00E+00	0.00E+00	7.86E-06	1.64E-06	6.00E-06	5.00E-07	1.10E-05	5.71E-06	9.87E-06	8.23E-07	3.47E-05	8.67E-06
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	1.32E-07	9.69E-08	9.59E-08	9.69E-08		0.00E+00	0.00E+00	3.16E-09	6.59E-10	2.67E-09	2.22E-10	4.83E-09	2.52E-09	4.39E-09	3.66E-10	1.51E-08	3.76E-09
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	6.87E-08	3.28E-08	3.23E-08	3.28E-08		0.00E+00	0.00E+00	1.64E-09	3.42E-10	9.03E-10	7.52E-11	1.63E-09	8.48E-10	1.49E-09	1.24E-10	5.66E-09	1.39E-09
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	1.93E-07	9.24E-08	9.11E-08	9.24E-08		0.00E+00	0.00E+00	4.62E-09	9.63E-10	2.54E-09	2.12E-10	4.59E-09	2.39E-09	4.19E-09	3.49E-10	1.59E-08	3.91E-09
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	1.12E-07	6.01E-08	5.95E-08	6.01E-08		0.00E+00	0.00E+00	2.68E-09	5.59E-10	1.65E-09	1.38E-10	3.00E-09	1.56E-09	2.72E-09	2.27E-10	1.01E-08	2.48E-09
Chrysene	218-01-9	78+178	1.03E-07	1.83E-07	1.03E-07	1.02E-07	1.03E-07		0.00E+00	0.00E+00	4.37E-09	9.11E-10	2.84E-09	2.37E-10	5.14E-09	2.68E-09	4.67E-09	3.89E-10	1.70E-08	4.21E-09
Fluoranthene	206-44-0	69+169	9.02E-07	1.47E-06	9.02E-07	8.97E-07	9.02E-07		0.00E+00	0.00E+00	3.52E-08	7.33E-09	2.48E-08	2.07E-09	4.52E-08	2.35E-08	4.09E-08	3.41E-09	1.46E-07	3.63E-08
Fluorene	86-73-7	81+181	3.76E-06	5.69E-06	3.76E-06	3.75E-06	3.76E-06		0.00E+00	0.00E+00	1.36E-07	2.84E-08	1.03E-07	8.62E-09	1.89E-07	9.83E-08	1.70E-07	1.42E-08	5.98E-07	1.49E-07
Formaldehyde	50-00-0	5	3.62E-04	5.71E-04	3.62E-04	3.61E-04	3.62E-04		0.00E+00	0.00E+00	1.36E-05	2.84E-06	9.95E-06	8.29E-07	1.82E-05	9.47E-06	1.64E-05	1.36E-06	5.82E-05	1.45E-05
Phenanthrene	85-01-8	83+183	6.88E-06	1.05E-05	6.88E-06	6.86E-06	6.88E-06		0.00E+00	0.00E+00	2.50E-07	5.21E-08	1.89E-07	1.58E-08	3.45E-07	1.80E-07	3.12E-07	2.60E-08	1.10E-06	2.74E-07
Pyrene	129-00-0	84+184	8.58E-07	1.44E-06	8.58E-07	8.53E-07	8.58E-07		0.00E+00	0.00E+00	3.43E-08	7.15E-09	2.36E-08	1.97E-09	4.29E-08	2.24E-08	3.88E-08	3.24E-09	1.40E-07	3.47E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.13E-03		0.00E+00	0.00E+00	2.51E-04	5.24E-05	1.69E-04	1.41E-05	3.04E-04	1.58E-04	2.78E-04	2.31E-05	1.00E-03	2.48E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	6.83E-03	3.98E-03	3.93E-03	3.98E-03		0.00E+00	0.00E+00	1.63E-04	3.40E-05	1.10E-04	9.14E-06	1.98E-04	1.03E-04	1.80E-04	1.50E-05	6.51E-04	1.61E-04

Source: Road Dust **R1B** **Main Access Road Toward Route du Nord**

Input	Value	Units	Source
Silt Content (%)	4.3	%	US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Table 13.2.2-1, Taconite mining and processing, service road
Round Trip Road Length (m)	24.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	0	trips/hour	Troilus
Trips per day	0	trips/day	Troilus
Speed	50	km/h	Troilus
Transport			
Trips per hour	1	trips/hour	Troilus
Trips per day	5	trips/day	Troilus
Speed	50	km/h	Troilus
Bus			
Trips per hour	2	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus
Dump Truck			
Trips per hour	2	trips/hour	Troilus
Trips per day	25	trips/day	Troilus
Speed	50	km/h	Troilus
Water Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	2	trips/day	Troilus
Speed	15	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{s_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight (kg)	Empty Weight (kg)	Average Weight (kg)	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	0	93.1	0	0	0.000	0.000	-	-	0.0	0.0
Transport	Various	Various	Diesel	350	62,000	30,000	46,000	50	2.5	93.1	1	5	0.167	0.139	7,667	6,389	24.8	124.0
Bus	Various	Various	Diesel	540	29,000	29,000	29,000	50	2.0	93.1	2	4	0.333	0.111	9,667	3,222.2	49.6	99.2
Dump Truck	Various	Various	Diesel	490	74,000	34,400	54,200	50	12.4	93.1	2	25	0.333	0.694	18,067	37,638.9	49.6	620.0
Water Truck			Diesel	350	30,000	30,000	30,000	15	3.3	97.9	1	2	0.167	0.056	5,000	1,667	24.8	49.6
TOTAL											**6**	**36**	**1.000**	**1.000**	**40,400**	**48,917**	**148.8**	**892.8**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										2.27	2.47							
Uncontrolled PM10 Emission Factor (kg/VKT)										0.56	0.61							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.06	0.06							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										6.46	1.76	4.68	1.28					
Controlled Emission Rate PM10 (g/s)										1.60	0.44	1.16	0.32					
Controlled Emission Rate PM2.5 (g/s)										0.16	0.04	0.12	0.03					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)						Emissions (g/s)											
			Pick up trucks	Transport	Bus	Dump Truck	Water Truck		Pick up trucks (1h)	Pick up trucks (24h)	Transport (1h)	Transport (24h)	Bus (1h)	Bus (24h)	Dump Truck (1h)	Dump Truck (24h)	Water Truck (1h)	Water Truck (24h)	Total (1h)	Total (24h)
								Operating Time (hours)	0.00	0.00	0.50	2.48	0.99	1.98	0.99	12.40	1.65	3.31		
								Horsepower (hp)	203	203	316	316	182	182	333	333	180	180		
PM_{10}	[PM10]	100	6.32E-03	1.08E-02	6.32E-03	6.23E-03	6.32E-03		0.00E+00	0.00E+00	4.72E-04	9.84E-05	3.17E-04	2.64E-05	5.72E-04	2.98E-04	5.22E-04	4.35E-05	1.88E-03	4.66E-04
$PM_{2.5}$	[PM2.5]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.13E-03		0.00E+00	0.00E+00	4.58E-04	9.55E-05	3.08E-04	2.56E-05	5.55E-04	2.89E-04	5.06E-04	4.22E-05	1.83E-03	4.52E-04
CO	630-08-0	2	1.91E-02	4.90E-02	1.91E-02	1.90E-02	1.91E-02		0.00E+00	0.00E+00	2.14E-03	4.45E-04	9.60E-04	8.00E-05	1.75E-03	9.10E-04	1.58E-03	1.32E-04	6.42E-03	1.57E-03
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03		0.00E+00	0.00E+00	6.16E-05	1.28E-05	7.09E-05	5.91E-06	1.30E-04	6.76E-05	1.17E-04	9.73E-06	3.79E-04	9.61E-05
Hydrocarbons	[NMHC]	1	9.27E-03	7.68E-03	9.27E-03	9.26E-03	9.27E-03		0.00E+00	0.00E+00	3.35E-04	6.98E-05	4.65E-04	3.88E-05	8.50E-04	4.43E-04	7.66E-04	6.38E-05	2.42E-03	6.15E-04
NOx	10102-44-0	3	1.11E-01	1.68E-01	1.11E-01	1.11E-01	1.11E-01		0.00E+00	0.00E+00	7.33E-03	1.53E-03	5.59E-03	4.66E-04	1.02E-02	5.32E-03	9.20E-03	7.66E-04	3.23E-02	8.08E-03
1,3-butadiene	106-99-0	24	7.50E-06	1.13E-05	7.50E-06	7.49E-06	7.50E-06		0.00E+00	0.00E+00	4.93E-07	1.03E-07	3.76E-07	3.14E-08	6.88E-07	3.58E-07	6.19E-07	5.16E-08	2.18E-06	5.44E-07
Acenaphthene	83-32-9	70+170	2.53E-06	3.71E-06	2.53E-06	2.52E-06	2.53E-06		0.00E+00	0.00E+00	1.62E-07	3.37E-08	1.27E-07	1.06E-08	2.32E-07	1.21E-07	2.09E-07	1.74E-08	7.29E-07	1.82E-07
Acenaphthylene	208-96-8	71+171	5.08E-06	7.56E-06	5.08E-06	5.07E-06	5.08E-06		0.00E+00	0.00E+00	3.30E-07	6.86E-08	2.55E-07	2.12E-08	4.66E-07	2.43E-07	4.19E-07	3.49E-08	1.47E-06	3.67E-07
Acetaldehyde	75-07-0	26	6.46E-04	7.21E-04	6.46E-04	6.45E-04	6.46E-04		0.00E+00	0.00E+00	3.14E-05	6.54E-06	3.24E-05	2.70E-06	5.93E-05	3.09E-05	5.34E-05	4.45E-06	1.76E-04	4.46E-05
Acrolein	107-02-8	27	9.50E-05	1.21E-04	9.50E-05	9.49E-05	9.50E-05		0.00E+00	0.00E+00	5.29E-06	1.10E-06	4.77E-06	3.97E-07	8.71E-06	4.54E-06	7.84E-06	6.54E-07	2.66E-05	6.69E-06
Anthracene	120-12-7	72+172	5.37E-07	8.49E-07	5.37E-07	5.34E-07	5.37E-07		0.00E+00	0.00E+00	3.70E-08	7.71E-09	2.69E-08	2.24E-09	4.91E-08	2.55E-08	4.43E-08	3.69E-09	1.57E-07	3.92E-08
Benzene	71-43-2	20	2.18E-04	3.29E-04	2.18E-04	2.18E-04	2.18E-04		0.00E+00	0.00E+00	1.43E-05	2.99E-06	1.09E-05	9.12E-07	2.00E-05	1.04E-05	1.80E-05	1.50E-06	6.33E-05	1.58E-05
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	1.32E-07	9.69E-08	9.59E-08	9.69E-08		0.00E+00	0.00E+00	5.77E-09	1.20E-09	4.86E-09	4.05E-10	8.81E-09	4.59E-09	8.00E-09	6.67E-10	2.74E-08	6.86E-09
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	6.87E-08	3.28E-08	3.23E-08	3.28E-08		0.00E+00	0.00E+00	2.99E-09	6.24E-10	1.65E-09	1.37E-10	2.97E-09	1.55E-09	2.71E-09	2.26E-10	1.03E-08	2.53E-09
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	1.93E-07	9.24E-08	9.11E-08	9.24E-08		0.00E+00	0.00E+00	8.43E-09	1.76E-09	4.64E-09	3.87E-10	8.37E-09	4.36E-09	7.64E-09	6.36E-10	2.91E-08	7.14E-09
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	1.12E-07	6.01E-08	5.95E-08	6.01E-08		0.00E+00	0.00E+00	4.89E-09	1.02E-09	3.02E-09	2.51E-10	5.47E-09	2.85E-09	4.96E-09	4.14E-10	1.83E-08	4.53E-09
Chrysene	218-01-9	78+178	1.03E-07	1.83E-07	1.03E-07	1.02E-07	1.03E-07		0.00E+00	0.00E+00	7.97E-09	1.66E-09	5.18E-09	4.31E-10	9.38E-09	4.88E-09	8.52E-09	7.10E-10	3.10E-08	7.69E-09
Fluoranthene	206-44-0	69+169	9.02E-07	1.47E-06	9.02E-07	8.97E-07	9.02E-07		0.00E+00	0.00E+00	6.42E-08	1.34E-08	4.53E-08	3.77E-09	8.24E-08	4.29E-08	7.45E-08	6.21E-09	2.66E-07	6.63E-08
Fluorene	86-73-7	81+181	3.76E-06	5.69E-06	3.76E-06	3.75E-06	3.76E-06		0.00E+00	0.00E+00	2.48E-07	5.17E-08	1.89E-07	1.57E-08	3.44E-07	1.79E-07	3.10E-07	2.59E-08	1.09E-06	2.73E-07
Formaldehyde	50-00-0	5	3.62E-04	5.71E-04	3.62E-04	3.61E-04	3.62E-04		0.00E+00	0.00E+00	2.49E-05	5.18E-06	1.81E-05	1.51E-06	3.32E-05	1.73E-05	2.99E-05	2.49E-06	1.06E-04	2.65E-05
Phenanthrene	85-01-8	83+183	6.88E-06	1.05E-05	6.88E-06	6.86E-06	6.88E-06		0.00E+00	0.00E+00	4.56E-07	9.49E-08	3.45E-07	2.88E-08	6.30E-07	3.28E-07	5.68E-07	4.74E-08	2.00E-06	4.99E-07
Pyrene	129-00-0	84+184	8.58E-07	1.44E-06	8.58E-07	8.53E-07	8.58E-07		0.00E+00	0.00E+00	6.25E-08	1.30E-08	4.30E-08	3.59E-09	7.83E-08	4.08E-08	7.08E-08	5.90E-09	2.55E-07	6.33E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.13E-03		0.00E+00	0.00E+00	4.58E-04	9.55E-05	3.08E-04	2.56E-05	5.55E-04	2.89E-04	5.06E-04	4.22E-05	1.83E-03	4.52E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	6.83E-03	3.98E-03	3.93E-03	3.98E-03		0.00E+00	0.00E+00	2.98E-04	6.21E-05	2.00E-04	1.67E-05	3.60E-04	1.88E-04	3.29E-04	2.74E-05	1.19E-03	2.94E-04

Source: Road Dust **HR2** **Road from Pit 87 to Plant**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	12.2	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	10	trips/hour	Troilus
Trips per day	20	trips/day	Troilus
Speed	50	km/h	Troilus
Haul Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	83	trips/day	Troilus
Speed	50	km/h	Troilus
Fuel Truck/Pump Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	6	trips/day	Troilus
Speed	50	km/h	Troilus
Mechanic/Blaster Truck			
Trips per hour	4	trips/hour	Troilus
Trips per day	8	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b} \quad \left\{\frac{kg}{VKT}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2790	2790	2,790	50	4.9	93.1	10	20	0.489	0.171	1,363.7	476.9	122.0	244.0
Haul truck	Caterpillar	793	Diesel	2650	391000	164000	277,500	50	20.3	93.1	3	83	0.169	0.709	46,909.4	196,859	42.2	1012.6
Fuel/Pump Truck	Caterpillar		Diesel	350	30000	30000	30,000	50	1.5	93.1	3	6	0.147	0.051	4,399.2	1,538.5	36.6	73.2
Mechanic/Blaster Truck	Various	Various	Gasoline	450	2790	2790	2,790	50	2.0	93.1	4	8	0.196	0.068	545.5	190.8	48.8	97.6
TOTAL											**20**	**117**	**1.000**	**1.000**	**53,218**	**199,065**	**249.6**	**1427.4**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										4.35	7.87							
Uncontrolled PM10 Emission Factor (kg/VKT)										1.25	2.27							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.13	0.23							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										20.80	8.97	15.07	6.50					
Controlled Emission Rate PM10 (g/s)										5.99	2.59	4.34	1.87					
Controlled Emission Rate PM2.5 (g/s)										0.60	0.26	0.43	0.19					

Combustion Emissions

CoPC	CAS	Emissions Factors (g/hp-hr)						Emissions (g/s)									
		MOVES ID	Pick up trucks	Haul truck	Fuel/Pump Truck	Mechanic/Blaster Truck		Pick up trucks (1h)	Pick up trucks (24h)	Haul truck (1h)	Haul truck (24h)	Fuel/Pump Truck (1h)	Fuel/Pump Truck (24h)	Mechanic/Blaster Truck (1h)	Mechanic/Blaster Truck (24h)	Total (1h)	Total (24h)
							Operating Time (hours)	2.44	4.88	0.84	20.25	0.73	1.46	0.98	1.95		
							Horsepower (hp)	203	203	1855	1855	211	211	135	135		
PM_{10}	[PM10]	100	6.32E-03	2.33E-02	6.32E-03	1.10E-02		8.69E-04	7.24E-05	1.01E-02	1.01E-02	2.71E-04	2.26E-05	4.03E-04	3.36E-05	1.17E-02	1.03E-02
$PM_{2.5}$	[PM2.5]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02		8.42E-04	7.02E-05	9.82E-03	9.82E-03	2.63E-04	2.19E-05	3.91E-04	3.25E-05	1.13E-02	9.94E-03
CO	630-08-0	2	1.91E-02	7.26E-02	1.91E-02	4.92E-02		2.63E-03	2.19E-04	3.16E-02	3.16E-02	8.19E-04	6.82E-05	1.80E-03	1.50E-04	3.68E-02	3.20E-02
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03		1.94E-04	1.62E-05	6.14E-04	6.14E-04	6.05E-05	5.04E-06	5.18E-05	4.32E-06	9.21E-04	6.40E-04
Hydrocarbons	[NMHC]	1	9.27E-03	3.16E-02	9.27E-03	7.69E-03		1.27E-03	1.06E-04	1.37E-02	1.37E-02	3.97E-04	3.31E-05	2.82E-04	2.35E-05	1.57E-02	1.39E-02
NOx	10102-44-0	3	1.11E-01	2.21E+00	1.11E-01	1.68E-01		1.53E-02	1.28E-03	9.59E-01	9.59E-01	4.77E-03	3.97E-04	6.17E-03	5.14E-04	9.85E-01	9.61E-01
1,3-butadiene	106-99-0	24	7.50E-06	6.53E-05	7.50E-06	1.13E-05		1.03E-06	8.59E-08	2.84E-05	2.84E-05	3.21E-07	2.68E-08	4.15E-07	3.46E-08	3.01E-05	2.85E-05
Acenaphthene	83-32-9	70+170	2.53E-06	2.13E-05	2.53E-06	3.72E-06		3.47E-07	2.89E-08	9.24E-06	9.24E-06	1.08E-07	9.02E-09	1.36E-07	1.13E-08	9.83E-06	9.29E-06
Acenaphthylene	208-96-8	71+171	5.08E-06	4.35E-05	5.08E-06	7.57E-06		6.98E-07	5.82E-08	1.89E-05	1.89E-05	2.17E-07	1.81E-08	2.77E-07	2.31E-08	2.01E-05	1.90E-05
Acetaldehyde	75-07-0	26	6.46E-04	3.65E-03	6.46E-04	7.21E-04		8.88E-05	7.40E-06	1.59E-03	1.59E-03	2.77E-05	2.31E-06	2.64E-05	2.20E-06	1.73E-03	1.60E-03
Acrolein	107-02-8	27	9.50E-05	6.56E-04	9.50E-05	1.21E-04		1.31E-05	1.09E-06	2.85E-04	2.85E-04	4.07E-06	3.39E-07	4.45E-06	3.71E-07	3.07E-04	2.87E-04
Anthracene	120-12-7	72+172	5.37E-07	3.75E-06	5.37E-07	8.54E-07		7.38E-08	6.15E-09	1.63E-06	1.63E-06	2.30E-08	1.92E-09	3.13E-08	2.61E-09	1.76E-06	1.64E-06
Benzene	71-43-2	20	2.18E-04	1.90E-03	2.18E-04	3.29E-04		3.00E-05	2.50E-06	8.25E-04	8.25E-04	9.34E-06	7.78E-07	1.21E-05	1.00E-06	8.77E-04	8.30E-04
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	4.49E-07	9.69E-08	1.34E-07		1.33E-08	1.11E-09	1.95E-07	1.95E-07	4.15E-09	3.46E-10	4.90E-09	4.08E-10	2.18E-07	1.97E-07
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	1.51E-07	3.28E-08	6.96E-08		4.51E-09	3.76E-10	6.55E-08	6.55E-08	1.40E-09	1.17E-10	2.55E-09	2.13E-10	7.40E-08	6.62E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	4.25E-07	9.24E-08	1.96E-07		1.27E-08	1.06E-09	1.85E-07	1.85E-07	3.96E-09	3.30E-10	7.18E-09	5.98E-10	2.08E-07	1.87E-07
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	3.70E-07	6.01E-08	1.13E-07		8.26E-09	6.88E-10	1.61E-07	1.61E-07	2.57E-09	2.14E-10	4.15E-09	3.46E-10	1.76E-07	1.62E-07
Chrysene	218-01-9	78+178	1.03E-07	5.65E-07	1.03E-07	1.85E-07		1.42E-08	1.18E-09	2.46E-07	2.46E-07	4.42E-09	3.68E-10	6.77E-09	5.64E-10	2.71E-07	2.48E-07
Fluoranthene	206-44-0	69+169	9.02E-07	6.35E-06	9.02E-07	1.48E-06		1.24E-07	1.03E-08	2.76E-06	2.76E-06	3.86E-08	3.22E-09	5.43E-08	4.52E-09	2.98E-06	2.78E-06
Fluorene	86-73-7	81+181	3.76E-06	2.95E-05	3.76E-06	5.71E-06		5.16E-07	4.30E-08	1.28E-05	1.28E-05	1.61E-07	1.34E-08	2.09E-07	1.74E-08	1.37E-05	1.29E-05
Formaldehyde	50-00-0	5	3.62E-04	3.11E-03	3.62E-04	5.71E-04		4.97E-05	4.14E-06	1.35E-03	1.35E-03	1.55E-05	1.29E-06	2.09E-05	1.74E-06	1.44E-03	1.36E-03
Phenanthrene	85-01-8	83+183	6.88E-06	5.03E-05	6.88E-06	1.05E-05		9.46E-07	7.88E-08	2.19E-05	2.19E-05	2.95E-07	2.46E-08	3.85E-07	3.21E-08	2.35E-05	2.20E-05
Pyrene	129-00-0	84+184	8.58E-07	5.95E-06	8.58E-07	1.44E-06		1.18E-07	9.82E-09	2.59E-06	2.59E-06	3.67E-08	3.06E-09	5.29E-08	4.41E-09	2.79E-06	2.60E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02		8.42E-04	7.02E-05	9.82E-03	9.82E-03	2.63E-04	2.19E-05	3.91E-04	3.25E-05	1.13E-02	9.94E-03
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	1.47E-02	3.98E-03	6.93E-03		5.48E-04	4.56E-05	6.38E-03	6.38E-03	1.71E-04	1.42E-05	2.54E-04	2.12E-05	7.35E-03	6.46E-03

Sources: Road Dust **HR3** **Road from Pit 87 to OB 87**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	9.6	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck CAT 793			
Trips per hour	6	trips/hour	Troilus
Trips per day	138	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b} \left\{\frac{kg}{VKT}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	26.5	93.1	6	138	1.000	1.000	277,500	277,500	55.2	1324.8
TOTAL											**6**	**138**	**1.000**	**1.000**	**277,500**	**277,500**	**55.2**	**1,324.8**

	1h	24h
Uncontrolled TSP Emission Factor (kg/VKT)	9.14	9.14
Uncontrolled PM10 Emission Factor (kg/VKT)	2.63	2.63
Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.26	0.26

	Summer		Winter	
	1h	24h	1h	24h
Controlled Emission Rate PM (g/s)	9.67	9.67	7.01	7.01
Controlled Emission Rate PM10 (g/s)	2.79	2.79	2.02	2.02
Controlled Emission Rate PM2.5 (g/s)	0.28	0.28	0.20	0.20

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
					Haul truck (1h)	Haul truck (24h)		
			Haul truck	Operating Time (hours)	1.10	26.50	Total (1h)	Total (24h)
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.3281E-02		1.32E-02	1.32E-02	1.32E-02	1.32E-02
$PM_{2.5}$	[PM2.5]	110	2.2582E-02		1.28E-02	1.28E-02	1.28E-02	1.28E-02
CO	630-08-0	2	7.2614E-02		4.13E-02	4.13E-02	4.13E-02	4.13E-02
SO_2	7446-09-5	31	1.4132E-03		8.04E-04	8.04E-04	8.04E-04	8.04E-04
Hydrocarbons	[NMHC]	1	3.1571E-02		1.80E-02	1.80E-02	1.80E-02	1.80E-02
NOx	10102-44-0	3	2.2050E+00		1.25E+00	1.25E+00	1.25E+00	1.25E+00
1,3-butadiene	106-99-0	24	6.5263E-05		3.71E-05	3.71E-05	3.71E-05	3.71E-05
Acenaphthene	83-32-9	70+170	2.1260E-05		1.21E-05	1.21E-05	1.21E-05	1.21E-05
Acenaphthylene	208-96-8	71+171	4.3502E-05		2.47E-05	2.47E-05	2.47E-05	2.47E-05
Acetaldehyde	75-07-0	26	3.6495E-03		2.08E-03	2.08E-03	2.08E-03	2.08E-03
Acrolein	107-02-8	27	6.5617E-04		3.73E-04	3.73E-04	3.73E-04	3.73E-04
Anthracene	120-12-7	72+172	3.7460E-06		2.13E-06	2.13E-06	2.13E-06	2.13E-06
Benzene	71-43-2	20	1.8981E-03		1.08E-03	1.08E-03	1.08E-03	1.08E-03
Benzo(a)anthracene	56-55-3	73+173	4.4923E-07		2.56E-07	2.56E-07	2.56E-07	2.56E-07
Benzo(a)pyrene	50-32-8	74+174	1.5062E-07		8.57E-08	8.57E-08	8.57E-08	8.57E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.2455E-07		2.41E-07	2.41E-07	2.41E-07	2.41E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.7046E-07		2.11E-07	2.11E-07	2.11E-07	2.11E-07
Chrysene	218-01-9	78+178	5.6526E-07		3.22E-07	3.22E-07	3.22E-07	3.22E-07
Fluoranthene	206-44-0	69+169	6.3498E-06		3.61E-06	3.61E-06	3.61E-06	3.61E-06
Fluorene	86-73-7	81+181	2.9519E-05		1.68E-05	1.68E-05	1.68E-05	1.68E-05
Formaldehyde	50-00-0	5	3.1080E-03		1.77E-03	1.77E-03	1.77E-03	1.77E-03
Phenanthrene	85-01-8	83+183	5.0269E-05		2.86E-05	2.86E-05	2.86E-05	2.86E-05
Pyrene	129-00-0	84+184	5.9499E-06		3.38E-06	3.38E-06	3.38E-06	3.38E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.2582E-02		1.28E-02	1.28E-02	1.28E-02	1.28E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.4679E-02		8.35E-03	8.35E-03	8.35E-03	8.35E-03

Source: Road Dust **HR4** **Road from Pit 87 to TSF**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	14.6	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck CAT 793			
Trips per hour	10	trips/hour	Troilus
Trips per day	231	trips/day	Troilus
Speed	50	km/h	Troilus
Haul Truck CAT 777			
Trips per hour	1	trips/hour	Troilus
Trips per day	14	trips/day	Troilus
Speed	50	km/h	Troilus
Capacity	91	tonnes	Troilus
Haul Truck Cat 740GC			
Trips per hour	1	trips/hour	Troilus
Trips per day	32	trips/day	Troilus
Speed	50	km/h	Troilus
Capacity	40	tonnes	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{s_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \quad \begin{Bmatrix} kg \\ VKT \end{Bmatrix}$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	67.5	93.1	10	231	0.834	0.834	231,417	231,417	140.5	3372.6
Haul truck	Caterpillar	777	Diesel	1025	165,000	74,000	119,500	50	4.1	93.1	1	14	0.051	0.051	6,040	6,040	8.5	204.4
Haul truck	Caterpillar	740GC	Diesel	452	71,900	31,900	51,900	50	9.3	93.1	1	32	0.116	0.116	5,996	5,996	19.5	467.2
			TOTAL								**12**	**277**	**1.000**	**1.000**	**243,452**	**243,452**	**168.5**	**4044.2**
										1h	**24h**							
									Uncontrolled TSP Emission Factor (kg/VKT)	8.62	8.62							
									Uncontrolled PM10 Emission Factor (kg/VKT)	2.48	2.48							
									Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.25	0.25							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
									Controlled Emission Rate PM (g/s)	27.83	27.83	20.17	20.17					
									Controlled Emission Rate PM10 (g/s)	8.02	8.02	5.81	5.81					
									Controlled Emission Rate PM2.5 (g/s)	0.80	0.80	0.58	0.58					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)				Emissions (g/s)							
			Haul truck CAT 793	Haul Truck CAT 777	Haul Truck CAT 740G		Haul Truck CAT 793 (1h)	Haul Truck CAT 793 (24h)	Haul Truck CAT 777 (1h)	Haul Truck CAT 777 (24h)	Haul Truck CAT 740G (1h)	Haul Truck CAT 740G (24h)	Total (1h)	Total (24h)
						Operating Time (hours)	2.81	67.45	0.17	4.09	0.39	9.34		
						Horsepower (hp)	1855	1855	718	718	316	316		
PM_{10}	[PM10]	100	2.33E-02	6.23E-03	6.23E-03		3.37E-02	3.37E-02	2.12E-04	2.12E-04	2.13E-04	2.13E-04	3.41E-02	3.41E-02
$PM_{2.5}$	[PM2.5]	110	2.26E-02	6.04E-03	6.04E-03		3.27E-02	3.27E-02	2.05E-04	2.05E-04	2.07E-04	2.07E-04	3.31E-02	3.31E-02
CO	630-08-0	2	7.26E-02	1.90E-02	1.90E-02		1.05E-01	1.05E-01	6.46E-04	6.46E-04	6.51E-04	6.51E-04	1.06E-01	1.06E-01
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03		2.05E-03	2.05E-03	4.80E-05	4.80E-05	4.84E-05	4.84E-05	2.14E-03	2.14E-03
Hydrocarbons	[NMHC]	1	3.16E-02	9.26E-03	9.26E-03		4.57E-02	4.57E-02	3.15E-04	3.15E-04	3.17E-04	3.17E-04	4.63E-02	4.63E-02
NOx	10102-44-0	3	2.21E+00	1.11E-01	1.11E-01		3.19E+00	3.19E+00	3.78E-03	3.78E-03	3.81E-03	3.81E-03	3.20E+00	3.20E+00
1,3-butadiene	106-99-0	24	6.53E-05	7.49E-06	7.49E-06		9.45E-05	9.45E-05	2.54E-07	2.54E-07	2.56E-07	2.56E-07	9.50E-05	9.50E-05
Acenaphthene	83-32-9	70+170	2.13E-05	2.52E-06	2.52E-06		3.08E-05	3.08E-05	8.57E-08	8.57E-08	8.63E-08	8.63E-08	3.10E-05	3.10E-05
Acenaphthylene	208-96-8	71+171	4.35E-05	5.07E-06	5.07E-06		6.30E-05	6.30E-05	1.72E-07	1.72E-07	1.74E-07	1.74E-07	6.33E-05	6.33E-05
Acetaldehyde	75-07-0	26	3.65E-03	6.45E-04	6.45E-04		5.28E-03	5.28E-03	2.19E-05	2.19E-05	2.21E-05	2.21E-05	5.33E-03	5.33E-03
Acrolein	107-02-8	27	6.56E-04	9.49E-05	9.49E-05		9.50E-04	9.50E-04	3.22E-06	3.22E-06	3.25E-06	3.25E-06	9.57E-04	9.57E-04
Anthracene	120-12-7	72+172	3.75E-06	5.34E-07	5.34E-07		5.42E-06	5.42E-06	1.82E-08	1.82E-08	1.83E-08	1.83E-08	5.46E-06	5.46E-06
Benzene	71-43-2	20	1.90E-03	2.18E-04	2.18E-04		2.75E-03	2.75E-03	7.40E-06	7.40E-06	7.45E-06	7.45E-06	2.76E-03	2.76E-03
Benzo(a)anthracene	56-55-3	73+173	4.49E-07	9.59E-08	9.59E-08		6.51E-07	6.51E-07	3.26E-09	3.26E-09	3.28E-09	3.28E-09	6.57E-07	6.57E-07
Benzo(a)pyrene	50-32-8	74+174	1.51E-07	3.23E-08	3.23E-08		2.18E-07	2.18E-07	1.10E-09	1.10E-09	1.11E-09	1.11E-09	2.20E-07	2.20E-07
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07	9.11E-08	9.11E-08		6.15E-07	6.15E-07	3.10E-09	3.10E-09	3.12E-09	3.12E-09	6.21E-07	6.21E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07	5.95E-08	5.95E-08		5.36E-07	5.36E-07	2.02E-09	2.02E-09	2.04E-09	2.04E-09	5.41E-07	5.41E-07
Chrysene	218-01-9	78+178	5.65E-07	1.02E-07	1.02E-07		8.19E-07	8.19E-07	3.47E-09	3.47E-09	3.49E-09	3.49E-09	8.26E-07	8.26E-07
Fluoranthene	206-44-0	69+169	6.35E-06	8.97E-07	8.97E-07		9.20E-06	9.20E-06	3.05E-08	3.05E-08	3.07E-08	3.07E-08	9.26E-06	9.26E-06
Fluorene	86-73-7	81+181	2.95E-05	3.75E-06	3.75E-06		4.27E-05	4.27E-05	1.27E-07	1.27E-07	1.28E-07	1.28E-07	4.30E-05	4.30E-05
Formaldehyde	50-00-0	5	3.11E-03	3.61E-04	3.61E-04		4.50E-03	4.50E-03	1.23E-05	1.23E-05	1.24E-05	1.24E-05	4.53E-03	4.53E-03
Phenanthrene	85-01-8	83+183	5.03E-05	6.86E-06	6.86E-06		7.28E-05	7.28E-05	2.33E-07	2.33E-07	2.35E-07	2.35E-07	7.33E-05	7.33E-05
Pyrene	129-00-0	84+184	5.95E-06	8.53E-07	8.53E-07		8.62E-06	8.62E-06	2.90E-08	2.90E-08	2.92E-08	2.92E-08	8.67E-06	8.67E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02	6.04E-03	6.04E-03		3.27E-02	3.27E-02	2.05E-04	2.05E-04	2.07E-04	2.07E-04	3.31E-02	3.31E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02	3.93E-03	3.93E-03		2.13E-02	2.13E-02	1.33E-04	1.33E-04	1.34E-04	1.34E-04	2.15E-02	2.15E-02

Source: Road Dust **HR5** **Road from Pit 87 to WD 87**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	10.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	8	trips/hour	Troilus
Trips per day	191	trips/day	Troilus
Speed	50	km/h	Troilus
Water Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	2	trips/day	Troilus
Speed	15	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

Heavy Duty Vehicle: $EF = k\left(\frac{s_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b}\ \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	41.3	93.1	8	191	0.888	0.990	246,523	274,624	86.0	2062.8
Water Truck			Diesel	350	30,000	30,000	30,000	15	1.4	97.9	1	2	0.112	0.010	3,349	311	10.8	21.6
TOTAL											**9**	**193**	**1.000**	**1.000**	**249,872**	**274,935**	**96.8**	**2084.4**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										8.72	9.10							
Uncontrolled PM10 Emission Factor (kg/VKT)										2.51	2.62							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.25	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										16.17	15.15	11.71	10.98					
Controlled Emission Rate PM10 (g/s)										4.66	4.37	3.38	3.16					
Controlled Emission Rate PM2.5 (g/s)										0.47	0.44	0.34	0.32					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)			Emissions (g/s)					
			Haul truck	Water Truck		Haul truck (1h)	Haul truck (24h)	Water truck (1h)	Water truck (24h)	Total (1h)	Total (24h)
					Operating Time (hours)	**1.72**	**41.26**	**0.72**	**1.44**		
					Horsepower (hp)	**1855**	**1855**	**180**	**180**		
PM_{10}	[PM10]	100	2.33E-02	6.32E-03		2.06E-02	2.06E-02	2.27E-04	1.89E-05	2.08E-02	2.06E-02
$PM_{2.5}$	[PM2.5]	110	2.26E-02	6.13E-03		2.00E-02	2.00E-02	2.20E-04	1.84E-05	2.02E-02	2.00E-02
CO	630-08-0	2	7.26E-02	1.91E-02		6.43E-02	6.43E-02	6.88E-04	5.73E-05	6.50E-02	6.44E-02
SO_2	7446-09-5	31	1.41E-03	1.41E-03		1.25E-03	1.25E-03	5.08E-05	4.24E-06	1.30E-03	1.26E-03
Hydrocarbons	[NMHC]	1	3.16E-02	9.27E-03		2.80E-02	2.80E-02	3.33E-04	2.78E-05	2.83E-02	2.80E-02
NOx	10102-44-0	3	2.21E+00	1.11E-01		1.95E+00	1.95E+00	4.00E-03	3.34E-04	1.96E+00	1.95E+00
1,3-butadiene	106-99-0	24	6.53E-05	7.50E-06		5.78E-05	5.78E-05	2.70E-07	2.25E-08	5.81E-05	5.78E-05
Acenaphthene	83-32-9	70+170	2.13E-05	2.53E-06		1.88E-05	1.88E-05	9.09E-08	7.57E-09	1.89E-05	1.88E-05
Acenaphthylene	208-96-8	71+171	4.35E-05	5.08E-06		3.85E-05	3.85E-05	1.83E-07	1.52E-08	3.87E-05	3.85E-05
Acetaldehyde	75-07-0	26	3.65E-03	6.46E-04		3.23E-03	3.23E-03	2.32E-05	1.94E-06	3.26E-03	3.23E-03
Acrolein	107-02-8	27	6.56E-04	9.50E-05		5.81E-04	5.81E-04	3.42E-06	2.85E-07	5.85E-04	5.81E-04
Anthracene	120-12-7	72+172	3.75E-06	5.37E-07		3.32E-06	3.32E-06	1.93E-08	1.61E-09	3.34E-06	3.32E-06
Benzene	71-43-2	20	1.90E-03	2.18E-04		1.68E-03	1.68E-03	7.84E-06	6.53E-07	1.69E-03	1.68E-03
Benzo(a)anthracene	56-55-3	73+173	4.49E-07	9.69E-08		3.98E-07	3.98E-07	3.49E-09	2.90E-10	4.01E-07	3.98E-07
Benzo(a)pyrene	50-32-8	74+174	1.51E-07	3.28E-08		1.33E-07	1.33E-07	1.18E-09	9.83E-11	1.35E-07	1.34E-07
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07	9.24E-08		3.76E-07	3.76E-07	3.33E-09	2.77E-10	3.79E-07	3.76E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07	6.01E-08		3.28E-07	3.28E-07	2.16E-09	1.80E-10	3.30E-07	3.28E-07
Chrysene	218-01-9	78+178	5.65E-07	1.03E-07		5.01E-07	5.01E-07	3.71E-09	3.09E-10	5.04E-07	5.01E-07
Fluoranthene	206-44-0	69+169	6.35E-06	9.02E-07		5.62E-06	5.62E-06	3.24E-08	2.70E-09	5.66E-06	5.63E-06
Fluorene	86-73-7	81+181	2.95E-05	3.76E-06		2.61E-05	2.61E-05	1.35E-07	1.13E-08	2.63E-05	2.62E-05
Formaldehyde	50-00-0	5	3.11E-03	3.62E-04		2.75E-03	2.75E-03	1.30E-05	1.08E-06	2.77E-03	2.75E-03
Phenanthrene	85-01-8	83+183	5.03E-05	6.88E-06		4.45E-05	4.45E-05	2.48E-07	2.06E-08	4.48E-05	4.45E-05
Pyrene	129-00-0	84+184	5.95E-06	8.58E-07		5.27E-06	5.27E-06	3.08E-08	2.57E-09	5.30E-06	5.27E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02	6.13E-03		2.00E-02	2.00E-02	2.20E-04	1.84E-05	2.02E-02	2.00E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02	3.98E-03		1.30E-02	1.30E-02	1.43E-04	1.19E-05	1.31E-02	1.30E-02

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S1	Primary Crusher Building	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	6.92E-01	6.02E-01
			PM_{10}	[PM10]	2.77E-01	2.41E-01
			$PM_{2.5}$	[PM2.5]	5.13E-02	4.46E-02
			Silver (Ag)	7440-22-4	1.34E-06	1.17E-06
			Aluminum (Al)	7429-90-5	5.23E-02	4.55E-02
			Arsenic (As)	7440-38-2	5.72E-05	4.97E-05
			Gold (Au)	7440-57-5	3.59E-07	3.12E-07
			Boron (B)	7440-42-8	7.91E-05	6.88E-05
			Barium (Ba)	7440-39-3	2.60E-04	2.26E-04
			Beryllium (Be)	7440-41-7	8.27E-07	7.19E-07
			Bismuth (Bi)	7440-69-9	2.28E-06	1.98E-06
			Carbon (C)	7440-44-0	9.71E-04	8.44E-04
			Calcium (Ca)	7440-70-2	1.98E-02	1.72E-02
			Cadmium (Cd)	7440-43-9	4.36E-06	3.79E-06
			Cerium (Ce)	7440-45-1	5.03E-05	4.37E-05
			Cobalt (Co)	7440-48-4	2.07E-05	1.80E-05
			Chromium (Cr)	7440-47-3	6.63E-05	5.76E-05
			Cesium (Cs)	7440-46-2	2.36E-06	2.05E-06
			Copper (Cu)	7440-50-8	3.85E-04	3.34E-04
			Iron (Fe)	7439-89-6	3.25E-02	2.82E-02
			Gallium (Ga)	7440-55-3	1.44E-05	1.25E-05
			Hafnium (Hf)	7440-58-6	2.95E-06	2.57E-06
			Mercury (Hg)	7439-97-6	1.73E-08	1.50E-08
			Indium (In)	7440-74-6	1.19E-08	1.04E-08
			Potassium (K)	7440-09-7	1.10E-02	9.54E-03
			Lanthanum (La)	7439-91-0	1.74E-05	1.51E-05
			Lithium (Li)	7439-93-2	1.78E-05	1.55E-05
			Lutetium (Lu)	7439-94-3	1.84E-07	1.60E-07
			Magnesium (Mg)	7439-95-4	9.31E-03	8.10E-03
			Manganese (Mn)	7439-96-5	1.35E-04	1.17E-04
			Molybdenum (Mo)	7439-98-7	5.19E-06	4.52E-06
			Sodium (Na)	7440-23-5	2.01E-02	1.75E-02
			Niobium (Nb)	7440--03-1	3.99E-06	3.47E-06
			Nickel (Ni)	7440-02-0	1.49E-05	1.29E-05
			Phosphorus (P)	7723-14-0	3.93E-04	3.42E-04
			Lead (Pb)	7439-92-1	1.23E-05	1.07E-05
			Rubidium (Rb)	7440-17-7	5.27E-05	4.59E-05
			Sulphur (S)	7704-34-9	3.39E-03	2.95E-03
			Antimony (Sb)	7440-36-0	6.32E-06	5.50E-06
			Scandium (Sc)	7440-20-2	1.06E-05	9.23E-06
			Selenium (Se)	7782-49-2	2.42E-07	2.11E-07
			Tin (Sn)	7440-31-5	6.40E-06	5.57E-06
			Strontium (Sr)	7440-24-6	1.67E-04	1.45E-04
			Tantalum (Ta)	7440-25-7	6.51E-07	5.67E-07
			Terbium (Tb)	7440-27-9	4.27E-07	3.71E-07
			Tellurium (Te)	13494-80-9	1.41E-07	1.23E-07
			Titanium (Ti)	7440-32-6	1.18E-03	1.03E-03
			Thallium (Tl)	7440-28-0	7.02E-07	6.10E-07
			Uranium (U)	7440-61-1	9.82E-07	8.54E-07
			Vanadium (v)	7440-62-2	9.95E-05	8.66E-05
			Tungsten (W)	7440-33-7	2.10E-05	1.82E-05
			Yttrium (Y)	7440-65-5	1.05E-05	9.16E-06
			Ytterbium (Yb)	7440-64-4	1.22E-06	1.06E-06
			Zinc (Zn)	7440-66-6	1.21E-04	1.05E-04
			Zirconium (Zr)	7440-67-7	6.60E-05	5.74E-05
			Silicon Dioxide (SiO2)	7631-86-9	4.35E-01	3.78E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.04E-01	9.02E-02
			Iron Oxide (Fe2O3)	1309-37-1	4.55E-02	3.96E-02
			Magnesium Oxide (MgO)	1309-48-4	1.83E-02	1.59E-02
			Calcium Oxide (CaO)	1305-78-8	3.14E-02	2.73E-02
			Sodium Oxide (Na2O)	1313-59-3	2.39E-02	2.08E-02
			Potassium Oxide (K2O)	12136-45-7	1.36E-02	1.19E-02
			Titanium dioxide (TiO2)	13463-67-7	1.74E-03	1.52E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	8.44E-04	7.34E-04
			Manganese Oxide (MnO)	1344-43-0	2.08E-04	1.81E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.91E-04	1.66E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.60E-04	1.39E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.78E-03	1.54E-03
			Bornite (Cu5FeS4)	1308-82-3	6.40E-05	5.57E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.93E-05	4.29E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.99E-05	1.73E-05
			Cuprite (CU_2O)	1317-39-1	3.46E-05	3.01E-05
			Galena (PbS)	1314-87-0	1.40E-04	1.22E-04
			Sphalerite (ZnS)	1314-98-3	2.87E-04	2.50E-04
			Pyrite (Fe, S2)	1309-36-0	5.31E-03	4.62E-03
			Pyrrhotite (Fe7S8)	12305-96-3	4.37E-03	3.80E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.67E-04	1.45E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.03E-03	1.77E-03
			Quartz	14808-60-7	2.80E-02	2.44E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.86E-01	2.49E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.02E-02	1.76E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.19E-02	7.12E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	3.21E-02	2.79E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.22E-03	5.41E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.86E-02	3.36E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.16E-02	1.01E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.42E-04	1.23E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.71E-03	1.49E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.14E-04	3.60E-04
			Calcite (CaCO3)	1317-65-3	7.57E-03	6.58E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.34E-04	1.16E-04
			Titanite (CaTiSiO5)	[TITAN]	1.99E-03	1.73E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.85E-03	1.61E-03
			Mica	12001-26-2	7.41E-02	6.45E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.66E-02	3.18E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.99E-02	2.60E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.32E-02	2.02E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	8.09E-02	7.04E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.76E-01	1.53E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	6.58E-02	5.72E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	9.62E-03	8.37E-03
			Sillimanite (Al2SiO5)	12141-45-6	3.05E-03	2.65E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S2	Primary Crusher Baghouse	Appendix C - Table C-2 Procedure for Preparing an Emission Summary and Dispersion Modelling Report	TSP	[PM]	1.11E-01	1.11E-01
			PM_{10}	[PM10]	5.33E-02	5.33E-02
			$PM_{2.5}$	[PM2.5]	1.11E-02	1.11E-02
			Silver (Ag)	7440-22-4	2.15E-07	2.15E-07
			Aluminum (Al)	7429-90-5	8.39E-03	8.39E-03
			Arsenic (As)	7440-38-2	9.18E-06	9.18E-06
			Gold (Au)	7440-57-5	5.77E-08	5.77E-08
			Boron (B)	7440-42-8	1.27E-05	1.27E-05
			Barium (Ba)	7440-39-3	4.18E-05	4.18E-05
			Beryllium (Be)	7440-41-7	1.33E-07	1.33E-07
			Bismuth (Bi)	7440-69-9	3.66E-07	3.66E-07
			Carbon (C)	7440-44-0	1.56E-04	1.56E-04
			Calcium (Ca)	7440-70-2	3.18E-03	3.18E-03
			Cadmium (Cd)	7440-43-9	7.00E-07	7.00E-07
			Cerium (Ce)	7440-45-1	8.07E-06	8.07E-06
			Cobalt (Co)	7440-48-4	3.33E-06	3.33E-06
			Chromium (Cr)	7440-47-3	1.06E-05	1.06E-05
			Cesium (Cs)	7440-46-2	3.79E-07	3.79E-07
			Copper (Cu)	7440-50-8	6.17E-05	6.17E-05
			Iron (Fe)	7439-89-6	5.21E-03	5.21E-03
			Gallium (Ga)	7440-55-3	2.32E-06	2.32E-06
			Hafnium (Hf)	7440-58-6	4.74E-07	4.74E-07
			Mercury (Hg)	7439-97-6	2.78E-09	2.78E-09
			Indium (In)	7440-74-6	1.91E-09	1.91E-09
			Potassium (K)	7440-09-7	1.76E-03	1.76E-03
			Lanthanum (La)	7439-91-0	2.80E-06	2.80E-06
			Lithium (Li)	7439-93-2	2.86E-06	2.86E-06
			Lutetium (Lu)	7439-94-3	2.96E-08	2.96E-08
			Magnesium (Mg)	7439-95-4	1.50E-03	1.50E-03
			Manganese (Mn)	7439-96-5	2.59E-05	2.59E-05
			Molybdenum (Mo)	7439-98-7	8.34E-07	8.34E-07
			Sodium (Na)	7440-23-5	3.23E-03	3.23E-03
			Niobium (Nb)	7440--03-1	6.40E-07	6.40E-07
			Nickel (Ni)	7440-02-0	2.87E-06	2.87E-06
			Phosphorus (P)	7723-14-0	6.31E-05	6.31E-05
			Lead (Pb)	7439-92-1	1.98E-06	1.98E-06
			Rubidium (Rb)	7440-17-7	8.47E-06	8.47E-06
			Sulphur (S)	7704-34-9	5.44E-04	5.44E-04
			Antimony (Sb)	7440-36-0	1.01E-06	1.01E-06
			Scandium (Sc)	7440-20-2	1.70E-06	1.70E-06
			Selenium (Se)	7782-49-2	3.89E-08	3.89E-08
			Tin (Sn)	7440-31-5	1.03E-06	1.03E-06
			Strontium (Sr)	7440-24-6	2.68E-05	2.68E-05
			Tantalum (Ta)	7440-25-7	1.05E-07	1.05E-07
			Terbium (Tb)	7440-27-9	6.85E-08	6.85E-08
			Tellurium (Te)	13494-80-9	2.26E-08	2.26E-08
			Titanium (Ti)	7440-32-6	2.28E-04	2.28E-04
			Thallium (Tl)	7440-28-0	1.13E-07	1.13E-07
			Uranium (U)	7440-61-1	1.58E-07	1.58E-07
			Vanadium (v)	7440-62-2	1.60E-05	1.60E-05
			Tungsten (W)	7440-33-7	3.37E-06	3.37E-06
			Yttrium (Y)	7440-65-5	1.69E-06	1.69E-06
			Ytterbium (Yb)	7440-64-4	1.95E-07	1.95E-07
			Zinc (Zn)	7440-66-6	1.95E-05	1.95E-05
			Zirconium (Zr)	7440-67-7	1.06E-05	1.06E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.98E-02	6.98E-02
			Aluminum Oxide (Al2O3)	1344-28-1	1.67E-02	1.67E-02
			Iron Oxide (Fe2O3)	1309-37-1	7.30E-03	7.30E-03
			Magnesium Oxide (MgO)	1309-48-4	2.94E-03	2.94E-03
			Calcium Oxide (CaO)	1305-78-8	5.04E-03	5.04E-03
			Sodium Oxide (Na2O)	1313-59-3	3.84E-03	3.84E-03
			Potassium Oxide (K2O)	12136-45-7	2.19E-03	2.19E-03
			Titanium dioxide (TiO2)	13463-67-7	3.36E-04	3.36E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.35E-04	1.35E-04
			Manganese Oxide (MnO)	1344-43-0	4.00E-05	4.00E-05
			Chromium Oxide (Cr2O3)	1308-38-9	3.07E-05	3.07E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	2.57E-05	2.57E-05
			Chalcopyrite (CuFeS2)	1308-56-1	2.85E-04	2.85E-04
			Bornite (Cu5FeS4)	1308-82-3	1.03E-05	1.03E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.92E-06	7.92E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.19E-06	3.19E-06
			Cuprite (CU_2O)	1317-39-1	5.56E-06	5.56E-06
			Galena (PbS)	1314-87-0	2.25E-05	2.25E-05
			Sphalerite (ZnS)	1314-98-3	4.61E-05	4.61E-05
			Pyrite (Fe, S2)	1309-36-0	8.52E-04	8.52E-04
			Pyrrhotite (Fe7S8)	12305-96-3	7.02E-04	7.02E-04
			Arsenopyrite (FeAsS)	1303-18-0	2.68E-05	2.68E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.92E-04	3.92E-04
			Quartz	14808-60-7	5.40E-03	5.40E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.59E-02	4.59E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.24E-03	3.24E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.31E-02	1.31E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.16E-03	5.16E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.20E-03	1.20E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	6.20E-03	6.20E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.87E-03	1.87E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.73E-05	2.73E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.74E-04	2.74E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	6.64E-05	6.64E-05
			Calcite (CaCO3)	1317-65-3	1.22E-03	1.22E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.57E-05	2.57E-05
			Titanite (CaTiSiO5)	[TITAN]	3.84E-04	3.84E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.97E-04	2.97E-04
			Mica	12001-26-2	1.19E-02	1.19E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.88E-03	5.88E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.80E-03	4.80E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.72E-03	3.72E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.30E-02	1.30E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.83E-02	2.83E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.06E-02	1.06E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.54E-03	1.54E-03
			Sillimanite (Al2SiO5)	12141-45-6	4.89E-04	4.89E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S3	Secondary Crusher Building	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	2.08E+00	1.81E+00
			PM_{10}	[PM10]	8.31E-01	7.22E-01
			$PM_{2.5}$	[PM2.5]	1.54E-01	1.34E-01
			Silver (Ag)	7440-22-4	4.03E-06	3.50E-06
			Aluminum (Al)	7429-90-5	1.57E-01	1.36E-01
			Arsenic (As)	7440-38-2	1.72E-04	1.49E-04
			Gold (Au)	7440-57-5	1.08E-06	9.37E-07
			Boron (B)	7440-42-8	2.37E-04	2.06E-04
			Barium (Ba)	7440-39-3	7.81E-04	6.79E-04
			Beryllium (Be)	7440-41-7	2.48E-06	2.16E-06
			Bismuth (Bi)	7440-69-9	6.84E-06	5.95E-06
			Carbon (C)	7440-44-0	2.91E-03	2.53E-03
			Calcium (Ca)	7440-70-2	5.95E-02	5.17E-02
			Cadmium (Cd)	7440-43-9	1.31E-05	1.14E-05
			Cerium (Ce)	7440-45-1	1.51E-04	1.31E-04
			Cobalt (Co)	7440-48-4	6.22E-05	5.41E-05
			Chromium (Cr)	7440-47-3	1.99E-04	1.73E-04
			Cesium (Cs)	7440-46-2	7.08E-06	6.16E-06
			Copper (Cu)	7440-50-8	1.15E-03	1.00E-03
			Iron (Fe)	7439-89-6	9.74E-02	8.47E-02
			Gallium (Ga)	7440-55-3	4.33E-05	3.76E-05
			Hafnium (Hf)	7440-58-6	8.86E-06	7.70E-06
			Mercury (Hg)	7439-97-6	5.19E-08	4.51E-08
			Indium (In)	7440-74-6	3.58E-08	3.11E-08
			Potassium (K)	7440-09-7	3.29E-02	2.86E-02
			Lanthanum (La)	7439-91-0	5.22E-05	4.54E-05
			Lithium (Li)	7439-93-2	5.35E-05	4.65E-05
			Lutetium (Lu)	7439-94-3	5.52E-07	4.80E-07
			Magnesium (Mg)	7439-95-4	2.79E-02	2.43E-02
			Manganese (Mn)	7439-96-5	4.04E-04	3.51E-04
			Molybdenum (Mo)	7439-98-7	1.56E-05	1.36E-05
			Sodium (Na)	7440-23-5	6.03E-02	5.25E-02
			Niobium (Nb)	7440--03-1	1.20E-05	1.04E-05
			Nickel (Ni)	7440-02-0	4.47E-05	3.88E-05
			Phosphorus (P)	7723-14-0	1.18E-03	1.03E-03
			Lead (Pb)	7439-92-1	3.70E-05	3.22E-05
			Rubidium (Rb)	7440-17-7	1.58E-04	1.38E-04
			Sulphur (S)	7704-34-9	1.02E-02	8.85E-03
			Antimony (Sb)	7440-36-0	1.90E-05	1.65E-05
			Scandium (Sc)	7440-20-2	3.19E-05	2.77E-05
			Selenium (Se)	7782-49-2	7.27E-07	6.32E-07
			Tin (Sn)	7440-31-5	1.92E-05	1.67E-05
			Strontium (Sr)	7440-24-6	5.01E-04	4.36E-04
			Tantalum (Ta)	7440-25-7	1.95E-06	1.70E-06
			Terbium (Tb)	7440-27-9	1.28E-06	1.11E-06
			Tellurium (Te)	13494-80-9	4.23E-07	3.68E-07
			Titanium (Ti)	7440-32-6	3.54E-03	3.08E-03
			Thallium (Tl)	7440-28-0	2.11E-06	1.83E-06
			Uranium (U)	7440-61-1	2.95E-06	2.56E-06
			Vanadium (v)	7440-62-2	2.99E-04	2.60E-04
			Tungsten (W)	7440-33-7	6.29E-05	5.47E-05
			Yttrium (Y)	7440-65-5	3.16E-05	2.75E-05
			Ytterbium (Yb)	7440-64-4	3.65E-06	3.17E-06
			Zinc (Zn)	7440-66-6	3.64E-04	3.16E-04
			Zirconium (Zr)	7440-67-7	1.98E-04	1.72E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.31E+00	1.14E+00
			Aluminum Oxide (Al2O3)	1344-28-1	3.11E-01	2.71E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.36E-01	1.19E-01
			Magnesium Oxide (MgO)	1309-48-4	5.49E-02	4.77E-02
			Calcium Oxide (CaO)	1305-78-8	9.41E-02	8.19E-02
			Sodium Oxide (Na2O)	1313-59-3	7.18E-02	6.25E-02
			Potassium Oxide (K2O)	12136-45-7	4.09E-02	3.56E-02
			Titanium dioxide (TiO2)	13463-67-7	5.23E-03	4.55E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.53E-03	2.20E-03
			Manganese Oxide (MnO)	1344-43-0	6.23E-04	5.42E-04
			Chromium Oxide (Cr2O3)	1308-38-9	5.74E-04	4.99E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	4.81E-04	4.18E-04
			Chalcopyrite (CuFeS2)	1308-56-1	5.33E-03	4.63E-03
			Bornite (Cu5FeS4)	1308-82-3	1.92E-04	1.67E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.48E-04	1.29E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	5.97E-05	5.19E-05
			Cuprite (CU_2O)	1317-39-1	1.04E-04	9.03E-05
			Galena (PbS)	1314-87-0	4.20E-04	3.65E-04
			Sphalerite (ZnS)	1314-98-3	8.62E-04	7.49E-04
			Pyrite (Fe, S2)	1309-36-0	1.59E-02	1.39E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.31E-02	1.14E-02
			Arsenopyrite (FeAsS)	1303-18-0	5.01E-04	4.36E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	6.10E-03	5.31E-03
			Quartz	14808-60-7	8.40E-02	7.31E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	8.58E-01	7.46E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.06E-02	5.27E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.46E-01	2.14E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.64E-02	8.38E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.87E-02	1.62E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.16E-01	1.01E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.49E-02	3.04E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	4.26E-04	3.70E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	5.12E-03	4.46E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.24E-03	1.08E-03
			Calcite (CaCO3)	1317-65-3	2.27E-02	1.97E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.01E-04	3.49E-04
			Titanite (CaTiSiO5)	[TITAN]	5.98E-03	5.20E-03
			Apatite (Ca5(PO4)3)	1306-05-4	5.56E-03	4.83E-03
			Mica	12001-26-2	2.22E-01	1.93E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.10E-01	9.55E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.97E-02	7.80E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.96E-02	6.05E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.43E-01	2.11E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.29E-01	4.60E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.97E-01	1.72E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.89E-02	2.51E-02
			Sillimanite (Al2SiO5)	12141-45-6	9.14E-03	7.94E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S4	Secondary Crusher Baghouse	Appendix C - Table C-2 Procedure for Preparing an Emission Summary and Dispersion Modelling Report	TSP	[PM]	5.56E-02	5.56E-02
			PM_{10}	[PM10]	2.67E-02	2.67E-02
			$PM_{2.5}$	[PM2.5]	5.56E-03	5.56E-03
			Silver (Ag)	7440-22-4	1.08E-07	1.08E-07
			Aluminum (Al)	7429-90-5	4.20E-03	4.20E-03
			Arsenic (As)	7440-38-2	4.59E-06	4.59E-06
			Gold (Au)	7440-57-5	2.88E-08	2.88E-08
			Boron (B)	7440-42-8	6.35E-06	6.35E-06
			Barium (Ba)	7440-39-3	2.09E-05	2.09E-05
			Beryllium (Be)	7440-41-7	6.64E-08	6.64E-08
			Bismuth (Bi)	7440-69-9	1.83E-07	1.83E-07
			Carbon (C)	7440-44-0	7.79E-05	7.79E-05
			Calcium (Ca)	7440-70-2	1.59E-03	1.59E-03
			Cadmium (Cd)	7440-43-9	3.50E-07	3.50E-07
			Cerium (Ce)	7440-45-1	4.04E-06	4.04E-06
			Cobalt (Co)	7440-48-4	1.67E-06	1.67E-06
			Chromium (Cr)	7440-47-3	5.32E-06	5.32E-06
			Cesium (Cs)	7440-46-2	1.89E-07	1.89E-07
			Copper (Cu)	7440-50-8	3.09E-05	3.09E-05
			Iron (Fe)	7439-89-6	2.61E-03	2.61E-03
			Gallium (Ga)	7440-55-3	1.16E-06	1.16E-06
			Hafnium (Hf)	7440-58-6	2.37E-07	2.37E-07
			Mercury (Hg)	7439-97-6	1.39E-09	1.39E-09
			Indium (In)	7440-74-6	9.57E-10	9.57E-10
			Potassium (K)	7440-09-7	8.81E-04	8.81E-04
			Lanthanum (La)	7439-91-0	1.40E-06	1.40E-06
			Lithium (Li)	7439-93-2	1.43E-06	1.43E-06
			Lutetium (Lu)	7439-94-3	1.48E-08	1.48E-08
			Magnesium (Mg)	7439-95-4	7.48E-04	7.48E-04
			Manganese (Mn)	7439-96-5	1.30E-05	1.30E-05
			Molybdenum (Mo)	7439-98-7	4.17E-07	4.17E-07
			Sodium (Na)	7440-23-5	1.61E-03	1.61E-03
			Niobium (Nb)	7440--03-1	3.20E-07	3.20E-07
			Nickel (Ni)	7440-02-0	1.43E-06	1.43E-06
			Phosphorus (P)	7723-14-0	3.15E-05	3.15E-05
			Lead (Pb)	7439-92-1	9.91E-07	9.91E-07
			Rubidium (Rb)	7440-17-7	4.23E-06	4.23E-06
			Sulphur (S)	7704-34-9	2.72E-04	2.72E-04
			Antimony (Sb)	7440-36-0	5.07E-07	5.07E-07
			Scandium (Sc)	7440-20-2	8.52E-07	8.52E-07
			Selenium (Se)	7782-49-2	1.94E-08	1.94E-08
			Tin (Sn)	7440-31-5	5.14E-07	5.14E-07
			Strontium (Sr)	7440-24-6	1.34E-05	1.34E-05
			Tantalum (Ta)	7440-25-7	5.23E-08	5.23E-08
			Terbium (Tb)	7440-27-9	3.43E-08	3.43E-08
			Tellurium (Te)	13494-80-9	1.13E-08	1.13E-08
			Titanium (Ti)	7440-32-6	1.14E-04	1.14E-04
			Thallium (Tl)	7440-28-0	5.63E-08	5.63E-08
			Uranium (U)	7440-61-1	7.88E-08	7.88E-08
			Vanadium (v)	7440-62-2	7.99E-06	7.99E-06
			Tungsten (W)	7440-33-7	1.68E-06	1.68E-06
			Yttrium (Y)	7440-65-5	8.46E-07	8.46E-07
			Ytterbium (Yb)	7440-64-4	9.76E-08	9.76E-08
			Zinc (Zn)	7440-66-6	9.73E-06	9.73E-06
			Zirconium (Zr)	7440-67-7	5.30E-06	5.30E-06
			Silicon Dioxide (SiO2)	7631-86-9	3.49E-02	3.49E-02
			Aluminum Oxide (Al2O3)	1344-28-1	8.33E-03	8.33E-03
			Iron Oxide (Fe2O3)	1309-37-1	3.65E-03	3.65E-03
			Magnesium Oxide (MgO)	1309-48-4	1.47E-03	1.47E-03
			Calcium Oxide (CaO)	1305-78-8	2.52E-03	2.52E-03
			Sodium Oxide (Na2O)	1313-59-3	1.92E-03	1.92E-03
			Potassium Oxide (K2O)	12136-45-7	1.09E-03	1.09E-03
			Titanium dioxide (TiO2)	13463-67-7	1.68E-04	1.68E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.77E-05	6.77E-05
			Manganese Oxide (MnO)	1344-43-0	2.00E-05	2.00E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.53E-05	1.53E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.29E-05	1.29E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.43E-04	1.43E-04
			Bornite (Cu5FeS4)	1308-82-3	5.14E-06	5.14E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.96E-06	3.96E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.60E-06	1.60E-06
			Cuprite (CU_2O)	1317-39-1	2.78E-06	2.78E-06
			Galena (PbS)	1314-87-0	1.12E-05	1.12E-05
			Sphalerite (ZnS)	1314-98-3	2.31E-05	2.31E-05
			Pyrite (Fe, S2)	1309-36-0	4.26E-04	4.26E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.51E-04	3.51E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.34E-05	1.34E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.96E-04	1.96E-04
			Quartz	14808-60-7	2.70E-03	2.70E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.30E-02	2.30E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.62E-03	1.62E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.57E-03	6.57E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.58E-03	2.58E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.00E-04	6.00E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.10E-03	3.10E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.35E-04	9.35E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.37E-05	1.37E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.37E-04	1.37E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.32E-05	3.32E-05
			Calcite (CaCO3)	1317-65-3	6.08E-04	6.08E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.29E-05	1.29E-05
			Titanite (CaTiSiO5)	[TITAN]	1.92E-04	1.92E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.49E-04	1.49E-04
			Mica	12001-26-2	5.95E-03	5.95E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.94E-03	2.94E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.40E-03	2.40E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.86E-03	1.86E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.49E-03	6.49E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.42E-02	1.42E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	5.28E-03	5.28E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.72E-04	7.72E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.44E-04	2.44E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S5	Secondary Crusher Screen Baghouse	Appendix C - Table C-2 Procedure for Preparing an Emission Summary and Dispersion Modelling Report	TSP	[PM]	6.39E-02	5.56E-02
			PM_{10}	[PM10]	3.07E-02	2.67E-02
			$PM_{2.5}$	[PM2.5]	6.39E-03	5.56E-03
			Silver (Ag)	7440-22-4	1.24E-07	1.08E-07
			Aluminum (Al)	7429-90-5	4.83E-03	4.20E-03
			Arsenic (As)	7440-38-2	5.28E-06	4.59E-06
			Gold (Au)	7440-57-5	3.32E-08	2.88E-08
			Boron (B)	7440-42-8	7.30E-06	6.35E-06
			Barium (Ba)	7440-39-3	2.40E-05	2.09E-05
			Beryllium (Be)	7440-41-7	7.63E-08	6.64E-08
			Bismuth (Bi)	7440-69-9	2.11E-07	1.83E-07
			Carbon (C)	7440-44-0	8.96E-05	7.79E-05
			Calcium (Ca)	7440-70-2	1.83E-03	1.59E-03
			Cadmium (Cd)	7440-43-9	4.03E-07	3.50E-07
			Cerium (Ce)	7440-45-1	4.64E-06	4.04E-06
			Cobalt (Co)	7440-48-4	1.92E-06	1.67E-06
			Chromium (Cr)	7440-47-3	6.12E-06	5.32E-06
			Cesium (Cs)	7440-46-2	2.18E-07	1.89E-07
			Copper (Cu)	7440-50-8	3.55E-05	3.09E-05
			Iron (Fe)	7439-89-6	3.00E-03	2.61E-03
			Gallium (Ga)	7440-55-3	1.33E-06	1.16E-06
			Hafnium (Hf)	7440-58-6	2.73E-07	2.37E-07
			Mercury (Hg)	7439-97-6	1.60E-09	1.39E-09
			Indium (In)	7440-74-6	1.10E-09	9.57E-10
			Potassium (K)	7440-09-7	1.01E-03	8.81E-04
			Lanthanum (La)	7439-91-0	1.61E-06	1.40E-06
			Lithium (Li)	7439-93-2	1.65E-06	1.43E-06
			Lutetium (Lu)	7439-94-3	1.70E-08	1.48E-08
			Magnesium (Mg)	7439-95-4	8.60E-04	7.48E-04
			Manganese (Mn)	7439-96-5	1.49E-05	1.30E-05
			Molybdenum (Mo)	7439-98-7	4.79E-07	4.17E-07
			Sodium (Na)	7440-23-5	1.86E-03	1.61E-03
			Niobium (Nb)	7440--03-1	3.68E-07	3.20E-07
			Nickel (Ni)	7440-02-0	1.65E-06	1.43E-06
			Phosphorus (P)	7723-14-0	3.63E-05	3.15E-05
			Lead (Pb)	7439-92-1	1.14E-06	9.91E-07
			Rubidium (Rb)	7440-17-7	4.87E-06	4.23E-06
			Sulphur (S)	7704-34-9	3.13E-04	2.72E-04
			Antimony (Sb)	7440-36-0	5.83E-07	5.07E-07
			Scandium (Sc)	7440-20-2	9.80E-07	8.52E-07
			Selenium (Se)	7782-49-2	2.24E-08	1.94E-08
			Tin (Sn)	7440-31-5	5.91E-07	5.14E-07
			Strontium (Sr)	7440-24-6	1.54E-05	1.34E-05
			Tantalum (Ta)	7440-25-7	6.01E-08	5.23E-08
			Terbium (Tb)	7440-27-9	3.94E-08	3.43E-08
			Tellurium (Te)	13494-80-9	1.30E-08	1.13E-08
			Titanium (Ti)	7440-32-6	1.31E-04	1.14E-04
			Thallium (Tl)	7440-28-0	6.48E-08	5.63E-08
			Uranium (U)	7440-61-1	9.07E-08	7.88E-08
			Vanadium (v)	7440-62-2	9.19E-06	7.99E-06
			Tungsten (W)	7440-33-7	1.94E-06	1.68E-06
			Yttrium (Y)	7440-65-5	9.73E-07	8.46E-07
			Ytterbium (Yb)	7440-64-4	1.12E-07	9.76E-08
			Zinc (Zn)	7440-66-6	1.12E-05	9.73E-06
			Zirconium (Zr)	7440-67-7	6.09E-06	5.30E-06
			Silicon Dioxide (SiO2)	7631-86-9	4.02E-02	3.49E-02
			Aluminum Oxide (Al2O3)	1344-28-1	9.58E-03	8.33E-03
			Iron Oxide (Fe2O3)	1309-37-1	4.20E-03	3.65E-03
			Magnesium Oxide (MgO)	1309-48-4	1.69E-03	1.47E-03
			Calcium Oxide (CaO)	1305-78-8	2.90E-03	2.52E-03
			Sodium Oxide (Na2O)	1313-59-3	2.21E-03	1.92E-03
			Potassium Oxide (K2O)	12136-45-7	1.26E-03	1.09E-03
			Titanium dioxide (TiO2)	13463-67-7	1.93E-04	1.68E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.79E-05	6.77E-05
			Manganese Oxide (MnO)	1344-43-0	2.30E-05	2.00E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.77E-05	1.53E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.48E-05	1.29E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.64E-04	1.43E-04
			Bornite (Cu5FeS4)	1308-82-3	5.91E-06	5.14E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.55E-06	3.96E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.84E-06	1.60E-06
			Cuprite (CU_2O)	1317-39-1	3.19E-06	2.78E-06
			Galena (PbS)	1314-87-0	1.29E-05	1.12E-05
			Sphalerite (ZnS)	1314-98-3	2.65E-05	2.31E-05
			Pyrite (Fe, S2)	1309-36-0	4.90E-04	4.26E-04
			Pyrrhotite (Fe7S8)	12305-96-3	4.04E-04	3.51E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.54E-05	1.34E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.25E-04	1.96E-04
			Quartz	14808-60-7	3.10E-03	2.70E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.64E-02	2.30E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.87E-03	1.62E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.56E-03	6.57E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.96E-03	2.58E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.89E-04	6.00E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.57E-03	3.10E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.07E-03	9.35E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.57E-05	1.37E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.58E-04	1.37E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.82E-05	3.32E-05
			Calcite (CaCO3)	1317-65-3	6.99E-04	6.08E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.48E-05	1.29E-05
			Titanite (CaTiSiO5)	[TITAN]	2.21E-04	1.92E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.71E-04	1.49E-04
			Mica	12001-26-2	6.84E-03	5.95E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.38E-03	2.94E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.76E-03	2.40E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.14E-03	1.86E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	7.47E-03	6.49E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.63E-02	1.42E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	6.08E-03	5.28E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	8.88E-04	7.72E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.81E-04	2.44E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S6	Crushed Ore Stockpile	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.98E-01	5.20E-01
			PM_{10}	[PM10]	2.83E-01	2.46E-01
			$PM_{2.5}$	[PM2.5]	4.28E-02	3.72E-02
			Silver (Ag)	7440-22-4	1.16E-06	1.01E-06
			Aluminum (Al)	7429-90-5	4.51E-02	3.93E-02
			Arsenic (As)	7440-38-2	4.94E-05	4.30E-05
			Gold (Au)	7440-57-5	3.10E-07	2.70E-07
			Boron (B)	7440-42-8	6.83E-05	5.94E-05
			Barium (Ba)	7440-39-3	2.25E-04	1.95E-04
			Beryllium (Be)	7440-41-7	7.14E-07	6.21E-07
			Bismuth (Bi)	7440-69-9	1.97E-06	1.71E-06
			Carbon (C)	7440-44-0	8.38E-04	7.29E-04
			Calcium (Ca)	7440-70-2	1.71E-02	1.49E-02
			Cadmium (Cd)	7440-43-9	3.76E-06	3.27E-06
			Cerium (Ce)	7440-45-1	4.34E-05	3.77E-05
			Cobalt (Co)	7440-48-4	1.79E-05	1.56E-05
			Chromium (Cr)	7440-47-3	5.72E-05	4.98E-05
			Cesium (Cs)	7440-46-2	2.04E-06	1.77E-06
			Copper (Cu)	7440-50-8	3.32E-04	2.89E-04
			Iron (Fe)	7439-89-6	2.80E-02	2.44E-02
			Gallium (Ga)	7440-55-3	1.25E-05	1.08E-05
			Hafnium (Hf)	7440-58-6	2.55E-06	2.22E-06
			Mercury (Hg)	7439-97-6	1.49E-08	1.30E-08
			Indium (In)	7440-74-6	1.03E-08	8.95E-09
			Potassium (K)	7440-09-7	9.47E-03	8.24E-03
			Lanthanum (La)	7439-91-0	1.50E-05	1.31E-05
			Lithium (Li)	7439-93-2	1.54E-05	1.34E-05
			Lutetium (Lu)	7439-94-3	1.59E-07	1.38E-07
			Magnesium (Mg)	7439-95-4	8.04E-03	6.99E-03
			Manganese (Mn)	7439-96-5	1.37E-04	1.19E-04
			Molybdenum (Mo)	7439-98-7	4.48E-06	3.90E-06
			Sodium (Na)	7440-23-5	1.74E-02	1.51E-02
			Niobium (Nb)	7440--03-1	3.44E-06	2.99E-06
			Nickel (Ni)	7440-02-0	1.52E-05	1.32E-05
			Phosphorus (P)	7723-14-0	3.39E-04	2.95E-04
			Lead (Pb)	7439-92-1	1.07E-05	9.26E-06
			Rubidium (Rb)	7440-17-7	4.55E-05	3.96E-05
			Sulphur (S)	7704-34-9	2.93E-03	2.55E-03
			Antimony (Sb)	7440-36-0	5.46E-06	4.74E-06
			Scandium (Sc)	7440-20-2	9.17E-06	7.97E-06
			Selenium (Se)	7782-49-2	2.09E-07	1.82E-07
			Tin (Sn)	7440-31-5	5.53E-06	4.81E-06
			Strontium (Sr)	7440-24-6	1.44E-04	1.25E-04
			Tantalum (Ta)	7440-25-7	5.62E-07	4.89E-07
			Terbium (Tb)	7440-27-9	3.69E-07	3.20E-07
			Tellurium (Te)	13494-80-9	1.22E-07	1.06E-07
			Titanium (Ti)	7440-32-6	1.21E-03	1.05E-03
			Thallium (Tl)	7440-28-0	6.06E-07	5.27E-07
			Uranium (U)	7440-61-1	8.48E-07	7.37E-07
			Vanadium (v)	7440-62-2	8.59E-05	7.47E-05
			Tungsten (W)	7440-33-7	1.81E-05	1.58E-05
			Yttrium (Y)	7440-65-5	9.10E-06	7.91E-06
			Ytterbium (Yb)	7440-64-4	1.05E-06	9.13E-07
			Zinc (Zn)	7440-66-6	1.05E-04	9.10E-05
			Zirconium (Zr)	7440-67-7	5.70E-05	4.95E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.76E-01	3.27E-01
			Aluminum Oxide (Al2O3)	1344-28-1	8.96E-02	7.79E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.93E-02	3.42E-02
			Magnesium Oxide (MgO)	1309-48-4	1.58E-02	1.37E-02
			Calcium Oxide (CaO)	1305-78-8	2.71E-02	2.36E-02
			Sodium Oxide (Na2O)	1313-59-3	2.07E-02	1.80E-02
			Potassium Oxide (K2O)	12136-45-7	1.18E-02	1.02E-02
			Titanium dioxide (TiO2)	13463-67-7	1.78E-03	1.55E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.29E-04	6.34E-04
			Manganese Oxide (MnO)	1344-43-0	2.12E-04	1.84E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.65E-04	1.44E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.38E-04	1.20E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.53E-03	1.33E-03
			Bornite (Cu5FeS4)	1308-82-3	5.53E-05	4.81E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.26E-05	3.70E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.72E-05	1.49E-05
			Cuprite (CU_2O)	1317-39-1	2.99E-05	2.60E-05
			Galena (PbS)	1314-87-0	1.21E-04	1.05E-04
			Sphalerite (ZnS)	1314-98-3	2.48E-04	2.16E-04
			Pyrite (Fe, S2)	1309-36-0	4.58E-03	3.99E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.78E-03	3.28E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.44E-04	1.25E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.08E-03	1.81E-03
			Quartz	14808-60-7	2.86E-02	2.49E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.47E-01	2.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.74E-02	1.52E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.07E-02	6.15E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.77E-02	2.41E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.35E-03	5.53E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.34E-02	2.90E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.01E-02	8.74E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.45E-04	1.26E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.47E-03	1.28E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.57E-04	3.11E-04
			Calcite (CaCO3)	1317-65-3	6.54E-03	5.68E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.36E-04	1.19E-04
			Titanite (CaTiSiO5)	[TITAN]	2.04E-03	1.77E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.60E-03	1.39E-03
			Mica	12001-26-2	6.40E-02	5.57E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.16E-02	2.75E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.58E-02	2.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.00E-02	1.74E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.99E-02	6.07E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.52E-01	1.33E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.68E-02	4.94E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	8.31E-03	7.22E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.63E-03	2.29E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S7	Crushed Ore Stockpile Reclaim Tunnel	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.98E-01	5.20E-01
			PM_{10}	[PM10]	2.83E-01	2.46E-01
			$PM_{2.5}$	[PM2.5]	4.28E-02	3.72E-02
			Silver (Ag)	7440-22-4	1.16E-06	1.01E-06
			Aluminum (Al)	7429-90-5	4.51E-02	3.93E-02
			Arsenic (As)	7440-38-2	4.94E-05	4.30E-05
			Gold (Au)	7440-57-5	3.10E-07	2.70E-07
			Boron (B)	7440-42-8	6.83E-05	5.94E-05
			Barium (Ba)	7440-39-3	2.25E-04	1.95E-04
			Beryllium (Be)	7440-41-7	7.14E-07	6.21E-07
			Bismuth (Bi)	7440-69-9	1.97E-06	1.71E-06
			Carbon (C)	7440-44-0	8.38E-04	7.29E-04
			Calcium (Ca)	7440-70-2	1.71E-02	1.49E-02
			Cadmium (Cd)	7440-43-9	3.76E-06	3.27E-06
			Cerium (Ce)	7440-45-1	4.34E-05	3.77E-05
			Cobalt (Co)	7440-48-4	1.79E-05	1.56E-05
			Chromium (Cr)	7440-47-3	5.72E-05	4.98E-05
			Cesium (Cs)	7440-46-2	2.04E-06	1.77E-06
			Copper (Cu)	7440-50-8	3.32E-04	2.89E-04
			Iron (Fe)	7439-89-6	2.80E-02	2.44E-02
			Gallium (Ga)	7440-55-3	1.25E-05	1.08E-05
			Hafnium (Hf)	7440-58-6	2.55E-06	2.22E-06
			Mercury (Hg)	7439-97-6	1.49E-08	1.30E-08
			Indium (In)	7440-74-6	1.03E-08	8.95E-09
			Potassium (K)	7440-09-7	9.47E-03	8.24E-03
			Lanthanum (La)	7439-91-0	1.50E-05	1.31E-05
			Lithium (Li)	7439-93-2	1.54E-05	1.34E-05
			Lutetium (Lu)	7439-94-3	1.59E-07	1.38E-07
			Magnesium (Mg)	7439-95-4	8.04E-03	6.99E-03
			Manganese (Mn)	7439-96-5	1.37E-04	1.19E-04
			Molybdenum (Mo)	7439-98-7	4.48E-06	3.90E-06
			Sodium (Na)	7440-23-5	1.74E-02	1.51E-02
			Niobium (Nb)	7440--03-1	3.44E-06	2.99E-06
			Nickel (Ni)	7440-02-0	1.52E-05	1.32E-05
			Phosphorus (P)	7723-14-0	3.39E-04	2.95E-04
			Lead (Pb)	7439-92-1	1.07E-05	9.26E-06
			Rubidium (Rb)	7440-17-7	4.55E-05	3.96E-05
			Sulphur (S)	7704-34-9	2.93E-03	2.55E-03
			Antimony (Sb)	7440-36-0	5.46E-06	4.74E-06
			Scandium (Sc)	7440-20-2	9.17E-06	7.97E-06
			Selenium (Se)	7782-49-2	2.09E-07	1.82E-07
			Tin (Sn)	7440-31-5	5.53E-06	4.81E-06
			Strontium (Sr)	7440-24-6	1.44E-04	1.25E-04
			Tantalum (Ta)	7440-25-7	5.62E-07	4.89E-07
			Terbium (Tb)	7440-27-9	3.69E-07	3.20E-07
			Tellurium (Te)	13494-80-9	1.22E-07	1.06E-07
			Titanium (Ti)	7440-32-6	1.21E-03	1.05E-03
			Thallium (Tl)	7440-28-0	6.06E-07	5.27E-07
			Uranium (U)	7440-61-1	8.48E-07	7.37E-07
			Vanadium (v)	7440-62-2	8.59E-05	7.47E-05
			Tungsten (W)	7440-33-7	1.81E-05	1.58E-05
			Yttrium (Y)	7440-65-5	9.10E-06	7.91E-06
			Ytterbium (Yb)	7440-64-4	1.05E-06	9.13E-07
			Zinc (Zn)	7440-66-6	1.05E-04	9.10E-05
			Zirconium (Zr)	7440-67-7	5.70E-05	4.95E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.76E-01	3.27E-01
			Aluminum Oxide (Al2O3)	1344-28-1	8.96E-02	7.79E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.93E-02	3.42E-02
			Magnesium Oxide (MgO)	1309-48-4	1.58E-02	1.37E-02
			Calcium Oxide (CaO)	1305-78-8	2.71E-02	2.36E-02
			Sodium Oxide (Na2O)	1313-59-3	2.07E-02	1.80E-02
			Potassium Oxide (K2O)	12136-45-7	1.18E-02	1.02E-02
			Titanium dioxide (TiO2)	13463-67-7	1.78E-03	1.55E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.29E-04	6.34E-04
			Manganese Oxide (MnO)	1344-43-0	2.12E-04	1.84E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.65E-04	1.44E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.38E-04	1.20E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.53E-03	1.33E-03
			Bornite (Cu5FeS4)	1308-82-3	5.53E-05	4.81E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.26E-05	3.70E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.72E-05	1.49E-05
			Cuprite (CU_2O)	1317-39-1	2.99E-05	2.60E-05
			Galena (PbS)	1314-87-0	1.21E-04	1.05E-04
			Sphalerite (ZnS)	1314-98-3	2.48E-04	2.16E-04
			Pyrite (Fe, S2)	1309-36-0	4.58E-03	3.99E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.78E-03	3.28E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.44E-04	1.25E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.08E-03	1.81E-03
			Quartz	14808-60-7	2.86E-02	2.49E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.47E-01	2.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.74E-02	1.52E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.07E-02	6.15E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.77E-02	2.41E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.35E-03	5.53E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.34E-02	2.90E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.01E-02	8.74E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.45E-04	1.26E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.47E-03	1.28E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.57E-04	3.11E-04
			Calcite (CaCO3)	1317-65-3	6.54E-03	5.68E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.36E-04	1.19E-04
			Titanite (CaTiSiO5)	[TITAN]	2.04E-03	1.77E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.60E-03	1.39E-03
			Mica	12001-26-2	6.40E-02	5.57E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.16E-02	2.75E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.58E-02	2.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.00E-02	1.74E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.99E-02	6.07E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.52E-01	1.33E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.68E-02	4.94E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	8.31E-03	7.22E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.63E-03	2.29E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S8	HPGR Building	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	2.08E+00	1.81E+00
			PM_{10}	[PM10]	6.92E-01	6.02E-01
			$PM_{2.5}$	[PM2.5]	1.28E-01	1.11E-01
			Silver (Ag)	7440-22-4	4.03E-06	3.50E-06
			Aluminum (Al)	7429-90-5	1.57E-01	1.36E-01
			Arsenic (As)	7440-38-2	1.72E-04	1.49E-04
			Gold (Au)	7440-57-5	1.08E-06	9.37E-07
			Boron (B)	7440-42-8	2.37E-04	2.06E-04
			Barium (Ba)	7440-39-3	7.81E-04	6.79E-04
			Beryllium (Be)	7440-41-7	2.48E-06	2.16E-06
			Bismuth (Bi)	7440-69-9	6.84E-06	5.95E-06
			Carbon (C)	7440-44-0	2.91E-03	2.53E-03
			Calcium (Ca)	7440-70-2	5.95E-02	5.17E-02
			Cadmium (Cd)	7440-43-9	1.31E-05	1.14E-05
			Cerium (Ce)	7440-45-1	1.51E-04	1.31E-04
			Cobalt (Co)	7440-48-4	6.22E-05	5.41E-05
			Chromium (Cr)	7440-47-3	1.99E-04	1.73E-04
			Cesium (Cs)	7440-46-2	7.08E-06	6.16E-06
			Copper (Cu)	7440-50-8	1.15E-03	1.00E-03
			Iron (Fe)	7439-89-6	9.74E-02	8.47E-02
			Gallium (Ga)	7440-55-3	4.33E-05	3.76E-05
			Hafnium (Hf)	7440-58-6	8.86E-06	7.70E-06
			Mercury (Hg)	7439-97-6	5.19E-08	4.51E-08
			Indium (In)	7440-74-6	3.58E-08	3.11E-08
			Potassium (K)	7440-09-7	3.29E-02	2.86E-02
			Lanthanum (La)	7439-91-0	5.22E-05	4.54E-05
			Lithium (Li)	7439-93-2	5.35E-05	4.65E-05
			Lutetium (Lu)	7439-94-3	5.52E-07	4.80E-07
			Magnesium (Mg)	7439-95-4	2.79E-02	2.43E-02
			Manganese (Mn)	7439-96-5	3.36E-04	2.92E-04
			Molybdenum (Mo)	7439-98-7	1.56E-05	1.36E-05
			Sodium (Na)	7440-23-5	6.03E-02	5.25E-02
			Niobium (Nb)	7440--03-1	1.20E-05	1.04E-05
			Nickel (Ni)	7440-02-0	3.72E-05	3.24E-05
			Phosphorus (P)	7723-14-0	1.18E-03	1.03E-03
			Lead (Pb)	7439-92-1	3.70E-05	3.22E-05
			Rubidium (Rb)	7440-17-7	1.58E-04	1.38E-04
			Sulphur (S)	7704-34-9	1.02E-02	8.85E-03
			Antimony (Sb)	7440-36-0	1.90E-05	1.65E-05
			Scandium (Sc)	7440-20-2	3.19E-05	2.77E-05
			Selenium (Se)	7782-49-2	7.27E-07	6.32E-07
			Tin (Sn)	7440-31-5	1.92E-05	1.67E-05
			Strontium (Sr)	7440-24-6	5.01E-04	4.36E-04
			Tantalum (Ta)	7440-25-7	1.95E-06	1.70E-06
			Terbium (Tb)	7440-27-9	1.28E-06	1.11E-06
			Tellurium (Te)	13494-80-9	4.23E-07	3.68E-07
			Titanium (Ti)	7440-32-6	2.95E-03	2.57E-03
			Thallium (Tl)	7440-28-0	2.11E-06	1.83E-06
			Uranium (U)	7440-61-1	2.95E-06	2.56E-06
			Vanadium (v)	7440-62-2	2.99E-04	2.60E-04
			Tungsten (W)	7440-33-7	6.29E-05	5.47E-05
			Yttrium (Y)	7440-65-5	3.16E-05	2.75E-05
			Ytterbium (Yb)	7440-64-4	3.65E-06	3.17E-06
			Zinc (Zn)	7440-66-6	3.64E-04	3.16E-04
			Zirconium (Zr)	7440-67-7	1.98E-04	1.72E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.31E+00	1.14E+00
			Aluminum Oxide (Al2O3)	1344-28-1	3.11E-01	2.71E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.36E-01	1.19E-01
			Magnesium Oxide (MgO)	1309-48-4	5.49E-02	4.77E-02
			Calcium Oxide (CaO)	1305-78-8	9.41E-02	8.19E-02
			Sodium Oxide (Na2O)	1313-59-3	7.18E-02	6.25E-02
			Potassium Oxide (K2O)	12136-45-7	4.09E-02	3.56E-02
			Titanium dioxide (TiO2)	13463-67-7	4.36E-03	3.79E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.53E-03	2.20E-03
			Manganese Oxide (MnO)	1344-43-0	5.20E-04	4.52E-04
			Chromium Oxide (Cr2O3)	1308-38-9	5.74E-04	4.99E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	4.81E-04	4.18E-04
			Chalcopyrite (CuFeS2)	1308-56-1	5.33E-03	4.63E-03
			Bornite (Cu5FeS4)	1308-82-3	1.92E-04	1.67E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.48E-04	1.29E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	5.97E-05	5.19E-05
			Cuprite (CU_2O)	1317-39-1	1.04E-04	9.03E-05
			Galena (PbS)	1314-87-0	4.20E-04	3.65E-04
			Sphalerite (ZnS)	1314-98-3	8.62E-04	7.49E-04
			Pyrite (Fe, S2)	1309-36-0	1.59E-02	1.39E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.31E-02	1.14E-02
			Arsenopyrite (FeAsS)	1303-18-0	5.01E-04	4.36E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	5.09E-03	4.42E-03
			Quartz	14808-60-7	7.00E-02	6.09E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	8.58E-01	7.46E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.06E-02	5.27E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.46E-01	2.14E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.64E-02	8.38E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.56E-02	1.35E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.16E-01	1.01E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.49E-02	3.04E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.55E-04	3.09E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	5.12E-03	4.46E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.24E-03	1.08E-03
			Calcite (CaCO3)	1317-65-3	2.27E-02	1.97E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.34E-04	2.91E-04
			Titanite (CaTiSiO5)	[TITAN]	4.99E-03	4.34E-03
			Apatite (Ca5(PO4)3)	1306-05-4	5.56E-03	4.83E-03
			Mica	12001-26-2	2.22E-01	1.93E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.10E-01	9.55E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.97E-02	7.80E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.96E-02	6.05E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.43E-01	2.11E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.29E-01	4.60E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.97E-01	1.72E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.89E-02	2.51E-02
			Sillimanite (Al2SiO5)	12141-45-6	9.14E-03	7.94E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S9	HPGR Baghouse	Appendix C - Table C-2 Procedure for Preparing an Emission Summary and Dispersion Modelling Report	TSP	[PM]	5.56E-02	5.56E-02
			PM_{10}	[PM10]	2.67E-02	2.67E-02
			$PM_{2.5}$	[PM2.5]	5.56E-03	5.56E-03
			Silver (Ag)	7440-22-4	1.08E-07	1.08E-07
			Aluminum (Al)	7429-90-5	4.20E-03	4.20E-03
			Arsenic (As)	7440-38-2	4.59E-06	4.59E-06
			Gold (Au)	7440-57-5	2.88E-08	2.88E-08
			Boron (B)	7440-42-8	6.35E-06	6.35E-06
			Barium (Ba)	7440-39-3	2.09E-05	2.09E-05
			Beryllium (Be)	7440-41-7	6.64E-08	6.64E-08
			Bismuth (Bi)	7440-69-9	1.83E-07	1.83E-07
			Carbon (C)	7440-44-0	7.79E-05	7.79E-05
			Calcium (Ca)	7440-70-2	1.59E-03	1.59E-03
			Cadmium (Cd)	7440-43-9	3.50E-07	3.50E-07
			Cerium (Ce)	7440-45-1	4.04E-06	4.04E-06
			Cobalt (Co)	7440-48-4	1.67E-06	1.67E-06
			Chromium (Cr)	7440-47-3	5.32E-06	5.32E-06
			Cesium (Cs)	7440-46-2	1.89E-07	1.89E-07
			Copper (Cu)	7440-50-8	3.09E-05	3.09E-05
			Iron (Fe)	7439-89-6	2.61E-03	2.61E-03
			Gallium (Ga)	7440-55-3	1.16E-06	1.16E-06
			Hafnium (Hf)	7440-58-6	2.37E-07	2.37E-07
			Mercury (Hg)	7439-97-6	1.39E-09	1.39E-09
			Indium (In)	7440-74-6	9.57E-10	9.57E-10
			Potassium (K)	7440-09-7	8.81E-04	8.81E-04
			Lanthanum (La)	7439-91-0	1.40E-06	1.40E-06
			Lithium (Li)	7439-93-2	1.43E-06	1.43E-06
			Lutetium (Lu)	7439-94-3	1.48E-08	1.48E-08
			Magnesium (Mg)	7439-95-4	7.48E-04	7.48E-04
			Manganese (Mn)	7439-96-5	1.30E-05	1.30E-05
			Molybdenum (Mo)	7439-98-7	4.17E-07	4.17E-07
			Sodium (Na)	7440-23-5	1.61E-03	1.61E-03
			Niobium (Nb)	7440--03-1	3.20E-07	3.20E-07
			Nickel (Ni)	7440-02-0	1.43E-06	1.43E-06
			Phosphorus (P)	7723-14-0	3.15E-05	3.15E-05
			Lead (Pb)	7439-92-1	9.91E-07	9.91E-07
			Rubidium (Rb)	7440-17-7	4.23E-06	4.23E-06
			Sulphur (S)	7704-34-9	2.72E-04	2.72E-04
			Antimony (Sb)	7440-36-0	5.07E-07	5.07E-07
			Scandium (Sc)	7440-20-2	8.52E-07	8.52E-07
			Selenium (Se)	7782-49-2	1.94E-08	1.94E-08
			Tin (Sn)	7440-31-5	5.14E-07	5.14E-07
			Strontium (Sr)	7440-24-6	1.34E-05	1.34E-05
			Tantalum (Ta)	7440-25-7	5.23E-08	5.23E-08
			Terbium (Tb)	7440-27-9	3.43E-08	3.43E-08
			Tellurium (Te)	13494-80-9	1.13E-08	1.13E-08
			Titanium (Ti)	7440-32-6	1.14E-04	1.14E-04
			Thallium (Tl)	7440-28-0	5.63E-08	5.63E-08
			Uranium (U)	7440-61-1	7.88E-08	7.88E-08
			Vanadium (v)	7440-62-2	7.99E-06	7.99E-06
			Tungsten (W)	7440-33-7	1.68E-06	1.68E-06
			Yttrium (Y)	7440-65-5	8.46E-07	8.46E-07
			Ytterbium (Yb)	7440-64-4	9.76E-08	9.76E-08
			Zinc (Zn)	7440-66-6	9.73E-06	9.73E-06
			Zirconium (Zr)	7440-67-7	5.30E-06	5.30E-06
			Silicon Dioxide (SiO2)	7631-86-9	3.49E-02	3.49E-02
			Aluminum Oxide (Al2O3)	1344-28-1	8.33E-03	8.33E-03
			Iron Oxide (Fe2O3)	1309-37-1	3.65E-03	3.65E-03
			Magnesium Oxide (MgO)	1309-48-4	1.47E-03	1.47E-03
			Calcium Oxide (CaO)	1305-78-8	2.52E-03	2.52E-03
			Sodium Oxide (Na2O)	1313-59-3	1.92E-03	1.92E-03
			Potassium Oxide (K2O)	12136-45-7	1.09E-03	1.09E-03
			Titanium dioxide (TiO2)	13463-67-7	1.68E-04	1.68E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.77E-05	6.77E-05
			Manganese Oxide (MnO)	1344-43-0	2.00E-05	2.00E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.53E-05	1.53E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.29E-05	1.29E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.43E-04	1.43E-04
			Bornite (Cu5FeS4)	1308-82-3	5.14E-06	5.14E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.96E-06	3.96E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.60E-06	1.60E-06
			Cuprite (CU_2O)	1317-39-1	2.78E-06	2.78E-06
			Galena (PbS)	1314-87-0	1.12E-05	1.12E-05
			Sphalerite (ZnS)	1314-98-3	2.31E-05	2.31E-05
			Pyrite (Fe, S2)	1309-36-0	4.26E-04	4.26E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.51E-04	3.51E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.34E-05	1.34E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.96E-04	1.96E-04
			Quartz	14808-60-7	2.70E-03	2.70E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.30E-02	2.30E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.62E-03	1.62E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.57E-03	6.57E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.58E-03	2.58E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.00E-04	6.00E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.10E-03	3.10E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.35E-04	9.35E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.37E-05	1.37E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.37E-04	1.37E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.32E-05	3.32E-05
			Calcite (CaCO3)	1317-65-3	6.08E-04	6.08E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.29E-05	1.29E-05
			Titanite (CaTiSiO5)	[TITAN]	1.92E-04	1.92E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.49E-04	1.49E-04
			Mica	12001-26-2	5.95E-03	5.95E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.94E-03	2.94E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.40E-03	2.40E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.86E-03	1.86E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.49E-03	6.49E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.42E-02	1.42E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	5.28E-03	5.28E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.72E-04	7.72E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.44E-04	2.44E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S10A	Mill Building - Reagents	US EPA AP-42 document Chapter 11.17 (Lime Manufacturing) Table 11.17-3 Emission Factors for Product Transfer and Conveying and Crushed Material Conveyor Transfer with Fabric Filter	Magnafloc 10	N/A	1.27E-02	1.27E-02
			Calcium Oxide	1305-78-8	9.27E-01	9.27E-01
			Potassium Amyl Xanthate (PAX)	2720-73-2	9.27E-03	9.27E-03
			Sodium sulphite	7757-83-7	6.62E-02	6.62E-02
			Zinc sulphate	7733-02-0	3.18E-03	3.18E-03
			Sodium trithiocarbonate	534-18-9	3.82E-03	3.82E-03
S10B	Mill Building Concentrate Loadout	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	2.50E-04	2.50E-04
			PM_{10}	[PM10]	1.18E-04	1.18E-04
			$PM_{2.5}$	[PM2.5]	1.79E-05	1.79E-05
			Silver (Ag)	7440-22-4	4.85E-10	4.85E-10
			Aluminum (Al)	7429-90-5	1.89E-05	1.89E-05
			Arsenic (As)	7440-38-2	2.07E-08	2.07E-08
			Gold (Au)	7440-57-5	1.30E-10	1.30E-10
			Boron (B)	7440-42-8	2.86E-08	2.86E-08
			Barium (Ba)	7440-39-3	9.42E-08	9.42E-08
			Beryllium (Be)	7440-41-7	2.99E-10	2.99E-10
			Bismuth (Bi)	7440-69-9	8.25E-10	8.25E-10
			Carbon (C)	7440-44-0	3.51E-07	3.51E-07
			Calcium (Ca)	7440-70-2	7.17E-06	7.17E-06
			Cadmium (Cd)	7440-43-9	1.58E-09	1.58E-09
			Cerium (Ce)	7440-45-1	1.82E-08	1.82E-08
			Cobalt (Co)	7440-48-4	7.50E-09	7.50E-09
			Chromium (Cr)	7440-47-3	2.40E-08	2.40E-08
			Cesium (Cs)	7440-46-2	8.53E-10	8.53E-10
			Copper (Cu)	7440-50-8	1.39E-07	1.39E-07
			Iron (Fe)	7439-89-6	1.17E-05	1.17E-05
			Gallium (Ga)	7440-55-3	5.22E-09	5.22E-09
			Hafnium (Hf)	7440-58-6	1.07E-09	1.07E-09
			Mercury (Hg)	7439-97-6	6.26E-12	6.26E-12
			Indium (In)	7440-74-6	4.31E-12	4.31E-12
			Potassium (K)	7440-09-7	3.97E-06	3.97E-06
			Lanthanum (La)	7439-91-0	6.30E-09	6.30E-09
			Lithium (Li)	7439-93-2	6.45E-09	6.45E-09
			Lutetium (Lu)	7439-94-3	6.66E-11	6.66E-11
			Magnesium (Mg)	7439-95-4	3.37E-06	3.37E-06
			Manganese (Mn)	7439-96-5	5.75E-08	5.75E-08
			Molybdenum (Mo)	7439-98-7	1.88E-09	1.88E-09
			Sodium (Na)	7440-23-5	7.27E-06	7.27E-06
			Niobium (Nb)	7440--03-1	1.44E-09	1.44E-09
			Nickel (Ni)	7440-02-0	6.37E-09	6.37E-09
			Phosphorus (P)	7723-14-0	1.42E-07	1.42E-07
			Lead (Pb)	7439-92-1	4.46E-09	4.46E-09
			Rubidium (Rb)	7440-17-7	1.91E-08	1.91E-08
			Sulphur (S)	7704-34-9	1.23E-06	1.23E-06
			Antimony (Sb)	7440-36-0	2.29E-09	2.29E-09
			Scandium (Sc)	7440-20-2	3.84E-09	3.84E-09
			Selenium (Se)	7782-49-2	8.76E-11	8.76E-11
			Tin (Sn)	7440-31-5	2.32E-09	2.32E-09
			Strontium (Sr)	7440-24-6	6.04E-08	6.04E-08
			Tantalum (Ta)	7440-25-7	2.36E-10	2.36E-10
			Terbium (Tb)	7440-27-9	1.54E-10	1.54E-10
			Tellurium (Te)	13494-80-9	5.09E-11	5.09E-11
			Titanium (Ti)	7440-32-6	5.05E-07	5.05E-07
			Thallium (Tl)	7440-28-0	2.54E-10	2.54E-10
			Uranium (U)	7440-61-1	3.55E-10	3.55E-10
			Vanadium (v)	7440-62-2	3.60E-08	3.60E-08
			Tungsten (W)	7440-33-7	7.59E-09	7.59E-09
			Yttrium (Y)	7440-65-5	3.81E-09	3.81E-09
			Ytterbium (Yb)	7440-64-4	4.40E-10	4.40E-10
			Zinc (Zn)	7440-66-6	4.39E-08	4.39E-08
			Zirconium (Zr)	7440-67-7	2.39E-08	2.39E-08
			Silicon Dioxide (SiO2)	7631-86-9	1.57E-04	1.57E-04
			Aluminum Oxide (Al2O3)	1344-28-1	3.75E-05	3.75E-05
			Iron Oxide (Fe2O3)	1309-37-1	1.65E-05	1.65E-05
			Magnesium Oxide (MgO)	1309-48-4	6.62E-06	6.62E-06
			Calcium Oxide (CaO)	1305-78-8	1.13E-05	1.13E-05
			Sodium Oxide (Na2O)	1313-59-3	8.66E-06	8.66E-06
			Potassium Oxide (K2O)	12136-45-7	4.93E-06	4.93E-06
			Titanium dioxide (TiO2)	13463-67-7	7.45E-07	7.45E-07
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.05E-07	3.05E-07
			Manganese Oxide (MnO)	1344-43-0	8.89E-08	8.89E-08
			Chromium Oxide (Cr2O3)	1308-38-9	6.91E-08	6.91E-08
			Vanadium Pentoxide (V2O5)	1314-62-1	5.80E-08	5.80E-08
			Chalcopyrite (CuFeS2)	1308-56-1	6.42E-07	6.42E-07
			Bornite (Cu5FeS4)	1308-82-3	2.32E-08	2.32E-08
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.78E-08	1.78E-08
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	7.19E-09	7.19E-09
			Cuprite (CU_2O)	1317-39-1	1.25E-08	1.25E-08
			Galena (PbS)	1314-87-0	5.06E-08	5.06E-08
			Sphalerite (ZnS)	1314-98-3	1.04E-07	1.04E-07
			Pyrite (Fe, S2)	1309-36-0	1.92E-06	1.92E-06
			Pyrrhotite (Fe7S8)	12305-96-3	1.58E-06	1.58E-06
			Arsenopyrite (FeAsS)	1303-18-0	6.04E-08	6.04E-08
			Ilmenite (Fe,Ti)2O3	12168-52-4	8.70E-07	8.70E-07
			Quartz	14808-60-7	1.20E-05	1.20E-05
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.03E-04	1.03E-04
			K-Feldspars (KAlSi3O8)	[K-FELD]	7.31E-06	7.31E-06
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.96E-05	2.96E-05
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.16E-05	1.16E-05
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.66E-06	2.66E-06
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.40E-05	1.40E-05
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	4.21E-06	4.21E-06
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.07E-08	6.07E-08
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	6.18E-07	6.18E-07
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.50E-07	1.50E-07
			Calcite (CaCO3)	1317-65-3	2.74E-06	2.74E-06
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	5.72E-08	5.72E-08
			Titanite (CaTiSiO5)	[TITAN]	8.53E-07	8.53E-07
			Apatite (Ca5(PO4)3)	1306-05-4	6.70E-07	6.70E-07
			Mica	12001-26-2	2.68E-05	2.68E-05
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.32E-05	1.32E-05
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.08E-05	1.08E-05
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	8.38E-06	8.38E-06
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.93E-05	2.93E-05
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	6.38E-05	6.38E-05
			Albite (NaAlSi 3O 8)	[ALBITE]	2.38E-05	2.38E-05
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	3.48E-06	3.48E-06
			Sillimanite (Al2SiO5)	12141-45-6	1.10E-06	1.10E-06

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S10C	Mill Building - Smelting	US EPA AP-42 document Chapter 11.3 (Primary Copper Smelting) Table 12.3-2. Concentrate Dryer Followed by Electric Furnace. Table 12.3-10. Smelting Furnace Fugitive Emissions	Sulphur Dioxide (SO2)	7446-09-5	2.39E+00	5.97E-01
			TSP	[PM]	1.08E-01	2.69E-02
			PM_{10}	[PM10]	2.95E-02	7.38E-03
			$PM_{2.5}$	[PM2.5]	2.31E-02	5.78E-03
			Silver (Ag)	7440-22-4	2.08E-07	5.21E-08
			Aluminum (Al)	7429-90-5	8.12E-03	2.03E-03
			Arsenic (As)	7440-38-2	8.89E-06	2.22E-06
			Gold (Au)	7440-57-5	5.58E-08	1.40E-08
			Boron (B)	7440-42-8	1.23E-05	3.07E-06
			Barium (Ba)	7440-39-3	4.05E-05	1.01E-05
			Beryllium (Be)	7440-41-7	1.28E-07	3.21E-08
			Bismuth (Bi)	7440-69-9	3.54E-07	8.86E-08
			Carbon (C)	7440-44-0	1.51E-04	3.77E-05
			Calcium (Ca)	7440-70-2	3.08E-03	7.70E-04
			Cadmium (Cd)	7440-43-9	6.78E-07	1.69E-07
			Cerium (Ce)	7440-45-1	7.81E-06	1.95E-06
			Cobalt (Co)	7440-48-4	3.22E-06	8.06E-07
			Chromium (Cr)	7440-47-3	1.03E-05	2.57E-06
			Cesium (Cs)	7440-46-2	3.67E-07	9.17E-08
			Copper (Cu)	7440-50-8	5.98E-05	1.49E-05
			Iron (Fe)	7439-89-6	5.05E-03	1.26E-03
			Gallium (Ga)	7440-55-3	2.24E-06	5.60E-07
			Hafnium (Hf)	7440-58-6	4.59E-07	1.15E-07
			Mercury (Hg)	7439-97-6	2.69E-09	6.72E-10
			Indium (In)	7440-74-6	1.85E-09	4.63E-10
			Potassium (K)	7440-09-7	1.71E-03	4.26E-04
			Lanthanum (La)	7439-91-0	2.71E-06	6.76E-07
			Lithium (Li)	7439-93-2	2.77E-06	6.93E-07
			Lutetium (Lu)	7439-94-3	2.86E-08	7.15E-09
			Magnesium (Mg)	7439-95-4	1.45E-03	3.62E-04
			Manganese (Mn)	7439-96-5	1.43E-05	3.59E-06
			Molybdenum (Mo)	7439-98-7	8.07E-07	2.02E-07
			Sodium (Na)	7440-23-5	3.13E-03	7.81E-04
			Niobium (Nb)	7440--03-1	6.19E-07	1.55E-07
			Nickel (Ni)	7440-02-0	1.59E-06	3.97E-07
			Phosphorus (P)	7723-14-0	6.11E-05	1.53E-05
			Lead (Pb)	7439-92-1	7.01E-05	1.75E-05
			Rubidium (Rb)	7440-17-7	8.19E-06	2.05E-06
			Sulphur (S)	7704-34-9	5.27E-04	1.32E-04
			Antimony (Sb)	7440-36-0	9.82E-07	2.45E-07
			Scandium (Sc)	7440-20-2	1.65E-06	4.13E-07
			Selenium (Se)	7782-49-2	3.76E-08	9.41E-09
			Tin (Sn)	7440-31-5	9.95E-07	2.49E-07
			Strontium (Sr)	7440-24-6	2.60E-05	6.49E-06
			Tantalum (Ta)	7440-25-7	1.01E-07	2.53E-08
			Terbium (Tb)	7440-27-9	6.63E-08	1.66E-08
			Tellurium (Te)	13494-80-9	2.19E-08	5.47E-09
			Titanium (Ti)	7440-32-6	1.26E-04	3.15E-05
			Thallium (Tl)	7440-28-0	1.09E-07	2.73E-08
			Uranium (U)	7440-61-1	1.53E-07	3.82E-08
			Vanadium (v)	7440-62-2	1.55E-05	3.87E-06
			Tungsten (W)	7440-33-7	3.26E-06	8.15E-07
			Yttrium (Y)	7440-65-5	1.64E-06	4.09E-07
			Ytterbium (Yb)	7440-64-4	1.89E-07	4.72E-08
			Zinc (Zn)	7440-66-6	1.88E-05	4.71E-06
			Zirconium (Zr)	7440-67-7	1.03E-05	2.56E-06
			Silicon Dioxide (SiO2)	7631-86-9	6.76E-02	1.69E-02
			Aluminum Oxide (Al2O3)	1344-28-1	1.61E-02	4.03E-03
			Iron Oxide (Fe2O3)	1309-37-1	7.07E-03	1.77E-03
			Magnesium Oxide (MgO)	1309-48-4	2.84E-03	7.11E-04
			Calcium Oxide (CaO)	1305-78-8	4.88E-03	1.22E-03
			Sodium Oxide (Na2O)	1313-59-3	3.72E-03	9.30E-04
			Potassium Oxide (K2O)	12136-45-7	2.12E-03	5.29E-04
			Titanium dioxide (TiO2)	13463-67-7	1.86E-04	4.65E-05
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.31E-04	3.28E-05
			Manganese Oxide (MnO)	1344-43-0	2.22E-05	5.54E-06
			Chromium Oxide (Cr2O3)	1308-38-9	2.97E-05	7.43E-06
			Vanadium Pentoxide (V2O5)	1314-62-1	2.49E-05	6.23E-06
			Chalcopyrite (CuFeS2)	1308-56-1	2.76E-04	6.90E-05
			Bornite (Cu5FeS4)	1308-82-3	9.95E-06	2.49E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.66E-06	1.92E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.09E-06	7.73E-07
			Cuprite (CU_2O)	1317-39-1	5.38E-06	1.34E-06
			Galena (PbS)	1314-87-0	2.18E-05	5.44E-06
			Sphalerite (ZnS)	1314-98-3	4.46E-05	1.12E-05
			Pyrite (Fe, S2)	1309-36-0	8.25E-04	2.06E-04
			Pyrrhotite (Fe7S8)	12305-96-3	6.79E-04	1.70E-04
			Arsenopyrite (FeAsS)	1303-18-0	2.60E-05	6.49E-06
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.17E-04	5.43E-05
			Quartz	14808-60-7	2.99E-03	7.47E-04
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.44E-02	1.11E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.14E-03	7.85E-04
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.27E-02	3.18E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.99E-03	1.25E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.64E-04	1.66E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	6.00E-03	1.50E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.81E-03	4.52E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.51E-05	3.79E-06
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.65E-04	6.63E-05
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	6.43E-05	1.61E-05
			Calcite (CaCO3)	1317-65-3	1.18E-03	2.94E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.43E-05	3.56E-06
			Titanite (CaTiSiO5)	[TITAN]	2.13E-04	5.32E-05
			Apatite (Ca5(PO4)3)	1306-05-4	2.88E-04	7.20E-05
			Mica	12001-26-2	1.15E-02	2.88E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.69E-03	1.42E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.65E-03	1.16E-03
			Labradorite ($(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.60E-03	9.01E-04
			Andesine ($(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.26E-02	3.14E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.74E-02	6.86E-03
			Albite (NaAlSi 3O 8)	[ALBITE]	1.02E-02	2.56E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.49E-03	3.74E-04
			Sillimanite (Al2SiO5)	12141-45-6	4.73E-04	1.18E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S10D	Mill Building - Smelting Baghouse	Appendix C - Table C-2 Procedure for Preparing an Emission Summary and Dispersion Modelling Report	TSP	[PM]	1.39E-02	1.39E-02
			PM_{10}	[PM10]	6.67E-03	6.67E-03
			$PM_{2.5}$	[PM2.5]	1.39E-03	1.39E-03
			Silver (Ag)	7440-22-4	2.69E-08	2.69E-08
			Aluminum (Al)	7429-90-5	1.05E-03	1.05E-03
			Arsenic (As)	7440-38-2	1.15E-06	1.15E-06
			Gold (Au)	7440-57-5	7.21E-09	7.21E-09
			Boron (B)	7440-42-8	1.59E-06	1.59E-06
			Barium (Ba)	7440-39-3	5.22E-06	5.22E-06
			Beryllium (Be)	7440-41-7	1.66E-08	1.66E-08
			Bismuth (Bi)	7440-69-9	4.58E-08	4.58E-08
			Carbon (C)	7440-44-0	1.95E-05	1.95E-05
			Calcium (Ca)	7440-70-2	3.98E-04	3.98E-04
			Cadmium (Cd)	7440-43-9	8.75E-08	8.75E-08
			Cerium (Ce)	7440-45-1	1.01E-06	1.01E-06
			Cobalt (Co)	7440-48-4	4.16E-07	4.16E-07
			Chromium (Cr)	7440-47-3	1.33E-06	1.33E-06
			Cesium (Cs)	7440-46-2	4.73E-08	4.73E-08
			Copper (Cu)	7440-50-8	7.72E-06	7.72E-06
			Iron (Fe)	7439-89-6	6.52E-04	6.52E-04
			Gallium (Ga)	7440-55-3	2.89E-07	2.89E-07
			Hafnium (Hf)	7440-58-6	5.92E-08	5.92E-08
			Mercury (Hg)	7439-97-6	3.47E-10	3.47E-10
			Indium (In)	7440-74-6	2.39E-10	2.39E-10
			Potassium (K)	7440-09-7	2.20E-04	2.20E-04
			Lanthanum (La)	7439-91-0	3.49E-07	3.49E-07
			Lithium (Li)	7439-93-2	3.58E-07	3.58E-07
			Lutetium (Lu)	7439-94-3	3.69E-09	3.69E-09
			Magnesium (Mg)	7439-95-4	1.87E-04	1.87E-04
			Manganese (Mn)	7439-96-5	3.24E-06	3.24E-06
			Molybdenum (Mo)	7439-98-7	1.04E-07	1.04E-07
			Sodium (Na)	7440-23-5	4.04E-04	4.04E-04
			Niobium (Nb)	7440--03-1	8.00E-08	8.00E-08
			Nickel (Ni)	7440-02-0	3.58E-07	3.58E-07
			Phosphorus (P)	7723-14-0	7.89E-06	7.89E-06
			Lead (Pb)	7439-92-1	9.06E-06	9.06E-06
			Rubidium (Rb)	7440-17-7	1.06E-06	1.06E-06
			Sulphur (S)	7704-34-9	6.80E-05	6.80E-05
			Antimony (Sb)	7440-36-0	1.27E-07	1.27E-07
			Scandium (Sc)	7440-20-2	2.13E-07	2.13E-07
			Selenium (Se)	7782-49-2	4.86E-09	4.86E-09
			Tin (Sn)	7440-31-5	1.28E-07	1.28E-07
			Strontium (Sr)	7440-24-6	3.35E-06	3.35E-06
			Tantalum (Ta)	7440-25-7	1.31E-08	1.31E-08
			Terbium (Tb)	7440-27-9	8.57E-09	8.57E-09
			Tellurium (Te)	13494-80-9	2.83E-09	2.83E-09
			Titanium (Ti)	7440-32-6	2.84E-05	2.84E-05
			Thallium (Tl)	7440-28-0	1.41E-08	1.41E-08
			Uranium (U)	7440-61-1	1.97E-08	1.97E-08
			Vanadium (v)	7440-62-2	2.00E-06	2.00E-06
			Tungsten (W)	7440-33-7	4.21E-07	4.21E-07
			Yttrium (Y)	7440-65-5	2.11E-07	2.11E-07
			Ytterbium (Yb)	7440-64-4	2.44E-08	2.44E-08
			Zinc (Zn)	7440-66-6	2.43E-06	2.43E-06
			Zirconium (Zr)	7440-67-7	1.32E-06	1.32E-06
			Silicon Dioxide (SiO2)	7631-86-9	8.73E-03	8.73E-03
			Aluminum Oxide (Al2O3)	1344-28-1	2.08E-03	2.08E-03
			Iron Oxide (Fe2O3)	1309-37-1	9.13E-04	9.13E-04
			Magnesium Oxide (MgO)	1309-48-4	3.67E-04	3.67E-04
			Calcium Oxide (CaO)	1305-78-8	6.30E-04	6.30E-04
			Sodium Oxide (Na2O)	1313-59-3	4.80E-04	4.80E-04
			Potassium Oxide (K2O)	12136-45-7	2.73E-04	2.73E-04
			Titanium dioxide (TiO2)	13463-67-7	4.20E-05	4.20E-05
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.69E-05	1.69E-05
			Manganese Oxide (MnO)	1344-43-0	5.00E-06	5.00E-06
			Chromium Oxide (Cr2O3)	1308-38-9	3.84E-06	3.84E-06
			Vanadium Pentoxide (V2O5)	1314-62-1	3.22E-06	3.22E-06
			Chalcopyrite (CuFeS2)	1308-56-1	3.56E-05	3.56E-05
			Bornite (Cu5FeS4)	1308-82-3	1.29E-06	1.29E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	9.90E-07	9.90E-07
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.99E-07	3.99E-07
			Cuprite (CU_2O)	1317-39-1	6.94E-07	6.94E-07
			Galena (PbS)	1314-87-0	2.81E-06	2.81E-06
			Sphalerite (ZnS)	1314-98-3	5.76E-06	5.76E-06
			Pyrite (Fe, S2)	1309-36-0	1.07E-04	1.07E-04
			Pyrrhotite (Fe7S8)	12305-96-3	8.78E-05	8.78E-05
			Arsenopyrite (FeAsS)	1303-18-0	3.35E-06	3.35E-06
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.90E-05	4.90E-05
			Quartz	14808-60-7	6.74E-04	6.74E-04
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.74E-03	5.74E-03
			K-Feldspars (KAlSi3O8)	[K-FELD]	4.05E-04	4.05E-04
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.64E-03	1.64E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	6.45E-04	6.45E-04
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.50E-04	1.50E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	7.75E-04	7.75E-04
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.34E-04	2.34E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.42E-06	3.42E-06
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.43E-05	3.43E-05
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.30E-06	8.30E-06
			Calcite (CaCO3)	1317-65-3	1.52E-04	1.52E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.22E-06	3.22E-06
			Titanite (CaTiSiO5)	[TITAN]	4.80E-05	4.80E-05
			Apatite (Ca5(PO4)3)	1306-05-4	3.72E-05	3.72E-05
			Mica	12001-26-2	1.49E-03	1.49E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	7.35E-04	7.35E-04
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.00E-04	6.00E-04
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.65E-04	4.65E-04
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.62E-03	1.62E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.54E-03	3.54E-03
			Albite (NaAlSi 3O 8)	[ALBITE]	1.32E-03	1.32E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.93E-04	1.93E-04
			Sillimanite (Al2SiO5)	12141-45-6	6.11E-05	6.11E-05

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S11	Mobile Primary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	3.16E-01	2.89E-01
			PM_{10}	[PM10]	1.26E-01	1.16E-01
			$PM_{2.5}$	[PM2.5]	2.34E-02	2.14E-02
			Silver (Ag)	7440-22-4	1.87E-07	1.71E-07
			Aluminum (Al)	7429-90-5	2.40E-02	2.20E-02
			Arsenic (As)	7440-38-2	5.08E-06	4.66E-06
			Gold (Au)	7440-57-5	2.64E-08	2.42E-08
			Boron (B)	7440-42-8	3.18E-05	2.91E-05
			Barium (Ba)	7440-39-3	1.15E-04	1.05E-04
			Beryllium (Be)	7440-41-7	3.72E-07	3.41E-07
			Bismuth (Bi)	7440-69-9	6.83E-07	6.26E-07
			Carbon (C)	7440-44-0	4.16E-04	3.82E-04
			Calcium (Ca)	7440-70-2	1.04E-02	9.53E-03
			Cadmium (Cd)	7440-43-9	3.70E-07	3.39E-07
			Cerium (Ce)	7440-45-1	2.29E-05	2.10E-05
			Cobalt (Co)	7440-48-4	6.31E-06	5.79E-06
			Chromium (Cr)	7440-47-3	2.73E-05	2.50E-05
			Cesium (Cs)	7440-46-2	1.08E-06	9.86E-07
			Copper (Cu)	7440-50-8	4.27E-05	3.91E-05
			Iron (Fe)	7439-89-6	1.31E-02	1.20E-02
			Gallium (Ga)	7440-55-3	6.41E-06	5.88E-06
			Hafnium (Hf)	7440-58-6	1.35E-06	1.23E-06
			Mercury (Hg)	7439-97-6	7.89E-09	7.23E-09
			Indium (In)	7440-74-6	5.44E-09	4.99E-09
			Potassium (K)	7440-09-7	4.41E-03	4.05E-03
			Lanthanum (La)	7439-91-0	6.18E-06	5.67E-06
			Lithium (Li)	7439-93-2	8.13E-06	7.45E-06
			Lutetium (Lu)	7439-94-3	8.40E-08	7.70E-08
			Magnesium (Mg)	7439-95-4	4.67E-03	4.28E-03
			Manganese (Mn)	7439-96-5	6.64E-05	6.09E-05
			Molybdenum (Mo)	7439-98-7	1.75E-06	1.61E-06
			Sodium (Na)	7440-23-5	9.09E-03	8.33E-03
			Niobium (Nb)	7440--03-1	1.82E-06	1.67E-06
			Nickel (Ni)	7440-02-0	6.43E-06	5.89E-06
			Phosphorus (P)	7723-14-0	1.94E-04	1.77E-04
			Lead (Pb)	7439-92-1	4.47E-06	4.10E-06
			Rubidium (Rb)	7440-17-7	2.40E-05	2.20E-05
			Sulphur (S)	7704-34-9	8.45E-04	7.75E-04
			Antimony (Sb)	7440-36-0	1.61E-06	1.48E-06
			Scandium (Sc)	7440-20-2	4.15E-06	3.81E-06
			Selenium (Se)	7782-49-2	1.10E-07	1.01E-07
			Tin (Sn)	7440-31-5	2.92E-06	2.68E-06
			Strontium (Sr)	7440-24-6	9.65E-05	8.85E-05
			Tantalum (Ta)	7440-25-7	2.97E-07	2.72E-07
			Terbium (Tb)	7440-27-9	1.95E-07	1.78E-07
			Tellurium (Te)	13494-80-9	6.43E-08	5.89E-08
			Titanium (Ti)	7440-32-6	4.64E-04	4.25E-04
			Thallium (Tl)	7440-28-0	3.20E-07	2.93E-07
			Uranium (U)	7440-61-1	4.48E-07	4.11E-07
			Vanadium (v)	7440-62-2	3.72E-05	3.41E-05
			Tungsten (W)	7440-33-7	8.51E-06	7.80E-06
			Yttrium (Y)	7440-65-5	4.81E-06	4.40E-06
			Ytterbium (Yb)	7440-64-4	5.54E-07	5.08E-07
			Zinc (Zn)	7440-66-6	3.37E-05	3.08E-05
			Zirconium (Zr)	7440-67-7	3.01E-05	2.76E-05
			Silicon Dioxide (SiO2)	7631-86-9	1.97E-01	1.81E-01
			Aluminum Oxide (Al2O3)	1344-28-1	4.74E-02	4.34E-02
			Iron Oxide (Fe2O3)	1309-37-1	2.08E-02	1.91E-02
			Magnesium Oxide (MgO)	1309-48-4	8.51E-03	7.80E-03
			Calcium Oxide (CaO)	1305-78-8	1.48E-02	1.36E-02
			Sodium Oxide (Na2O)	1313-59-3	1.07E-02	9.77E-03
			Potassium Oxide (K2O)	12136-45-7	6.19E-03	5.67E-03
			Titanium dioxide (TiO2)	13463-67-7	7.79E-04	7.14E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	4.05E-04	3.71E-04
			Manganese Oxide (MnO)	1344-43-0	1.03E-04	9.42E-05
			Chromium Oxide (Cr2O3)	1308-38-9	9.20E-05	8.43E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	8.48E-05	7.77E-05
			Chalcopyrite (CuFeS2)	1308-56-1	8.10E-04	7.42E-04
			Bornite (Cu5FeS4)	1308-82-3	2.92E-05	2.68E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.25E-05	2.06E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	9.07E-06	8.31E-06
			Cuprite (CU_2O)	1317-39-1	1.58E-05	1.45E-05
			Galena (PbS)	1314-87-0	6.39E-05	5.85E-05
			Sphalerite (ZnS)	1314-98-3	1.31E-04	1.20E-04
			Pyrite (Fe, S2)	1309-36-0	1.89E-03	1.74E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.99E-03	1.83E-03
			Arsenopyrite (FeAsS)	1303-18-0	7.62E-05	6.98E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	9.28E-04	8.51E-04
			Quartz	14808-60-7	1.48E-02	1.35E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.72E-01	1.57E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	9.22E-03	8.45E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.61E-02	2.39E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.56E-03	5.09E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.84E-03	2.60E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.38E-03	3.10E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	5.31E-03	4.87E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.47E-05	5.93E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.79E-04	7.14E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.89E-04	1.73E-04
			Calcite (CaCO3)	1317-65-3	1.52E-03	1.39E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	6.10E-05	5.59E-05
			Titanite (CaTiSiO5)	[TITAN]	3.54E-04	3.24E-04
			Apatite (Ca5(PO4)3)	1306-05-4	8.45E-04	7.75E-04
			Mica	12001-26-2	3.38E-02	3.10E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.67E-02	1.53E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.36E-02	1.25E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.06E-02	9.69E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.69E-02	3.38E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	8.05E-02	7.38E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	3.00E-02	2.75E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.39E-03	4.02E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.39E-03	1.27E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
S12	Mobile Secondary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	8.68E-01	8.68E-01
			PM_{10}	[PM10]	3.47E-01	3.47E-01
			$PM_{2.5}$	[PM2.5]	6.43E-02	6.43E-02
			Silver (Ag)	7440-22-4	5.14E-07	5.14E-07
			Aluminum (Al)	7429-90-5	6.59E-02	6.59E-02
			Arsenic (As)	7440-38-2	1.40E-05	1.40E-05
			Gold (Au)	7440-57-5	7.26E-08	7.26E-08
			Boron (B)	7440-42-8	8.73E-05	8.73E-05
			Barium (Ba)	7440-39-3	3.16E-04	3.16E-04
			Beryllium (Be)	7440-41-7	1.02E-06	1.02E-06
			Bismuth (Bi)	7440-69-9	1.88E-06	1.88E-06
			Carbon (C)	7440-44-0	1.14E-03	1.14E-03
			Calcium (Ca)	7440-70-2	2.86E-02	2.86E-02
			Cadmium (Cd)	7440-43-9	1.02E-06	1.02E-06
			Cerium (Ce)	7440-45-1	6.31E-05	6.31E-05
			Cobalt (Co)	7440-48-4	1.74E-05	1.74E-05
			Chromium (Cr)	7440-47-3	7.50E-05	7.50E-05
			Cesium (Cs)	7440-46-2	2.96E-06	2.96E-06
			Copper (Cu)	7440-50-8	1.17E-04	1.17E-04
			Iron (Fe)	7439-89-6	3.60E-02	3.60E-02
			Gallium (Ga)	7440-55-3	1.76E-05	1.76E-05
			Hafnium (Hf)	7440-58-6	3.70E-06	3.70E-06
			Mercury (Hg)	7439-97-6	2.17E-08	2.17E-08
			Indium (In)	7440-74-6	1.50E-08	1.50E-08
			Potassium (K)	7440-09-7	1.21E-02	1.21E-02
			Lanthanum (La)	7439-91-0	1.70E-05	1.70E-05
			Lithium (Li)	7439-93-2	2.24E-05	2.24E-05
			Lutetium (Lu)	7439-94-3	2.31E-07	2.31E-07
			Magnesium (Mg)	7439-95-4	1.29E-02	1.29E-02
			Manganese (Mn)	7439-96-5	1.83E-04	1.83E-04
			Molybdenum (Mo)	7439-98-7	4.82E-06	4.82E-06
			Sodium (Na)	7440-23-5	2.50E-02	2.50E-02
			Niobium (Nb)	7440--03-1	5.00E-06	5.00E-06
			Nickel (Ni)	7440-02-0	1.77E-05	1.77E-05
			Phosphorus (P)	7723-14-0	5.32E-04	5.32E-04
			Lead (Pb)	7439-92-1	1.23E-05	1.23E-05
			Rubidium (Rb)	7440-17-7	6.61E-05	6.61E-05
			Sulphur (S)	7704-34-9	2.32E-03	2.32E-03
			Antimony (Sb)	7440-36-0	4.44E-06	4.44E-06
			Scandium (Sc)	7440-20-2	1.14E-05	1.14E-05
			Selenium (Se)	7782-49-2	3.04E-07	3.04E-07
			Tin (Sn)	7440-31-5	8.03E-06	8.03E-06
			Strontium (Sr)	7440-24-6	2.65E-04	2.65E-04
			Tantalum (Ta)	7440-25-7	8.17E-07	8.17E-07
			Terbium (Tb)	7440-27-9	5.35E-07	5.35E-07
			Tellurium (Te)	13494-80-9	1.77E-07	1.77E-07
			Titanium (Ti)	7440-32-6	1.28E-03	1.28E-03
			Thallium (Tl)	7440-28-0	8.80E-07	8.80E-07
			Uranium (U)	7440-61-1	1.23E-06	1.23E-06
			Vanadium (v)	7440-62-2	1.02E-04	1.02E-04
			Tungsten (W)	7440-33-7	2.34E-05	2.34E-05
			Yttrium (Y)	7440-65-5	1.32E-05	1.32E-05
			Ytterbium (Yb)	7440-64-4	1.52E-06	1.52E-06
			Zinc (Zn)	7440-66-6	9.25E-05	9.25E-05
			Zirconium (Zr)	7440-67-7	8.28E-05	8.28E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.42E-01	5.42E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.30E-01	1.30E-01
			Iron Oxide (Fe2O3)	1309-37-1	5.73E-02	5.73E-02
			Magnesium Oxide (MgO)	1309-48-4	2.34E-02	2.34E-02
			Calcium Oxide (CaO)	1305-78-8	4.08E-02	4.08E-02
			Sodium Oxide (Na2O)	1313-59-3	2.93E-02	2.93E-02
			Potassium Oxide (K2O)	12136-45-7	1.70E-02	1.70E-02
			Titanium dioxide (TiO2)	13463-67-7	2.14E-03	2.14E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.11E-03	1.11E-03
			Manganese Oxide (MnO)	1344-43-0	2.83E-04	2.83E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.53E-04	2.53E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.33E-04	2.33E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.23E-03	2.23E-03
			Bornite (Cu5FeS4)	1308-82-3	8.03E-05	8.03E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.19E-05	6.19E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.49E-05	2.49E-05
			Cuprite (CU_2O)	1317-39-1	4.34E-05	4.34E-05
			Galena (PbS)	1314-87-0	1.76E-04	1.76E-04
			Sphalerite (ZnS)	1314-98-3	3.60E-04	3.60E-04
			Pyrite (Fe, S2)	1309-36-0	5.21E-03	5.21E-03
			Pyrrhotite (Fe7S8)	12305-96-3	5.48E-03	5.48E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.10E-04	2.10E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.55E-03	2.55E-03
			Quartz	14808-60-7	4.06E-02	4.06E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.72E-01	4.72E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.53E-02	2.53E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.17E-02	7.17E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.53E-02	1.53E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.81E-03	7.81E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	9.29E-03	9.29E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.46E-02	1.46E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.78E-04	1.78E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.14E-03	2.14E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.19E-04	5.19E-04
			Calcite (CaCO3)	1317-65-3	4.17E-03	4.17E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.68E-04	1.68E-04
			Titanite (CaTiSiO5)	[TITAN]	9.72E-04	9.72E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.32E-03	2.32E-03
			Mica	12001-26-2	9.30E-02	9.30E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.59E-02	4.59E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.75E-02	3.75E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.91E-02	2.91E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.01E-01	1.01E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.21E-01	2.21E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	8.26E-02	8.26E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.21E-02	1.21E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.82E-03	3.82E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
S13	Mobile Tertiary Crusher	US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing	TSP	[PM]	8.68E-01	8.68E-01
			PM_{10}	[PM10]	2.89E-01	2.89E-01
			$PM_{2.5}$	[PM2.5]	5.36E-02	5.36E-02
			Silver (Ag)	7440-22-4	5.14E-07	5.14E-07
			Aluminum (Al)	7429-90-5	6.59E-02	6.59E-02
			Arsenic (As)	7440-38-2	1.40E-05	1.40E-05
			Gold (Au)	7440-57-5	7.26E-08	7.26E-08
			Boron (B)	7440-42-8	8.73E-05	8.73E-05
			Barium (Ba)	7440-39-3	3.16E-04	3.16E-04
			Beryllium (Be)	7440-41-7	1.02E-06	1.02E-06
			Bismuth (Bi)	7440-69-9	1.88E-06	1.88E-06
			Carbon (C)	7440-44-0	1.14E-03	1.14E-03
			Calcium (Ca)	7440-70-2	2.86E-02	2.86E-02
			Cadmium (Cd)	7440-43-9	1.02E-06	1.02E-06
			Cerium (Ce)	7440-45-1	6.31E-05	6.31E-05
			Cobalt (Co)	7440-48-4	1.74E-05	1.74E-05
			Chromium (Cr)	7440-47-3	7.50E-05	7.50E-05
			Cesium (Cs)	7440-46-2	2.96E-06	2.96E-06
			Copper (Cu)	7440-50-8	1.17E-04	1.17E-04
			Iron (Fe)	7439-89-6	3.60E-02	3.60E-02
			Gallium (Ga)	7440-55-3	1.76E-05	1.76E-05
			Hafnium (Hf)	7440-58-6	3.70E-06	3.70E-06
			Mercury (Hg)	7439-97-6	2.17E-08	2.17E-08
			Indium (In)	7440-74-6	1.50E-08	1.50E-08
			Potassium (K)	7440-09-7	1.21E-02	1.21E-02
			Lanthanum (La)	7439-91-0	1.70E-05	1.70E-05
			Lithium (Li)	7439-93-2	2.24E-05	2.24E-05
			Lutetium (Lu)	7439-94-3	2.31E-07	2.31E-07
			Magnesium (Mg)	7439-95-4	1.29E-02	1.29E-02
			Manganese (Mn)	7439-96-5	1.52E-04	1.52E-04
			Molybdenum (Mo)	7439-98-7	4.82E-06	4.82E-06
			Sodium (Na)	7440-23-5	2.50E-02	2.50E-02
			Niobium (Nb)	7440--03-1	5.00E-06	5.00E-06
			Nickel (Ni)	7440-02-0	1.47E-05	1.47E-05
			Phosphorus (P)	7723-14-0	5.32E-04	5.32E-04
			Lead (Pb)	7439-92-1	1.23E-05	1.23E-05
			Rubidium (Rb)	7440-17-7	6.61E-05	6.61E-05
			Sulphur (S)	7704-34-9	2.32E-03	2.32E-03
			Antimony (Sb)	7440-36-0	4.44E-06	4.44E-06
			Scandium (Sc)	7440-20-2	1.14E-05	1.14E-05
			Selenium (Se)	7782-49-2	3.04E-07	3.04E-07
			Tin (Sn)	7440-31-5	8.03E-06	8.03E-06
			Strontium (Sr)	7440-24-6	2.65E-04	2.65E-04
			Tantalum (Ta)	7440-25-7	8.17E-07	8.17E-07
			Terbium (Tb)	7440-27-9	5.35E-07	5.35E-07
			Tellurium (Te)	13494-80-9	1.77E-07	1.77E-07
			Titanium (Ti)	7440-32-6	1.06E-03	1.06E-03
			Thallium (Tl)	7440-28-0	8.80E-07	8.80E-07
			Uranium (U)	7440-61-1	1.23E-06	1.23E-06
			Vanadium (v)	7440-62-2	1.02E-04	1.02E-04
			Tungsten (W)	7440-33-7	2.34E-05	2.34E-05
			Yttrium (Y)	7440-65-5	1.32E-05	1.32E-05
			Ytterbium (Yb)	7440-64-4	1.52E-06	1.52E-06
			Zinc (Zn)	7440-66-6	9.25E-05	9.25E-05
			Zirconium (Zr)	7440-67-7	8.28E-05	8.28E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.42E-01	5.42E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.30E-01	1.30E-01
			Iron Oxide (Fe2O3)	1309-37-1	5.73E-02	5.73E-02
			Magnesium Oxide (MgO)	1309-48-4	2.34E-02	2.34E-02
			Calcium Oxide (CaO)	1305-78-8	4.08E-02	4.08E-02
			Sodium Oxide (Na2O)	1313-59-3	2.93E-02	2.93E-02
			Potassium Oxide (K2O)	12136-45-7	1.70E-02	1.70E-02
			Titanium dioxide (TiO2)	13463-67-7	1.79E-03	1.79E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.11E-03	1.11E-03
			Manganese Oxide (MnO)	1344-43-0	2.36E-04	2.36E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.53E-04	2.53E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.33E-04	2.33E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.23E-03	2.23E-03
			Bornite (Cu5FeS4)	1308-82-3	8.03E-05	8.03E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.19E-05	6.19E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.49E-05	2.49E-05
			Cuprite (CU_2O)	1317-39-1	4.34E-05	4.34E-05
			Galena (PbS)	1314-87-0	1.76E-04	1.76E-04
			Sphalerite (ZnS)	1314-98-3	3.60E-04	3.60E-04
			Pyrite (Fe, S2)	1309-36-0	5.21E-03	5.21E-03
			Pyrrhotite (Fe7S8)	12305-96-3	5.48E-03	5.48E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.10E-04	2.10E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.13E-03	2.13E-03
			Quartz	14808-60-7	3.38E-02	3.38E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.72E-01	4.72E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.53E-02	2.53E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.17E-02	7.17E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.53E-02	1.53E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.51E-03	6.51E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	9.29E-03	9.29E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.46E-02	1.46E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.48E-04	1.48E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.14E-03	2.14E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.19E-04	5.19E-04
			Calcite (CaCO3)	1317-65-3	4.17E-03	4.17E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.40E-04	1.40E-04
			Titanite (CaTiSiO5)	[TITAN]	8.10E-04	8.10E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.32E-03	2.32E-03
			Mica	12001-26-2	9.30E-02	9.30E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.59E-02	4.59E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.75E-02	3.75E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.91E-02	2.91E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.01E-01	1.01E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.21E-01	2.21E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	8.26E-02	8.26E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.21E-02	1.21E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.82E-03	3.82E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P1A	Pit 87 Drilling	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-4 Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	1.44E-01	1.44E-01
			PM_{10}	[PM10]	7.58E-02	7.58E-02
			$PM_{2.5}$	[PM2.5]	1.40E-02	1.40E-02
			Silver (Ag)	7440-22-4	2.80E-07	2.80E-07
			Aluminum (Al)	7429-90-5	1.09E-02	1.09E-02
			Arsenic (As)	7440-38-2	1.19E-05	1.19E-05
			Gold (Au)	7440-57-5	7.49E-08	7.49E-08
			Boron (B)	7440-42-8	1.65E-05	1.65E-05
			Barium (Ba)	7440-39-3	5.42E-05	5.42E-05
			Beryllium (Be)	7440-41-7	1.72E-07	1.72E-07
			Bismuth (Bi)	7440-69-9	4.75E-07	4.75E-07
			Carbon (C)	7440-44-0	2.02E-04	2.02E-04
			Calcium (Ca)	7440-70-2	4.75E-03	4.75E-03
			Cadmium (Cd)	7440-43-9	9.09E-07	9.09E-07
			Cerium (Ce)	7440-45-1	1.05E-05	1.05E-05
			Cobalt (Co)	7440-48-4	4.32E-06	4.32E-06
			Chromium (Cr)	7440-47-3	1.38E-05	1.38E-05
			Cesium (Cs)	7440-46-2	4.92E-07	4.92E-07
			Copper (Cu)	7440-50-8	8.01E-05	8.01E-05
			Iron (Fe)	7439-89-6	6.77E-03	6.77E-03
			Gallium (Ga)	7440-55-3	3.01E-06	3.01E-06
			Hafnium (Hf)	7440-58-6	6.15E-07	6.15E-07
			Mercury (Hg)	7439-97-6	3.60E-09	3.60E-09
			Indium (In)	7440-74-6	2.48E-09	2.48E-09
			Potassium (K)	7440-09-7	2.29E-03	2.29E-03
			Lanthanum (La)	7439-91-0	3.63E-06	3.63E-06
			Lithium (Li)	7439-93-2	3.71E-06	3.71E-06
			Lutetium (Lu)	7439-94-3	3.83E-08	3.83E-08
			Magnesium (Mg)	7439-95-4	2.14E-03	2.14E-03
			Manganese (Mn)	7439-96-5	3.98E-05	3.98E-05
			Molybdenum (Mo)	7439-98-7	1.08E-06	1.08E-06
			Sodium (Na)	7440-23-5	4.19E-03	4.19E-03
			Niobium (Nb)	7440--03-1	8.31E-07	8.31E-07
			Nickel (Ni)	7440-02-0	4.07E-06	4.07E-06
			Phosphorus (P)	7723-14-0	8.84E-05	8.84E-05
			Lead (Pb)	7439-92-1	2.57E-06	2.57E-06
			Rubidium (Rb)	7440-17-7	1.10E-05	1.10E-05
			Sulphur (S)	7704-34-9	7.06E-04	7.06E-04
			Antimony (Sb)	7440-36-0	1.32E-06	1.32E-06
			Scandium (Sc)	7440-20-2	2.21E-06	2.21E-06
			Selenium (Se)	7782-49-2	5.05E-08	5.05E-08
			Tin (Sn)	7440-31-5	1.33E-06	1.33E-06
			Strontium (Sr)	7440-24-6	4.41E-05	4.41E-05
			Tantalum (Ta)	7440-25-7	1.36E-07	1.36E-07
			Terbium (Tb)	7440-27-9	8.89E-08	8.89E-08
			Tellurium (Te)	13494-80-9	2.94E-08	2.94E-08
			Titanium (Ti)	7440-32-6	3.23E-04	3.23E-04
			Thallium (Tl)	7440-28-0	1.46E-07	1.46E-07
			Uranium (U)	7440-61-1	2.05E-07	2.05E-07
			Vanadium (v)	7440-62-2	2.07E-05	2.07E-05
			Tungsten (W)	7440-33-7	4.37E-06	4.37E-06
			Yttrium (Y)	7440-65-5	2.20E-06	2.20E-06
			Ytterbium (Yb)	7440-64-4	2.53E-07	2.53E-07
			Zinc (Zn)	7440-66-6	2.53E-05	2.53E-05
			Zirconium (Zr)	7440-67-7	1.38E-05	1.38E-05
			Silicon Dioxide (SiO2)	7631-86-9	9.06E-02	9.06E-02
			Aluminum Oxide (Al2O3)	1344-28-1	2.16E-02	2.16E-02
			Iron Oxide (Fe2O3)	1309-37-1	9.52E-03	9.52E-03
			Magnesium Oxide (MgO)	1309-48-4	3.89E-03	3.89E-03
			Calcium Oxide (CaO)	1305-78-8	6.78E-03	6.78E-03
			Sodium Oxide (Na2O)	1313-59-3	4.99E-03	4.99E-03
			Potassium Oxide (K2O)	12136-45-7	2.84E-03	2.84E-03
			Titanium dioxide (TiO2)	13463-67-7	4.77E-04	4.77E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.85E-04	1.85E-04
			Manganese Oxide (MnO)	1344-43-0	6.17E-05	6.17E-05
			Chromium Oxide (Cr2O3)	1308-38-9	4.20E-05	4.20E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	3.87E-05	3.87E-05
			Chalcopyrite (CuFeS2)	1308-56-1	3.70E-04	3.70E-04
			Bornite (Cu5FeS4)	1308-82-3	1.33E-05	1.33E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.03E-05	1.03E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	4.14E-06	4.14E-06
			Cuprite (CU_2O)	1317-39-1	7.21E-06	7.21E-06
			Galena (PbS)	1314-87-0	2.92E-05	2.92E-05
			Sphalerite (ZnS)	1314-98-3	5.98E-05	5.98E-05
			Pyrite (Fe, S2)	1309-36-0	1.11E-03	1.11E-03
			Pyrrhotite (Fe7S8)	12305-96-3	9.11E-04	9.11E-04
			Arsenopyrite (FeAsS)	1303-18-0	3.48E-05	3.48E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	5.57E-04	5.57E-04
			Quartz	14808-60-7	8.85E-03	8.85E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.84E-02	7.84E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	4.21E-03	4.21E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.71E-02	1.71E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	6.69E-03	6.69E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.70E-03	1.70E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	8.05E-03	8.05E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.43E-03	2.43E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.88E-05	3.88E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.56E-04	3.56E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.62E-05	8.62E-05
			Calcite (CaCO3)	1317-65-3	1.58E-03	1.58E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.66E-05	3.66E-05
			Titanite (CaTiSiO5)	[TITAN]	5.46E-04	5.46E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.86E-04	3.86E-04
			Mica	12001-26-2	1.54E-02	1.54E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	7.63E-03	7.63E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.23E-03	6.23E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.83E-03	4.83E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.69E-02	1.69E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.68E-02	3.68E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.37E-02	1.37E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.00E-03	2.00E-03
			Sillimanite (Al2SiO5)	12141-45-6	6.34E-04	6.34E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P1B	Pit 87 Blasting	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 and Austrailia Government - NPI - Explosives Detonation and Firing Ranges	Nitrogen Oxides (NOx)	10102-44-0	1.57E+00	7.46E-02
			Sulphur Dioxide (SO_2)	7446-09--5	4.70E-01	2.24E-02
			Carbon Monoxide (CO)	630-08-0	1.80E+01	8.58E-01
			TSP	[PM]	9.50E+00	5.79E-01
			PM_{10}	[PM10]	4.94E+00	3.01E-01
			$PM_{2.5}$	[PM2.5]	2.85E-01	1.74E-02
			Silver (Ag)	7440-22-4	1.84E-05	1.12E-06
			Aluminum (Al)	7429-90-5	7.21E-01	4.40E-02
			Arsenic (As)	7440-38-2	7.85E-04	4.79E-05
			Gold (Au)	7440-57-5	4.93E-06	3.01E-07
			Boron (B)	7440-42-8	1.09E-03	6.62E-05
			Barium (Ba)	7440-39-3	3.57E-03	2.18E-04
			Beryllium (Be)	7440-41-7	1.13E-05	6.92E-07
			Bismuth (Bi)	7440-69-9	3.13E-05	1.91E-06
			Carbon (C)	7440-44-0	1.33E-02	8.13E-04
			Calcium (Ca)	7440-70-2	3.13E-01	1.91E-02
			Cadmium (Cd)	7440-43-9	5.99E-05	3.65E-06
			Cerium (Ce)	7440-45-1	6.90E-04	4.21E-05
			Cobalt (Co)	7440-48-4	2.85E-04	1.74E-05
			Chromium (Cr)	7440-47-3	9.10E-04	5.55E-05
			Cesium (Cs)	7440-46-2	3.24E-05	1.98E-06
			Copper (Cu)	7440-50-8	5.28E-03	3.22E-04
			Iron (Fe)	7439-89-6	4.46E-01	2.72E-02
			Gallium (Ga)	7440-55-3	1.98E-04	1.21E-05
			Hafnium (Hf)	7440-58-6	4.05E-05	2.47E-06
			Mercury (Hg)	7439-97-6	2.38E-07	1.45E-08
			Indium (In)	7440-74-6	1.64E-07	9.98E-09
			Potassium (K)	7440-09-7	1.51E-01	9.19E-03
			Lanthanum (La)	7439-91-0	2.39E-04	1.46E-05
			Lithium (Li)	7439-93-2	2.45E-04	1.49E-05
			Lutetium (Lu)	7439-94-3	2.53E-06	1.54E-07
			Magnesium (Mg)	7439-95-4	1.41E-01	8.58E-03
			Manganese (Mn)	7439-96-5	2.60E-03	1.58E-04
			Molybdenum (Mo)	7439-98-7	7.13E-05	4.35E-06
			Sodium (Na)	7440-23-5	2.76E-01	1.68E-02
			Niobium (Nb)	7440--03-1	5.47E-05	3.34E-06
			Nickel (Ni)	7440-02-0	2.66E-04	1.62E-05
			Phosphorus (P)	7723-14-0	5.82E-03	3.55E-04
			Lead (Pb)	7439-92-1	1.69E-04	1.03E-05
			Rubidium (Rb)	7440-17-7	7.24E-04	4.41E-05
			Sulphur (S)	7704-34-9	4.65E-02	2.84E-03
			Antimony (Sb)	7440-36-0	8.67E-05	5.29E-06
			Scandium (Sc)	7440-20-2	1.46E-04	8.89E-06
			Selenium (Se)	7782-49-2	3.33E-06	2.03E-07
			Tin (Sn)	7440-31-5	8.79E-05	5.36E-06
			Strontium (Sr)	7440-24-6	2.91E-03	1.77E-04
			Tantalum (Ta)	7440-25-7	8.94E-06	5.45E-07
			Terbium (Tb)	7440-27-9	5.86E-06	3.57E-07
			Tellurium (Te)	13494-80-9	1.93E-06	1.18E-07
			Titanium (Ti)	7440-32-6	2.11E-02	1.29E-03
			Thallium (Tl)	7440-28-0	9.63E-06	5.87E-07
			Uranium (U)	7440-61-1	1.35E-05	8.22E-07
			Vanadium (v)	7440-62-2	1.37E-03	8.33E-05
			Tungsten (W)	7440-33-7	2.88E-04	1.76E-05
			Yttrium (Y)	7440-65-5	1.45E-04	8.82E-06
			Ytterbium (Yb)	7440-64-4	1.67E-05	1.02E-06
			Zinc (Zn)	7440-66-6	1.66E-03	1.02E-04
			Zirconium (Zr)	7440-67-7	9.06E-04	5.52E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.97E+00	3.64E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.43E+00	8.70E-02
			Iron Oxide (Fe2O3)	1309-37-1	6.27E-01	3.83E-02
			Magnesium Oxide (MgO)	1309-48-4	2.56E-01	1.56E-02
			Calcium Oxide (CaO)	1305-78-8	4.47E-01	2.72E-02
			Sodium Oxide (Na2O)	1313-59-3	3.29E-01	2.00E-02
			Potassium Oxide (K2O)	12136-45-7	1.87E-01	1.14E-02
			Titanium dioxide (TiO2)	13463-67-7	3.11E-02	1.90E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.22E-02	7.44E-04
			Manganese Oxide (MnO)	1344-43-0	4.02E-03	2.45E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.77E-03	1.69E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.55E-03	1.56E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.44E-02	1.49E-03
			Bornite (Cu5FeS4)	1308-82-3	8.79E-04	5.36E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.77E-04	4.13E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.73E-04	1.66E-05
			Cuprite (CU_2O)	1317-39-1	4.75E-04	2.90E-05
			Galena (PbS)	1314-87-0	1.92E-03	1.17E-04
			Sphalerite (ZnS)	1314-98-3	3.94E-03	2.40E-04
			Pyrite (Fe, S2)	1309-36-0	7.29E-02	4.44E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.00E-02	3.66E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.29E-03	1.40E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.63E-02	2.21E-03
			Quartz	14808-60-7	5.77E-01	3.52E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.16E+00	3.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.77E-01	1.69E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.12E+00	6.85E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.41E-01	2.69E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.11E-01	6.77E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.30E-01	3.23E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.60E-01	9.75E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.53E-03	1.54E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.34E-02	1.43E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.68E-03	3.46E-04
			Calcite (CaCO3)	1317-65-3	1.04E-01	6.34E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.38E-03	1.45E-04
			Titanite (CaTiSiO5)	[TITAN]	3.56E-02	2.17E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.54E-02	1.55E-03
			Mica	12001-26-2	1.02E+00	6.20E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.03E-01	3.06E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.10E-01	2.50E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}\ O_8$	[LAB]	3.18E-01	1.94E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E+00	6.77E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.42E+00	1.48E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.04E-01	5.51E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-01	8.05E-03
			Sillimanite (Al2SiO5)	12141-45-6	4.18E-02	2.55E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P1C	Pit 87 Material Movement	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	1.90E-06	1.90E-06
			Aluminum (Al)	7429-90-5	7.45E-02	7.45E-02
			Arsenic (As)	7440-38-2	8.12E-05	8.12E-05
			Gold (Au)	7440-57-5	5.10E-07	5.10E-07
			Boron (B)	7440-42-8	1.12E-04	1.12E-04
			Barium (Ba)	7440-39-3	3.69E-04	3.69E-04
			Beryllium (Be)	7440-41-7	1.17E-06	1.17E-06
			Bismuth (Bi)	7440-69-9	3.24E-06	3.24E-06
			Carbon (C)	7440-44-0	1.38E-03	1.38E-03
			Calcium (Ca)	7440-70-2	3.23E-02	3.23E-02
			Cadmium (Cd)	7440-43-9	6.19E-06	6.19E-06
			Cerium (Ce)	7440-45-1	7.13E-05	7.13E-05
			Cobalt (Co)	7440-48-4	2.94E-05	2.94E-05
			Chromium (Cr)	7440-47-3	9.40E-05	9.40E-05
			Cesium (Cs)	7440-46-2	3.35E-06	3.35E-06
			Copper (Cu)	7440-50-8	5.46E-04	5.46E-04
			Iron (Fe)	7439-89-6	4.61E-02	4.61E-02
			Gallium (Ga)	7440-55-3	2.05E-05	2.05E-05
			Hafnium (Hf)	7440-58-6	4.19E-06	4.19E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	1.69E-08	1.69E-08
			Potassium (K)	7440-09-7	1.56E-02	1.56E-02
			Lanthanum (La)	7439-91-0	2.47E-05	2.47E-05
			Lithium (Li)	7439-93-2	2.53E-05	2.53E-05
			Lutetium (Lu)	7439-94-3	2.61E-07	2.61E-07
			Magnesium (Mg)	7439-95-4	1.45E-02	1.45E-02
			Manganese (Mn)	7439-96-5	9.96E-05	9.96E-05
			Molybdenum (Mo)	7439-98-7	7.37E-06	7.37E-06
			Sodium (Na)	7440-23-5	2.85E-02	2.85E-02
			Niobium (Nb)	7440--03-1	5.66E-06	5.66E-06
			Nickel (Ni)	7440-02-0	1.02E-05	1.02E-05
			Phosphorus (P)	7723-14-0	6.02E-04	6.02E-04
			Lead (Pb)	7439-92-1	1.75E-05	1.75E-05
			Rubidium (Rb)	7440-17-7	7.48E-05	7.48E-05
			Sulphur (S)	7704-34-9	4.81E-03	4.81E-03
			Antimony (Sb)	7440-36-0	8.97E-06	8.97E-06
			Scandium (Sc)	7440-20-2	1.51E-05	1.51E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	9.08E-06	9.08E-06
			Strontium (Sr)	7440-24-6	3.00E-04	3.00E-04
			Tantalum (Ta)	7440-25-7	9.24E-07	9.24E-07
			Terbium (Tb)	7440-27-9	6.06E-07	6.06E-07
			Tellurium (Te)	13494-80-9	2.00E-07	2.00E-07
			Titanium (Ti)	7440-32-6	8.08E-04	8.08E-04
			Thallium (Tl)	7440-28-0	9.96E-07	9.96E-07
			Uranium (U)	7440-61-1	1.39E-06	1.39E-06
			Vanadium (v)	7440-62-2	1.41E-04	1.41E-04
			Tungsten (W)	7440-33-7	2.98E-05	2.98E-05
			Yttrium (Y)	7440-65-5	1.49E-05	1.49E-05
			Ytterbium (Yb)	7440-64-4	1.72E-06	1.72E-06
			Zinc (Zn)	7440-66-6	1.72E-04	1.72E-04
			Zirconium (Zr)	7440-67-7	9.36E-05	9.36E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.17E-01	6.17E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.47E-01	1.47E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.49E-02	6.49E-02
			Magnesium Oxide (MgO)	1309-48-4	2.65E-02	2.65E-02
			Calcium Oxide (CaO)	1305-78-8	4.62E-02	4.62E-02
			Sodium Oxide (Na2O)	1313-59-3	3.40E-02	3.40E-02
			Potassium Oxide (K2O)	12136-45-7	1.93E-02	1.93E-02
			Titanium dioxide (TiO2)	13463-67-7	1.19E-03	1.19E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.26E-03	1.26E-03
			Manganese Oxide (MnO)	1344-43-0	1.54E-04	1.54E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.86E-04	2.86E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.64E-04	2.64E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.52E-03	2.52E-03
			Bornite (Cu5FeS4)	1308-82-3	9.09E-05	9.09E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.00E-05	7.00E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.82E-05	2.82E-05
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.99E-04	1.99E-04
			Sphalerite (ZnS)	1314-98-3	4.07E-04	4.07E-04
			Pyrite (Fe, S2)	1309-36-0	7.53E-03	7.53E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.20E-03	6.20E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.37E-04	2.37E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.87E-02	2.87E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.16E-01	1.16E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.56E-02	4.56E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.26E-03	4.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.48E-02	5.48E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.65E-02	1.65E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	9.71E-05	9.71E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.42E-03	2.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.87E-04	5.87E-04
			Calcite (CaCO3)	1317-65-3	1.07E-02	1.07E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.14E-05	9.14E-05
			Titanite (CaTiSiO5)	[TITAN]	1.36E-03	1.36E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.63E-03	2.63E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
P1D	Pit 87 Loading	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.63E-01	5.63E-01
			PM_{10}	[PM10]	2.66E-01	2.66E-01
			$PM_{2.5}$	[PM2.5]	4.03E-02	4.03E-02
			Silver (Ag)	7440-22-4	1.09E-06	1.09E-06
			Aluminum (Al)	7429-90-5	4.27E-02	4.27E-02
			Arsenic (As)	7440-38-2	4.66E-05	4.66E-05
			Gold (Au)	7440-57-5	2.92E-07	2.92E-07
			Boron (B)	7440-42-8	6.44E-05	6.44E-05
			Barium (Ba)	7440-39-3	2.12E-04	2.12E-04
			Beryllium (Be)	7440-41-7	6.73E-07	6.73E-07
			Bismuth (Bi)	7440-69-9	1.86E-06	1.86E-06
			Carbon (C)	7440-44-0	7.90E-04	7.90E-04
			Calcium (Ca)	7440-70-2	1.85E-02	1.85E-02
			Cadmium (Cd)	7440-43-9	3.55E-06	3.55E-06
			Cerium (Ce)	7440-45-1	4.09E-05	4.09E-05
			Cobalt (Co)	7440-48-4	1.69E-05	1.69E-05
			Chromium (Cr)	7440-47-3	5.39E-05	5.39E-05
			Cesium (Cs)	7440-46-2	1.92E-06	1.92E-06
			Copper (Cu)	7440-50-8	3.13E-04	3.13E-04
			Iron (Fe)	7439-89-6	2.64E-02	2.64E-02
			Gallium (Ga)	7440-55-3	1.17E-05	1.17E-05
			Hafnium (Hf)	7440-58-6	2.40E-06	2.40E-06
			Mercury (Hg)	7439-97-6	1.41E-08	1.41E-08
			Indium (In)	7440-74-6	9.70E-09	9.70E-09
			Potassium (K)	7440-09-7	8.93E-03	8.93E-03
			Lanthanum (La)	7439-91-0	1.42E-05	1.42E-05
			Lithium (Li)	7439-93-2	1.45E-05	1.45E-05
			Lutetium (Lu)	7439-94-3	1.50E-07	1.50E-07
			Magnesium (Mg)	7439-95-4	8.34E-03	8.34E-03
			Manganese (Mn)	7439-96-5	1.40E-04	1.40E-04
			Molybdenum (Mo)	7439-98-7	4.23E-06	4.23E-06
			Sodium (Na)	7440-23-5	1.64E-02	1.64E-02
			Niobium (Nb)	7440--03-1	3.24E-06	3.24E-06
			Nickel (Ni)	7440-02-0	1.43E-05	1.43E-05
			Phosphorus (P)	7723-14-0	3.45E-04	3.45E-04
			Lead (Pb)	7439-92-1	1.00E-05	1.00E-05
			Rubidium (Rb)	7440-17-7	4.29E-05	4.29E-05
			Sulphur (S)	7704-34-9	2.76E-03	2.76E-03
			Antimony (Sb)	7440-36-0	5.14E-06	5.14E-06
			Scandium (Sc)	7440-20-2	8.64E-06	8.64E-06
			Selenium (Se)	7782-49-2	1.97E-07	1.97E-07
			Tin (Sn)	7440-31-5	5.21E-06	5.21E-06
			Strontium (Sr)	7440-24-6	1.72E-04	1.72E-04
			Tantalum (Ta)	7440-25-7	5.30E-07	5.30E-07
			Terbium (Tb)	7440-27-9	3.47E-07	3.47E-07
			Tellurium (Te)	13494-80-9	1.15E-07	1.15E-07
			Titanium (Ti)	7440-32-6	1.14E-03	1.14E-03
			Thallium (Tl)	7440-28-0	5.71E-07	5.71E-07
			Uranium (U)	7440-61-1	7.99E-07	7.99E-07
			Vanadium (v)	7440-62-2	8.10E-05	8.10E-05
			Tungsten (W)	7440-33-7	1.71E-05	1.71E-05
			Yttrium (Y)	7440-65-5	8.57E-06	8.57E-06
			Ytterbium (Yb)	7440-64-4	9.89E-07	9.89E-07
			Zinc (Zn)	7440-66-6	9.87E-05	9.87E-05
			Zirconium (Zr)	7440-67-7	5.37E-05	5.37E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.54E-01	3.54E-01
			Aluminum Oxide (Al2O3)	1344-28-1	8.45E-02	8.45E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.72E-02	3.72E-02
			Magnesium Oxide (MgO)	1309-48-4	1.52E-02	1.52E-02
			Calcium Oxide (CaO)	1305-78-8	2.65E-02	2.65E-02
			Sodium Oxide (Na2O)	1313-59-3	1.95E-02	1.95E-02
			Potassium Oxide (K2O)	12136-45-7	1.11E-02	1.11E-02
			Titanium dioxide (TiO2)	13463-67-7	1.68E-03	1.68E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.23E-04	7.23E-04
			Manganese Oxide (MnO)	1344-43-0	2.17E-04	2.17E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.64E-04	1.64E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.51E-04	1.51E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.44E-03	1.44E-03
			Bornite (Cu5FeS4)	1308-82-3	5.21E-05	5.21E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.01E-05	4.01E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.62E-05	1.62E-05
			Cuprite (CU_2O)	1317-39-1	2.82E-05	2.82E-05
			Galena (PbS)	1314-87-0	1.14E-04	1.14E-04
			Sphalerite (ZnS)	1314-98-3	2.34E-04	2.34E-04
			Pyrite (Fe, S2)	1309-36-0	4.32E-03	4.32E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.56E-03	3.56E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.36E-04	1.36E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.96E-03	1.96E-03
			Quartz	14808-60-7	3.11E-02	3.11E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	3.06E-01	3.06E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.64E-02	1.64E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.66E-02	6.66E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.61E-02	2.61E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.99E-03	5.99E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.14E-02	3.14E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.48E-03	9.48E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.37E-04	1.37E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.39E-03	1.39E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.37E-04	3.37E-04
			Calcite (CaCO3)	1317-65-3	6.16E-03	6.16E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.29E-04	1.29E-04
			Titanite (CaTiSiO5)	[TITAN]	1.92E-03	1.92E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.51E-03	1.51E-03
			Mica	12001-26-2	6.03E-02	6.03E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.98E-02	2.98E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.43E-02	2.43E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.89E-02	1.89E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.58E-02	6.58E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.44E-01	1.44E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.36E-02	5.36E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.83E-03	7.83E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.48E-03	2.48E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P2A	Pit J Drilling	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-4 Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	5.07E-02	5.07E-02
			PM_{10}	[PM10]	2.66E-02	2.66E-02
			$PM_{2.5}$	[PM2.5]	4.92E-03	4.92E-03
			Silver (Ag)	7440-22-4	9.82E-08	9.82E-08
			Aluminum (Al)	7429-90-5	3.84E-03	3.84E-03
			Arsenic (As)	7440-38-2	4.19E-06	4.19E-06
			Gold (Au)	7440-57-5	2.63E-08	2.63E-08
			Boron (B)	7440-42-8	5.79E-06	5.79E-06
			Barium (Ba)	7440-39-3	1.91E-05	1.91E-05
			Beryllium (Be)	7440-41-7	6.05E-08	6.05E-08
			Bismuth (Bi)	7440-69-9	1.67E-07	1.67E-07
			Carbon (C)	7440-44-0	7.11E-05	7.11E-05
			Calcium (Ca)	7440-70-2	1.67E-03	1.67E-03
			Cadmium (Cd)	7440-43-9	3.19E-07	3.19E-07
			Cerium (Ce)	7440-45-1	3.68E-06	3.68E-06
			Cobalt (Co)	7440-48-4	1.52E-06	1.52E-06
			Chromium (Cr)	7440-47-3	4.85E-06	4.85E-06
			Cesium (Cs)	7440-46-2	1.73E-07	1.73E-07
			Copper (Cu)	7440-50-8	2.81E-05	2.81E-05
			Iron (Fe)	7439-89-6	2.38E-03	2.38E-03
			Gallium (Ga)	7440-55-3	1.06E-06	1.06E-06
			Hafnium (Hf)	7440-58-6	2.16E-07	2.16E-07
			Mercury (Hg)	7439-97-6	1.27E-09	1.27E-09
			Indium (In)	7440-74-6	8.73E-10	8.73E-10
			Potassium (K)	7440-09-7	8.03E-04	8.03E-04
			Lanthanum (La)	7439-91-0	1.27E-06	1.27E-06
			Lithium (Li)	7439-93-2	1.30E-06	1.30E-06
			Lutetium (Lu)	7439-94-3	1.35E-08	1.35E-08
			Magnesium (Mg)	7439-95-4	7.50E-04	7.50E-04
			Manganese (Mn)	7439-96-5	1.40E-05	1.40E-05
			Molybdenum (Mo)	7439-98-7	3.80E-07	3.80E-07
			Sodium (Na)	7440-23-5	1.47E-03	1.47E-03
			Niobium (Nb)	7440--03-1	2.92E-07	2.92E-07
			Nickel (Ni)	7440-02-0	1.43E-06	1.43E-06
			Phosphorus (P)	7723-14-0	3.11E-05	3.11E-05
			Lead (Pb)	7439-92-1	9.03E-07	9.03E-07
			Rubidium (Rb)	7440-17-7	3.86E-06	3.86E-06
			Sulphur (S)	7704-34-9	2.48E-04	2.48E-04
			Antimony (Sb)	7440-36-0	4.63E-07	4.63E-07
			Scandium (Sc)	7440-20-2	7.77E-07	7.77E-07
			Selenium (Se)	7782-49-2	1.77E-08	1.77E-08
			Tin (Sn)	7440-31-5	4.69E-07	4.69E-07
			Strontium (Sr)	7440-24-6	1.55E-05	1.55E-05
			Tantalum (Ta)	7440-25-7	4.77E-08	4.77E-08
			Terbium (Tb)	7440-27-9	3.12E-08	3.12E-08
			Tellurium (Te)	13494-80-9	1.03E-08	1.03E-08
			Titanium (Ti)	7440-32-6	1.14E-04	1.14E-04
			Thallium (Tl)	7440-28-0	5.14E-08	5.14E-08
			Uranium (U)	7440-61-1	7.19E-08	7.19E-08
			Vanadium (v)	7440-62-2	7.28E-06	7.28E-06
			Tungsten (W)	7440-33-7	1.54E-06	1.54E-06
			Yttrium (Y)	7440-65-5	7.71E-07	7.71E-07
			Ytterbium (Yb)	7440-64-4	8.90E-08	8.90E-08
			Zinc (Zn)	7440-66-6	8.88E-06	8.88E-06
			Zirconium (Zr)	7440-67-7	4.83E-06	4.83E-06
			Silicon Dioxide (SiO2)	7631-86-9	3.18E-02	3.18E-02
			Aluminum Oxide (Al2O3)	1344-28-1	7.60E-03	7.60E-03
			Iron Oxide (Fe2O3)	1309-37-1	3.35E-03	3.35E-03
			Magnesium Oxide (MgO)	1309-48-4	1.37E-03	1.37E-03
			Calcium Oxide (CaO)	1305-78-8	2.38E-03	2.38E-03
			Sodium Oxide (Na2O)	1313-59-3	1.75E-03	1.75E-03
			Potassium Oxide (K2O)	12136-45-7	9.97E-04	9.97E-04
			Titanium dioxide (TiO2)	13463-67-7	1.68E-04	1.68E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.50E-05	6.50E-05
			Manganese Oxide (MnO)	1344-43-0	2.17E-05	2.17E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.48E-05	1.48E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.36E-05	1.36E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.30E-04	1.30E-04
			Bornite (Cu5FeS4)	1308-82-3	4.69E-06	4.69E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.61E-06	3.61E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.46E-06	1.46E-06
			Cuprite (CU_2O)	1317-39-1	2.53E-06	2.53E-06
			Galena (PbS)	1314-87-0	1.02E-05	1.02E-05
			Sphalerite (ZnS)	1314-98-3	2.10E-05	2.10E-05
			Pyrite (Fe, S2)	1309-36-0	3.89E-04	3.89E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.20E-04	3.20E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.22E-05	1.22E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.96E-04	1.96E-04
			Quartz	14808-60-7	3.11E-03	3.11E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.75E-02	2.75E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.48E-03	1.48E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	5.99E-03	5.99E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.35E-03	2.35E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.98E-04	5.98E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.83E-03	2.83E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	8.52E-04	8.52E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.36E-05	1.36E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.25E-04	1.25E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.03E-05	3.03E-05
			Calcite (CaCO3)	1317-65-3	5.54E-04	5.54E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.28E-05	1.28E-05
			Titanite (CaTiSiO5)	[TITAN]	1.92E-04	1.92E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.36E-04	1.36E-04
			Mica	12001-26-2	5.42E-03	5.42E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.68E-03	2.68E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.19E-03	2.19E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.70E-03	1.70E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.92E-03	5.92E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.29E-02	1.29E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	4.82E-03	4.82E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.04E-04	7.04E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.23E-04	2.23E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P2B	Pit J Blasting	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining) Table 11.9-2 and Austrailia Government - NPI - Explosives Detonation and Firing Ranges	Nitrogen Oxides (NOx)	10102-44-0	8.05E-01	2.62E-02
			Sulphur Dioxide (SO_2)	7446-09--5	2.42E-01	7.87E-03
			Carbon Monoxide (CO)	630-08-0	9.26E+00	3.02E-01
			TSP	[PM]	4.88E+00	2.04E-01
			PM_{10}	[PM10]	2.54E+00	1.06E-01
			$PM_{2.5}$	[PM2.5]	1.47E-01	6.11E-03
			Silver (Ag)	7440-22-4	9.47E-06	3.95E-07
			Aluminum (Al)	7429-90-5	3.71E-01	1.54E-02
			Arsenic (As)	7440-38-2	4.04E-04	1.68E-05
			Gold (Au)	7440-57-5	2.54E-06	1.06E-07
			Boron (B)	7440-42-8	5.58E-04	2.33E-05
			Barium (Ba)	7440-39-3	1.84E-03	7.66E-05
			Beryllium (Be)	7440-41-7	5.83E-06	2.43E-07
			Bismuth (Bi)	7440-69-9	1.61E-05	6.71E-07
			Carbon (C)	7440-44-0	6.85E-03	2.85E-04
			Calcium (Ca)	7440-70-2	1.61E-01	6.70E-03
			Cadmium (Cd)	7440-43-9	3.08E-05	1.28E-06
			Cerium (Ce)	7440-45-1	3.55E-04	1.48E-05
			Cobalt (Co)	7440-48-4	1.46E-04	6.10E-06
			Chromium (Cr)	7440-47-3	4.68E-04	1.95E-05
			Cesium (Cs)	7440-46-2	1.67E-05	6.94E-07
			Copper (Cu)	7440-50-8	2.71E-03	1.13E-04
			Iron (Fe)	7439-89-6	2.29E-01	9.55E-03
			Gallium (Ga)	7440-55-3	1.02E-04	4.24E-06
			Hafnium (Hf)	7440-58-6	2.08E-05	8.68E-07
			Mercury (Hg)	7439-97-6	1.22E-07	5.09E-09
			Indium (In)	7440-74-6	8.42E-08	3.51E-09
			Potassium (K)	7440-09-7	7.74E-02	3.23E-03
			Lanthanum (La)	7439-91-0	1.23E-04	5.12E-06
			Lithium (Li)	7439-93-2	1.26E-04	5.24E-06
			Lutetium (Lu)	7439-94-3	1.30E-06	5.41E-08
			Magnesium (Mg)	7439-95-4	7.23E-02	3.01E-03
			Manganese (Mn)	7439-96-5	1.34E-03	5.57E-05
			Molybdenum (Mo)	7439-98-7	3.67E-05	1.53E-06
			Sodium (Na)	7440-23-5	1.42E-01	5.91E-03
			Niobium (Nb)	7440--03-1	2.81E-05	1.17E-06
			Nickel (Ni)	7440-02-0	1.37E-04	5.69E-06
			Phosphorus (P)	7723-14-0	2.99E-03	1.25E-04
			Lead (Pb)	7439-92-1	8.71E-05	3.63E-06
			Rubidium (Rb)	7440-17-7	3.72E-04	1.55E-05
			Sulphur (S)	7704-34-9	2.39E-02	9.97E-04
			Antimony (Sb)	7440-36-0	4.46E-05	1.86E-06
			Scandium (Sc)	7440-20-2	7.49E-05	3.12E-06
			Selenium (Se)	7782-49-2	1.71E-06	7.12E-08
			Tin (Sn)	7440-31-5	4.52E-05	1.88E-06
			Strontium (Sr)	7440-24-6	1.49E-03	6.22E-05
			Tantalum (Ta)	7440-25-7	4.60E-06	1.92E-07
			Terbium (Tb)	7440-27-9	3.01E-06	1.26E-07
			Tellurium (Te)	13494-80-9	9.94E-07	4.14E-08
			Titanium (Ti)	7440-32-6	1.08E-02	4.51E-04
			Thallium (Tl)	7440-28-0	4.95E-06	2.06E-07
			Uranium (U)	7440-61-1	6.93E-06	2.89E-07
			Vanadium (v)	7440-62-2	7.02E-04	2.93E-05
			Tungsten (W)	7440-33-7	1.48E-04	6.17E-06
			Yttrium (Y)	7440-65-5	7.44E-05	3.10E-06
			Ytterbium (Yb)	7440-64-4	8.58E-06	3.57E-07
			Zinc (Zn)	7440-66-6	8.56E-04	3.57E-05
			Zirconium (Zr)	7440-67-7	4.66E-04	1.94E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.07E+00	1.28E-01
			Aluminum Oxide (Al2O3)	1344-28-1	7.33E-01	3.05E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.23E-01	1.34E-02
			Magnesium Oxide (MgO)	1309-48-4	1.32E-01	5.49E-03
			Calcium Oxide (CaO)	1305-78-8	2.30E-01	9.57E-03
			Sodium Oxide (Na2O)	1313-59-3	1.69E-01	7.04E-03
			Potassium Oxide (K2O)	12136-45-7	9.62E-02	4.01E-03
			Titanium dioxide (TiO2)	13463-67-7	1.60E-02	6.66E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.27E-03	2.61E-04
			Manganese Oxide (MnO)	1344-43-0	2.07E-03	8.61E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.42E-03	5.93E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.31E-03	5.47E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.25E-02	5.22E-04
			Bornite (Cu5FeS4)	1308-82-3	4.52E-04	1.88E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.48E-04	1.45E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.40E-04	5.85E-06
			Cuprite (CU_2O)	1317-39-1	2.44E-04	1.02E-05
			Galena (PbS)	1314-87-0	9.88E-04	4.12E-05
			Sphalerite (ZnS)	1314-98-3	2.03E-03	8.44E-05
			Pyrite (Fe, S2)	1309-36-0	3.75E-02	1.56E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.09E-02	1.29E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.18E-03	4.91E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.87E-02	7.78E-04
			Quartz	14808-60-7	2.97E-01	1.24E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.65E+00	1.11E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.43E-01	5.94E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	5.78E-01	2.41E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.27E-01	9.44E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.71E-02	2.38E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.73E-01	1.14E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	8.22E-02	3.42E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.30E-03	5.43E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.21E-02	5.02E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.92E-03	1.22E-04
			Calcite (CaCO3)	1317-65-3	5.34E-02	2.23E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.23E-03	5.11E-05
			Titanite (CaTiSiO5)	[TITAN]	1.83E-02	7.62E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.31E-02	5.45E-04
			Mica	12001-26-2	5.23E-01	2.18E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.58E-01	1.08E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.11E-01	8.79E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.64E-01	6.82E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.71E-01	2.38E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.25E+00	5.19E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	4.64E-01	1.94E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	6.79E-02	2.83E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.15E-02	8.95E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P2C	Pit J Material Movement	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	1.90E-06	1.90E-06
			Aluminum (Al)	7429-90-5	7.45E-02	7.45E-02
			Arsenic (As)	7440-38-2	8.12E-05	8.12E-05
			Gold (Au)	7440-57-5	5.10E-07	5.10E-07
			Boron (B)	7440-42-8	1.12E-04	1.12E-04
			Barium (Ba)	7440-39-3	3.69E-04	3.69E-04
			Beryllium (Be)	7440-41-7	1.17E-06	1.17E-06
			Bismuth (Bi)	7440-69-9	3.24E-06	3.24E-06
			Carbon (C)	7440-44-0	1.38E-03	1.38E-03
			Calcium (Ca)	7440-70-2	3.23E-02	3.23E-02
			Cadmium (Cd)	7440-43-9	6.19E-06	6.19E-06
			Cerium (Ce)	7440-45-1	7.13E-05	7.13E-05
			Cobalt (Co)	7440-48-4	2.94E-05	2.94E-05
			Chromium (Cr)	7440-47-3	9.40E-05	9.40E-05
			Cesium (Cs)	7440-46-2	3.35E-06	3.35E-06
			Copper (Cu)	7440-50-8	5.46E-04	5.46E-04
			Iron (Fe)	7439-89-6	4.61E-02	4.61E-02
			Gallium (Ga)	7440-55-3	2.05E-05	2.05E-05
			Hafnium (Hf)	7440-58-6	4.19E-06	4.19E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	1.69E-08	1.69E-08
			Potassium (K)	7440-09-7	1.56E-02	1.56E-02
			Lanthanum (La)	7439-91-0	2.47E-05	2.47E-05
			Lithium (Li)	7439-93-2	2.53E-05	2.53E-05
			Lutetium (Lu)	7439-94-3	2.61E-07	2.61E-07
			Magnesium (Mg)	7439-95-4	1.45E-02	1.45E-02
			Manganese (Mn)	7439-96-5	9.96E-05	9.96E-05
			Molybdenum (Mo)	7439-98-7	7.37E-06	7.37E-06
			Sodium (Na)	7440-23-5	2.85E-02	2.85E-02
			Niobium (Nb)	7440--03-1	5.66E-06	5.66E-06
			Nickel (Ni)	7440-02-0	1.02E-05	1.02E-05
			Phosphorus (P)	7723-14-0	6.02E-04	6.02E-04
			Lead (Pb)	7439-92-1	1.75E-05	1.75E-05
			Rubidium (Rb)	7440-17-7	7.48E-05	7.48E-05
			Sulphur (S)	7704-34-9	4.81E-03	4.81E-03
			Antimony (Sb)	7440-36-0	8.97E-06	8.97E-06
			Scandium (Sc)	7440-20-2	1.51E-05	1.51E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	9.08E-06	9.08E-06
			Strontium (Sr)	7440-24-6	3.00E-04	3.00E-04
			Tantalum (Ta)	7440-25-7	9.24E-07	9.24E-07
			Terbium (Tb)	7440-27-9	6.06E-07	6.06E-07
			Tellurium (Te)	13494-80-9	2.00E-07	2.00E-07
			Titanium (Ti)	7440-32-6	8.08E-04	8.08E-04
			Thallium (Tl)	7440-28-0	9.96E-07	9.96E-07
			Uranium (U)	7440-61-1	1.39E-06	1.39E-06
			Vanadium (v)	7440-62-2	1.41E-04	1.41E-04
			Tungsten (W)	7440-33-7	2.98E-05	2.98E-05
			Yttrium (Y)	7440-65-5	1.49E-05	1.49E-05
			Ytterbium (Yb)	7440-64-4	1.72E-06	1.72E-06
			Zinc (Zn)	7440-66-6	1.72E-04	1.72E-04
			Zirconium (Zr)	7440-67-7	9.36E-05	9.36E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.17E-01	6.17E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.47E-01	1.47E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.49E-02	6.49E-02
			Magnesium Oxide (MgO)	1309-48-4	2.65E-02	2.65E-02
			Calcium Oxide (CaO)	1305-78-8	4.62E-02	4.62E-02
			Sodium Oxide (Na2O)	1313-59-3	3.40E-02	3.40E-02
			Potassium Oxide (K2O)	12136-45-7	1.93E-02	1.93E-02
			Titanium dioxide (TiO2)	13463-67-7	1.19E-03	1.19E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.26E-03	1.26E-03
			Manganese Oxide (MnO)	1344-43-0	1.54E-04	1.54E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.86E-04	2.86E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.64E-04	2.64E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.52E-03	2.52E-03
			Bornite (Cu5FeS4)	1308-82-3	9.09E-05	9.09E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.00E-05	7.00E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.82E-05	2.82E-05
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.99E-04	1.99E-04
			Sphalerite (ZnS)	1314-98-3	4.07E-04	4.07E-04
			Pyrite (Fe, S2)	1309-36-0	7.53E-03	7.53E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.20E-03	6.20E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.37E-04	2.37E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.87E-02	2.87E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.16E-01	1.16E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.56E-02	4.56E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.26E-03	4.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.48E-02	5.48E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.65E-02	1.65E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	9.71E-05	9.71E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.42E-03	2.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.87E-04	5.87E-04
			Calcite (CaCO3)	1317-65-3	1.07E-02	1.07E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.14E-05	9.14E-05
			Titanite (CaTiSiO5)	[TITAN]	1.36E-03	1.36E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.63E-03	2.63E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P2D	Pit J Loading	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	1.98E-01	1.98E-01
			PM_{10}	[PM10]	9.36E-02	9.36E-02
			$PM_{2.5}$	[PM2.5]	1.42E-02	1.42E-02
			Silver (Ag)	7440-22-4	3.84E-07	3.84E-07
			Aluminum (Al)	7429-90-5	1.50E-02	1.50E-02
			Arsenic (As)	7440-38-2	1.64E-05	1.64E-05
			Gold (Au)	7440-57-5	1.03E-07	1.03E-07
			Boron (B)	7440-42-8	2.26E-05	2.26E-05
			Barium (Ba)	7440-39-3	7.44E-05	7.44E-05
			Beryllium (Be)	7440-41-7	2.36E-07	2.36E-07
			Bismuth (Bi)	7440-69-9	6.52E-07	6.52E-07
			Carbon (C)	7440-44-0	2.78E-04	2.78E-04
			Calcium (Ca)	7440-70-2	6.51E-03	6.51E-03
			Cadmium (Cd)	7440-43-9	1.25E-06	1.25E-06
			Cerium (Ce)	7440-45-1	1.44E-05	1.44E-05
			Cobalt (Co)	7440-48-4	5.93E-06	5.93E-06
			Chromium (Cr)	7440-47-3	1.89E-05	1.89E-05
			Cesium (Cs)	7440-46-2	6.75E-07	6.75E-07
			Copper (Cu)	7440-50-8	1.10E-04	1.10E-04
			Iron (Fe)	7439-89-6	9.28E-03	9.28E-03
			Gallium (Ga)	7440-55-3	4.12E-06	4.12E-06
			Hafnium (Hf)	7440-58-6	8.44E-07	8.44E-07
			Mercury (Hg)	7439-97-6	4.95E-09	4.95E-09
			Indium (In)	7440-74-6	3.41E-09	3.41E-09
			Potassium (K)	7440-09-7	3.14E-03	3.14E-03
			Lanthanum (La)	7439-91-0	4.98E-06	4.98E-06
			Lithium (Li)	7439-93-2	5.10E-06	5.10E-06
			Lutetium (Lu)	7439-94-3	5.26E-08	5.26E-08
			Magnesium (Mg)	7439-95-4	2.93E-03	2.93E-03
			Manganese (Mn)	7439-96-5	4.92E-05	4.92E-05
			Molybdenum (Mo)	7439-98-7	1.48E-06	1.48E-06
			Sodium (Na)	7440-23-5	5.75E-03	5.75E-03
			Niobium (Nb)	7440--03-1	1.14E-06	1.14E-06
			Nickel (Ni)	7440-02-0	5.03E-06	5.03E-06
			Phosphorus (P)	7723-14-0	1.21E-04	1.21E-04
			Lead (Pb)	7439-92-1	3.53E-06	3.53E-06
			Rubidium (Rb)	7440-17-7	1.51E-05	1.51E-05
			Sulphur (S)	7704-34-9	9.69E-04	9.69E-04
			Antimony (Sb)	7440-36-0	1.81E-06	1.81E-06
			Scandium (Sc)	7440-20-2	3.04E-06	3.04E-06
			Selenium (Se)	7782-49-2	6.92E-08	6.92E-08
			Tin (Sn)	7440-31-5	1.83E-06	1.83E-06
			Strontium (Sr)	7440-24-6	6.05E-05	6.05E-05
			Tantalum (Ta)	7440-25-7	1.86E-07	1.86E-07
			Terbium (Tb)	7440-27-9	1.22E-07	1.22E-07
			Tellurium (Te)	13494-80-9	4.03E-08	4.03E-08
			Titanium (Ti)	7440-32-6	3.99E-04	3.99E-04
			Thallium (Tl)	7440-28-0	2.01E-07	2.01E-07
			Uranium (U)	7440-61-1	2.81E-07	2.81E-07
			Vanadium (v)	7440-62-2	2.85E-05	2.85E-05
			Tungsten (W)	7440-33-7	6.00E-06	6.00E-06
			Yttrium (Y)	7440-65-5	3.01E-06	3.01E-06
			Ytterbium (Yb)	7440-64-4	3.47E-07	3.47E-07
			Zinc (Zn)	7440-66-6	3.47E-05	3.47E-05
			Zirconium (Zr)	7440-67-7	1.89E-05	1.89E-05
			Silicon Dioxide (SiO2)	7631-86-9	1.24E-01	1.24E-01
			Aluminum Oxide (Al2O3)	1344-28-1	2.97E-02	2.97E-02
			Iron Oxide (Fe2O3)	1309-37-1	1.31E-02	1.31E-02
			Magnesium Oxide (MgO)	1309-48-4	5.34E-03	5.34E-03
			Calcium Oxide (CaO)	1305-78-8	9.31E-03	9.31E-03
			Sodium Oxide (Na2O)	1313-59-3	6.84E-03	6.84E-03
			Potassium Oxide (K2O)	12136-45-7	3.90E-03	3.90E-03
			Titanium dioxide (TiO2)	13463-67-7	5.89E-04	5.89E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.54E-04	2.54E-04
			Manganese Oxide (MnO)	1344-43-0	7.62E-05	7.62E-05
			Chromium Oxide (Cr2O3)	1308-38-9	5.77E-05	5.77E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	5.32E-05	5.32E-05
			Chalcopyrite (CuFeS2)	1308-56-1	5.08E-04	5.08E-04
			Bornite (Cu5FeS4)	1308-82-3	1.83E-05	1.83E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.41E-05	1.41E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	5.69E-06	5.69E-06
			Cuprite (CU_2O)	1317-39-1	9.89E-06	9.89E-06
			Galena (PbS)	1314-87-0	4.00E-05	4.00E-05
			Sphalerite (ZnS)	1314-98-3	8.21E-05	8.21E-05
			Pyrite (Fe, S2)	1309-36-0	1.52E-03	1.52E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.25E-03	1.25E-03
			Arsenopyrite (FeAsS)	1303-18-0	4.78E-05	4.78E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	6.88E-04	6.88E-04
			Quartz	14808-60-7	1.09E-02	1.09E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.08E-01	1.08E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	5.78E-03	5.78E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.34E-02	2.34E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.18E-03	9.18E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.10E-03	2.10E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.10E-02	1.10E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.33E-03	3.33E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	4.80E-05	4.80E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	4.88E-04	4.88E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.18E-04	1.18E-04
			Calcite (CaCO3)	1317-65-3	2.16E-03	2.16E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.52E-05	4.52E-05
			Titanite (CaTiSiO5)	[TITAN]	6.74E-04	6.74E-04
			Apatite (Ca5(PO4)3)	1306-05-4	5.30E-04	5.30E-04
			Mica	12001-26-2	2.12E-02	2.12E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.05E-02	1.05E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.55E-03	8.55E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.63E-03	6.63E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.31E-02	2.31E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.05E-02	5.05E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.88E-02	1.88E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.75E-03	2.75E-03
			Sillimanite (Al2SiO5)	12141-45-6	8.71E-04	8.71E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P3A	Pit SW Drilling	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-4 Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	1.44E-01	1.44E-01
			PM_{10}	[PM10]	7.58E-02	7.58E-02
			$PM_{2.5}$	[PM2.5]	1.40E-02	1.40E-02
			Silver (Ag)	7440-22-4	2.80E-07	2.80E-07
			Aluminum (Al)	7429-90-5	1.09E-02	1.09E-02
			Arsenic (As)	7440-38-2	1.19E-05	1.19E-05
			Gold (Au)	7440-57-5	7.49E-08	7.49E-08
			Boron (B)	7440-42-8	1.65E-05	1.65E-05
			Barium (Ba)	7440-39-3	5.42E-05	5.42E-05
			Beryllium (Be)	7440-41-7	1.72E-07	1.72E-07
			Bismuth (Bi)	7440-69-9	4.75E-07	4.75E-07
			Carbon (C)	7440-44-0	2.02E-04	2.02E-04
			Calcium (Ca)	7440-70-2	4.75E-03	4.75E-03
			Cadmium (Cd)	7440-43-9	9.09E-07	9.09E-07
			Cerium (Ce)	7440-45-1	1.05E-05	1.05E-05
			Cobalt (Co)	7440-48-4	4.32E-06	4.32E-06
			Chromium (Cr)	7440-47-3	1.38E-05	1.38E-05
			Cesium (Cs)	7440-46-2	4.92E-07	4.92E-07
			Copper (Cu)	7440-50-8	8.01E-05	8.01E-05
			Iron (Fe)	7439-89-6	6.77E-03	6.77E-03
			Gallium (Ga)	7440-55-3	3.01E-06	3.01E-06
			Hafnium (Hf)	7440-58-6	6.15E-07	6.15E-07
			Mercury (Hg)	7439-97-6	3.60E-09	3.60E-09
			Indium (In)	7440-74-6	2.48E-09	2.48E-09
			Potassium (K)	7440-09-7	2.29E-03	2.29E-03
			Lanthanum (La)	7439-91-0	3.63E-06	3.63E-06
			Lithium (Li)	7439-93-2	3.71E-06	3.71E-06
			Lutetium (Lu)	7439-94-3	3.83E-08	3.83E-08
			Magnesium (Mg)	7439-95-4	2.14E-03	2.14E-03
			Manganese (Mn)	7439-96-5	3.98E-05	3.98E-05
			Molybdenum (Mo)	7439-98-7	1.08E-06	1.08E-06
			Sodium (Na)	7440-23-5	4.19E-03	4.19E-03
			Niobium (Nb)	7440--03-1	8.31E-07	8.31E-07
			Nickel (Ni)	7440-02-0	4.07E-06	4.07E-06
			Phosphorus (P)	7723-14-0	8.84E-05	8.84E-05
			Lead (Pb)	7439-92-1	2.57E-06	2.57E-06
			Rubidium (Rb)	7440-17-7	1.10E-05	1.10E-05
			Sulphur (S)	7704-34-9	7.06E-04	7.06E-04
			Antimony (Sb)	7440-36-0	1.32E-06	1.32E-06
			Scandium (Sc)	7440-20-2	2.21E-06	2.21E-06
			Selenium (Se)	7782-49-2	5.05E-08	5.05E-08
			Tin (Sn)	7440-31-5	1.33E-06	1.33E-06
			Strontium (Sr)	7440-24-6	4.41E-05	4.41E-05
			Tantalum (Ta)	7440-25-7	1.36E-07	1.36E-07
			Terbium (Tb)	7440-27-9	8.89E-08	8.89E-08
			Tellurium (Te)	13494-80-9	2.94E-08	2.94E-08
			Titanium (Ti)	7440-32-6	3.23E-04	3.23E-04
			Thallium (Tl)	7440-28-0	1.46E-07	1.46E-07
			Uranium (U)	7440-61-1	2.05E-07	2.05E-07
			Vanadium (v)	7440-62-2	2.07E-05	2.07E-05
			Tungsten (W)	7440-33-7	4.37E-06	4.37E-06
			Yttrium (Y)	7440-65-5	2.20E-06	2.20E-06
			Ytterbium (Yb)	7440-64-4	2.53E-07	2.53E-07
			Zinc (Zn)	7440-66-6	2.53E-05	2.53E-05
			Zirconium (Zr)	7440-67-7	1.38E-05	1.38E-05
			Silicon Dioxide (SiO2)	7631-86-9	9.06E-02	9.06E-02
			Aluminum Oxide (Al2O3)	1344-28-1	2.16E-02	2.16E-02
			Iron Oxide (Fe2O3)	1309-37-1	9.52E-03	9.52E-03
			Magnesium Oxide (MgO)	1309-48-4	3.89E-03	3.89E-03
			Calcium Oxide (CaO)	1305-78-8	6.78E-03	6.78E-03
			Sodium Oxide (Na2O)	1313-59-3	4.99E-03	4.99E-03
			Potassium Oxide (K2O)	12136-45-7	2.84E-03	2.84E-03
			Titanium dioxide (TiO2)	13463-67-7	4.77E-04	4.77E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.85E-04	1.85E-04
			Manganese Oxide (MnO)	1344-43-0	6.17E-05	6.17E-05
			Chromium Oxide (Cr2O3)	1308-38-9	4.20E-05	4.20E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	3.87E-05	3.87E-05
			Chalcopyrite (CuFeS2)	1308-56-1	3.70E-04	3.70E-04
			Bornite (Cu5FeS4)	1308-82-3	1.33E-05	1.33E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.03E-05	1.03E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	4.14E-06	4.14E-06
			Cuprite (CU_2O)	1317-39-1	7.21E-06	7.21E-06
			Galena (PbS)	1314-87-0	2.92E-05	2.92E-05
			Sphalerite (ZnS)	1314-98-3	5.98E-05	5.98E-05
			Pyrite (Fe, S2)	1309-36-0	1.11E-03	1.11E-03
			Pyrrhotite (Fe7S8)	12305-96-3	9.11E-04	9.11E-04
			Arsenopyrite (FeAsS)	1303-18-0	3.48E-05	3.48E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	5.57E-04	5.57E-04
			Quartz	14808-60-7	8.85E-03	8.85E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.84E-02	7.84E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	4.21E-03	4.21E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.71E-02	1.71E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	6.69E-03	6.69E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.70E-03	1.70E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	8.05E-03	8.05E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.43E-03	2.43E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.88E-05	3.88E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.56E-04	3.56E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.62E-05	8.62E-05
			Calcite (CaCO3)	1317-65-3	1.58E-03	1.58E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.66E-05	3.66E-05
			Titanite (CaTiSiO5)	[TITAN]	5.46E-04	5.46E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.86E-04	3.86E-04
			Mica	12001-26-2	1.54E-02	1.54E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	7.63E-03	7.63E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.23E-03	6.23E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.83E-03	4.83E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.69E-02	1.69E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.68E-02	3.68E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.37E-02	1.37E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.00E-03	2.00E-03
			Sillimanite (Al2SiO5)	12141-45-6	6.34E-04	6.34E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P3B	Pit SW Blasting	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 and Austrailia Government - NPI - Explosives Detonation and Firing Ranges	Nitrogen Oxides (NOx)	10102-44-0	1.57E+00	7.46E-02
			Sulphur Dioxide (SO_2)	7446-09--5	4.70E-01	2.24E-02
			Carbon Monoxide (CO)	630-08-0	1.80E+01	8.58E-01
			TSP	[PM]	9.50E+00	5.79E-01
			PM_{10}	[PM10]	4.94E+00	3.01E-01
			$PM_{2.5}$	[PM2.5]	2.85E-01	1.74E-02
			Silver (Ag)	7440-22-4	1.84E-05	1.12E-06
			Aluminum (Al)	7429-90-5	7.21E-01	4.40E-02
			Arsenic (As)	7440-38-2	7.85E-04	4.79E-05
			Gold (Au)	7440-57-5	4.93E-06	3.01E-07
			Boron (B)	7440-42-8	1.09E-03	6.62E-05
			Barium (Ba)	7440-39-3	3.57E-03	2.18E-04
			Beryllium (Be)	7440-41-7	1.13E-05	6.92E-07
			Bismuth (Bi)	7440-69-9	3.13E-05	1.91E-06
			Carbon (C)	7440-44-0	1.33E-02	8.13E-04
			Calcium (Ca)	7440-70-2	3.13E-01	1.91E-02
			Cadmium (Cd)	7440-43-9	5.99E-05	3.65E-06
			Cerium (Ce)	7440-45-1	6.90E-04	4.21E-05
			Cobalt (Co)	7440-48-4	2.85E-04	1.74E-05
			Chromium (Cr)	7440-47-3	9.10E-04	5.55E-05
			Cesium (Cs)	7440-46-2	3.24E-05	1.98E-06
			Copper (Cu)	7440-50-8	5.28E-03	3.22E-04
			Iron (Fe)	7439-89-6	4.46E-01	2.72E-02
			Gallium (Ga)	7440-55-3	1.98E-04	1.21E-05
			Hafnium (Hf)	7440-58-6	4.05E-05	2.47E-06
			Mercury (Hg)	7439-97-6	2.38E-07	1.45E-08
			Indium (In)	7440-74-6	1.64E-07	9.98E-09
			Potassium (K)	7440-09-7	1.51E-01	9.19E-03
			Lanthanum (La)	7439-91-0	2.39E-04	1.46E-05
			Lithium (Li)	7439-93-2	2.45E-04	1.49E-05
			Lutetium (Lu)	7439-94-3	2.53E-06	1.54E-07
			Magnesium (Mg)	7439-95-4	1.41E-01	8.58E-03
			Manganese (Mn)	7439-96-5	2.60E-03	1.58E-04
			Molybdenum (Mo)	7439-98-7	7.13E-05	4.35E-06
			Sodium (Na)	7440-23-5	2.76E-01	1.68E-02
			Niobium (Nb)	7440--03-1	5.47E-05	3.34E-06
			Nickel (Ni)	7440-02-0	2.66E-04	1.62E-05
			Phosphorus (P)	7723-14-0	5.82E-03	3.55E-04
			Lead (Pb)	7439-92-1	1.69E-04	1.03E-05
			Rubidium (Rb)	7440-17-7	7.24E-04	4.41E-05
			Sulphur (S)	7704-34-9	4.65E-02	2.84E-03
			Antimony (Sb)	7440-36-0	8.67E-05	5.29E-06
			Scandium (Sc)	7440-20-2	1.46E-04	8.89E-06
			Selenium (Se)	7782-49-2	3.33E-06	2.03E-07
			Tin (Sn)	7440-31-5	8.79E-05	5.36E-06
			Strontium (Sr)	7440-24-6	2.91E-03	1.77E-04
			Tantalum (Ta)	7440-25-7	8.94E-06	5.45E-07
			Terbium (Tb)	7440-27-9	5.86E-06	3.57E-07
			Tellurium (Te)	13494-80-9	1.93E-06	1.18E-07
			Titanium (Ti)	7440-32-6	2.11E-02	1.29E-03
			Thallium (Tl)	7440-28-0	9.63E-06	5.87E-07
			Uranium (U)	7440-61-1	1.35E-05	8.22E-07
			Vanadium (v)	7440-62-2	1.37E-03	8.33E-05
			Tungsten (W)	7440-33-7	2.88E-04	1.76E-05
			Yttrium (Y)	7440-65-5	1.45E-04	8.82E-06
			Ytterbium (Yb)	7440-64-4	1.67E-05	1.02E-06
			Zinc (Zn)	7440-66-6	1.66E-03	1.02E-04
			Zirconium (Zr)	7440-67-7	9.06E-04	5.52E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.97E+00	3.64E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.43E+00	8.70E-02
			Iron Oxide (Fe2O3)	1309-37-1	6.27E-01	3.83E-02
			Magnesium Oxide (MgO)	1309-48-4	2.56E-01	1.56E-02
			Calcium Oxide (CaO)	1305-78-8	4.47E-01	2.72E-02
			Sodium Oxide (Na2O)	1313-59-3	3.29E-01	2.00E-02
			Potassium Oxide (K2O)	12136-45-7	1.87E-01	1.14E-02
			Titanium dioxide (TiO2)	13463-67-7	3.11E-02	1.90E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.22E-02	7.44E-04
			Manganese Oxide (MnO)	1344-43-0	4.02E-03	2.45E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.77E-03	1.69E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.55E-03	1.56E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.44E-02	1.49E-03
			Bornite (Cu5FeS4)	1308-82-3	8.79E-04	5.36E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.77E-04	4.13E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.73E-04	1.66E-05
			Cuprite (CU_2O)	1317-39-1	4.75E-04	2.90E-05
			Galena (PbS)	1314-87-0	1.92E-03	1.17E-04
			Sphalerite (ZnS)	1314-98-3	3.94E-03	2.40E-04
			Pyrite (Fe, S2)	1309-36-0	7.29E-02	4.44E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.00E-02	3.66E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.29E-03	1.40E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.63E-02	2.21E-03
			Quartz	14808-60-7	5.77E-01	3.52E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.16E+00	3.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.77E-01	1.69E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.12E+00	6.85E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.41E-01	2.69E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.11E-01	6.77E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.30E-01	3.23E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.60E-01	9.75E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.53E-03	1.54E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.34E-02	1.43E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.68E-03	3.46E-04
			Calcite (CaCO3)	1317-65-3	1.04E-01	6.34E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.38E-03	1.45E-04
			Titanite (CaTiSiO5)	[TITAN]	3.56E-02	2.17E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.54E-02	1.55E-03
			Mica	12001-26-2	1.02E+00	6.20E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.03E-01	3.06E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.10E-01	2.50E-02
			Labradorite ($(Na,Ca)_{1-2}Si_{3-2}$ O_8	[LAB]	3.18E-01	1.94E-02
			Andesine ($(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E+00	6.77E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.42E+00	1.48E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.04E-01	5.51E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-01	8.05E-03
			Sillimanite (Al2SiO5)	12141-45-6	4.18E-02	2.55E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
P3C	Pit SW Material Movement	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	1.90E-06	1.90E-06
			Aluminum (Al)	7429-90-5	7.45E-02	7.45E-02
			Arsenic (As)	7440-38-2	8.12E-05	8.12E-05
			Gold (Au)	7440-57-5	5.10E-07	5.10E-07
			Boron (B)	7440-42-8	1.12E-04	1.12E-04
			Barium (Ba)	7440-39-3	3.69E-04	3.69E-04
			Beryllium (Be)	7440-41-7	1.17E-06	1.17E-06
			Bismuth (Bi)	7440-69-9	3.24E-06	3.24E-06
			Carbon (C)	7440-44-0	1.38E-03	1.38E-03
			Calcium (Ca)	7440-70-2	3.23E-02	3.23E-02
			Cadmium (Cd)	7440-43-9	6.19E-06	6.19E-06
			Cerium (Ce)	7440-45-1	7.13E-05	7.13E-05
			Cobalt (Co)	7440-48-4	2.94E-05	2.94E-05
			Chromium (Cr)	7440-47-3	9.40E-05	9.40E-05
			Cesium (Cs)	7440-46-2	3.35E-06	3.35E-06
			Copper (Cu)	7440-50-8	5.46E-04	5.46E-04
			Iron (Fe)	7439-89-6	4.61E-02	4.61E-02
			Gallium (Ga)	7440-55-3	2.05E-05	2.05E-05
			Hafnium (Hf)	7440-58-6	4.19E-06	4.19E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	1.69E-08	1.69E-08
			Potassium (K)	7440-09-7	1.56E-02	1.56E-02
			Lanthanum (La)	7439-91-0	2.47E-05	2.47E-05
			Lithium (Li)	7439-93-2	2.53E-05	2.53E-05
			Lutetium (Lu)	7439-94-3	2.61E-07	2.61E-07
			Magnesium (Mg)	7439-95-4	1.45E-02	1.45E-02
			Manganese (Mn)	7439-96-5	9.96E-05	9.96E-05
			Molybdenum (Mo)	7439-98-7	7.37E-06	7.37E-06
			Sodium (Na)	7440-23-5	2.85E-02	2.85E-02
			Niobium (Nb)	7440--03-1	5.66E-06	5.66E-06
			Nickel (Ni)	7440-02-0	1.02E-05	1.02E-05
			Phosphorus (P)	7723-14-0	6.02E-04	6.02E-04
			Lead (Pb)	7439-92-1	1.75E-05	1.75E-05
			Rubidium (Rb)	7440-17-7	7.48E-05	7.48E-05
			Sulphur (S)	7704-34-9	4.81E-03	4.81E-03
			Antimony (Sb)	7440-36-0	8.97E-06	8.97E-06
			Scandium (Sc)	7440-20-2	1.51E-05	1.51E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	9.08E-06	9.08E-06
			Strontium (Sr)	7440-24-6	3.00E-04	3.00E-04
			Tantalum (Ta)	7440-25-7	9.24E-07	9.24E-07
			Terbium (Tb)	7440-27-9	6.06E-07	6.06E-07
			Tellurium (Te)	13494-80-9	2.00E-07	2.00E-07
			Titanium (Ti)	7440-32-6	8.08E-04	8.08E-04
			Thallium (Tl)	7440-28-0	9.96E-07	9.96E-07
			Uranium (U)	7440-61-1	1.39E-06	1.39E-06
			Vanadium (v)	7440-62-2	1.41E-04	1.41E-04
			Tungsten (W)	7440-33-7	2.98E-05	2.98E-05
			Yttrium (Y)	7440-65-5	1.49E-05	1.49E-05
			Ytterbium (Yb)	7440-64-4	1.72E-06	1.72E-06
			Zinc (Zn)	7440-66-6	1.72E-04	1.72E-04
			Zirconium (Zr)	7440-67-7	9.36E-05	9.36E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.17E-01	6.17E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.47E-01	1.47E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.49E-02	6.49E-02
			Magnesium Oxide (MgO)	1309-48-4	2.65E-02	2.65E-02
			Calcium Oxide (CaO)	1305-78-8	4.62E-02	4.62E-02
			Sodium Oxide (Na2O)	1313-59-3	3.40E-02	3.40E-02
			Potassium Oxide (K2O)	12136-45-7	1.93E-02	1.93E-02
			Titanium dioxide (TiO2)	13463-67-7	1.19E-03	1.19E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.26E-03	1.26E-03
			Manganese Oxide (MnO)	1344-43-0	1.54E-04	1.54E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.86E-04	2.86E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.64E-04	2.64E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.52E-03	2.52E-03
			Bornite (Cu5FeS4)	1308-82-3	9.09E-05	9.09E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.00E-05	7.00E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.82E-05	2.82E-05
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.99E-04	1.99E-04
			Sphalerite (ZnS)	1314-98-3	4.07E-04	4.07E-04
			Pyrite (Fe, S2)	1309-36-0	7.53E-03	7.53E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.20E-03	6.20E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.37E-04	2.37E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.87E-02	2.87E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.16E-01	1.16E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.56E-02	4.56E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.26E-03	4.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.48E-02	5.48E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.65E-02	1.65E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	9.71E-05	9.71E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.42E-03	2.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.87E-04	5.87E-04
			Calcite (CaCO3)	1317-65-3	1.07E-02	1.07E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.14E-05	9.14E-05
			Titanite (CaTiSiO5)	[TITAN]	1.36E-03	1.36E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.63E-03	2.63E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
P3D	Pit J Loading	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.63E-01	5.63E-01
			PM_{10}	[PM10]	2.66E-01	2.66E-01
			$PM_{2.5}$	[PM2.5]	4.03E-02	4.03E-02
			Silver (Ag)	7440-22-4	1.09E-06	1.09E-06
			Aluminum (Al)	7429-90-5	4.27E-02	4.27E-02
			Arsenic (As)	7440-38-2	4.66E-05	4.66E-05
			Gold (Au)	7440-57-5	2.92E-07	2.92E-07
			Boron (B)	7440-42-8	6.44E-05	6.44E-05
			Barium (Ba)	7440-39-3	2.12E-04	2.12E-04
			Beryllium (Be)	7440-41-7	6.73E-07	6.73E-07
			Bismuth (Bi)	7440-69-9	1.86E-06	1.86E-06
			Carbon (C)	7440-44-0	7.90E-04	7.90E-04
			Calcium (Ca)	7440-70-2	1.85E-02	1.85E-02
			Cadmium (Cd)	7440-43-9	3.55E-06	3.55E-06
			Cerium (Ce)	7440-45-1	4.09E-05	4.09E-05
			Cobalt (Co)	7440-48-4	1.69E-05	1.69E-05
			Chromium (Cr)	7440-47-3	5.39E-05	5.39E-05
			Cesium (Cs)	7440-46-2	1.92E-06	1.92E-06
			Copper (Cu)	7440-50-8	3.13E-04	3.13E-04
			Iron (Fe)	7439-89-6	2.64E-02	2.64E-02
			Gallium (Ga)	7440-55-3	1.17E-05	1.17E-05
			Hafnium (Hf)	7440-58-6	2.40E-06	2.40E-06
			Mercury (Hg)	7439-97-6	1.41E-08	1.41E-08
			Indium (In)	7440-74-6	9.70E-09	9.70E-09
			Potassium (K)	7440-09-7	8.93E-03	8.93E-03
			Lanthanum (La)	7439-91-0	1.42E-05	1.42E-05
			Lithium (Li)	7439-93-2	1.45E-05	1.45E-05
			Lutetium (Lu)	7439-94-3	1.50E-07	1.50E-07
			Magnesium (Mg)	7439-95-4	8.34E-03	8.34E-03
			Manganese (Mn)	7439-96-5	1.40E-04	1.40E-04
			Molybdenum (Mo)	7439-98-7	4.23E-06	4.23E-06
			Sodium (Na)	7440-23-5	1.64E-02	1.64E-02
			Niobium (Nb)	7440--03-1	3.24E-06	3.24E-06
			Nickel (Ni)	7440-02-0	1.43E-05	1.43E-05
			Phosphorus (P)	7723-14-0	3.45E-04	3.45E-04
			Lead (Pb)	7439-92-1	1.00E-05	1.00E-05
			Rubidium (Rb)	7440-17-7	4.29E-05	4.29E-05
			Sulphur (S)	7704-34-9	2.76E-03	2.76E-03
			Antimony (Sb)	7440-36-0	5.14E-06	5.14E-06
			Scandium (Sc)	7440-20-2	8.64E-06	8.64E-06
			Selenium (Se)	7782-49-2	1.97E-07	1.97E-07
			Tin (Sn)	7440-31-5	5.21E-06	5.21E-06
			Strontium (Sr)	7440-24-6	1.72E-04	1.72E-04
			Tantalum (Ta)	7440-25-7	5.30E-07	5.30E-07
			Terbium (Tb)	7440-27-9	3.47E-07	3.47E-07
			Tellurium (Te)	13494-80-9	1.15E-07	1.15E-07
			Titanium (Ti)	7440-32-6	1.14E-03	1.14E-03
			Thallium (Tl)	7440-28-0	5.71E-07	5.71E-07
			Uranium (U)	7440-61-1	7.99E-07	7.99E-07
			Vanadium (v)	7440-62-2	8.10E-05	8.10E-05
			Tungsten (W)	7440-33-7	1.71E-05	1.71E-05
			Yttrium (Y)	7440-65-5	8.57E-06	8.57E-06
			Ytterbium (Yb)	7440-64-4	9.89E-07	9.89E-07
			Zinc (Zn)	7440-66-6	9.87E-05	9.87E-05
			Zirconium (Zr)	7440-67-7	5.37E-05	5.37E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.54E-01	3.54E-01
			Aluminum Oxide (Al2O3)	1344-28-1	8.45E-02	8.45E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.72E-02	3.72E-02
			Magnesium Oxide (MgO)	1309-48-4	1.52E-02	1.52E-02
			Calcium Oxide (CaO)	1305-78-8	2.65E-02	2.65E-02
			Sodium Oxide (Na2O)	1313-59-3	1.95E-02	1.95E-02
			Potassium Oxide (K2O)	12136-45-7	1.11E-02	1.11E-02
			Titanium dioxide (TiO2)	13463-67-7	1.68E-03	1.68E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.23E-04	7.23E-04
			Manganese Oxide (MnO)	1344-43-0	2.17E-04	2.17E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.64E-04	1.64E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.51E-04	1.51E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.44E-03	1.44E-03
			Bornite (Cu5FeS4)	1308-82-3	5.21E-05	5.21E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.01E-05	4.01E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.62E-05	1.62E-05
			Cuprite (CU_2O)	1317-39-1	2.82E-05	2.82E-05
			Galena (PbS)	1314-87-0	1.14E-04	1.14E-04
			Sphalerite (ZnS)	1314-98-3	2.34E-04	2.34E-04
			Pyrite (Fe, S2)	1309-36-0	4.32E-03	4.32E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.56E-03	3.56E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.36E-04	1.36E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.96E-03	1.96E-03
			Quartz	14808-60-7	3.11E-02	3.11E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	3.06E-01	3.06E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.64E-02	1.64E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.66E-02	6.66E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.61E-02	2.61E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.99E-03	5.99E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.14E-02	3.14E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.48E-03	9.48E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.37E-04	1.37E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.39E-03	1.39E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.37E-04	3.37E-04
			Calcite (CaCO3)	1317-65-3	6.16E-03	6.16E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.29E-04	1.29E-04
			Titanite (CaTiSiO5)	[TITAN]	1.92E-03	1.92E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.51E-03	1.51E-03
			Mica	12001-26-2	6.03E-02	6.03E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.98E-02	2.98E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.43E-02	2.43E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.89E-02	1.89E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.58E-02	6.58E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.44E-01	1.44E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.36E-02	5.36E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.83E-03	7.83E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.48E-03	2.48E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
M1	Unloading/Loading Ore at Coarse Ore Storage Area	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.86E-01	5.86E-01
			PM_{10}	[PM10]	2.77E-01	2.77E-01
			$PM_{2.5}$	[PM2.5]	4.20E-02	4.20E-02
			Silver (Ag)	7440-22-4	1.14E-06	1.14E-06
			Aluminum (Al)	7429-90-5	4.43E-02	4.43E-02
			Arsenic (As)	7440-38-2	4.84E-05	4.84E-05
			Gold (Au)	7440-57-5	3.04E-07	3.04E-07
			Boron (B)	7440-42-8	6.69E-05	6.69E-05
			Barium (Ba)	7440-39-3	2.20E-04	2.20E-04
			Beryllium (Be)	7440-41-7	7.00E-07	7.00E-07
			Bismuth (Bi)	7440-69-9	1.93E-06	1.93E-06
			Carbon (C)	7440-44-0	8.22E-04	8.22E-04
			Calcium (Ca)	7440-70-2	1.68E-02	1.68E-02
			Cadmium (Cd)	7440-43-9	3.69E-06	3.69E-06
			Cerium (Ce)	7440-45-1	4.25E-05	4.25E-05
			Cobalt (Co)	7440-48-4	1.76E-05	1.76E-05
			Chromium (Cr)	7440-47-3	5.61E-05	5.61E-05
			Cesium (Cs)	7440-46-2	2.00E-06	2.00E-06
			Copper (Cu)	7440-50-8	3.25E-04	3.25E-04
			Iron (Fe)	7439-89-6	2.75E-02	2.75E-02
			Gallium (Ga)	7440-55-3	1.22E-05	1.22E-05
			Hafnium (Hf)	7440-58-6	2.50E-06	2.50E-06
			Mercury (Hg)	7439-97-6	1.46E-08	1.46E-08
			Indium (In)	7440-74-6	1.01E-08	1.01E-08
			Potassium (K)	7440-09-7	9.29E-03	9.29E-03
			Lanthanum (La)	7439-91-0	1.47E-05	1.47E-05
			Lithium (Li)	7439-93-2	1.51E-05	1.51E-05
			Lutetium (Lu)	7439-94-3	1.56E-07	1.56E-07
			Magnesium (Mg)	7439-95-4	7.88E-03	7.88E-03
			Manganese (Mn)	7439-96-5	1.35E-04	1.35E-04
			Molybdenum (Mo)	7439-98-7	4.40E-06	4.40E-06
			Sodium (Na)	7440-23-5	1.70E-02	1.70E-02
			Niobium (Nb)	7440--03-1	3.37E-06	3.37E-06
			Nickel (Ni)	7440-02-0	1.49E-05	1.49E-05
			Phosphorus (P)	7723-14-0	3.33E-04	3.33E-04
			Lead (Pb)	7439-92-1	1.04E-05	1.04E-05
			Rubidium (Rb)	7440-17-7	4.46E-05	4.46E-05
			Sulphur (S)	7704-34-9	2.87E-03	2.87E-03
			Antimony (Sb)	7440-36-0	5.35E-06	5.35E-06
			Scandium (Sc)	7440-20-2	8.99E-06	8.99E-06
			Selenium (Se)	7782-49-2	2.05E-07	2.05E-07
			Tin (Sn)	7440-31-5	5.42E-06	5.42E-06
			Strontium (Sr)	7440-24-6	1.41E-04	1.41E-04
			Tantalum (Ta)	7440-25-7	5.51E-07	5.51E-07
			Terbium (Tb)	7440-27-9	3.61E-07	3.61E-07
			Tellurium (Te)	13494-80-9	1.19E-07	1.19E-07
			Titanium (Ti)	7440-32-6	1.18E-03	1.18E-03
			Thallium (Tl)	7440-28-0	5.94E-07	5.94E-07
			Uranium (U)	7440-61-1	8.31E-07	8.31E-07
			Vanadium (v)	7440-62-2	8.42E-05	8.42E-05
			Tungsten (W)	7440-33-7	1.78E-05	1.78E-05
			Yttrium (Y)	7440-65-5	8.92E-06	8.92E-06
			Ytterbium (Yb)	7440-64-4	1.03E-06	1.03E-06
			Zinc (Zn)	7440-66-6	1.03E-04	1.03E-04
			Zirconium (Zr)	7440-67-7	5.59E-05	5.59E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.68E-01	3.68E-01
			Aluminum Oxide (Al2O3)	1344-28-1	8.78E-02	8.78E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.85E-02	3.85E-02
			Magnesium Oxide (MgO)	1309-48-4	1.55E-02	1.55E-02
			Calcium Oxide (CaO)	1305-78-8	2.66E-02	2.66E-02
			Sodium Oxide (Na2O)	1313-59-3	2.03E-02	2.03E-02
			Potassium Oxide (K2O)	12136-45-7	1.15E-02	1.15E-02
			Titanium dioxide (TiO2)	13463-67-7	1.74E-03	1.74E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.14E-04	7.14E-04
			Manganese Oxide (MnO)	1344-43-0	2.08E-04	2.08E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.62E-04	1.62E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.36E-04	1.36E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.50E-03	1.50E-03
			Bornite (Cu5FeS4)	1308-82-3	5.42E-05	5.42E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.17E-05	4.17E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.68E-05	1.68E-05
			Cuprite (CU_2O)	1317-39-1	2.93E-05	2.93E-05
			Galena (PbS)	1314-87-0	1.18E-04	1.18E-04
			Sphalerite (ZnS)	1314-98-3	2.43E-04	2.43E-04
			Pyrite (Fe, S2)	1309-36-0	4.49E-03	4.49E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.70E-03	3.70E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.41E-04	1.41E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.04E-03	2.04E-03
			Quartz	14808-60-7	2.80E-02	2.80E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.42E-01	2.42E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.71E-02	1.71E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.93E-02	6.93E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.72E-02	2.72E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.23E-03	6.23E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.27E-02	3.27E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.85E-03	9.85E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.42E-04	1.42E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.45E-03	1.45E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.50E-04	3.50E-04
			Calcite (CaCO3)	1317-65-3	6.41E-03	6.41E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.34E-04	1.34E-04
			Titanite (CaTiSiO5)	[TITAN]	2.00E-03	2.00E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.57E-03	1.57E-03
			Mica	12001-26-2	6.27E-02	6.27E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.10E-02	3.10E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.53E-02	2.53E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.96E-02	1.96E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.85E-02	6.85E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.49E-01	1.49E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	5.57E-02	5.57E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	8.14E-03	8.14E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.58E-03	2.58E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
M2	Unloading OVB at OB NW	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	6.09E-02	6.09E-02
			PM_{10}	[PM10]	2.88E-02	2.88E-02
			$PM_{2.5}$	[PM2.5]	4.36E-03	4.36E-03
			Silver (Ag)	7440-22-4	3.61E-08	3.61E-08
			Aluminum (Al)	7429-90-5	4.62E-03	4.62E-03
			Arsenic (As)	7440-38-2	9.80E-07	9.80E-07
			Gold (Au)	7440-57-5	5.10E-09	5.10E-09
			Boron (B)	7440-42-8	6.13E-06	6.13E-06
			Barium (Ba)	7440-39-3	2.22E-05	2.22E-05
			Beryllium (Be)	7440-41-7	7.18E-08	7.18E-08
			Bismuth (Bi)	7440-69-9	1.32E-07	1.32E-07
			Carbon (C)	7440-44-0	8.03E-05	8.03E-05
			Calcium (Ca)	7440-70-2	2.01E-03	2.01E-03
			Cadmium (Cd)	7440-43-9	7.13E-08	7.13E-08
			Cerium (Ce)	7440-45-1	4.42E-06	4.42E-06
			Cobalt (Co)	7440-48-4	1.22E-06	1.22E-06
			Chromium (Cr)	7440-47-3	5.26E-06	5.26E-06
			Cesium (Cs)	7440-46-2	2.08E-07	2.08E-07
			Copper (Cu)	7440-50-8	8.23E-06	8.23E-06
			Iron (Fe)	7439-89-6	2.52E-03	2.52E-03
			Gallium (Ga)	7440-55-3	1.24E-06	1.24E-06
			Hafnium (Hf)	7440-58-6	2.60E-07	2.60E-07
			Mercury (Hg)	7439-97-6	1.52E-09	1.52E-09
			Indium (In)	7440-74-6	1.05E-09	1.05E-09
			Potassium (K)	7440-09-7	8.51E-04	8.51E-04
			Lanthanum (La)	7439-91-0	1.19E-06	1.19E-06
			Lithium (Li)	7439-93-2	1.57E-06	1.57E-06
			Lutetium (Lu)	7439-94-3	1.62E-08	1.62E-08
			Magnesium (Mg)	7439-95-4	9.02E-04	9.02E-04
			Manganese (Mn)	7439-96-5	1.51E-05	1.51E-05
			Molybdenum (Mo)	7439-98-7	3.38E-07	3.38E-07
			Sodium (Na)	7440-23-5	1.75E-03	1.75E-03
			Niobium (Nb)	7440--03-1	3.51E-07	3.51E-07
			Nickel (Ni)	7440-02-0	1.47E-06	1.47E-06
			Phosphorus (P)	7723-14-0	3.73E-05	3.73E-05
			Lead (Pb)	7439-92-1	8.62E-07	8.62E-07
			Rubidium (Rb)	7440-17-7	4.64E-06	4.64E-06
			Sulphur (S)	7704-34-9	1.63E-04	1.63E-04
			Antimony (Sb)	7440-36-0	3.11E-07	3.11E-07
			Scandium (Sc)	7440-20-2	8.01E-07	8.01E-07
			Selenium (Se)	7782-49-2	2.13E-08	2.13E-08
			Tin (Sn)	7440-31-5	5.63E-07	5.63E-07
			Strontium (Sr)	7440-24-6	1.86E-05	1.86E-05
			Tantalum (Ta)	7440-25-7	5.73E-08	5.73E-08
			Terbium (Tb)	7440-27-9	3.76E-08	3.76E-08
			Tellurium (Te)	13494-80-9	1.24E-08	1.24E-08
			Titanium (Ti)	7440-32-6	1.06E-04	1.06E-04
			Thallium (Tl)	7440-28-0	6.17E-08	6.17E-08
			Uranium (U)	7440-61-1	8.64E-08	8.64E-08
			Vanadium (v)	7440-62-2	7.18E-06	7.18E-06
			Tungsten (W)	7440-33-7	1.64E-06	1.64E-06
			Yttrium (Y)	7440-65-5	9.27E-07	9.27E-07
			Ytterbium (Yb)	7440-64-4	1.07E-07	1.07E-07
			Zinc (Zn)	7440-66-6	6.49E-06	6.49E-06
			Zirconium (Zr)	7440-67-7	5.81E-06	5.81E-06
			Silicon Dioxide (SiO2)	7631-86-9	3.80E-02	3.80E-02
			Aluminum Oxide (Al2O3)	1344-28-1	9.14E-03	9.14E-03
			Iron Oxide (Fe2O3)	1309-37-1	4.02E-03	4.02E-03
			Magnesium Oxide (MgO)	1309-48-4	1.64E-03	1.64E-03
			Calcium Oxide (CaO)	1305-78-8	2.86E-03	2.86E-03
			Sodium Oxide (Na2O)	1313-59-3	2.06E-03	2.06E-03
			Potassium Oxide (K2O)	12136-45-7	1.19E-03	1.19E-03
			Titanium dioxide (TiO2)	13463-67-7	1.78E-04	1.78E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.82E-05	7.82E-05
			Manganese Oxide (MnO)	1344-43-0	2.34E-05	2.34E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.78E-05	1.78E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.64E-05	1.64E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.56E-04	1.56E-04
			Bornite (Cu5FeS4)	1308-82-3	5.63E-06	5.63E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.34E-06	4.34E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.75E-06	1.75E-06
			Cuprite (CU_2O)	1317-39-1	3.04E-06	3.04E-06
			Galena (PbS)	1314-87-0	1.23E-05	1.23E-05
			Sphalerite (ZnS)	1314-98-3	2.53E-05	2.53E-05
			Pyrite (Fe, S2)	1309-36-0	3.65E-04	3.65E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.85E-04	3.85E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.47E-05	1.47E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.12E-04	2.12E-04
			Quartz	14808-60-7	3.37E-03	3.37E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	3.31E-02	3.31E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.78E-03	1.78E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	5.03E-03	5.03E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.07E-03	1.07E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.48E-04	6.48E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	6.52E-04	6.52E-04
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.02E-03	1.02E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.48E-05	1.48E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.50E-04	1.50E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.64E-05	3.64E-05
			Calcite (CaCO3)	1317-65-3	2.92E-04	2.92E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.39E-05	1.39E-05
			Titanite (CaTiSiO5)	[TITAN]	8.06E-05	8.06E-05
			Apatite (Ca5(PO4)3)	1306-05-4	1.63E-04	1.63E-04
			Mica	12001-26-2	6.52E-03	6.52E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.22E-03	3.22E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.63E-03	2.63E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.04E-03	2.04E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	7.12E-03	7.12E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.55E-02	1.55E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	5.79E-03	5.79E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	8.46E-04	8.46E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.68E-04	2.68E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M3	Unloading OVB at OB West	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	5.26E-02	5.26E-02
			PM_{10}	[PM10]	2.49E-02	2.49E-02
			$PM_{2.5}$	[PM2.5]	3.77E-03	3.77E-03
			Silver (Ag)	7440-22-4	3.11E-08	3.11E-08
			Aluminum (Al)	7429-90-5	3.99E-03	3.99E-03
			Arsenic (As)	7440-38-2	8.46E-07	8.46E-07
			Gold (Au)	7440-57-5	4.40E-09	4.40E-09
			Boron (B)	7440-42-8	5.29E-06	5.29E-06
			Barium (Ba)	7440-39-3	1.91E-05	1.91E-05
			Beryllium (Be)	7440-41-7	6.20E-08	6.20E-08
			Bismuth (Bi)	7440-69-9	1.14E-07	1.14E-07
			Carbon (C)	7440-44-0	6.94E-05	6.94E-05
			Calcium (Ca)	7440-70-2	1.73E-03	1.73E-03
			Cadmium (Cd)	7440-43-9	6.16E-08	6.16E-08
			Cerium (Ce)	7440-45-1	3.82E-06	3.82E-06
			Cobalt (Co)	7440-48-4	1.05E-06	1.05E-06
			Chromium (Cr)	7440-47-3	4.54E-06	4.54E-06
			Cesium (Cs)	7440-46-2	1.79E-07	1.79E-07
			Copper (Cu)	7440-50-8	7.11E-06	7.11E-06
			Iron (Fe)	7439-89-6	2.18E-03	2.18E-03
			Gallium (Ga)	7440-55-3	1.07E-06	1.07E-06
			Hafnium (Hf)	7440-58-6	2.24E-07	2.24E-07
			Mercury (Hg)	7439-97-6	1.31E-09	1.31E-09
			Indium (In)	7440-74-6	9.06E-10	9.06E-10
			Potassium (K)	7440-09-7	7.35E-04	7.35E-04
			Lanthanum (La)	7439-91-0	1.03E-06	1.03E-06
			Lithium (Li)	7439-93-2	1.35E-06	1.35E-06
			Lutetium (Lu)	7439-94-3	1.40E-08	1.40E-08
			Magnesium (Mg)	7439-95-4	7.79E-04	7.79E-04
			Manganese (Mn)	7439-96-5	1.31E-05	1.31E-05
			Molybdenum (Mo)	7439-98-7	2.92E-07	2.92E-07
			Sodium (Na)	7440-23-5	1.51E-03	1.51E-03
			Niobium (Nb)	7440--03-1	3.03E-07	3.03E-07
			Nickel (Ni)	7440-02-0	1.27E-06	1.27E-06
			Phosphorus (P)	7723-14-0	3.22E-05	3.22E-05
			Lead (Pb)	7439-92-1	7.44E-07	7.44E-07
			Rubidium (Rb)	7440-17-7	4.01E-06	4.01E-06
			Sulphur (S)	7704-34-9	1.41E-04	1.41E-04
			Antimony (Sb)	7440-36-0	2.69E-07	2.69E-07
			Scandium (Sc)	7440-20-2	6.92E-07	6.92E-07
			Selenium (Se)	7782-49-2	1.84E-08	1.84E-08
			Tin (Sn)	7440-31-5	4.86E-07	4.86E-07
			Strontium (Sr)	7440-24-6	1.61E-05	1.61E-05
			Tantalum (Ta)	7440-25-7	4.95E-08	4.95E-08
			Terbium (Tb)	7440-27-9	3.24E-08	3.24E-08
			Tellurium (Te)	13494-80-9	1.07E-08	1.07E-08
			Titanium (Ti)	7440-32-6	9.14E-05	9.14E-05
			Thallium (Tl)	7440-28-0	5.33E-08	5.33E-08
			Uranium (U)	7440-61-1	7.46E-08	7.46E-08
			Vanadium (v)	7440-62-2	6.20E-06	6.20E-06
			Tungsten (W)	7440-33-7	1.42E-06	1.42E-06
			Yttrium (Y)	7440-65-5	8.00E-07	8.00E-07
			Ytterbium (Yb)	7440-64-4	9.23E-08	9.23E-08
			Zinc (Zn)	7440-66-6	5.61E-06	5.61E-06
			Zirconium (Zr)	7440-67-7	5.01E-06	5.01E-06
			Silicon Dioxide (SiO2)	7631-86-9	3.28E-02	3.28E-02
			Aluminum Oxide (Al2O3)	1344-28-1	7.89E-03	7.89E-03
			Iron Oxide (Fe2O3)	1309-37-1	3.47E-03	3.47E-03
			Magnesium Oxide (MgO)	1309-48-4	1.42E-03	1.42E-03
			Calcium Oxide (CaO)	1305-78-8	2.47E-03	2.47E-03
			Sodium Oxide (Na2O)	1313-59-3	1.78E-03	1.78E-03
			Potassium Oxide (K2O)	12136-45-7	1.03E-03	1.03E-03
			Titanium dioxide (TiO2)	13463-67-7	1.53E-04	1.53E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.75E-05	6.75E-05
			Manganese Oxide (MnO)	1344-43-0	2.02E-05	2.02E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.53E-05	1.53E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.41E-05	1.41E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.35E-04	1.35E-04
			Bornite (Cu5FeS4)	1308-82-3	4.87E-06	4.87E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.75E-06	3.75E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.51E-06	1.51E-06
			Cuprite (CU_2O)	1317-39-1	2.63E-06	2.63E-06
			Galena (PbS)	1314-87-0	1.06E-05	1.06E-05
			Sphalerite (ZnS)	1314-98-3	2.18E-05	2.18E-05
			Pyrite (Fe, S2)	1309-36-0	3.15E-04	3.15E-04
			Pyrrhotite (Fe7S8)	12305-96-3	3.32E-04	3.32E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.27E-05	1.27E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.83E-04	1.83E-04
			Quartz	14808-60-7	2.91E-03	2.91E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.86E-02	2.86E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.54E-03	1.54E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.34E-03	4.34E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.25E-04	9.25E-04
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.59E-04	5.59E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.63E-04	5.63E-04
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	8.85E-04	8.85E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.27E-05	1.27E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.30E-04	1.30E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.14E-05	3.14E-05
			Calcite (CaCO3)	1317-65-3	2.52E-04	2.52E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.20E-05	1.20E-05
			Titanite (CaTiSiO5)	[TITAN]	6.96E-05	6.96E-05
			Apatite (Ca5(PO4)3)	1306-05-4	1.41E-04	1.41E-04
			Mica	12001-26-2	5.63E-03	5.63E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.78E-03	2.78E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.27E-03	2.27E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.76E-03	1.76E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.15E-03	6.15E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.34E-02	1.34E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	5.00E-03	5.00E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.31E-04	7.31E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.31E-04	2.31E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M4	Unloading OVB at OB SW	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	8.51E-03	8.51E-03
			PM_{10}	[PM10]	4.03E-03	4.03E-03
			$PM_{2.5}$	[PM2.5]	6.10E-04	6.10E-04
			Silver (Ag)	7440-22-4	5.04E-09	5.04E-09
			Aluminum (Al)	7429-90-5	6.46E-04	6.46E-04
			Arsenic (As)	7440-38-2	1.37E-07	1.37E-07
			Gold (Au)	7440-57-5	7.12E-10	7.12E-10
			Boron (B)	7440-42-8	8.56E-07	8.56E-07
			Barium (Ba)	7440-39-3	3.10E-06	3.10E-06
			Beryllium (Be)	7440-41-7	1.00E-08	1.00E-08
			Bismuth (Bi)	7440-69-9	1.84E-08	1.84E-08
			Carbon (C)	7440-44-0	1.12E-05	1.12E-05
			Calcium (Ca)	7440-70-2	2.80E-04	2.80E-04
			Cadmium (Cd)	7440-43-9	9.97E-09	9.97E-09
			Cerium (Ce)	7440-45-1	6.18E-07	6.18E-07
			Cobalt (Co)	7440-48-4	1.70E-07	1.70E-07
			Chromium (Cr)	7440-47-3	7.35E-07	7.35E-07
			Cesium (Cs)	7440-46-2	2.90E-08	2.90E-08
			Copper (Cu)	7440-50-8	1.15E-06	1.15E-06
			Iron (Fe)	7439-89-6	3.53E-04	3.53E-04
			Gallium (Ga)	7440-55-3	1.73E-07	1.73E-07
			Hafnium (Hf)	7440-58-6	3.63E-08	3.63E-08
			Mercury (Hg)	7439-97-6	2.13E-10	2.13E-10
			Indium (In)	7440-74-6	1.47E-10	1.47E-10
			Potassium (K)	7440-09-7	1.19E-04	1.19E-04
			Lanthanum (La)	7439-91-0	1.67E-07	1.67E-07
			Lithium (Li)	7439-93-2	2.19E-07	2.19E-07
			Lutetium (Lu)	7439-94-3	2.26E-09	2.26E-09
			Magnesium (Mg)	7439-95-4	1.26E-04	1.26E-04
			Manganese (Mn)	7439-96-5	2.12E-06	2.12E-06
			Molybdenum (Mo)	7439-98-7	4.73E-08	4.73E-08
			Sodium (Na)	7440-23-5	2.45E-04	2.45E-04
			Niobium (Nb)	7440--03-1	4.90E-08	4.90E-08
			Nickel (Ni)	7440-02-0	2.05E-07	2.05E-07
			Phosphorus (P)	7723-14-0	5.22E-06	5.22E-06
			Lead (Pb)	7439-92-1	1.21E-07	1.21E-07
			Rubidium (Rb)	7440-17-7	6.49E-07	6.49E-07
			Sulphur (S)	7704-34-9	2.28E-05	2.28E-05
			Antimony (Sb)	7440-36-0	4.35E-08	4.35E-08
			Scandium (Sc)	7440-20-2	1.12E-07	1.12E-07
			Selenium (Se)	7782-49-2	2.98E-09	2.98E-09
			Tin (Sn)	7440-31-5	7.88E-08	7.88E-08
			Strontium (Sr)	7440-24-6	2.60E-06	2.60E-06
			Tantalum (Ta)	7440-25-7	8.01E-09	8.01E-09
			Terbium (Tb)	7440-27-9	5.25E-09	5.25E-09
			Tellurium (Te)	13494-80-9	1.73E-09	1.73E-09
			Titanium (Ti)	7440-32-6	1.48E-05	1.48E-05
			Thallium (Tl)	7440-28-0	8.63E-09	8.63E-09
			Uranium (U)	7440-61-1	1.21E-08	1.21E-08
			Vanadium (v)	7440-62-2	1.00E-06	1.00E-06
			Tungsten (W)	7440-33-7	2.29E-07	2.29E-07
			Yttrium (Y)	7440-65-5	1.30E-07	1.30E-07
			Ytterbium (Yb)	7440-64-4	1.50E-08	1.50E-08
			Zinc (Zn)	7440-66-6	9.08E-07	9.08E-07
			Zirconium (Zr)	7440-67-7	8.12E-07	8.12E-07
			Silicon Dioxide (SiO2)	7631-86-9	5.32E-03	5.32E-03
			Aluminum Oxide (Al2O3)	1344-28-1	1.28E-03	1.28E-03
			Iron Oxide (Fe2O3)	1309-37-1	5.62E-04	5.62E-04
			Magnesium Oxide (MgO)	1309-48-4	2.30E-04	2.30E-04
			Calcium Oxide (CaO)	1305-78-8	4.00E-04	4.00E-04
			Sodium Oxide (Na2O)	1313-59-3	2.88E-04	2.88E-04
			Potassium Oxide (K2O)	12136-45-7	1.67E-04	1.67E-04
			Titanium dioxide (TiO2)	13463-67-7	2.48E-05	2.48E-05
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.09E-05	1.09E-05
			Manganese Oxide (MnO)	1344-43-0	3.28E-06	3.28E-06
			Chromium Oxide (Cr2O3)	1308-38-9	2.48E-06	2.48E-06
			Vanadium Pentoxide (V2O5)	1314-62-1	2.29E-06	2.29E-06
			Chalcopyrite (CuFeS2)	1308-56-1	2.18E-05	2.18E-05
			Bornite (Cu5FeS4)	1308-82-3	7.88E-07	7.88E-07
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.07E-07	6.07E-07
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.45E-07	2.45E-07
			Cuprite (CU_2O)	1317-39-1	4.26E-07	4.26E-07
			Galena (PbS)	1314-87-0	1.72E-06	1.72E-06
			Sphalerite (ZnS)	1314-98-3	3.53E-06	3.53E-06
			Pyrite (Fe, S2)	1309-36-0	5.11E-05	5.11E-05
			Pyrrhotite (Fe7S8)	12305-96-3	5.38E-05	5.38E-05
			Arsenopyrite (FeAsS)	1303-18-0	2.05E-06	2.05E-06
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.96E-05	2.96E-05
			Quartz	14808-60-7	4.71E-04	4.71E-04
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.63E-03	4.63E-03
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.49E-04	2.49E-04
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.03E-04	7.03E-04
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.50E-04	1.50E-04
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	9.05E-05	9.05E-05
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	9.11E-05	9.11E-05
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.43E-04	1.43E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.06E-06	2.06E-06
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.10E-05	2.10E-05
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.09E-06	5.09E-06
			Calcite (CaCO3)	1317-65-3	4.09E-05	4.09E-05
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.94E-06	1.94E-06
			Titanite (CaTiSiO5)	[TITAN]	1.13E-05	1.13E-05
			Apatite (Ca5(PO4)3)	1306-05-4	2.28E-05	2.28E-05
			Mica	12001-26-2	9.12E-04	9.12E-04
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.50E-04	4.50E-04
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.68E-04	3.68E-04
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.85E-04	2.85E-04
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	9.95E-04	9.95E-04
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.17E-03	2.17E-03
			Albite (NaAlSi 3O 8)	[ALBITE]	8.10E-04	8.10E-04
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.18E-04	1.18E-04
			Sillimanite (Al2SiO5)	12141-45-6	3.75E-05	3.75E-05

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M5	Unloading WR at WD SW	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	7.80E-01	7.80E-01
			PM_{10}	[PM10]	3.69E-01	3.69E-01
			$PM_{2.5}$	[PM2.5]	5.58E-02	5.58E-02
			Silver (Ag)	7440-22-4	4.62E-07	4.62E-07
			Aluminum (Al)	7429-90-5	5.92E-02	5.92E-02
			Arsenic (As)	7440-38-2	1.25E-05	1.25E-05
			Gold (Au)	7440-57-5	6.52E-08	6.52E-08
			Boron (B)	7440-42-8	7.84E-05	7.84E-05
			Barium (Ba)	7440-39-3	2.84E-04	2.84E-04
			Beryllium (Be)	7440-41-7	9.19E-07	9.19E-07
			Bismuth (Bi)	7440-69-9	1.69E-06	1.69E-06
			Carbon (C)	7440-44-0	1.03E-03	1.03E-03
			Calcium (Ca)	7440-70-2	2.57E-02	2.57E-02
			Cadmium (Cd)	7440-43-9	9.13E-07	9.13E-07
			Cerium (Ce)	7440-45-1	5.66E-05	5.66E-05
			Cobalt (Co)	7440-48-4	1.56E-05	1.56E-05
			Chromium (Cr)	7440-47-3	6.73E-05	6.73E-05
			Cesium (Cs)	7440-46-2	2.66E-06	2.66E-06
			Copper (Cu)	7440-50-8	1.05E-04	1.05E-04
			Iron (Fe)	7439-89-6	3.23E-02	3.23E-02
			Gallium (Ga)	7440-55-3	1.58E-05	1.58E-05
			Hafnium (Hf)	7440-58-6	3.33E-06	3.33E-06
			Mercury (Hg)	7439-97-6	1.95E-08	1.95E-08
			Indium (In)	7440-74-6	1.34E-08	1.34E-08
			Potassium (K)	7440-09-7	1.09E-02	1.09E-02
			Lanthanum (La)	7439-91-0	1.53E-05	1.53E-05
			Lithium (Li)	7439-93-2	2.01E-05	2.01E-05
			Lutetium (Lu)	7439-94-3	2.07E-07	2.07E-07
			Magnesium (Mg)	7439-95-4	1.15E-02	1.15E-02
			Manganese (Mn)	7439-96-5	1.94E-04	1.94E-04
			Molybdenum (Mo)	7439-98-7	4.33E-06	4.33E-06
			Sodium (Na)	7440-23-5	2.25E-02	2.25E-02
			Niobium (Nb)	7440--03-1	4.49E-06	4.49E-06
			Nickel (Ni)	7440-02-0	1.88E-05	1.88E-05
			Phosphorus (P)	7723-14-0	4.78E-04	4.78E-04
			Lead (Pb)	7439-92-1	1.10E-05	1.10E-05
			Rubidium (Rb)	7440-17-7	5.94E-05	5.94E-05
			Sulphur (S)	7704-34-9	2.09E-03	2.09E-03
			Antimony (Sb)	7440-36-0	3.99E-06	3.99E-06
			Scandium (Sc)	7440-20-2	1.03E-05	1.03E-05
			Selenium (Se)	7782-49-2	2.73E-07	2.73E-07
			Tin (Sn)	7440-31-5	7.21E-06	7.21E-06
			Strontium (Sr)	7440-24-6	2.38E-04	2.38E-04
			Tantalum (Ta)	7440-25-7	7.34E-07	7.34E-07
			Terbium (Tb)	7440-27-9	4.81E-07	4.81E-07
			Tellurium (Te)	13494-80-9	1.59E-07	1.59E-07
			Titanium (Ti)	7440-32-6	1.35E-03	1.35E-03
			Thallium (Tl)	7440-28-0	7.90E-07	7.90E-07
			Uranium (U)	7440-61-1	1.11E-06	1.11E-06
			Vanadium (v)	7440-62-2	9.20E-05	9.20E-05
			Tungsten (W)	7440-33-7	2.10E-05	2.10E-05
			Yttrium (Y)	7440-65-5	1.19E-05	1.19E-05
			Ytterbium (Yb)	7440-64-4	1.37E-06	1.37E-06
			Zinc (Zn)	7440-66-6	8.31E-05	8.31E-05
			Zirconium (Zr)	7440-67-7	7.43E-05	7.43E-05
			Silicon Dioxide (SiO2)	7631-86-9	4.87E-01	4.87E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.17E-01	1.17E-01
			Iron Oxide (Fe2O3)	1309-37-1	5.15E-02	5.15E-02
			Magnesium Oxide (MgO)	1309-48-4	2.10E-02	2.10E-02
			Calcium Oxide (CaO)	1305-78-8	3.67E-02	3.67E-02
			Sodium Oxide (Na2O)	1313-59-3	2.63E-02	2.63E-02
			Potassium Oxide (K2O)	12136-45-7	1.53E-02	1.53E-02
			Titanium dioxide (TiO2)	13463-67-7	2.27E-03	2.27E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.00E-03	1.00E-03
			Manganese Oxide (MnO)	1344-43-0	3.00E-04	3.00E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.27E-04	2.27E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.09E-04	2.09E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.00E-03	2.00E-03
			Bornite (Cu5FeS4)	1308-82-3	7.21E-05	7.21E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	5.56E-05	5.56E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.24E-05	2.24E-05
			Cuprite (CU_2O)	1317-39-1	3.90E-05	3.90E-05
			Galena (PbS)	1314-87-0	1.58E-04	1.58E-04
			Sphalerite (ZnS)	1314-98-3	3.23E-04	3.23E-04
			Pyrite (Fe, S2)	1309-36-0	4.68E-03	4.68E-03
			Pyrrhotite (Fe7S8)	12305-96-3	4.93E-03	4.93E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.88E-04	1.88E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.71E-03	2.71E-03
			Quartz	14808-60-7	4.31E-02	4.31E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.24E-01	4.24E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.28E-02	2.28E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.44E-02	6.44E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.37E-02	1.37E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	8.29E-03	8.29E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	8.34E-03	8.34E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.31E-02	1.31E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.89E-04	1.89E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.92E-03	1.92E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.66E-04	4.66E-04
			Calcite (CaCO3)	1317-65-3	3.74E-03	3.74E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.78E-04	1.78E-04
			Titanite (CaTiSiO5)	[TITAN]	1.03E-03	1.03E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.09E-03	2.09E-03
			Mica	12001-26-2	8.35E-02	8.35E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.12E-02	4.12E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.37E-02	3.37E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.61E-02	2.61E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	9.11E-02	9.11E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.99E-01	1.99E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	7.41E-02	7.41E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.08E-02	1.08E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.43E-03	3.43E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M6	Unloading WR at TSF	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	1.32E-01	1.32E-01
			PM_{10}	[PM10]	6.24E-02	6.24E-02
			$PM_{2.5}$	[PM2.5]	9.45E-03	9.45E-03
			Silver (Ag)	7440-22-4	7.82E-08	7.82E-08
			Aluminum (Al)	7429-90-5	1.00E-02	1.00E-02
			Arsenic (As)	7440-38-2	2.12E-06	2.12E-06
			Gold (Au)	7440-57-5	1.10E-08	1.10E-08
			Boron (B)	7440-42-8	1.33E-05	1.33E-05
			Barium (Ba)	7440-39-3	4.80E-05	4.80E-05
			Beryllium (Be)	7440-41-7	1.56E-07	1.56E-07
			Bismuth (Bi)	7440-69-9	2.86E-07	2.86E-07
			Carbon (C)	7440-44-0	1.74E-04	1.74E-04
			Calcium (Ca)	7440-70-2	4.35E-03	4.35E-03
			Cadmium (Cd)	7440-43-9	1.55E-07	1.55E-07
			Cerium (Ce)	7440-45-1	9.59E-06	9.59E-06
			Cobalt (Co)	7440-48-4	2.64E-06	2.64E-06
			Chromium (Cr)	7440-47-3	1.14E-05	1.14E-05
			Cesium (Cs)	7440-46-2	4.50E-07	4.50E-07
			Copper (Cu)	7440-50-8	1.78E-05	1.78E-05
			Iron (Fe)	7439-89-6	5.47E-03	5.47E-03
			Gallium (Ga)	7440-55-3	2.68E-06	2.68E-06
			Hafnium (Hf)	7440-58-6	5.63E-07	5.63E-07
			Mercury (Hg)	7439-97-6	3.30E-09	3.30E-09
			Indium (In)	7440-74-6	2.27E-09	2.27E-09
			Potassium (K)	7440-09-7	1.85E-03	1.85E-03
			Lanthanum (La)	7439-91-0	2.58E-06	2.58E-06
			Lithium (Li)	7439-93-2	3.40E-06	3.40E-06
			Lutetium (Lu)	7439-94-3	3.51E-08	3.51E-08
			Magnesium (Mg)	7439-95-4	1.95E-03	1.95E-03
			Manganese (Mn)	7439-96-5	3.28E-05	3.28E-05
			Molybdenum (Mo)	7439-98-7	7.33E-07	7.33E-07
			Sodium (Na)	7440-23-5	3.80E-03	3.80E-03
			Niobium (Nb)	7440--03-1	7.60E-07	7.60E-07
			Nickel (Ni)	7440-02-0	3.18E-06	3.18E-06
			Phosphorus (P)	7723-14-0	8.09E-05	8.09E-05
			Lead (Pb)	7439-92-1	1.87E-06	1.87E-06
			Rubidium (Rb)	7440-17-7	1.01E-05	1.01E-05
			Sulphur (S)	7704-34-9	3.53E-04	3.53E-04
			Antimony (Sb)	7440-36-0	6.75E-07	6.75E-07
			Scandium (Sc)	7440-20-2	1.74E-06	1.74E-06
			Selenium (Se)	7782-49-2	4.62E-08	4.62E-08
			Tin (Sn)	7440-31-5	1.22E-06	1.22E-06
			Strontium (Sr)	7440-24-6	4.04E-05	4.04E-05
			Tantalum (Ta)	7440-25-7	1.24E-07	1.24E-07
			Terbium (Tb)	7440-27-9	8.14E-08	8.14E-08
			Tellurium (Te)	13494-80-9	2.69E-08	2.69E-08
			Titanium (Ti)	7440-32-6	2.29E-04	2.29E-04
			Thallium (Tl)	7440-28-0	1.34E-07	1.34E-07
			Uranium (U)	7440-61-1	1.87E-07	1.87E-07
			Vanadium (v)	7440-62-2	1.56E-05	1.56E-05
			Tungsten (W)	7440-33-7	3.56E-06	3.56E-06
			Yttrium (Y)	7440-65-5	2.01E-06	2.01E-06
			Ytterbium (Yb)	7440-64-4	2.32E-07	2.32E-07
			Zinc (Zn)	7440-66-6	1.41E-05	1.41E-05
			Zirconium (Zr)	7440-67-7	1.26E-05	1.26E-05
			Silicon Dioxide (SiO2)	7631-86-9	8.25E-02	8.25E-02
			Aluminum Oxide (Al2O3)	1344-28-1	1.98E-02	1.98E-02
			Iron Oxide (Fe2O3)	1309-37-1	8.72E-03	8.72E-03
			Magnesium Oxide (MgO)	1309-48-4	3.56E-03	3.56E-03
			Calcium Oxide (CaO)	1305-78-8	6.21E-03	6.21E-03
			Sodium Oxide (Na2O)	1313-59-3	4.46E-03	4.46E-03
			Potassium Oxide (K2O)	12136-45-7	2.59E-03	2.59E-03
			Titanium dioxide (TiO2)	13463-67-7	3.85E-04	3.85E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.69E-04	1.69E-04
			Manganese Oxide (MnO)	1344-43-0	5.08E-05	5.08E-05
			Chromium Oxide (Cr2O3)	1308-38-9	3.85E-05	3.85E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	3.55E-05	3.55E-05
			Chalcopyrite (CuFeS2)	1308-56-1	3.39E-04	3.39E-04
			Bornite (Cu5FeS4)	1308-82-3	1.22E-05	1.22E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	9.41E-06	9.41E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.79E-06	3.79E-06
			Cuprite (CU_2O)	1317-39-1	6.60E-06	6.60E-06
			Galena (PbS)	1314-87-0	2.67E-05	2.67E-05
			Sphalerite (ZnS)	1314-98-3	5.48E-05	5.48E-05
			Pyrite (Fe, S2)	1309-36-0	7.92E-04	7.92E-04
			Pyrrhotite (Fe7S8)	12305-96-3	8.34E-04	8.34E-04
			Arsenopyrite (FeAsS)	1303-18-0	3.19E-05	3.19E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.59E-04	4.59E-04
			Quartz	14808-60-7	7.30E-03	7.30E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.17E-02	7.17E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.85E-03	3.85E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.09E-02	1.09E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.32E-03	2.32E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.40E-03	1.40E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.41E-03	1.41E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.22E-03	2.22E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.20E-05	3.20E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.26E-04	3.26E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	7.89E-05	7.89E-05
			Calcite (CaCO3)	1317-65-3	6.34E-04	6.34E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.01E-05	3.01E-05
			Titanite (CaTiSiO5)	[TITAN]	1.75E-04	1.75E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.53E-04	3.53E-04
			Mica	12001-26-2	1.41E-02	1.41E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	6.98E-03	6.98E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	5.70E-03	5.70E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.42E-03	4.42E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.54E-02	1.54E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.37E-02	3.37E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.26E-02	1.26E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.83E-03	1.83E-03
			Sillimanite (Al2SiO5)	12141-45-6	5.81E-04	5.81E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M7	Unloading WR at WD 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles)	TSP	[PM]	7.60E-01	7.60E-01
			PM_{10}	[PM10]	3.59E-01	3.59E-01
			$PM_{2.5}$	[PM2.5]	5.44E-02	5.44E-02
			Silver (Ag)	7440-22-4	4.50E-07	4.50E-07
			Aluminum (Al)	7429-90-5	5.77E-02	5.77E-02
			Arsenic (As)	7440-38-2	1.22E-05	1.22E-05
			Gold (Au)	7440-57-5	6.36E-08	6.36E-08
			Boron (B)	7440-42-8	7.64E-05	7.64E-05
			Barium (Ba)	7440-39-3	2.76E-04	2.76E-04
			Beryllium (Be)	7440-41-7	8.96E-07	8.96E-07
			Bismuth (Bi)	7440-69-9	1.64E-06	1.64E-06
			Carbon (C)	7440-44-0	1.00E-03	1.00E-03
			Calcium (Ca)	7440-70-2	2.50E-02	2.50E-02
			Cadmium (Cd)	7440-43-9	8.90E-07	8.90E-07
			Cerium (Ce)	7440-45-1	5.52E-05	5.52E-05
			Cobalt (Co)	7440-48-4	1.52E-05	1.52E-05
			Chromium (Cr)	7440-47-3	6.56E-05	6.56E-05
			Cesium (Cs)	7440-46-2	2.59E-06	2.59E-06
			Copper (Cu)	7440-50-8	1.03E-04	1.03E-04
			Iron (Fe)	7439-89-6	3.15E-02	3.15E-02
			Gallium (Ga)	7440-55-3	1.54E-05	1.54E-05
			Hafnium (Hf)	7440-58-6	3.24E-06	3.24E-06
			Mercury (Hg)	7439-97-6	1.90E-08	1.90E-08
			Indium (In)	7440-74-6	1.31E-08	1.31E-08
			Potassium (K)	7440-09-7	1.06E-02	1.06E-02
			Lanthanum (La)	7439-91-0	1.49E-05	1.49E-05
			Lithium (Li)	7439-93-2	1.96E-05	1.96E-05
			Lutetium (Lu)	7439-94-3	2.02E-07	2.02E-07
			Magnesium (Mg)	7439-95-4	1.13E-02	1.13E-02
			Manganese (Mn)	7439-96-5	1.89E-04	1.89E-04
			Molybdenum (Mo)	7439-98-7	4.22E-06	4.22E-06
			Sodium (Na)	7440-23-5	2.19E-02	2.19E-02
			Niobium (Nb)	7440--03-1	4.38E-06	4.38E-06
			Nickel (Ni)	7440-02-0	1.83E-05	1.83E-05
			Phosphorus (P)	7723-14-0	4.66E-04	4.66E-04
			Lead (Pb)	7439-92-1	1.08E-05	1.08E-05
			Rubidium (Rb)	7440-17-7	5.79E-05	5.79E-05
			Sulphur (S)	7704-34-9	2.03E-03	2.03E-03
			Antimony (Sb)	7440-36-0	3.89E-06	3.89E-06
			Scandium (Sc)	7440-20-2	1.00E-05	1.00E-05
			Selenium (Se)	7782-49-2	2.66E-07	2.66E-07
			Tin (Sn)	7440-31-5	7.03E-06	7.03E-06
			Strontium (Sr)	7440-24-6	2.32E-04	2.32E-04
			Tantalum (Ta)	7440-25-7	7.15E-07	7.15E-07
			Terbium (Tb)	7440-27-9	4.69E-07	4.69E-07
			Tellurium (Te)	13494-80-9	1.55E-07	1.55E-07
			Titanium (Ti)	7440-32-6	1.32E-03	1.32E-03
			Thallium (Tl)	7440-28-0	7.70E-07	7.70E-07
			Uranium (U)	7440-61-1	1.08E-06	1.08E-06
			Vanadium (v)	7440-62-2	8.96E-05	8.96E-05
			Tungsten (W)	7440-33-7	2.05E-05	2.05E-05
			Yttrium (Y)	7440-65-5	1.16E-05	1.16E-05
			Ytterbium (Yb)	7440-64-4	1.33E-06	1.33E-06
			Zinc (Zn)	7440-66-6	8.10E-05	8.10E-05
			Zirconium (Zr)	7440-67-7	7.24E-05	7.24E-05
			Silicon Dioxide (SiO2)	7631-86-9	4.75E-01	4.75E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.14E-01	1.14E-01
			Iron Oxide (Fe2O3)	1309-37-1	5.02E-02	5.02E-02
			Magnesium Oxide (MgO)	1309-48-4	2.05E-02	2.05E-02
			Calcium Oxide (CaO)	1305-78-8	3.57E-02	3.57E-02
			Sodium Oxide (Na2O)	1313-59-3	2.57E-02	2.57E-02
			Potassium Oxide (K2O)	12136-45-7	1.49E-02	1.49E-02
			Titanium dioxide (TiO2)	13463-67-7	2.22E-03	2.22E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	9.75E-04	9.75E-04
			Manganese Oxide (MnO)	1344-43-0	2.92E-04	2.92E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.21E-04	2.21E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.04E-04	2.04E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.95E-03	1.95E-03
			Bornite (Cu5FeS4)	1308-82-3	7.03E-05	7.03E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	5.41E-05	5.41E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.18E-05	2.18E-05
			Cuprite (CU_2O)	1317-39-1	3.80E-05	3.80E-05
			Galena (PbS)	1314-87-0	1.54E-04	1.54E-04
			Sphalerite (ZnS)	1314-98-3	3.15E-04	3.15E-04
			Pyrite (Fe, S2)	1309-36-0	4.56E-03	4.56E-03
			Pyrrhotite (Fe7S8)	12305-96-3	4.80E-03	4.80E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.83E-04	1.83E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.64E-03	2.64E-03
			Quartz	14808-60-7	4.20E-02	4.20E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.13E-01	4.13E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.22E-02	2.22E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.28E-02	6.28E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.34E-02	1.34E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	8.08E-03	8.08E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	8.13E-03	8.13E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.28E-02	1.28E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.84E-04	1.84E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.87E-03	1.87E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.54E-04	4.54E-04
			Calcite (CaCO3)	1317-65-3	3.65E-03	3.65E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.73E-04	1.73E-04
			Titanite (CaTiSiO5)	[TITAN]	1.01E-03	1.01E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.03E-03	2.03E-03
			Mica	12001-26-2	8.14E-02	8.14E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.02E-02	4.02E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.28E-02	3.28E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.55E-02	2.55E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	8.88E-02	8.88E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.94E-01	1.94E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	7.23E-02	7.23E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.06E-02	1.06E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.34E-03	3.34E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M8	WD 87 Material Movement	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	5.82E-07	5.82E-07
			Aluminum (Al)	7429-90-5	7.45E-02	7.45E-02
			Arsenic (As)	7440-38-2	1.58E-05	1.58E-05
			Gold (Au)	7440-57-5	8.22E-08	8.22E-08
			Boron (B)	7440-42-8	9.88E-05	9.88E-05
			Barium (Ba)	7440-39-3	3.57E-04	3.57E-04
			Beryllium (Be)	7440-41-7	1.16E-06	1.16E-06
			Bismuth (Bi)	7440-69-9	2.13E-06	2.13E-06
			Carbon (C)	7440-44-0	1.30E-03	1.30E-03
			Calcium (Ca)	7440-70-2	3.23E-02	3.23E-02
			Cadmium (Cd)	7440-43-9	1.15E-06	1.15E-06
			Cerium (Ce)	7440-45-1	7.13E-05	7.13E-05
			Cobalt (Co)	7440-48-4	1.96E-05	1.96E-05
			Chromium (Cr)	7440-47-3	8.48E-05	8.48E-05
			Cesium (Cs)	7440-46-2	3.35E-06	3.35E-06
			Copper (Cu)	7440-50-8	1.33E-04	1.33E-04
			Iron (Fe)	7439-89-6	4.07E-02	4.07E-02
			Gallium (Ga)	7440-55-3	1.99E-05	1.99E-05
			Hafnium (Hf)	7440-58-6	4.19E-06	4.19E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	1.69E-08	1.69E-08
			Potassium (K)	7440-09-7	1.37E-02	1.37E-02
			Lanthanum (La)	7439-91-0	1.92E-05	1.92E-05
			Lithium (Li)	7439-93-2	2.53E-05	2.53E-05
			Lutetium (Lu)	7439-94-3	2.61E-07	2.61E-07
			Magnesium (Mg)	7439-95-4	1.45E-02	1.45E-02
			Manganese (Mn)	7439-96-5	9.96E-05	9.96E-05
			Molybdenum (Mo)	7439-98-7	5.46E-06	5.46E-06
			Sodium (Na)	7440-23-5	2.83E-02	2.83E-02
			Niobium (Nb)	7440--03-1	5.66E-06	5.66E-06
			Nickel (Ni)	7440-02-0	9.64E-06	9.64E-06
			Phosphorus (P)	7723-14-0	6.02E-04	6.02E-04
			Lead (Pb)	7439-92-1	1.39E-05	1.39E-05
			Rubidium (Rb)	7440-17-7	7.48E-05	7.48E-05
			Sulphur (S)	7704-34-9	2.63E-03	2.63E-03
			Antimony (Sb)	7440-36-0	5.02E-06	5.02E-06
			Scandium (Sc)	7440-20-2	1.29E-05	1.29E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	9.08E-06	9.08E-06
			Strontium (Sr)	7440-24-6	3.00E-04	3.00E-04
			Tantalum (Ta)	7440-25-7	9.24E-07	9.24E-07
			Terbium (Tb)	7440-27-9	6.06E-07	6.06E-07
			Tellurium (Te)	13494-80-9	2.00E-07	2.00E-07
			Titanium (Ti)	7440-32-6	6.96E-04	6.96E-04
			Thallium (Tl)	7440-28-0	9.96E-07	9.96E-07
			Uranium (U)	7440-61-1	1.39E-06	1.39E-06
			Vanadium (v)	7440-62-2	1.16E-04	1.16E-04
			Tungsten (W)	7440-33-7	2.65E-05	2.65E-05
			Yttrium (Y)	7440-65-5	1.49E-05	1.49E-05
			Ytterbium (Yb)	7440-64-4	1.72E-06	1.72E-06
			Zinc (Zn)	7440-66-6	1.05E-04	1.05E-04
			Zirconium (Zr)	7440-67-7	9.36E-05	9.36E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.13E-01	6.13E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.47E-01	1.47E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.49E-02	6.49E-02
			Magnesium Oxide (MgO)	1309-48-4	2.65E-02	2.65E-02
			Calcium Oxide (CaO)	1305-78-8	4.62E-02	4.62E-02
			Sodium Oxide (Na2O)	1313-59-3	3.32E-02	3.32E-02
			Potassium Oxide (K2O)	12136-45-7	1.93E-02	1.93E-02
			Titanium dioxide (TiO2)	13463-67-7	1.17E-03	1.17E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.26E-03	1.26E-03
			Manganese Oxide (MnO)	1344-43-0	1.54E-04	1.54E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.86E-04	2.86E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.64E-04	2.64E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.52E-03	2.52E-03
			Bornite (Cu5FeS4)	1308-82-3	9.09E-05	9.09E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.00E-05	7.00E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.82E-05	2.82E-05
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.99E-04	1.99E-04
			Sphalerite (ZnS)	1314-98-3	4.07E-04	4.07E-04
			Pyrite (Fe, S2)	1309-36-0	5.89E-03	5.89E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.20E-03	6.20E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.37E-04	2.37E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.87E-02	2.87E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.11E-02	8.11E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.73E-02	1.73E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.26E-03	4.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.05E-02	1.05E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.65E-02	1.65E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	9.71E-05	9.71E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.42E-03	2.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.87E-04	5.87E-04
			Calcite (CaCO3)	1317-65-3	4.71E-03	4.71E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.14E-05	9.14E-05
			Titanite (CaTiSiO5)	[TITAN]	5.30E-04	5.30E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.63E-03	2.63E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M9	WD SW Material Movement	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	9.82E-01	9.82E-01
			PM_{10}	[PM10]	1.89E-01	1.89E-01
			$PM_{2.5}$	[PM2.5]	1.03E-01	1.03E-01
			Silver (Ag)	7440-22-4	5.82E-07	5.82E-07
			Aluminum (Al)	7429-90-5	7.45E-02	7.45E-02
			Arsenic (As)	7440-38-2	1.58E-05	1.58E-05
			Gold (Au)	7440-57-5	8.22E-08	8.22E-08
			Boron (B)	7440-42-8	9.88E-05	9.88E-05
			Barium (Ba)	7440-39-3	3.57E-04	3.57E-04
			Beryllium (Be)	7440-41-7	1.16E-06	1.16E-06
			Bismuth (Bi)	7440-69-9	2.13E-06	2.13E-06
			Carbon (C)	7440-44-0	1.30E-03	1.30E-03
			Calcium (Ca)	7440-70-2	3.23E-02	3.23E-02
			Cadmium (Cd)	7440-43-9	1.15E-06	1.15E-06
			Cerium (Ce)	7440-45-1	7.13E-05	7.13E-05
			Cobalt (Co)	7440-48-4	1.96E-05	1.96E-05
			Chromium (Cr)	7440-47-3	8.48E-05	8.48E-05
			Cesium (Cs)	7440-46-2	3.35E-06	3.35E-06
			Copper (Cu)	7440-50-8	1.33E-04	1.33E-04
			Iron (Fe)	7439-89-6	4.07E-02	4.07E-02
			Gallium (Ga)	7440-55-3	1.99E-05	1.99E-05
			Hafnium (Hf)	7440-58-6	4.19E-06	4.19E-06
			Mercury (Hg)	7439-97-6	2.45E-08	2.45E-08
			Indium (In)	7440-74-6	1.69E-08	1.69E-08
			Potassium (K)	7440-09-7	1.37E-02	1.37E-02
			Lanthanum (La)	7439-91-0	1.92E-05	1.92E-05
			Lithium (Li)	7439-93-2	2.53E-05	2.53E-05
			Lutetium (Lu)	7439-94-3	2.61E-07	2.61E-07
			Magnesium (Mg)	7439-95-4	1.45E-02	1.45E-02
			Manganese (Mn)	7439-96-5	9.96E-05	9.96E-05
			Molybdenum (Mo)	7439-98-7	5.46E-06	5.46E-06
			Sodium (Na)	7440-23-5	2.83E-02	2.83E-02
			Niobium (Nb)	7440--03-1	5.66E-06	5.66E-06
			Nickel (Ni)	7440-02-0	9.64E-06	9.64E-06
			Phosphorus (P)	7723-14-0	6.02E-04	6.02E-04
			Lead (Pb)	7439-92-1	1.39E-05	1.39E-05
			Rubidium (Rb)	7440-17-7	7.48E-05	7.48E-05
			Sulphur (S)	7704-34-9	2.63E-03	2.63E-03
			Antimony (Sb)	7440-36-0	5.02E-06	5.02E-06
			Scandium (Sc)	7440-20-2	1.29E-05	1.29E-05
			Selenium (Se)	7782-49-2	3.44E-07	3.44E-07
			Tin (Sn)	7440-31-5	9.08E-06	9.08E-06
			Strontium (Sr)	7440-24-6	3.00E-04	3.00E-04
			Tantalum (Ta)	7440-25-7	9.24E-07	9.24E-07
			Terbium (Tb)	7440-27-9	6.06E-07	6.06E-07
			Tellurium (Te)	13494-80-9	2.00E-07	2.00E-07
			Titanium (Ti)	7440-32-6	6.96E-04	6.96E-04
			Thallium (Tl)	7440-28-0	9.96E-07	9.96E-07
			Uranium (U)	7440-61-1	1.39E-06	1.39E-06
			Vanadium (v)	7440-62-2	1.16E-04	1.16E-04
			Tungsten (W)	7440-33-7	2.65E-05	2.65E-05
			Yttrium (Y)	7440-65-5	1.49E-05	1.49E-05
			Ytterbium (Yb)	7440-64-4	1.72E-06	1.72E-06
			Zinc (Zn)	7440-66-6	1.05E-04	1.05E-04
			Zirconium (Zr)	7440-67-7	9.36E-05	9.36E-05
			Silicon Dioxide (SiO2)	7631-86-9	6.13E-01	6.13E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.47E-01	1.47E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.49E-02	6.49E-02
			Magnesium Oxide (MgO)	1309-48-4	2.65E-02	2.65E-02
			Calcium Oxide (CaO)	1305-78-8	4.62E-02	4.62E-02
			Sodium Oxide (Na2O)	1313-59-3	3.32E-02	3.32E-02
			Potassium Oxide (K2O)	12136-45-7	1.93E-02	1.93E-02
			Titanium dioxide (TiO2)	13463-67-7	1.17E-03	1.17E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.26E-03	1.26E-03
			Manganese Oxide (MnO)	1344-43-0	1.54E-04	1.54E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.86E-04	2.86E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.64E-04	2.64E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.52E-03	2.52E-03
			Bornite (Cu5FeS4)	1308-82-3	9.09E-05	9.09E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.00E-05	7.00E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.82E-05	2.82E-05
			Cuprite (CU_2O)	1317-39-1	4.91E-05	4.91E-05
			Galena (PbS)	1314-87-0	1.99E-04	1.99E-04
			Sphalerite (ZnS)	1314-98-3	4.07E-04	4.07E-04
			Pyrite (Fe, S2)	1309-36-0	5.89E-03	5.89E-03
			Pyrrhotite (Fe7S8)	12305-96-3	6.20E-03	6.20E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.37E-04	2.37E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.39E-03	1.39E-03
			Quartz	14808-60-7	2.21E-02	2.21E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.34E-01	5.34E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.87E-02	2.87E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	8.11E-02	8.11E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.73E-02	1.73E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.26E-03	4.26E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.05E-02	1.05E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.65E-02	1.65E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	9.71E-05	9.71E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.42E-03	2.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.87E-04	5.87E-04
			Calcite (CaCO3)	1317-65-3	4.71E-03	4.71E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.14E-05	9.14E-05
			Titanite (CaTiSiO5)	[TITAN]	5.30E-04	5.30E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.63E-03	2.63E-03
			Mica	12001-26-2	1.05E-01	1.05E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.19E-02	5.19E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.24E-02	4.24E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.29E-02	3.29E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.15E-01	1.15E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.50E-01	2.50E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.34E-02	9.34E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.36E-02	1.36E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.32E-03	4.32E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
M10	TSF Construction	US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining). Table 11.9-2 Emission Factor Equations for Uncontrolled Particulate Emission Factors for Open Dust Sources at Western Surface Coal Mines	TSP	[PM]	3.93E+00	3.93E+00
			PM_{10}	[PM10]	7.58E-01	7.58E-01
			$PM_{2.5}$	[PM2.5]	4.12E-01	4.12E-01
			Silver (Ag)	7440-22-4	2.33E-06	2.33E-06
			Aluminum (Al)	7429-90-5	2.98E-01	2.98E-01
			Arsenic (As)	7440-38-2	6.32E-05	6.32E-05
			Gold (Au)	7440-57-5	3.29E-07	3.29E-07
			Boron (B)	7440-42-8	3.95E-04	3.95E-04
			Barium (Ba)	7440-39-3	1.43E-03	1.43E-03
			Beryllium (Be)	7440-41-7	4.63E-06	4.63E-06
			Bismuth (Bi)	7440-69-9	8.50E-06	8.50E-06
			Carbon (C)	7440-44-0	5.18E-03	5.18E-03
			Calcium (Ca)	7440-70-2	1.29E-01	1.29E-01
			Cadmium (Cd)	7440-43-9	4.60E-06	4.60E-06
			Cerium (Ce)	7440-45-1	2.85E-04	2.85E-04
			Cobalt (Co)	7440-48-4	7.86E-05	7.86E-05
			Chromium (Cr)	7440-47-3	3.39E-04	3.39E-04
			Cesium (Cs)	7440-46-2	1.34E-05	1.34E-05
			Copper (Cu)	7440-50-8	5.31E-04	5.31E-04
			Iron (Fe)	7439-89-6	1.63E-01	1.63E-01
			Gallium (Ga)	7440-55-3	7.98E-05	7.98E-05
			Hafnium (Hf)	7440-58-6	1.68E-05	1.68E-05
			Mercury (Hg)	7439-97-6	9.82E-08	9.82E-08
			Indium (In)	7440-74-6	6.77E-08	6.77E-08
			Potassium (K)	7440-09-7	5.49E-02	5.49E-02
			Lanthanum (La)	7439-91-0	7.69E-05	7.69E-05
			Lithium (Li)	7439-93-2	1.01E-04	1.01E-04
			Lutetium (Lu)	7439-94-3	1.04E-06	1.04E-06
			Magnesium (Mg)	7439-95-4	5.82E-02	5.82E-02
			Manganese (Mn)	7439-96-5	3.98E-04	3.98E-04
			Molybdenum (Mo)	7439-98-7	2.18E-05	2.18E-05
			Sodium (Na)	7440-23-5	1.13E-01	1.13E-01
			Niobium (Nb)	7440--03-1	2.26E-05	2.26E-05
			Nickel (Ni)	7440-02-0	3.86E-05	3.86E-05
			Phosphorus (P)	7723-14-0	2.41E-03	2.41E-03
			Lead (Pb)	7439-92-1	5.56E-05	5.56E-05
			Rubidium (Rb)	7440-17-7	2.99E-04	2.99E-04
			Sulphur (S)	7704-34-9	1.05E-02	1.05E-02
			Antimony (Sb)	7440-36-0	2.01E-05	2.01E-05
			Scandium (Sc)	7440-20-2	5.17E-05	5.17E-05
			Selenium (Se)	7782-49-2	1.37E-06	1.37E-06
			Tin (Sn)	7440-31-5	3.63E-05	3.63E-05
			Strontium (Sr)	7440-24-6	1.20E-03	1.20E-03
			Tantalum (Ta)	7440-25-7	3.70E-06	3.70E-06
			Terbium (Tb)	7440-27-9	2.42E-06	2.42E-06
			Tellurium (Te)	13494-80-9	8.00E-07	8.00E-07
			Titanium (Ti)	7440-32-6	2.78E-03	2.78E-03
			Thallium (Tl)	7440-28-0	3.98E-06	3.98E-06
			Uranium (U)	7440-61-1	5.57E-06	5.57E-06
			Vanadium (v)	7440-62-2	4.63E-04	4.63E-04
			Tungsten (W)	7440-33-7	1.06E-04	1.06E-04
			Yttrium (Y)	7440-65-5	5.98E-05	5.98E-05
			Ytterbium (Yb)	7440-64-4	6.90E-06	6.90E-06
			Zinc (Zn)	7440-66-6	4.19E-04	4.19E-04
			Zirconium (Zr)	7440-67-7	3.75E-04	3.75E-04
			Silicon Dioxide (SiO2)	7631-86-9	2.45E+00	2.45E+00
			Aluminum Oxide (Al2O3)	1344-28-1	5.90E-01	5.90E-01
			Iron Oxide (Fe2O3)	1309-37-1	2.59E-01	2.59E-01
			Magnesium Oxide (MgO)	1309-48-4	1.06E-01	1.06E-01
			Calcium Oxide (CaO)	1305-78-8	1.85E-01	1.85E-01
			Sodium Oxide (Na2O)	1313-59-3	1.33E-01	1.33E-01
			Potassium Oxide (K2O)	12136-45-7	7.70E-02	7.70E-02
			Titanium dioxide (TiO2)	13463-67-7	4.67E-03	4.67E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	5.04E-03	5.04E-03
			Manganese Oxide (MnO)	1344-43-0	6.17E-04	6.17E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.14E-03	1.14E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	1.06E-03	1.06E-03
			Chalcopyrite (CuFeS2)	1308-56-1	1.01E-02	1.01E-02
			Bornite (Cu5FeS4)	1308-82-3	3.63E-04	3.63E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.80E-04	2.80E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.13E-04	1.13E-04
			Cuprite (CU_2O)	1317-39-1	1.96E-04	1.96E-04
			Galena (PbS)	1314-87-0	7.95E-04	7.95E-04
			Sphalerite (ZnS)	1314-98-3	1.63E-03	1.63E-03
			Pyrite (Fe, S2)	1309-36-0	2.36E-02	2.36E-02
			Pyrrhotite (Fe7S8)	12305-96-3	2.48E-02	2.48E-02
			Arsenopyrite (FeAsS)	1303-18-0	9.48E-04	9.48E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	5.57E-03	5.57E-03
			Quartz	14808-60-7	8.85E-02	8.85E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.13E+00	2.13E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.15E-01	1.15E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	3.24E-01	3.24E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	6.91E-02	6.91E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.70E-02	1.70E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.20E-02	4.20E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	6.61E-02	6.61E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.88E-04	3.88E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	9.69E-03	9.69E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.35E-03	2.35E-03
			Calcite (CaCO3)	1317-65-3	1.89E-02	1.89E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	3.66E-04	3.66E-04
			Titanite (CaTiSiO5)	[TITAN]	2.12E-03	2.12E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.05E-02	1.05E-02
			Mica	12001-26-2	4.21E-01	4.21E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.08E-01	2.08E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.70E-01	1.70E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.32E-01	1.32E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	4.59E-01	4.59E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.00E+00	1.00E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	3.74E-01	3.74E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	5.46E-02	5.46E-02
			Sillimanite (Al2SiO5)	12141-45-6	1.73E-02	1.73E-02

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
R1	Main Access Road	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	4.39E+00	1.04E+00
			PM_{10}	[PM10]	1.10E+00	2.59E-01
			$PM_{2.5}$	[PM2.5]	1.10E-01	2.60E-02
			Silver (Ag)	7440-22-4	2.60E-06	6.16E-07
			Aluminum (Al)	7429-90-5	3.33E-01	7.89E-02
			Arsenic (As)	7440-38-2	7.06E-05	1.67E-05
			Gold (Au)	7440-57-5	3.67E-07	8.70E-08
			Boron (B)	7440-42-8	4.41E-04	1.05E-04
			Barium (Ba)	7440-39-3	1.60E-03	3.78E-04
			Beryllium (Be)	7440-41-7	5.17E-06	1.23E-06
			Bismuth (Bi)	7440-69-9	9.49E-06	2.25E-06
			Carbon (C)	7440-44-0	5.78E-03	1.37E-03
			Calcium (Ca)	7440-70-2	1.44E-01	3.42E-02
			Cadmium (Cd)	7440-43-9	5.14E-06	1.22E-06
			Cerium (Ce)	7440-45-1	3.19E-04	7.55E-05
			Cobalt (Co)	7440-48-4	8.77E-05	2.08E-05
			Chromium (Cr)	7440-47-3	3.79E-04	8.98E-05
			Cesium (Cs)	7440-46-2	1.49E-05	3.54E-06
			Copper (Cu)	7440-50-8	5.93E-04	1.41E-04
			Iron (Fe)	7439-89-6	1.82E-01	4.31E-02
			Gallium (Ga)	7440-55-3	8.90E-05	2.11E-05
			Hafnium (Hf)	7440-58-6	1.87E-05	4.44E-06
			Mercury (Hg)	7439-97-6	1.10E-07	2.60E-08
			Indium (In)	7440-74-6	7.55E-08	1.79E-08
			Potassium (K)	7440-09-7	6.13E-02	1.45E-02
			Lanthanum (La)	7439-91-0	8.59E-05	2.04E-05
			Lithium (Li)	7439-93-2	1.13E-04	2.68E-05
			Lutetium (Lu)	7439-94-3	1.17E-06	2.77E-07
			Magnesium (Mg)	7439-95-4	6.49E-02	1.54E-02
			Manganese (Mn)	7439-96-5	5.74E-04	1.36E-04
			Molybdenum (Mo)	7439-98-7	2.44E-05	5.78E-06
			Sodium (Na)	7440-23-5	1.26E-01	2.99E-02
			Niobium (Nb)	7440--03-1	2.53E-05	5.99E-06
			Nickel (Ni)	7440-02-0	5.56E-05	1.32E-05
			Phosphorus (P)	7723-14-0	2.69E-03	6.37E-04
			Lead (Pb)	7439-92-1	6.21E-05	1.47E-05
			Rubidium (Rb)	7440-17-7	3.34E-04	7.92E-05
			Sulphur (S)	7704-34-9	1.17E-02	2.78E-03
			Antimony (Sb)	7440-36-0	2.24E-05	5.32E-06
			Scandium (Sc)	7440-20-2	5.77E-05	1.37E-05
			Selenium (Se)	7782-49-2	1.53E-06	3.64E-07
			Tin (Sn)	7440-31-5	4.06E-05	9.62E-06
			Strontium (Sr)	7440-24-6	1.34E-03	3.18E-04
			Tantalum (Ta)	7440-25-7	4.13E-06	9.79E-07
			Terbium (Tb)	7440-27-9	2.70E-06	6.41E-07
			Tellurium (Te)	13494-80-9	8.92E-07	2.12E-07
			Titanium (Ti)	7440-32-6	4.01E-03	9.51E-04
			Thallium (Tl)	7440-28-0	4.45E-06	1.05E-06
			Uranium (U)	7440-61-1	6.22E-06	1.48E-06
			Vanadium (v)	7440-62-2	5.17E-04	1.23E-04
			Tungsten (W)	7440-33-7	1.18E-04	2.80E-05
			Yttrium (Y)	7440-65-5	6.67E-05	1.58E-05
			Ytterbium (Yb)	7440-64-4	7.70E-06	1.83E-06
			Zinc (Zn)	7440-66-6	4.67E-04	1.11E-04
			Zirconium (Zr)	7440-67-7	4.18E-04	9.92E-05
			Silicon Dioxide (SiO2)	7631-86-9	2.74E+00	6.50E-01
			Aluminum Oxide (Al2O3)	1344-28-1	6.58E-01	1.56E-01
			Iron Oxide (Fe2O3)	1309-37-1	2.90E-01	6.87E-02
			Magnesium Oxide (MgO)	1309-48-4	1.18E-01	2.80E-02
			Calcium Oxide (CaO)	1305-78-8	2.06E-01	4.89E-02
			Sodium Oxide (Na2O)	1313-59-3	1.48E-01	3.51E-02
			Potassium Oxide (K2O)	12136-45-7	8.60E-02	2.04E-02
			Titanium dioxide (TiO2)	13463-67-7	6.74E-03	1.60E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	5.63E-03	1.33E-03
			Manganese Oxide (MnO)	1344-43-0	8.89E-04	2.11E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.28E-03	3.03E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.18E-03	2.79E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.12E-02	2.67E-03
			Bornite (Cu5FeS4)	1308-82-3	4.06E-04	9.62E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.12E-04	7.41E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.26E-04	2.99E-05
			Cuprite (CU_2O)	1317-39-1	2.19E-04	5.20E-05
			Galena (PbS)	1314-87-0	8.87E-04	2.10E-04
			Sphalerite (ZnS)	1314-98-3	1.82E-03	4.31E-04
			Pyrite (Fe, S2)	1309-36-0	2.63E-02	6.24E-03
			Pyrrhotite (Fe7S8)	12305-96-3	2.77E-02	6.57E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.06E-03	2.51E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	8.03E-03	1.90E-03
			Quartz	14808-60-7	1.28E-01	3.03E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.38E+00	5.65E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.28E-01	3.04E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	3.62E-01	8.59E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	7.72E-02	1.83E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.46E-02	5.82E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.69E-02	1.11E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	7.38E-02	1.75E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	5.60E-04	1.33E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.08E-02	2.57E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.62E-03	6.21E-04
			Calcite (CaCO3)	1317-65-3	2.10E-02	4.99E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	5.27E-04	1.25E-04
			Titanite (CaTiSiO5)	[TITAN]	3.06E-03	7.25E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.17E-02	2.78E-03
			Mica	12001-26-2	4.70E-01	1.11E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.32E-01	5.50E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.89E-01	4.49E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.47E-01	3.48E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.13E-01	1.22E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.12E+00	2.65E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	4.17E-01	9.89E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	6.09E-02	1.45E-02
			Sillimanite (Al2SiO5)	12141-45-6	1.93E-02	4.57E-03
			Carbon Monoxide (CO)	630-08-0	3.62E-03	8.11E-04
			Sulphur Dioxide (SO2)	7446-09-5	2.16E-04	5.36E-05
			Hydrocarbons	[NMHC]	1.38E-03	3.46E-04
			Nitrogen Oxides (NOx)	10102-44-0	1.83E-02	4.39E-03
			1,3-butadiene	106-99-0	1.23E-06	2.95E-07
			Acenaphthene	83-32-9	4.13E-07	9.92E-08
			Acenaphthylene	208-96-8	8.34E-07	2.00E-07
			Acetaldehyde	75-07-0	1.00E-04	2.47E-05
			Acrolein	107-02-8	1.51E-05	3.68E-06
			Anthracene	120-12-7	8.91E-08	2.12E-08
			Benzene	71-43-2	3.59E-05	8.59E-06
			Benzo(a)anthracene	56-55-3	1.55E-08	3.75E-09
			Benzo(a)pyrene	50-32-8	5.81E-09	1.34E-09
			Benzo(b+k)fluoranthene	205-99-2	1.64E-08	3.76E-09
			Benzo(g,h,i)perylene	191-24-2	1.04E-08	2.42E-09
			Chrysene	218-01-9	1.75E-08	4.11E-09
			Fluoranthene	206-44-0	1.51E-07	3.58E-08
			Fluorene	86-73-7	6.19E-07	1.48E-07
			Formaldehyde	50-00-0	6.01E-05	1.43E-05
			Phenanthrene	85-01-8	1.13E-06	2.71E-07
			Pyrene	129-00-0	1.44E-07	3.41E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.03E-03	2.43E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	6.70E-04	1.58E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.35E-08	3.15E-09

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
R1B	Main Access Road toward Route du Nord	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	8.00E+00	1.90E+00
			PM_{10}	[PM10]	1.99E+00	4.72E-01
			$PM_{2.5}$	[PM2.5]	1.99E-01	4.73E-02
			Silver (Ag)	7440-22-4	4.74E-06	1.12E-06
			Aluminum (Al)	7429-90-5	6.07E-01	1.44E-01
			Arsenic (As)	7440-38-2	1.29E-04	3.05E-05
			Gold (Au)	7440-57-5	6.69E-07	1.59E-07
			Boron (B)	7440-42-8	8.04E-04	1.91E-04
			Barium (Ba)	7440-39-3	2.91E-03	6.90E-04
			Beryllium (Be)	7440-41-7	9.43E-06	2.24E-06
			Bismuth (Bi)	7440-69-9	1.73E-05	4.10E-06
			Carbon (C)	7440-44-0	1.05E-02	2.50E-03
			Calcium (Ca)	7440-70-2	2.63E-01	6.24E-02
			Cadmium (Cd)	7440-43-9	9.37E-06	2.22E-06
			Cerium (Ce)	7440-45-1	5.81E-04	1.38E-04
			Cobalt (Co)	7440-48-4	1.60E-04	3.79E-05
			Chromium (Cr)	7440-47-3	6.91E-04	1.64E-04
			Cesium (Cs)	7440-46-2	2.73E-05	6.46E-06
			Copper (Cu)	7440-50-8	1.08E-03	2.56E-04
			Iron (Fe)	7439-89-6	3.31E-01	7.85E-02
			Gallium (Ga)	7440-55-3	1.62E-04	3.85E-05
			Hafnium (Hf)	7440-58-6	3.41E-05	8.09E-06
			Mercury (Hg)	7439-97-6	2.00E-07	4.74E-08
			Indium (In)	7440-74-6	1.38E-07	3.27E-08
			Potassium (K)	7440-09-7	1.12E-01	2.65E-02
			Lanthanum (La)	7439-91-0	1.57E-04	3.71E-05
			Lithium (Li)	7439-93-2	2.06E-04	4.88E-05
			Lutetium (Lu)	7439-94-3	2.13E-06	5.04E-07
			Magnesium (Mg)	7439-95-4	1.18E-01	2.81E-02
			Manganese (Mn)	7439-96-5	1.05E-03	2.48E-04
			Molybdenum (Mo)	7439-98-7	4.44E-05	1.05E-05
			Sodium (Na)	7440-23-5	2.30E-01	5.46E-02
			Niobium (Nb)	7440--03-1	4.61E-05	1.09E-05
			Nickel (Ni)	7440-02-0	1.01E-04	2.40E-05
			Phosphorus (P)	7723-14-0	4.90E-03	1.16E-03
			Lead (Pb)	7439-92-1	1.13E-04	2.68E-05
			Rubidium (Rb)	7440-17-7	6.09E-04	1.44E-04
			Sulphur (S)	7704-34-9	2.14E-02	5.08E-03
			Antimony (Sb)	7440-36-0	4.09E-05	9.70E-06
			Scandium (Sc)	7440-20-2	1.05E-04	2.49E-05
			Selenium (Se)	7782-49-2	2.80E-06	6.64E-07
			Tin (Sn)	7440-31-5	7.40E-05	1.75E-05
			Strontium (Sr)	7440-24-6	2.45E-03	5.80E-04
			Tantalum (Ta)	7440-25-7	7.53E-06	1.78E-06
			Terbium (Tb)	7440-27-9	4.93E-06	1.17E-06
			Tellurium (Te)	13494-80-9	1.63E-06	3.86E-07
			Titanium (Ti)	7440-32-6	7.32E-03	1.73E-03
			Thallium (Tl)	7440-28-0	8.11E-06	1.92E-06
			Uranium (U)	7440-61-1	1.13E-05	2.69E-06
			Vanadium (v)	7440-62-2	9.43E-04	2.24E-04
			Tungsten (W)	7440-33-7	2.16E-04	5.11E-05
			Yttrium (Y)	7440-65-5	1.22E-04	2.89E-05
			Ytterbium (Yb)	7440-64-4	1.40E-05	3.33E-06
			Zinc (Zn)	7440-66-6	8.52E-04	2.02E-04
			Zirconium (Zr)	7440-67-7	7.62E-04	1.81E-04
			Silicon Dioxide (SiO2)	7631-86-9	5.00E+00	1.18E+00
			Aluminum Oxide (Al2O3)	1344-28-1	1.20E+00	2.85E-01
			Iron Oxide (Fe2O3)	1309-37-1	5.28E-01	1.25E-01
			Magnesium Oxide (MgO)	1309-48-4	2.16E-01	5.11E-02
			Calcium Oxide (CaO)	1305-78-8	3.76E-01	8.92E-02
			Sodium Oxide (Na2O)	1313-59-3	2.70E-01	6.41E-02
			Potassium Oxide (K2O)	12136-45-7	1.57E-01	3.72E-02
			Titanium dioxide (TiO2)	13463-67-7	1.23E-02	2.91E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.03E-02	2.43E-03
			Manganese Oxide (MnO)	1344-43-0	1.62E-03	3.84E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.33E-03	5.53E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.15E-03	5.09E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.05E-02	4.86E-03
			Bornite (Cu5FeS4)	1308-82-3	7.40E-04	1.75E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	5.70E-04	1.35E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.30E-04	5.45E-05
			Cuprite (CU_2O)	1317-39-1	4.00E-04	9.48E-05
			Galena (PbS)	1314-87-0	1.62E-03	3.84E-04
			Sphalerite (ZnS)	1314-98-3	3.32E-03	7.87E-04
			Pyrite (Fe, S2)	1309-36-0	4.80E-02	1.14E-02
			Pyrrhotite (Fe7S8)	12305-96-3	5.05E-02	1.20E-02
			Arsenopyrite (FeAsS)	1303-18-0	1.93E-03	4.58E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.46E-02	3.47E-03
			Quartz	14808-60-7	2.33E-01	5.52E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	4.35E+00	1.03E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.33E-01	5.54E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	6.60E-01	1.57E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.41E-01	3.34E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	4.48E-02	1.06E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	8.56E-02	2.03E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.35E-01	3.19E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.02E-03	2.42E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.97E-02	4.68E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	4.78E-03	1.13E-03
			Calcite (CaCO3)	1317-65-3	3.84E-02	9.10E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	9.61E-04	2.28E-04
			Titanite (CaTiSiO5)	[TITAN]	5.58E-03	1.32E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.14E-02	5.08E-03
			Mica	12001-26-2	8.56E-01	2.03E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	4.23E-01	1.00E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	3.45E-01	8.19E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	2.68E-01	6.35E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	9.35E-01	2.22E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.04E+00	4.83E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	7.60E-01	1.80E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.11E-01	2.64E-02
			Sillimanite (Al2SiO5)	12141-45-6	3.52E-02	8.34E-03
			Carbon Monoxide (CO)	630-08-0	6.60E-03	1.48E-03
			Sulphur Dioxide (SO2)	7446-09-5	3.93E-04	9.77E-05
			Hydrocarbons	[NMHC]	2.51E-03	6.32E-04
			Nitrogen Oxides (NOx)	10102-44-0	3.35E-02	8.01E-03
			1,3-butadiene	106-99-0	2.25E-06	5.39E-07
			Acenaphthene	83-32-9	7.54E-07	1.81E-07
			Acenaphthylene	208-96-8	1.52E-06	3.64E-07
			Acetaldehyde	75-07-0	1.83E-04	4.50E-05
			Acrolein	107-02-8	2.76E-05	6.70E-06
			Anthracene	120-12-7	1.62E-07	3.87E-08
			Benzene	71-43-2	6.54E-05	1.57E-05
			Benzo(a)anthracene	56-55-3	2.83E-08	6.84E-09
			Benzo(a)pyrene	50-32-8	1.06E-08	2.43E-09
			Benzo(b+k)fluoranthene	205-99-2	2.99E-08	6.86E-09
			Benzo(g,h,i)perylene	191-24-2	1.89E-08	4.40E-09
			Chrysene	218-01-9	3.20E-08	7.50E-09
			Fluoranthene	206-44-0	2.75E-07	6.52E-08
			Fluorene	86-73-7	1.13E-06	2.70E-07
			Formaldehyde	50-00-0	1.10E-04	2.61E-05
			Phenanthrene	85-01-8	2.07E-06	4.94E-07
			Pyrene	129-00-0	2.63E-07	6.21E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.88E-03	4.42E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.22E-03	2.87E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.46E-08	5.75E-09

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR2	Road from Pit 87 to Plant	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	2.05E+01	1.06E+01
			PM_{10}	[PM10]	5.91E+00	3.06E+00
			$PM_{2.5}$	[PM2.5]	6.03E-01	3.17E-01
			Silver (Ag)	7440-22-4	1.21E-05	6.26E-06
			Aluminum (Al)	7429-90-5	1.55E+00	8.02E-01
			Arsenic (As)	7440-38-2	3.29E-04	1.70E-04
			Gold (Au)	7440-57-5	1.71E-06	8.84E-07
			Boron (B)	7440-42-8	2.06E-03	1.06E-03
			Barium (Ba)	7440-39-3	7.44E-03	3.84E-03
			Beryllium (Be)	7440-41-7	2.41E-05	1.25E-05
			Bismuth (Bi)	7440-69-9	4.42E-05	2.29E-05
			Carbon (C)	7440-44-0	2.70E-02	1.39E-02
			Calcium (Ca)	7440-70-2	6.73E-01	3.48E-01
			Cadmium (Cd)	7440-43-9	2.39E-05	1.24E-05
			Cerium (Ce)	7440-45-1	1.48E-03	7.67E-04
			Cobalt (Co)	7440-48-4	4.09E-04	2.11E-04
			Chromium (Cr)	7440-47-3	1.77E-03	9.12E-04
			Cesium (Cs)	7440-46-2	6.97E-05	3.60E-05
			Copper (Cu)	7440-50-8	2.76E-03	1.43E-03
			Iron (Fe)	7439-89-6	8.47E-01	4.38E-01
			Gallium (Ga)	7440-55-3	4.15E-04	2.15E-04
			Hafnium (Hf)	7440-58-6	8.72E-05	4.51E-05
			Mercury (Hg)	7439-97-6	5.11E-07	2.64E-07
			Indium (In)	7440-74-6	3.52E-07	1.82E-07
			Potassium (K)	7440-09-7	2.86E-01	1.48E-01
			Lanthanum (La)	7439-91-0	4.00E-04	2.07E-04
			Lithium (Li)	7439-93-2	5.27E-04	2.72E-04
			Lutetium (Lu)	7439-94-3	5.44E-06	2.81E-06
			Magnesium (Mg)	7439-95-4	3.03E-01	1.56E-01
			Manganese (Mn)	7439-96-5	3.10E-03	1.60E-03
			Molybdenum (Mo)	7439-98-7	1.14E-04	5.87E-05
			Sodium (Na)	7440-23-5	5.89E-01	3.04E-01
			Niobium (Nb)	7440--03-1	1.18E-04	6.08E-05
			Nickel (Ni)	7440-02-0	3.00E-04	1.55E-04
			Phosphorus (P)	7723-14-0	1.25E-02	6.48E-03
			Lead (Pb)	7439-92-1	2.89E-04	1.50E-04
			Rubidium (Rb)	7440-17-7	1.56E-03	8.05E-04
			Sulphur (S)	7704-34-9	5.47E-02	2.83E-02
			Antimony (Sb)	7440-36-0	1.05E-04	5.40E-05
			Scandium (Sc)	7440-20-2	2.69E-04	1.39E-04
			Selenium (Se)	7782-49-2	7.15E-06	3.70E-06
			Tin (Sn)	7440-31-5	1.89E-04	9.77E-05
			Strontium (Sr)	7440-24-6	6.25E-03	3.23E-03
			Tantalum (Ta)	7440-25-7	1.92E-05	9.94E-06
			Terbium (Tb)	7440-27-9	1.26E-05	6.51E-06
			Tellurium (Te)	13494-80-9	4.16E-06	2.15E-06
			Titanium (Ti)	7440-32-6	2.16E-02	1.12E-02
			Thallium (Tl)	7440-28-0	2.07E-05	1.07E-05
			Uranium (U)	7440-61-1	2.90E-05	1.50E-05
			Vanadium (v)	7440-62-2	2.41E-03	1.25E-03
			Tungsten (W)	7440-33-7	5.51E-04	2.85E-04
			Yttrium (Y)	7440-65-5	3.11E-04	1.61E-04
			Ytterbium (Yb)	7440-64-4	3.59E-05	1.86E-05
			Zinc (Zn)	7440-66-6	2.18E-03	1.13E-03
			Zirconium (Zr)	7440-67-7	1.95E-03	1.01E-03
			Silicon Dioxide (SiO2)	7631-86-9	1.28E+01	6.60E+00
			Aluminum Oxide (Al2O3)	1344-28-1	3.07E+00	1.59E+00
			Iron Oxide (Fe2O3)	1309-37-1	1.35E+00	6.98E-01
			Magnesium Oxide (MgO)	1309-48-4	5.51E-01	2.85E-01
			Calcium Oxide (CaO)	1305-78-8	9.61E-01	4.97E-01
			Sodium Oxide (Na2O)	1313-59-3	6.91E-01	3.57E-01
			Potassium Oxide (K2O)	12136-45-7	4.01E-01	2.07E-01
			Titanium dioxide (TiO2)	13463-67-7	3.63E-02	1.88E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.62E-02	1.36E-02
			Manganese Oxide (MnO)	1344-43-0	4.80E-03	2.48E-03
			Chromium Oxide (Cr2O3)	1308-38-9	5.96E-03	3.08E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	5.49E-03	2.84E-03
			Chalcopyrite (CuFeS2)	1308-56-1	5.24E-02	2.71E-02
			Bornite (Cu5FeS4)	1308-82-3	1.89E-03	9.77E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.46E-03	7.53E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	5.87E-04	3.04E-04
			Cuprite (CU_2O)	1317-39-1	1.02E-03	5.28E-04
			Galena (PbS)	1314-87-0	4.14E-03	2.14E-03
			Sphalerite (ZnS)	1314-98-3	8.48E-03	4.38E-03
			Pyrite (Fe, S2)	1309-36-0	1.23E-01	6.34E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.29E-01	6.67E-02
			Arsenopyrite (FeAsS)	1303-18-0	4.93E-03	2.55E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	4.33E-02	2.24E-02
			Quartz	14808-60-7	6.88E-01	3.56E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.11E+01	5.74E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	5.97E-01	3.08E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.69E+00	8.72E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	3.60E-01	1.86E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.32E-01	6.84E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.19E-01	1.13E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.44E-01	1.78E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	3.02E-03	1.56E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	5.04E-02	2.61E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.22E-02	6.31E-03
			Calcite (CaCO3)	1317-65-3	9.81E-02	5.07E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.84E-03	1.47E-03
			Titanite (CaTiSiO5)	[TITAN]	1.65E-02	8.52E-03
			Apatite (Ca5(PO4)3)	1306-05-4	5.47E-02	2.83E-02
			Mica	12001-26-2	2.19E+00	1.13E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.08E+00	5.59E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	8.83E-01	4.56E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	6.85E-01	3.54E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.39E+00	1.23E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.21E+00	2.69E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	1.94E+00	1.00E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.84E-01	1.47E-01
			Sillimanite (Al2SiO5)	12141-45-6	8.99E-02	4.65E-02
			Carbon Monoxide (CO)	630-08-0	4.34E-02	3.97E-02
			Sulphur Dioxide (SO2)	7446-09-5	1.01E-03	7.88E-04
			Hydrocarbons	[NMHC]	1.86E-02	1.72E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.22E+00	1.20E+00
			1,3-butadiene	106-99-0	3.67E-05	3.55E-05
			Acenaphthene	83-32-9	1.20E-05	1.16E-05
			Acenaphthylene	208-96-8	2.45E-05	2.37E-05
			Acetaldehyde	75-07-0	2.09E-03	1.99E-03
			Acrolein	107-02-8	3.72E-04	3.57E-04
			Anthracene	120-12-7	2.13E-06	2.04E-06
			Benzene	71-43-2	1.07E-03	1.03E-03
			Benzo(a)anthracene	56-55-3	2.61E-07	2.45E-07
			Benzo(a)pyrene	50-32-8	8.82E-08	8.22E-08
			Benzo(b+k)fluoranthene	205-99-2	2.49E-07	2.32E-07
			Benzo(g,h,i)perylene	191-24-2	2.12E-07	2.02E-07
			Chrysene	218-01-9	3.26E-07	3.08E-07
			Fluoranthene	206-44-0	3.61E-06	3.46E-06
			Fluorene	86-73-7	1.67E-05	1.61E-05
			Formaldehyde	50-00-0	1.75E-03	1.69E-03
			Phenanthrene	85-01-8	2.85E-05	2.74E-05
			Pyrene	129-00-0	3.39E-06	3.24E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.34E-02	1.23E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	8.71E-03	8.02E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.54E-07	2.41E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR3	Road from Pit J to Plant	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.10E+01	5.16E+00
			PM_{10}	[PM10]	3.17E+00	1.49E+00
			$PM_{2.5}$	[PM2.5]	3.23E-01	1.55E-01
			Silver (Ag)	7440-22-4	6.48E-06	3.05E-06
			Aluminum (Al)	7429-90-5	8.30E-01	3.91E-01
			Arsenic (As)	7440-38-2	1.76E-04	8.29E-05
			Gold (Au)	7440-57-5	9.16E-07	4.31E-07
			Boron (B)	7440-42-8	1.10E-03	5.18E-04
			Barium (Ba)	7440-39-3	3.98E-03	1.87E-03
			Beryllium (Be)	7440-41-7	1.29E-05	6.08E-06
			Bismuth (Bi)	7440-69-9	2.37E-05	1.12E-05
			Carbon (C)	7440-44-0	1.44E-02	6.80E-03
			Calcium (Ca)	7440-70-2	3.60E-01	1.70E-01
			Cadmium (Cd)	7440-43-9	1.28E-05	6.04E-06
			Cerium (Ce)	7440-45-1	7.95E-04	3.74E-04
			Cobalt (Co)	7440-48-4	2.19E-04	1.03E-04
			Chromium (Cr)	7440-47-3	9.45E-04	4.45E-04
			Cesium (Cs)	7440-46-2	3.73E-05	1.76E-05
			Copper (Cu)	7440-50-8	1.48E-03	6.96E-04
			Iron (Fe)	7439-89-6	4.53E-01	2.13E-01
			Gallium (Ga)	7440-55-3	2.22E-04	1.05E-04
			Hafnium (Hf)	7440-58-6	4.67E-05	2.20E-05
			Mercury (Hg)	7439-97-6	2.74E-07	1.29E-07
			Indium (In)	7440-74-6	1.89E-07	8.88E-08
			Potassium (K)	7440-09-7	1.53E-01	7.20E-02
			Lanthanum (La)	7439-91-0	2.14E-04	1.01E-04
			Lithium (Li)	7439-93-2	2.82E-04	1.33E-04
			Lutetium (Lu)	7439-94-3	2.91E-06	1.37E-06
			Magnesium (Mg)	7439-95-4	1.62E-01	7.63E-02
			Manganese (Mn)	7439-96-5	1.66E-03	7.82E-04
			Molybdenum (Mo)	7439-98-7	6.08E-05	2.86E-05
			Sodium (Na)	7440-23-5	3.15E-01	1.48E-01
			Niobium (Nb)	7440--03-1	6.30E-05	2.97E-05
			Nickel (Ni)	7440-02-0	1.61E-04	7.57E-05
			Phosphorus (P)	7723-14-0	6.71E-03	3.16E-03
			Lead (Pb)	7439-92-1	1.55E-04	7.29E-05
			Rubidium (Rb)	7440-17-7	8.34E-04	3.93E-04
			Sulphur (S)	7704-34-9	2.93E-02	1.38E-02
			Antimony (Sb)	7440-36-0	5.60E-05	2.64E-05
			Scandium (Sc)	7440-20-2	1.44E-04	6.78E-05
			Selenium (Se)	7782-49-2	3.83E-06	1.80E-06
			Tin (Sn)	7440-31-5	1.01E-04	4.77E-05
			Strontium (Sr)	7440-24-6	3.35E-03	1.58E-03
			Tantalum (Ta)	7440-25-7	1.03E-05	4.85E-06
			Terbium (Tb)	7440-27-9	6.75E-06	3.18E-06
			Tellurium (Te)	13494-80-9	2.23E-06	1.05E-06
			Titanium (Ti)	7440-32-6	1.16E-02	5.46E-03
			Thallium (Tl)	7440-28-0	1.11E-05	5.22E-06
			Uranium (U)	7440-61-1	1.55E-05	7.31E-06
			Vanadium (v)	7440-62-2	1.29E-03	6.08E-04
			Tungsten (W)	7440-33-7	2.95E-04	1.39E-04
			Yttrium (Y)	7440-65-5	1.67E-04	7.84E-05
			Ytterbium (Yb)	7440-64-4	1.92E-05	9.05E-06
			Zinc (Zn)	7440-66-6	1.17E-03	5.49E-04
			Zirconium (Zr)	7440-67-7	1.04E-03	4.91E-04
			Silicon Dioxide (SiO2)	7631-86-9	6.84E+00	3.22E+00
			Aluminum Oxide (Al2O3)	1344-28-1	1.64E+00	7.73E-01
			Iron Oxide (Fe2O3)	1309-37-1	7.23E-01	3.40E-01
			Magnesium Oxide (MgO)	1309-48-4	2.95E-01	1.39E-01
			Calcium Oxide (CaO)	1305-78-8	5.15E-01	2.42E-01
			Sodium Oxide (Na2O)	1313-59-3	3.70E-01	1.74E-01
			Potassium Oxide (K2O)	12136-45-7	2.15E-01	1.01E-01
			Titanium dioxide (TiO2)	13463-67-7	1.95E-02	9.17E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.40E-02	6.61E-03
			Manganese Oxide (MnO)	1344-43-0	2.57E-03	1.21E-03
			Chromium Oxide (Cr2O3)	1308-38-9	3.19E-03	1.50E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	2.94E-03	1.38E-03
			Chalcopyrite (CuFeS2)	1308-56-1	2.81E-02	1.32E-02
			Bornite (Cu5FeS4)	1308-82-3	1.01E-03	4.77E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	7.80E-04	3.67E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.14E-04	1.48E-04
			Cuprite (CU_2O)	1317-39-1	5.47E-04	2.58E-04
			Galena (PbS)	1314-87-0	2.21E-03	1.04E-03
			Sphalerite (ZnS)	1314-98-3	4.54E-03	2.14E-03
			Pyrite (Fe, S2)	1309-36-0	6.56E-02	3.09E-02
			Pyrrhotite (Fe7S8)	12305-96-3	6.91E-02	3.26E-02
			Arsenopyrite (FeAsS)	1303-18-0	2.64E-03	1.24E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.32E-02	1.09E-02
			Quartz	14808-60-7	3.69E-01	1.74E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.95E+00	2.80E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.19E-01	1.50E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	9.04E-01	4.26E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.93E-01	9.07E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.10E-02	3.34E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.17E-01	5.51E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.84E-01	8.67E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.62E-03	7.62E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.70E-02	1.27E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	6.54E-03	3.08E-03
			Calcite (CaCO3)	1317-65-3	5.25E-02	2.47E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.52E-03	7.18E-04
			Titanite (CaTiSiO5)	[TITAN]	8.84E-03	4.16E-03
			Apatite (Ca5(PO4)3)	1306-05-4	2.93E-02	1.38E-02
			Mica	12001-26-2	1.17E+00	5.52E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.79E-01	2.73E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.73E-01	2.23E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.67E-01	1.73E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.28E+00	6.02E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.79E+00	1.31E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	1.04E+00	4.90E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.52E-01	7.16E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.81E-02	2.27E-02
			Carbon Monoxide (CO)	630-08-0	2.18E-02	1.93E-02
			Sulphur Dioxide (SO2)	7446-09-5	5.72E-04	3.86E-04
			Hydrocarbons	[NMHC]	9.63E-03	8.41E-03
			Nitrogen Oxides (NOx)	10102-44-0	5.97E-01	5.82E-01
			1,3-butadiene	106-99-0	1.83E-05	1.73E-05
			Acenaphthene	83-32-9	5.96E-06	5.63E-06
			Acenaphthylene	208-96-8	1.22E-05	1.15E-05
			Acetaldehyde	75-07-0	1.05E-03	9.68E-04
			Acrolein	107-02-8	1.86E-04	1.74E-04
			Anthracene	120-12-7	1.06E-06	9.92E-07
			Benzene	71-43-2	5.31E-04	5.02E-04
			Benzo(a)anthracene	56-55-3	1.32E-07	1.19E-07
			Benzo(a)pyrene	50-32-8	4.43E-08	4.00E-08
			Benzo(b+k)fluoranthene	205-99-2	1.25E-07	1.13E-07
			Benzo(g,h,i)perylene	191-24-2	1.06E-07	9.82E-08
			Chrysene	218-01-9	1.64E-07	1.50E-07
			Fluoranthene	206-44-0	1.80E-06	1.68E-06
			Fluorene	86-73-7	8.31E-06	7.82E-06
			Formaldehyde	50-00-0	8.70E-04	8.23E-04
			Phenanthrene	85-01-8	1.42E-05	1.33E-05
			Pyrene	129-00-0	1.69E-06	1.58E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	6.82E-03	6.01E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	4.43E-03	3.91E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.28E-07	1.17E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR4	Road from Pit SW to Plant	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	3.20E+01	1.51E+01
			PM_{10}	[PM10]	9.25E+00	4.37E+00
			$PM_{2.5}$	[PM2.5]	9.42E-01	4.52E-01
			Silver (Ag)	7440-22-4	1.90E-05	8.95E-06
			Aluminum (Al)	7429-90-5	2.43E+00	1.15E+00
			Arsenic (As)	7440-38-2	5.16E-04	2.43E-04
			Gold (Au)	7440-57-5	2.68E-06	1.26E-06
			Boron (B)	7440-42-8	3.22E-03	1.52E-03
			Barium (Ba)	7440-39-3	1.17E-02	5.50E-03
			Beryllium (Be)	7440-41-7	3.78E-05	1.78E-05
			Bismuth (Bi)	7440-69-9	6.93E-05	3.27E-05
			Carbon (C)	7440-44-0	4.23E-02	1.99E-02
			Calcium (Ca)	7440-70-2	1.06E+00	4.98E-01
			Cadmium (Cd)	7440-43-9	3.75E-05	1.77E-05
			Cerium (Ce)	7440-45-1	2.33E-03	1.10E-03
			Cobalt (Co)	7440-48-4	6.41E-04	3.02E-04
			Chromium (Cr)	7440-47-3	2.77E-03	1.31E-03
			Cesium (Cs)	7440-46-2	1.09E-04	5.15E-05
			Copper (Cu)	7440-50-8	4.33E-03	2.04E-03
			Iron (Fe)	7439-89-6	1.33E+00	6.26E-01
			Gallium (Ga)	7440-55-3	6.51E-04	3.07E-04
			Hafnium (Hf)	7440-58-6	1.37E-04	6.45E-05
			Mercury (Hg)	7439-97-6	8.01E-07	3.78E-07
			Indium (In)	7440-74-6	5.52E-07	2.60E-07
			Potassium (K)	7440-09-7	4.48E-01	2.11E-01
			Lanthanum (La)	7439-91-0	6.27E-04	2.96E-04
			Lithium (Li)	7439-93-2	8.25E-04	3.89E-04
			Lutetium (Lu)	7439-94-3	8.52E-06	4.02E-06
			Magnesium (Mg)	7439-95-4	4.74E-01	2.24E-01
			Manganese (Mn)	7439-96-5	4.85E-03	2.29E-03
			Molybdenum (Mo)	7439-98-7	1.78E-04	8.40E-05
			Sodium (Na)	7440-23-5	9.23E-01	4.35E-01
			Niobium (Nb)	7440--03-1	1.85E-04	8.71E-05
			Nickel (Ni)	7440-02-0	4.70E-04	2.22E-04
			Phosphorus (P)	7723-14-0	1.96E-02	9.27E-03
			Lead (Pb)	7439-92-1	4.54E-04	2.14E-04
			Rubidium (Rb)	7440-17-7	2.44E-03	1.15E-03
			Sulphur (S)	7704-34-9	8.58E-02	4.05E-02
			Antimony (Sb)	7440-36-0	1.64E-04	7.73E-05
			Scandium (Sc)	7440-20-2	4.22E-04	1.99E-04
			Selenium (Se)	7782-49-2	1.12E-05	5.29E-06
			Tin (Sn)	7440-31-5	2.96E-04	1.40E-04
			Strontium (Sr)	7440-24-6	9.80E-03	4.62E-03
			Tantalum (Ta)	7440-25-7	3.02E-05	1.42E-05
			Terbium (Tb)	7440-27-9	1.98E-05	9.32E-06
			Tellurium (Te)	13494-80-9	6.52E-06	3.08E-06
			Titanium (Ti)	7440-32-6	3.39E-02	1.60E-02
			Thallium (Tl)	7440-28-0	3.25E-05	1.53E-05
			Uranium (U)	7440-61-1	4.55E-05	2.14E-05
			Vanadium (v)	7440-62-2	3.78E-03	1.78E-03
			Tungsten (W)	7440-33-7	8.64E-04	4.07E-04
			Yttrium (Y)	7440-65-5	4.88E-04	2.30E-04
			Ytterbium (Yb)	7440-64-4	5.63E-05	2.65E-05
			Zinc (Zn)	7440-66-6	3.42E-03	1.61E-03
			Zirconium (Zr)	7440-67-7	3.06E-03	1.44E-03
			Silicon Dioxide (SiO2)	7631-86-9	2.00E+01	9.44E+00
			Aluminum Oxide (Al2O3)	1344-28-1	4.81E+00	2.27E+00
			Iron Oxide (Fe2O3)	1309-37-1	2.12E+00	9.98E-01
			Magnesium Oxide (MgO)	1309-48-4	8.64E-01	4.08E-01
			Calcium Oxide (CaO)	1305-78-8	1.51E+00	7.11E-01
			Sodium Oxide (Na2O)	1313-59-3	1.08E+00	5.11E-01
			Potassium Oxide (K2O)	12136-45-7	6.28E-01	2.96E-01
			Titanium dioxide (TiO2)	13463-67-7	5.69E-02	2.68E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	4.11E-02	1.94E-02
			Manganese Oxide (MnO)	1344-43-0	7.51E-03	3.54E-03
			Chromium Oxide (Cr2O3)	1308-38-9	9.34E-03	4.41E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	8.61E-03	4.06E-03
			Chalcopyrite (CuFeS2)	1308-56-1	8.22E-02	3.88E-02
			Bornite (Cu5FeS4)	1308-82-3	2.96E-03	1.40E-03
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.28E-03	1.08E-03
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	9.21E-04	4.34E-04
			Cuprite (CU_2O)	1317-39-1	1.60E-03	7.56E-04
			Galena (PbS)	1314-87-0	6.48E-03	3.06E-03
			Sphalerite (ZnS)	1314-98-3	1.33E-02	6.27E-03
			Pyrite (Fe, S2)	1309-36-0	1.92E-01	9.07E-02
			Pyrrhotite (Fe7S8)	12305-96-3	2.02E-01	9.55E-02
			Arsenopyrite (FeAsS)	1303-18-0	7.73E-03	3.65E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	6.78E-02	3.20E-02
			Quartz	14808-60-7	1.08E+00	5.08E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.74E+01	8.21E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	9.35E-01	4.41E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.65E+00	1.25E+00
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.64E-01	2.66E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.07E-01	9.78E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.43E-01	1.62E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	5.39E-01	2.54E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	4.73E-03	2.23E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.91E-02	3.73E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.92E-02	9.03E-03
			Calcite (CaCO3)	1317-65-3	1.54E-01	7.25E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.45E-03	2.10E-03
			Titanite (CaTiSiO5)	[TITAN]	2.58E-02	1.22E-02
			Apatite (Ca5(PO4)3)	1306-05-4	8.58E-02	4.05E-02
			Mica	12001-26-2	3.43E+00	1.62E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.69E+00	8.00E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.38E+00	6.53E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.07E+00	5.06E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.75E+00	1.77E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	8.17E+00	3.85E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	3.05E+00	1.44E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.45E-01	2.10E-01
			Sillimanite (Al2SiO5)	12141-45-6	1.41E-01	6.65E-02
			Carbon Monoxide (CO)	630-08-0	6.25E-02	5.57E-02
			Sulphur Dioxide (SO2)	7446-09-5	1.54E-03	1.11E-03
			Hydrocarbons	[NMHC]	2.69E-02	2.42E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.71E+00	1.67E+00
			1,3-butadiene	106-99-0	5.21E-05	4.97E-05
			Acenaphthene	83-32-9	1.70E-05	1.62E-05
			Acenaphthylene	208-96-8	3.47E-05	3.31E-05
			Acetaldehyde	75-07-0	2.98E-03	2.78E-03
			Acrolein	107-02-8	5.30E-04	5.00E-04
			Anthracene	120-12-7	3.03E-06	2.86E-06
			Benzene	71-43-2	1.52E-03	1.45E-03
			Benzo(a)anthracene	56-55-3	3.74E-07	3.43E-07
			Benzo(a)pyrene	50-32-8	1.26E-07	1.15E-07
			Benzo(b+k)fluoranthene	205-99-2	3.56E-07	3.25E-07
			Benzo(g,h,i)perylene	191-24-2	3.03E-07	2.83E-07
			Chrysene	218-01-9	4.66E-07	4.32E-07
			Fluoranthene	206-44-0	5.13E-06	4.84E-06
			Fluorene	86-73-7	2.37E-05	2.25E-05
			Formaldehyde	50-00-0	2.48E-03	2.37E-03
			Phenanthrene	85-01-8	4.05E-05	3.83E-05
			Pyrene	129-00-0	4.82E-06	4.54E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.93E-02	1.73E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.26E-02	1.12E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.63E-07	3.37E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
HR5	Road from Pit J to OB NW	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.18E+00	1.18E+00
			PM_{10}	[PM10]	3.42E-01	3.42E-01
			$PM_{2.5}$	[PM2.5]	3.57E-02	3.57E-02
			Silver (Ag)	7440-22-4	7.00E-07	7.00E-07
			Aluminum (Al)	7429-90-5	8.97E-02	8.97E-02
			Arsenic (As)	7440-38-2	1.90E-05	1.90E-05
			Gold (Au)	7440-57-5	9.90E-08	9.90E-08
			Boron (B)	7440-42-8	1.19E-04	1.19E-04
			Barium (Ba)	7440-39-3	4.30E-04	4.30E-04
			Beryllium (Be)	7440-41-7	1.39E-06	1.39E-06
			Bismuth (Bi)	7440-69-9	2.56E-06	2.56E-06
			Carbon (C)	7440-44-0	1.56E-03	1.56E-03
			Calcium (Ca)	7440-70-2	3.89E-02	3.89E-02
			Cadmium (Cd)	7440-43-9	1.39E-06	1.39E-06
			Cerium (Ce)	7440-45-1	8.59E-05	8.59E-05
			Cobalt (Co)	7440-48-4	2.37E-05	2.37E-05
			Chromium (Cr)	7440-47-3	1.02E-04	1.02E-04
			Cesium (Cs)	7440-46-2	4.03E-06	4.03E-06
			Copper (Cu)	7440-50-8	1.60E-04	1.60E-04
			Iron (Fe)	7439-89-6	4.90E-02	4.90E-02
			Gallium (Ga)	7440-55-3	2.40E-05	2.40E-05
			Hafnium (Hf)	7440-58-6	5.04E-06	5.04E-06
			Mercury (Hg)	7439-97-6	2.96E-08	2.96E-08
			Indium (In)	7440-74-6	2.04E-08	2.04E-08
			Potassium (K)	7440-09-7	1.65E-02	1.65E-02
			Lanthanum (La)	7439-91-0	2.32E-05	2.32E-05
			Lithium (Li)	7439-93-2	3.05E-05	3.05E-05
			Lutetium (Lu)	7439-94-3	3.15E-07	3.15E-07
			Magnesium (Mg)	7439-95-4	1.75E-02	1.75E-02
			Manganese (Mn)	7439-96-5	1.79E-04	1.79E-04
			Molybdenum (Mo)	7439-98-7	6.57E-06	6.57E-06
			Sodium (Na)	7440-23-5	3.41E-02	3.41E-02
			Niobium (Nb)	7440--03-1	6.81E-06	6.81E-06
			Nickel (Ni)	7440-02-0	1.74E-05	1.74E-05
			Phosphorus (P)	7723-14-0	7.25E-04	7.25E-04
			Lead (Pb)	7439-92-1	1.67E-05	1.67E-05
			Rubidium (Rb)	7440-17-7	9.01E-05	9.01E-05
			Sulphur (S)	7704-34-9	3.17E-03	3.17E-03
			Antimony (Sb)	7440-36-0	6.05E-06	6.05E-06
			Scandium (Sc)	7440-20-2	1.56E-05	1.56E-05
			Selenium (Se)	7782-49-2	4.14E-07	4.14E-07
			Tin (Sn)	7440-31-5	1.09E-05	1.09E-05
			Strontium (Sr)	7440-24-6	3.62E-04	3.62E-04
			Tantalum (Ta)	7440-25-7	1.11E-06	1.11E-06
			Terbium (Tb)	7440-27-9	7.29E-07	7.29E-07
			Tellurium (Te)	13494-80-9	2.41E-07	2.41E-07
			Titanium (Ti)	7440-32-6	1.25E-03	1.25E-03
			Thallium (Tl)	7440-28-0	1.20E-06	1.20E-06
			Uranium (U)	7440-61-1	1.68E-06	1.68E-06
			Vanadium (v)	7440-62-2	1.40E-04	1.40E-04
			Tungsten (W)	7440-33-7	3.19E-05	3.19E-05
			Yttrium (Y)	7440-65-5	1.80E-05	1.80E-05
			Ytterbium (Yb)	7440-64-4	2.08E-06	2.08E-06
			Zinc (Zn)	7440-66-6	1.26E-04	1.26E-04
			Zirconium (Zr)	7440-67-7	1.13E-04	1.13E-04
			Silicon Dioxide (SiO2)	7631-86-9	7.39E-01	7.39E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.78E-01	1.78E-01
			Iron Oxide (Fe2O3)	1309-37-1	7.81E-02	7.81E-02
			Magnesium Oxide (MgO)	1309-48-4	3.19E-02	3.19E-02
			Calcium Oxide (CaO)	1305-78-8	5.56E-02	5.56E-02
			Sodium Oxide (Na2O)	1313-59-3	4.00E-02	4.00E-02
			Potassium Oxide (K2O)	12136-45-7	2.32E-02	2.32E-02
			Titanium dioxide (TiO2)	13463-67-7	2.10E-03	2.10E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.52E-03	1.52E-03
			Manganese Oxide (MnO)	1344-43-0	2.77E-04	2.77E-04
			Chromium Oxide (Cr2O3)	1308-38-9	3.45E-04	3.45E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	3.18E-04	3.18E-04
			Chalcopyrite (CuFeS2)	1308-56-1	3.03E-03	3.03E-03
			Bornite (Cu5FeS4)	1308-82-3	1.09E-04	1.09E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	8.43E-05	8.43E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.40E-05	3.40E-05
			Cuprite (CU_2O)	1317-39-1	5.91E-05	5.91E-05
			Galena (PbS)	1314-87-0	2.39E-04	2.39E-04
			Sphalerite (ZnS)	1314-98-3	4.91E-04	4.91E-04
			Pyrite (Fe, S2)	1309-36-0	7.10E-03	7.10E-03
			Pyrrhotite (Fe7S8)	12305-96-3	7.47E-03	7.47E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.85E-04	2.85E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.51E-03	2.51E-03
			Quartz	14808-60-7	3.98E-02	3.98E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	6.43E-01	6.43E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.45E-02	3.45E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	9.77E-02	9.77E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.08E-02	2.08E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.66E-03	7.66E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.27E-02	1.27E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.99E-02	1.99E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.75E-04	1.75E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.92E-03	2.92E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	7.07E-04	7.07E-04
			Calcite (CaCO3)	1317-65-3	5.68E-03	5.68E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.65E-04	1.65E-04
			Titanite (CaTiSiO5)	[TITAN]	9.54E-04	9.54E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.17E-03	3.17E-03
			Mica	12001-26-2	1.27E-01	1.27E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	6.26E-02	6.26E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	5.11E-02	5.11E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.96E-02	3.96E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.38E-01	1.38E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.02E-01	3.02E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.12E-01	1.12E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.64E-02	1.64E-02
			Sillimanite (Al2SiO5)	12141-45-6	5.20E-03	5.20E-03
			Carbon Monoxide (CO)	630-08-0	5.05E-03	5.05E-03
			Sulphur Dioxide (SO2)	7446-09-5	9.83E-05	9.83E-05
			Hydrocarbons	[NMHC]	2.20E-03	2.20E-03
			Nitrogen Oxides (NOx)	10102-44-0	1.53E-01	1.53E-01
			1,3-butadiene	106-99-0	4.54E-06	4.54E-06
			Acenaphthene	83-32-9	1.48E-06	1.48E-06
			Acenaphthylene	208-96-8	3.03E-06	3.03E-06
			Acetaldehyde	75-07-0	2.54E-04	2.54E-04
			Acrolein	107-02-8	4.56E-05	4.56E-05
			Anthracene	120-12-7	2.61E-07	2.61E-07
			Benzene	71-43-2	1.32E-04	1.32E-04
			Benzo(a)anthracene	56-55-3	3.12E-08	3.12E-08
			Benzo(a)pyrene	50-32-8	1.05E-08	1.05E-08
			Benzo(b+k)fluoranthene	205-99-2	2.95E-08	2.95E-08
			Benzo(g,h,i)perylene	191-24-2	2.58E-08	2.58E-08
			Chrysene	218-01-9	3.93E-08	3.93E-08
			Fluoranthene	206-44-0	4.42E-07	4.42E-07
			Fluorene	86-73-7	2.05E-06	2.05E-06
			Formaldehyde	50-00-0	2.16E-04	2.16E-04
			Phenanthrene	85-01-8	3.50E-06	3.50E-06
			Pyrene	129-00-0	4.14E-07	4.14E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.57E-03	1.57E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.02E-03	1.02E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.07E-08	3.07E-08

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR6	Road from Pit J to OB West	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.14E+00	1.14E+00
			PM_{10}	[PM10]	3.31E-01	3.31E-01
			$PM_{2.5}$	[PM2.5]	3.44E-02	3.44E-02
			Silver (Ag)	7440-22-4	6.76E-07	6.76E-07
			Aluminum (Al)	7429-90-5	8.66E-02	8.66E-02
			Arsenic (As)	7440-38-2	1.84E-05	1.84E-05
			Gold (Au)	7440-57-5	9.55E-08	9.55E-08
			Boron (B)	7440-42-8	1.15E-04	1.15E-04
			Barium (Ba)	7440-39-3	4.15E-04	4.15E-04
			Beryllium (Be)	7440-41-7	1.35E-06	1.35E-06
			Bismuth (Bi)	7440-69-9	2.47E-06	2.47E-06
			Carbon (C)	7440-44-0	1.51E-03	1.51E-03
			Calcium (Ca)	7440-70-2	3.76E-02	3.76E-02
			Cadmium (Cd)	7440-43-9	1.34E-06	1.34E-06
			Cerium (Ce)	7440-45-1	8.29E-05	8.29E-05
			Cobalt (Co)	7440-48-4	2.28E-05	2.28E-05
			Chromium (Cr)	7440-47-3	9.86E-05	9.86E-05
			Cesium (Cs)	7440-46-2	3.89E-06	3.89E-06
			Copper (Cu)	7440-50-8	1.54E-04	1.54E-04
			Iron (Fe)	7439-89-6	4.73E-02	4.73E-02
			Gallium (Ga)	7440-55-3	2.32E-05	2.32E-05
			Hafnium (Hf)	7440-58-6	4.87E-06	4.87E-06
			Mercury (Hg)	7439-97-6	2.85E-08	2.85E-08
			Indium (In)	7440-74-6	1.97E-08	1.97E-08
			Potassium (K)	7440-09-7	1.60E-02	1.60E-02
			Lanthanum (La)	7439-91-0	2.24E-05	2.24E-05
			Lithium (Li)	7439-93-2	2.94E-05	2.94E-05
			Lutetium (Lu)	7439-94-3	3.04E-07	3.04E-07
			Magnesium (Mg)	7439-95-4	1.69E-02	1.69E-02
			Manganese (Mn)	7439-96-5	1.73E-04	1.73E-04
			Molybdenum (Mo)	7439-98-7	6.34E-06	6.34E-06
			Sodium (Na)	7440-23-5	3.29E-02	3.29E-02
			Niobium (Nb)	7440--03-1	6.58E-06	6.58E-06
			Nickel (Ni)	7440-02-0	1.68E-05	1.68E-05
			Phosphorus (P)	7723-14-0	7.00E-04	7.00E-04
			Lead (Pb)	7439-92-1	1.62E-05	1.62E-05
			Rubidium (Rb)	7440-17-7	8.70E-05	8.70E-05
			Sulphur (S)	7704-34-9	3.06E-03	3.06E-03
			Antimony (Sb)	7440-36-0	5.84E-06	5.84E-06
			Scandium (Sc)	7440-20-2	1.50E-05	1.50E-05
			Selenium (Se)	7782-49-2	4.00E-07	4.00E-07
			Tin (Sn)	7440-31-5	1.06E-05	1.06E-05
			Strontium (Sr)	7440-24-6	3.49E-04	3.49E-04
			Tantalum (Ta)	7440-25-7	1.07E-06	1.07E-06
			Terbium (Tb)	7440-27-9	7.04E-07	7.04E-07
			Tellurium (Te)	13494-80-9	2.32E-07	2.32E-07
			Titanium (Ti)	7440-32-6	1.21E-03	1.21E-03
			Thallium (Tl)	7440-28-0	1.16E-06	1.16E-06
			Uranium (U)	7440-61-1	1.62E-06	1.62E-06
			Vanadium (v)	7440-62-2	1.35E-04	1.35E-04
			Tungsten (W)	7440-33-7	3.08E-05	3.08E-05
			Yttrium (Y)	7440-65-5	1.74E-05	1.74E-05
			Ytterbium (Yb)	7440-64-4	2.01E-06	2.01E-06
			Zinc (Zn)	7440-66-6	1.22E-04	1.22E-04
			Zirconium (Zr)	7440-67-7	1.09E-04	1.09E-04
			Silicon Dioxide (SiO2)	7631-86-9	7.13E-01	7.13E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.71E-01	1.71E-01
			Iron Oxide (Fe2O3)	1309-37-1	7.54E-02	7.54E-02
			Magnesium Oxide (MgO)	1309-48-4	3.08E-02	3.08E-02
			Calcium Oxide (CaO)	1305-78-8	5.37E-02	5.37E-02
			Sodium Oxide (Na2O)	1313-59-3	3.86E-02	3.86E-02
			Potassium Oxide (K2O)	12136-45-7	2.24E-02	2.24E-02
			Titanium dioxide (TiO2)	13463-67-7	2.03E-03	2.03E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.47E-03	1.47E-03
			Manganese Oxide (MnO)	1344-43-0	2.68E-04	2.68E-04
			Chromium Oxide (Cr2O3)	1308-38-9	3.33E-04	3.33E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	3.07E-04	3.07E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.93E-03	2.93E-03
			Bornite (Cu5FeS4)	1308-82-3	1.06E-04	1.06E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	8.14E-05	8.14E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.28E-05	3.28E-05
			Cuprite (CU_2O)	1317-39-1	5.71E-05	5.71E-05
			Galena (PbS)	1314-87-0	2.31E-04	2.31E-04
			Sphalerite (ZnS)	1314-98-3	4.74E-04	4.74E-04
			Pyrite (Fe, S2)	1309-36-0	6.85E-03	6.85E-03
			Pyrrhotite (Fe7S8)	12305-96-3	7.21E-03	7.21E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.76E-04	2.76E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.42E-03	2.42E-03
			Quartz	14808-60-7	3.85E-02	3.85E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	6.21E-01	6.21E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.33E-02	3.33E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	9.43E-02	9.43E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.01E-02	2.01E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.40E-03	7.40E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.22E-02	1.22E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.92E-02	1.92E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.69E-04	1.69E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.82E-03	2.82E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	6.82E-04	6.82E-04
			Calcite (CaCO3)	1317-65-3	5.48E-03	5.48E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.59E-04	1.59E-04
			Titanite (CaTiSiO5)	[TITAN]	9.21E-04	9.21E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.06E-03	3.06E-03
			Mica	12001-26-2	1.22E-01	1.22E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	6.04E-02	6.04E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.93E-02	4.93E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.82E-02	3.82E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.33E-01	1.33E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.91E-01	2.91E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	1.09E-01	1.09E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.59E-02	1.59E-02
			Sillimanite (Al2SiO5)	12141-45-6	5.02E-03	5.02E-03
			Carbon Monoxide (CO)	630-08-0	4.88E-03	4.88E-03
			Sulphur Dioxide (SO2)	7446-09-5	9.49E-05	9.49E-05
			Hydrocarbons	[NMHC]	2.12E-03	2.12E-03
			Nitrogen Oxides (NOx)	10102-44-0	1.48E-01	1.48E-01
			1,3-butadiene	106-99-0	4.38E-06	4.38E-06
			Acenaphthene	83-32-9	1.43E-06	1.43E-06
			Acenaphthylene	208-96-8	2.92E-06	2.92E-06
			Acetaldehyde	75-07-0	2.45E-04	2.45E-04
			Acrolein	107-02-8	4.41E-05	4.41E-05
			Anthracene	120-12-7	2.52E-07	2.52E-07
			Benzene	71-43-2	1.27E-04	1.27E-04
			Benzo(a)anthracene	56-55-3	3.02E-08	3.02E-08
			Benzo(a)pyrene	50-32-8	1.01E-08	1.01E-08
			Benzo(b+k)fluoranthene	205-99-2	2.85E-08	2.85E-08
			Benzo(g,h,i)perylene	191-24-2	2.49E-08	2.49E-08
			Chrysene	218-01-9	3.80E-08	3.80E-08
			Fluoranthene	206-44-0	4.26E-07	4.26E-07
			Fluorene	86-73-7	1.98E-06	1.98E-06
			Formaldehyde	50-00-0	2.09E-04	2.09E-04
			Phenanthrene	85-01-8	3.38E-06	3.38E-06
			Pyrene	129-00-0	4.00E-07	4.00E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.52E-03	1.52E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	9.86E-04	9.86E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.97E-08	2.97E-08

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
HR7	Road from Pit SW to OB SW	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.19E+00	1.99E-01
			PM_{10}	[PM10]	3.45E-01	5.75E-02
			$PM_{2.5}$	[PM2.5]	3.59E-02	5.99E-03
			Silver (Ag)	7440-22-4	7.06E-07	1.18E-07
			Aluminum (Al)	7429-90-5	9.04E-02	1.51E-02
			Arsenic (As)	7440-38-2	1.92E-05	3.20E-06
			Gold (Au)	7440-57-5	9.97E-08	1.66E-08
			Boron (B)	7440-42-8	1.20E-04	2.00E-05
			Barium (Ba)	7440-39-3	4.33E-04	7.22E-05
			Beryllium (Be)	7440-41-7	1.41E-06	2.34E-07
			Bismuth (Bi)	7440-69-9	2.58E-06	4.30E-07
			Carbon (C)	7440-44-0	1.57E-03	2.62E-04
			Calcium (Ca)	7440-70-2	3.92E-02	6.54E-03
			Cadmium (Cd)	7440-43-9	1.40E-06	2.33E-07
			Cerium (Ce)	7440-45-1	8.65E-05	1.44E-05
			Cobalt (Co)	7440-48-4	2.38E-05	3.97E-06
			Chromium (Cr)	7440-47-3	1.03E-04	1.72E-05
			Cesium (Cs)	7440-46-2	4.06E-06	6.77E-07
			Copper (Cu)	7440-50-8	1.61E-04	2.68E-05
			Iron (Fe)	7439-89-6	4.94E-02	8.23E-03
			Gallium (Ga)	7440-55-3	2.42E-05	4.03E-06
			Hafnium (Hf)	7440-58-6	5.08E-06	8.47E-07
			Mercury (Hg)	7439-97-6	2.98E-08	4.96E-09
			Indium (In)	7440-74-6	2.05E-08	3.42E-09
			Potassium (K)	7440-09-7	1.67E-02	2.78E-03
			Lanthanum (La)	7439-91-0	2.33E-05	3.89E-06
			Lithium (Li)	7439-93-2	3.07E-05	5.12E-06
			Lutetium (Lu)	7439-94-3	3.17E-07	5.28E-08
			Magnesium (Mg)	7439-95-4	1.76E-02	2.94E-03
			Manganese (Mn)	7439-96-5	1.81E-04	3.01E-05
			Molybdenum (Mo)	7439-98-7	6.62E-06	1.10E-06
			Sodium (Na)	7440-23-5	3.43E-02	5.72E-03
			Niobium (Nb)	7440--03-1	6.86E-06	1.14E-06
			Nickel (Ni)	7440-02-0	1.75E-05	2.91E-06
			Phosphorus (P)	7723-14-0	7.30E-04	1.22E-04
			Lead (Pb)	7439-92-1	1.69E-05	2.81E-06
			Rubidium (Rb)	7440-17-7	9.08E-05	1.51E-05
			Sulphur (S)	7704-34-9	3.19E-03	5.32E-04
			Antimony (Sb)	7440-36-0	6.09E-06	1.02E-06
			Scandium (Sc)	7440-20-2	1.57E-05	2.61E-06
			Selenium (Se)	7782-49-2	4.17E-07	6.95E-08
			Tin (Sn)	7440-31-5	1.10E-05	1.84E-06
			Strontium (Sr)	7440-24-6	3.64E-04	6.07E-05
			Tantalum (Ta)	7440-25-7	1.12E-06	1.87E-07
			Terbium (Tb)	7440-27-9	7.35E-07	1.22E-07
			Tellurium (Te)	13494-80-9	2.42E-07	4.04E-08
			Titanium (Ti)	7440-32-6	1.26E-03	2.10E-04
			Thallium (Tl)	7440-28-0	1.21E-06	2.01E-07
			Uranium (U)	7440-61-1	1.69E-06	2.82E-07
			Vanadium (v)	7440-62-2	1.41E-04	2.34E-05
			Tungsten (W)	7440-33-7	3.21E-05	5.35E-06
			Yttrium (Y)	7440-65-5	1.81E-05	3.02E-06
			Ytterbium (Yb)	7440-64-4	2.09E-06	3.49E-07
			Zinc (Zn)	7440-66-6	1.27E-04	2.12E-05
			Zirconium (Zr)	7440-67-7	1.14E-04	1.89E-05
			Silicon Dioxide (SiO2)	7631-86-9	7.44E-01	1.24E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.79E-01	2.98E-02
			Iron Oxide (Fe2O3)	1309-37-1	7.87E-02	1.31E-02
			Magnesium Oxide (MgO)	1309-48-4	3.21E-02	5.36E-03
			Calcium Oxide (CaO)	1305-78-8	5.60E-02	9.34E-03
			Sodium Oxide (Na2O)	1313-59-3	4.02E-02	6.71E-03
			Potassium Oxide (K2O)	12136-45-7	2.34E-02	3.89E-03
			Titanium dioxide (TiO2)	13463-67-7	2.12E-03	3.53E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.53E-03	2.55E-04
			Manganese Oxide (MnO)	1344-43-0	2.79E-04	4.66E-05
			Chromium Oxide (Cr2O3)	1308-38-9	3.47E-04	5.79E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	3.20E-04	5.33E-05
			Chalcopyrite (CuFeS2)	1308-56-1	3.06E-03	5.09E-04
			Bornite (Cu5FeS4)	1308-82-3	1.10E-04	1.84E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	8.49E-05	1.42E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	3.42E-05	5.71E-06
			Cuprite (CU_2O)	1317-39-1	5.96E-05	9.93E-06
			Galena (PbS)	1314-87-0	2.41E-04	4.02E-05
			Sphalerite (ZnS)	1314-98-3	4.94E-04	8.24E-05
			Pyrite (Fe, S2)	1309-36-0	7.15E-03	1.19E-03
			Pyrrhotite (Fe7S8)	12305-96-3	7.53E-03	1.25E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.88E-04	4.79E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.52E-03	4.21E-04
			Quartz	14808-60-7	4.01E-02	6.69E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	6.48E-01	1.08E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	3.48E-02	5.80E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	9.84E-02	1.64E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.10E-02	3.49E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	7.72E-03	1.29E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.27E-02	2.12E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.00E-02	3.34E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.76E-04	2.93E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.94E-03	4.90E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	7.12E-04	1.19E-04
			Calcite (CaCO3)	1317-65-3	5.72E-03	9.53E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.66E-04	2.76E-05
			Titanite (CaTiSiO5)	[TITAN]	9.61E-04	1.60E-04
			Apatite (Ca5(PO4)3)	1306-05-4	3.19E-03	5.32E-04
			Mica	12001-26-2	1.28E-01	2.13E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	6.30E-02	1.05E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	5.15E-02	8.58E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.99E-02	6.65E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.39E-01	2.32E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.04E-01	5.06E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	1.13E-01	1.89E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.66E-02	2.76E-03
			Sillimanite (Al2SiO5)	12141-45-6	5.24E-03	8.74E-04
			Carbon Monoxide (CO)	630-08-0	5.09E-03	8.48E-04
			Sulphur Dioxide (SO2)	7446-09-5	9.90E-05	1.65E-05
			Hydrocarbons	[NMHC]	2.21E-03	3.69E-04
			Nitrogen Oxides (NOx)	10102-44-0	1.55E-01	2.58E-02
			1,3-butadiene	106-99-0	4.57E-06	7.62E-07
			Acenaphthene	83-32-9	1.49E-06	2.48E-07
			Acenaphthylene	208-96-8	3.05E-06	5.08E-07
			Acetaldehyde	75-07-0	2.56E-04	4.26E-05
			Acrolein	107-02-8	4.60E-05	7.66E-06
			Anthracene	120-12-7	2.62E-07	4.37E-08
			Benzene	71-43-2	1.33E-04	2.22E-05
			Benzo(a)anthracene	56-55-3	3.15E-08	5.25E-09
			Benzo(a)pyrene	50-32-8	1.06E-08	1.76E-09
			Benzo(b+k)fluoranthene	205-99-2	2.97E-08	4.96E-09
			Benzo(g,h,i)perylene	191-24-2	2.60E-08	4.33E-09
			Chrysene	218-01-9	3.96E-08	6.60E-09
			Fluoranthene	206-44-0	4.45E-07	7.42E-08
			Fluorene	86-73-7	2.07E-06	3.45E-07
			Formaldehyde	50-00-0	2.18E-04	3.63E-05
			Phenanthrene	85-01-8	3.52E-06	5.87E-07
			Pyrene	129-00-0	4.17E-07	6.95E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.58E-03	2.64E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.03E-03	1.71E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.09E-08	5.16E-09

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR8	Road from Pit SW to WD SW	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	1.45E+01	1.45E+01
			PM_{10}	[PM10]	4.18E+00	4.18E+00
			$PM_{2.5}$	[PM2.5]	4.35E-01	4.35E-01
			Silver (Ag)	7440-22-4	8.55E-06	8.55E-06
			Aluminum (Al)	7429-90-5	1.10E+00	1.10E+00
			Arsenic (As)	7440-38-2	2.32E-04	2.32E-04
			Gold (Au)	7440-57-5	1.21E-06	1.21E-06
			Boron (B)	7440-42-8	1.45E-03	1.45E-03
			Barium (Ba)	7440-39-3	5.25E-03	5.25E-03
			Beryllium (Be)	7440-41-7	1.70E-05	1.70E-05
			Bismuth (Bi)	7440-69-9	3.12E-05	3.12E-05
			Carbon (C)	7440-44-0	1.90E-02	1.90E-02
			Calcium (Ca)	7440-70-2	4.75E-01	4.75E-01
			Cadmium (Cd)	7440-43-9	1.69E-05	1.69E-05
			Cerium (Ce)	7440-45-1	1.05E-03	1.05E-03
			Cobalt (Co)	7440-48-4	2.89E-04	2.89E-04
			Chromium (Cr)	7440-47-3	1.25E-03	1.25E-03
			Cesium (Cs)	7440-46-2	4.92E-05	4.92E-05
			Copper (Cu)	7440-50-8	1.95E-03	1.95E-03
			Iron (Fe)	7439-89-6	5.98E-01	5.98E-01
			Gallium (Ga)	7440-55-3	2.93E-04	2.93E-04
			Hafnium (Hf)	7440-58-6	6.16E-05	6.16E-05
			Mercury (Hg)	7439-97-6	3.61E-07	3.61E-07
			Indium (In)	7440-74-6	2.49E-07	2.49E-07
			Potassium (K)	7440-09-7	2.02E-01	2.02E-01
			Lanthanum (La)	7439-91-0	2.83E-04	2.83E-04
			Lithium (Li)	7439-93-2	3.72E-04	3.72E-04
			Lutetium (Lu)	7439-94-3	3.84E-06	3.84E-06
			Magnesium (Mg)	7439-95-4	2.14E-01	2.14E-01
			Manganese (Mn)	7439-96-5	2.19E-03	2.19E-03
			Molybdenum (Mo)	7439-98-7	8.02E-05	8.02E-05
			Sodium (Na)	7440-23-5	4.16E-01	4.16E-01
			Niobium (Nb)	7440--03-1	8.32E-05	8.32E-05
			Nickel (Ni)	7440-02-0	2.12E-04	2.12E-04
			Phosphorus (P)	7723-14-0	8.85E-03	8.85E-03
			Lead (Pb)	7439-92-1	2.04E-04	2.04E-04
			Rubidium (Rb)	7440-17-7	1.10E-03	1.10E-03
			Sulphur (S)	7704-34-9	3.87E-02	3.87E-02
			Antimony (Sb)	7440-36-0	7.38E-05	7.38E-05
			Scandium (Sc)	7440-20-2	1.90E-04	1.90E-04
			Selenium (Se)	7782-49-2	5.05E-06	5.05E-06
			Tin (Sn)	7440-31-5	1.34E-04	1.34E-04
			Strontium (Sr)	7440-24-6	4.42E-03	4.42E-03
			Tantalum (Ta)	7440-25-7	1.36E-05	1.36E-05
			Terbium (Tb)	7440-27-9	8.90E-06	8.90E-06
			Tellurium (Te)	13494-80-9	2.94E-06	2.94E-06
			Titanium (Ti)	7440-32-6	1.53E-02	1.53E-02
			Thallium (Tl)	7440-28-0	1.46E-05	1.46E-05
			Uranium (U)	7440-61-1	2.05E-05	2.05E-05
			Vanadium (v)	7440-62-2	1.70E-03	1.70E-03
			Tungsten (W)	7440-33-7	3.89E-04	3.89E-04
			Yttrium (Y)	7440-65-5	2.20E-04	2.20E-04
			Ytterbium (Yb)	7440-64-4	2.54E-05	2.54E-05
			Zinc (Zn)	7440-66-6	1.54E-03	1.54E-03
			Zirconium (Zr)	7440-67-7	1.38E-03	1.38E-03
			Silicon Dioxide (SiO2)	7631-86-9	9.02E+00	9.02E+00
			Aluminum Oxide (Al2O3)	1344-28-1	2.17E+00	2.17E+00
			Iron Oxide (Fe2O3)	1309-37-1	9.54E-01	9.54E-01
			Magnesium Oxide (MgO)	1309-48-4	3.89E-01	3.89E-01
			Calcium Oxide (CaO)	1305-78-8	6.79E-01	6.79E-01
			Sodium Oxide (Na2O)	1313-59-3	4.88E-01	4.88E-01
			Potassium Oxide (K2O)	12136-45-7	2.83E-01	2.83E-01
			Titanium dioxide (TiO2)	13463-67-7	2.57E-02	2.57E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.85E-02	1.85E-02
			Manganese Oxide (MnO)	1344-43-0	3.39E-03	3.39E-03
			Chromium Oxide (Cr2O3)	1308-38-9	4.21E-03	4.21E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	3.88E-03	3.88E-03
			Chalcopyrite (CuFeS2)	1308-56-1	3.70E-02	3.70E-02
			Bornite (Cu5FeS4)	1308-82-3	1.34E-03	1.34E-03
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.03E-03	1.03E-03
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	4.15E-04	4.15E-04
			Cuprite (CU_2O)	1317-39-1	7.22E-04	7.22E-04
			Galena (PbS)	1314-87-0	2.92E-03	2.92E-03
			Sphalerite (ZnS)	1314-98-3	5.99E-03	5.99E-03
			Pyrite (Fe, S2)	1309-36-0	8.66E-02	8.66E-02
			Pyrrhotite (Fe7S8)	12305-96-3	9.12E-02	9.12E-02
			Arsenopyrite (FeAsS)	1303-18-0	3.49E-03	3.49E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	3.06E-02	3.06E-02
			Quartz	14808-60-7	4.86E-01	4.86E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	7.85E+00	7.85E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	4.22E-01	4.22E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	1.19E+00	1.19E+00
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	2.54E-01	2.54E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	9.36E-02	9.36E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.54E-01	1.54E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	2.43E-01	2.43E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	2.13E-03	2.13E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	3.56E-02	3.56E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	8.63E-03	8.63E-03
			Calcite (CaCO3)	1317-65-3	6.93E-02	6.93E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	2.01E-03	2.01E-03
			Titanite (CaTiSiO5)	[TITAN]	1.17E-02	1.17E-02
			Apatite (Ca5(PO4)3)	1306-05-4	3.87E-02	3.87E-02
			Mica	12001-26-2	1.55E+00	1.55E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	7.64E-01	7.64E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	6.24E-01	6.24E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	4.84E-01	4.84E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.69E+00	1.69E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	3.68E+00	3.68E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	1.37E+00	1.37E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	2.01E-01	2.01E-01
			Sillimanite (Al2SiO5)	12141-45-6	6.35E-02	6.35E-02
			Carbon Monoxide (CO)	630-08-0	6.17E-02	6.17E-02
			Sulphur Dioxide (SO2)	7446-09-5	1.20E-03	1.20E-03
			Hydrocarbons	[NMHC]	2.68E-02	2.68E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.87E+00	1.87E+00
			1,3-butadiene	106-99-0	5.54E-05	5.54E-05
			Acenaphthene	83-32-9	1.81E-05	1.81E-05
			Acenaphthylene	208-96-8	3.69E-05	3.69E-05
			Acetaldehyde	75-07-0	3.10E-03	3.10E-03
			Acrolein	107-02-8	5.57E-04	5.57E-04
			Anthracene	120-12-7	3.18E-06	3.18E-06
			Benzene	71-43-2	1.61E-03	1.61E-03
			Benzo(a)anthracene	56-55-3	3.81E-07	3.81E-07
			Benzo(a)pyrene	50-32-8	1.28E-07	1.28E-07
			Benzo(b+k)fluoranthene	205-99-2	3.61E-07	3.61E-07
			Benzo(g,h,i)perylene	191-24-2	3.15E-07	3.15E-07
			Chrysene	218-01-9	4.80E-07	4.80E-07
			Fluoranthene	206-44-0	5.39E-06	5.39E-06
			Fluorene	86-73-7	2.51E-05	2.51E-05
			Formaldehyde	50-00-0	2.64E-03	2.64E-03
			Phenanthrene	85-01-8	4.27E-05	4.27E-05
			Pyrene	129-00-0	5.05E-06	5.05E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.92E-02	1.92E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.25E-02	1.25E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.75E-07	3.75E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
HR9	Road from Pit 87 to TSF	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	5.69E+00	5.69E+00
			PM_{10}	[PM10]	1.65E+00	1.65E+00
			$PM_{2.5}$	[PM2.5]	1.71E-01	1.71E-01
			Silver (Ag)	7440-22-4	3.37E-06	3.37E-06
			Aluminum (Al)	7429-90-5	4.31E-01	4.31E-01
			Arsenic (As)	7440-38-2	9.15E-05	9.15E-05
			Gold (Au)	7440-57-5	4.76E-07	4.76E-07
			Boron (B)	7440-42-8	5.72E-04	5.72E-04
			Barium (Ba)	7440-39-3	2.07E-03	2.07E-03
			Beryllium (Be)	7440-41-7	6.71E-06	6.71E-06
			Bismuth (Bi)	7440-69-9	1.23E-05	1.23E-05
			Carbon (C)	7440-44-0	7.50E-03	7.50E-03
			Calcium (Ca)	7440-70-2	1.87E-01	1.87E-01
			Cadmium (Cd)	7440-43-9	6.66E-06	6.66E-06
			Cerium (Ce)	7440-45-1	4.13E-04	4.13E-04
			Cobalt (Co)	7440-48-4	1.14E-04	1.14E-04
			Chromium (Cr)	7440-47-3	4.91E-04	4.91E-04
			Cesium (Cs)	7440-46-2	1.94E-05	1.94E-05
			Copper (Cu)	7440-50-8	7.68E-04	7.68E-04
			Iron (Fe)	7439-89-6	2.36E-01	2.36E-01
			Gallium (Ga)	7440-55-3	1.15E-04	1.15E-04
			Hafnium (Hf)	7440-58-6	2.43E-05	2.43E-05
			Mercury (Hg)	7439-97-6	1.42E-07	1.42E-07
			Indium (In)	7440-74-6	9.80E-08	9.80E-08
			Potassium (K)	7440-09-7	7.95E-02	7.95E-02
			Lanthanum (La)	7439-91-0	1.11E-04	1.11E-04
			Lithium (Li)	7439-93-2	1.46E-04	1.46E-04
			Lutetium (Lu)	7439-94-3	1.51E-06	1.51E-06
			Magnesium (Mg)	7439-95-4	8.42E-02	8.42E-02
			Manganese (Mn)	7439-96-5	8.62E-04	8.62E-04
			Molybdenum (Mo)	7439-98-7	3.16E-05	3.16E-05
			Sodium (Na)	7440-23-5	1.64E-01	1.64E-01
			Niobium (Nb)	7440--03-1	3.27E-05	3.27E-05
			Nickel (Ni)	7440-02-0	8.34E-05	8.34E-05
			Phosphorus (P)	7723-14-0	3.49E-03	3.49E-03
			Lead (Pb)	7439-92-1	8.05E-05	8.05E-05
			Rubidium (Rb)	7440-17-7	4.33E-04	4.33E-04
			Sulphur (S)	7704-34-9	1.52E-02	1.52E-02
			Antimony (Sb)	7440-36-0	2.91E-05	2.91E-05
			Scandium (Sc)	7440-20-2	7.48E-05	7.48E-05
			Selenium (Se)	7782-49-2	1.99E-06	1.99E-06
			Tin (Sn)	7440-31-5	5.26E-05	5.26E-05
			Strontium (Sr)	7440-24-6	1.74E-03	1.74E-03
			Tantalum (Ta)	7440-25-7	5.35E-06	5.35E-06
			Terbium (Tb)	7440-27-9	3.51E-06	3.51E-06
			Tellurium (Te)	13494-80-9	1.16E-06	1.16E-06
			Titanium (Ti)	7440-32-6	6.02E-03	6.02E-03
			Thallium (Tl)	7440-28-0	5.76E-06	5.76E-06
			Uranium (U)	7440-61-1	8.07E-06	8.07E-06
			Vanadium (v)	7440-62-2	6.71E-04	6.71E-04
			Tungsten (W)	7440-33-7	1.53E-04	1.53E-04
			Yttrium (Y)	7440-65-5	8.66E-05	8.66E-05
			Ytterbium (Yb)	7440-64-4	9.99E-06	9.99E-06
			Zinc (Zn)	7440-66-6	6.06E-04	6.06E-04
			Zirconium (Zr)	7440-67-7	5.42E-04	5.42E-04
			Silicon Dioxide (SiO2)	7631-86-9	3.55E+00	3.55E+00
			Aluminum Oxide (Al2O3)	1344-28-1	8.53E-01	8.53E-01
			Iron Oxide (Fe2O3)	1309-37-1	3.76E-01	3.76E-01
			Magnesium Oxide (MgO)	1309-48-4	1.53E-01	1.53E-01
			Calcium Oxide (CaO)	1305-78-8	2.67E-01	2.67E-01
			Sodium Oxide (Na2O)	1313-59-3	1.92E-01	1.92E-01
			Potassium Oxide (K2O)	12136-45-7	1.12E-01	1.12E-01
			Titanium dioxide (TiO2)	13463-67-7	1.01E-02	1.01E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	7.30E-03	7.30E-03
			Manganese Oxide (MnO)	1344-43-0	1.33E-03	1.33E-03
			Chromium Oxide (Cr2O3)	1308-38-9	1.66E-03	1.66E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	1.53E-03	1.53E-03
			Chalcopyrite (CuFeS2)	1308-56-1	1.46E-02	1.46E-02
			Bornite (Cu5FeS4)	1308-82-3	5.26E-04	5.26E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	4.05E-04	4.05E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.63E-04	1.63E-04
			Cuprite (CU_2O)	1317-39-1	2.84E-04	2.84E-04
			Galena (PbS)	1314-87-0	1.15E-03	1.15E-03
			Sphalerite (ZnS)	1314-98-3	2.36E-03	2.36E-03
			Pyrite (Fe, S2)	1309-36-0	3.41E-02	3.41E-02
			Pyrrhotite (Fe7S8)	12305-96-3	3.59E-02	3.59E-02
			Arsenopyrite (FeAsS)	1303-18-0	1.37E-03	1.37E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.20E-02	1.20E-02
			Quartz	14808-60-7	1.92E-01	1.92E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	3.09E+00	3.09E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.66E-01	1.66E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.70E-01	4.70E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.00E-01	1.00E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.68E-02	3.68E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	6.08E-02	6.08E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	9.57E-02	9.57E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	8.40E-04	8.40E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.40E-02	1.40E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.40E-03	3.40E-03
			Calcite (CaCO3)	1317-65-3	2.73E-02	2.73E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.91E-04	7.91E-04
			Titanite (CaTiSiO5)	[TITAN]	4.59E-03	4.59E-03
			Apatite (Ca5(PO4)3)	1306-05-4	1.52E-02	1.52E-02
			Mica	12001-26-2	6.09E-01	6.09E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	3.01E-01	3.01E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.46E-01	2.46E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.90E-01	1.90E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.65E-01	6.65E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.45E+00	1.45E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	5.41E-01	5.41E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.90E-02	7.90E-02
			Sillimanite (Al2SiO5)	12141-45-6	2.50E-02	2.50E-02
			Carbon Monoxide (CO)	630-08-0	2.43E-02	2.43E-02
			Sulphur Dioxide (SO2)	7446-09-5	4.73E-04	4.73E-04
			Hydrocarbons	[NMHC]	1.06E-02	1.06E-02
			Nitrogen Oxides (NOx)	10102-44-0	7.37E-01	7.37E-01
			1,3-butadiene	106-99-0	2.18E-05	2.18E-05
			Acenaphthene	83-32-9	7.11E-06	7.11E-06
			Acenaphthylene	208-96-8	1.45E-05	1.45E-05
			Acetaldehyde	75-07-0	1.22E-03	1.22E-03
			Acrolein	107-02-8	2.19E-04	2.19E-04
			Anthracene	120-12-7	1.25E-06	1.25E-06
			Benzene	71-43-2	6.35E-04	6.35E-04
			Benzo(a)anthracene	56-55-3	1.50E-07	1.50E-07
			Benzo(a)pyrene	50-32-8	5.04E-08	5.04E-08
			Benzo(b+k)fluoranthene	205-99-2	1.42E-07	1.42E-07
			Benzo(g,h,i)perylene	191-24-2	1.24E-07	1.24E-07
			Chrysene	218-01-9	1.89E-07	1.89E-07
			Fluoranthene	206-44-0	2.12E-06	2.12E-06
			Fluorene	86-73-7	9.87E-06	9.87E-06
			Formaldehyde	50-00-0	1.04E-03	1.04E-03
			Phenanthrene	85-01-8	1.68E-05	1.68E-05
			Pyrene	129-00-0	1.99E-06	1.99E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	7.55E-03	7.55E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	4.91E-03	4.91E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.48E-07	1.48E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR10	Road from Pit 87 to WD 87	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	2.97E+01	2.97E+01
			PM_{10}	[PM10]	8.59E+00	8.59E+00
			$PM_{2.5}$	[PM2.5]	8.94E-01	8.94E-01
			Silver (Ag)	7440-22-4	1.76E-05	1.76E-05
			Aluminum (Al)	7429-90-5	2.25E+00	2.25E+00
			Arsenic (As)	7440-38-2	4.77E-04	4.77E-04
			Gold (Au)	7440-57-5	2.48E-06	2.48E-06
			Boron (B)	7440-42-8	2.98E-03	2.98E-03
			Barium (Ba)	7440-39-3	1.08E-02	1.08E-02
			Beryllium (Be)	7440-41-7	3.50E-05	3.50E-05
			Bismuth (Bi)	7440-69-9	6.42E-05	6.42E-05
			Carbon (C)	7440-44-0	3.91E-02	3.91E-02
			Calcium (Ca)	7440-70-2	9.77E-01	9.77E-01
			Cadmium (Cd)	7440-43-9	3.47E-05	3.47E-05
			Cerium (Ce)	7440-45-1	2.15E-03	2.15E-03
			Cobalt (Co)	7440-48-4	5.93E-04	5.93E-04
			Chromium (Cr)	7440-47-3	2.56E-03	2.56E-03
			Cesium (Cs)	7440-46-2	1.01E-04	1.01E-04
			Copper (Cu)	7440-50-8	4.01E-03	4.01E-03
			Iron (Fe)	7439-89-6	1.23E+00	1.23E+00
			Gallium (Ga)	7440-55-3	6.02E-04	6.02E-04
			Hafnium (Hf)	7440-58-6	1.27E-04	1.27E-04
			Mercury (Hg)	7439-97-6	7.41E-07	7.41E-07
			Indium (In)	7440-74-6	5.11E-07	5.11E-07
			Potassium (K)	7440-09-7	4.15E-01	4.15E-01
			Lanthanum (La)	7439-91-0	5.81E-04	5.81E-04
			Lithium (Li)	7439-93-2	7.64E-04	7.64E-04
			Lutetium (Lu)	7439-94-3	7.89E-06	7.89E-06
			Magnesium (Mg)	7439-95-4	4.39E-01	4.39E-01
			Manganese (Mn)	7439-96-5	4.50E-03	4.50E-03
			Molybdenum (Mo)	7439-98-7	1.65E-04	1.65E-04
			Sodium (Na)	7440-23-5	8.54E-01	8.54E-01
			Niobium (Nb)	7440--03-1	1.71E-04	1.71E-04
			Nickel (Ni)	7440-02-0	4.35E-04	4.35E-04
			Phosphorus (P)	7723-14-0	1.82E-02	1.82E-02
			Lead (Pb)	7439-92-1	4.20E-04	4.20E-04
			Rubidium (Rb)	7440-17-7	2.26E-03	2.26E-03
			Sulphur (S)	7704-34-9	7.94E-02	7.94E-02
			Antimony (Sb)	7440-36-0	1.52E-04	1.52E-04
			Scandium (Sc)	7440-20-2	3.90E-04	3.90E-04
			Selenium (Se)	7782-49-2	1.04E-05	1.04E-05
			Tin (Sn)	7440-31-5	2.74E-04	2.74E-04
			Strontium (Sr)	7440-24-6	9.07E-03	9.07E-03
			Tantalum (Ta)	7440-25-7	2.79E-05	2.79E-05
			Terbium (Tb)	7440-27-9	1.83E-05	1.83E-05
			Tellurium (Te)	13494-80-9	6.04E-06	6.04E-06
			Titanium (Ti)	7440-32-6	3.14E-02	3.14E-02
			Thallium (Tl)	7440-28-0	3.01E-05	3.01E-05
			Uranium (U)	7440-61-1	4.21E-05	4.21E-05
			Vanadium (v)	7440-62-2	3.50E-03	3.50E-03
			Tungsten (W)	7440-33-7	7.99E-04	7.99E-04
			Yttrium (Y)	7440-65-5	4.51E-04	4.51E-04
			Ytterbium (Yb)	7440-64-4	5.21E-05	5.21E-05
			Zinc (Zn)	7440-66-6	3.16E-03	3.16E-03
			Zirconium (Zr)	7440-67-7	2.83E-03	2.83E-03
			Silicon Dioxide (SiO2)	7631-86-9	1.85E+01	1.85E+01
			Aluminum Oxide (Al2O3)	1344-28-1	4.45E+00	4.45E+00
			Iron Oxide (Fe2O3)	1309-37-1	1.96E+00	1.96E+00
			Magnesium Oxide (MgO)	1309-48-4	8.00E-01	8.00E-01
			Calcium Oxide (CaO)	1305-78-8	1.39E+00	1.39E+00
			Sodium Oxide (Na2O)	1313-59-3	1.00E+00	1.00E+00
			Potassium Oxide (K2O)	12136-45-7	5.82E-01	5.82E-01
			Titanium dioxide (TiO2)	13463-67-7	5.27E-02	5.27E-02
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.81E-02	3.81E-02
			Manganese Oxide (MnO)	1344-43-0	6.96E-03	6.96E-03
			Chromium Oxide (Cr2O3)	1308-38-9	8.65E-03	8.65E-03
			Vanadium Pentoxide (V2O5)	1314-62-1	7.97E-03	7.97E-03
			Chalcopyrite (CuFeS2)	1308-56-1	7.61E-02	7.61E-02
			Bornite (Cu5FeS4)	1308-82-3	2.74E-03	2.74E-03
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.11E-03	2.11E-03
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	8.52E-04	8.52E-04
			Cuprite (CU_2O)	1317-39-1	1.48E-03	1.48E-03
			Galena (PbS)	1314-87-0	6.00E-03	6.00E-03
			Sphalerite (ZnS)	1314-98-3	1.23E-02	1.23E-02
			Pyrite (Fe, S2)	1309-36-0	1.78E-01	1.78E-01
			Pyrrhotite (Fe7S8)	12305-96-3	1.87E-01	1.87E-01
			Arsenopyrite (FeAsS)	1303-18-0	7.16E-03	7.16E-03
			Ilmenite (Fe,Ti)2O3	12168-52-4	6.28E-02	6.28E-02
			Quartz	14808-60-7	9.99E-01	9.99E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.61E+01	1.61E+01
			K-Feldspars (KAlSi3O8)	[K-FELD]	8.66E-01	8.66E-01
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.45E+00	2.45E+00
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.22E-01	5.22E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	1.92E-01	1.92E-01
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.17E-01	3.17E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	4.99E-01	4.99E-01
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	4.38E-03	4.38E-03
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.32E-02	7.32E-02
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.77E-02	1.77E-02
			Calcite (CaCO3)	1317-65-3	1.42E-01	1.42E-01
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	4.13E-03	4.13E-03
			Titanite (CaTiSiO5)	[TITAN]	2.39E-02	2.39E-02
			Apatite (Ca5(PO4)3)	1306-05-4	7.94E-02	7.94E-02
			Mica	12001-26-2	3.18E+00	3.18E+00
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.57E+00	1.57E+00
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.28E+00	1.28E+00
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	9.94E-01	9.94E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.47E+00	3.47E+00
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	7.56E+00	7.56E+00
			Albite (NaAlSi 3O 8)	[ALBITE]	2.82E+00	2.82E+00
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.12E-01	4.12E-01
			Sillimanite (Al2SiO5)	12141-45-6	1.30E-01	1.30E-01
			Carbon Monoxide (CO)	630-08-0	1.27E-01	1.27E-01
			Sulphur Dioxide (SO2)	7446-09-5	2.47E-03	2.47E-03
			Hydrocarbons	[NMHC]	5.51E-02	5.51E-02
			Nitrogen Oxides (NOx)	10102-44-0	3.85E+00	3.85E+00
			1,3-butadiene	106-99-0	1.14E-04	1.14E-04
			Acenaphthene	83-32-9	3.71E-05	3.71E-05
			Acenaphthylene	208-96-8	7.59E-05	7.59E-05
			Acetaldehyde	75-07-0	6.37E-03	6.37E-03
			Acrolein	107-02-8	1.14E-03	1.14E-03
			Anthracene	120-12-7	6.53E-06	6.53E-06
			Benzene	71-43-2	3.31E-03	3.31E-03
			Benzo(a)anthracene	56-55-3	7.84E-07	7.84E-07
			Benzo(a)pyrene	50-32-8	2.63E-07	2.63E-07
			Benzo(b+k)fluoranthene	205-99-2	7.41E-07	7.41E-07
			Benzo(g,h,i)perylene	191-24-2	6.46E-07	6.46E-07
			Chrysene	218-01-9	9.86E-07	9.86E-07
			Fluoranthene	206-44-0	1.11E-05	1.11E-05
			Fluorene	86-73-7	5.15E-05	5.15E-05
			Formaldehyde	50-00-0	5.42E-03	5.42E-03
			Phenanthrene	85-01-8	8.77E-05	8.77E-05
			Pyrene	129-00-0	1.04E-05	1.04E-05
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	3.94E-02	3.94E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	2.56E-02	2.56E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	7.70E-07	7.70E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
HR11	Road from Mobile Crusher (SW Pit) to TSF	Equation (1) in the US EPA AP-42 document Chapter 13.2.2 (Unpaved Roads) and MOVES.	TSP	[PM]	9.47E-01	9.47E-01
			PM_{10}	[PM10]	2.73E-01	2.73E-01
			$PM_{2.5}$	[PM2.5]	2.74E-02	2.74E-02
			Silver (Ag)	7440-22-4	5.61E-07	5.61E-07
			Aluminum (Al)	7429-90-5	7.19E-02	7.19E-02
			Arsenic (As)	7440-38-2	1.52E-05	1.52E-05
			Gold (Au)	7440-57-5	7.92E-08	7.92E-08
			Boron (B)	7440-42-8	9.53E-05	9.53E-05
			Barium (Ba)	7440-39-3	3.45E-04	3.45E-04
			Beryllium (Be)	7440-41-7	1.12E-06	1.12E-06
			Bismuth (Bi)	7440-69-9	2.05E-06	2.05E-06
			Carbon (C)	7440-44-0	1.25E-03	1.25E-03
			Calcium (Ca)	7440-70-2	3.12E-02	3.12E-02
			Cadmium (Cd)	7440-43-9	1.11E-06	1.11E-06
			Cerium (Ce)	7440-45-1	6.88E-05	6.88E-05
			Cobalt (Co)	7440-48-4	1.89E-05	1.89E-05
			Chromium (Cr)	7440-47-3	8.18E-05	8.18E-05
			Cesium (Cs)	7440-46-2	3.23E-06	3.23E-06
			Copper (Cu)	7440-50-8	1.28E-04	1.28E-04
			Iron (Fe)	7439-89-6	3.92E-02	3.92E-02
			Gallium (Ga)	7440-55-3	1.92E-05	1.92E-05
			Hafnium (Hf)	7440-58-6	4.04E-06	4.04E-06
			Mercury (Hg)	7439-97-6	2.37E-08	2.37E-08
			Indium (In)	7440-74-6	1.63E-08	1.63E-08
			Potassium (K)	7440-09-7	1.32E-02	1.32E-02
			Lanthanum (La)	7439-91-0	1.85E-05	1.85E-05
			Lithium (Li)	7439-93-2	2.44E-05	2.44E-05
			Lutetium (Lu)	7439-94-3	2.52E-07	2.52E-07
			Magnesium (Mg)	7439-95-4	1.40E-02	1.40E-02
			Manganese (Mn)	7439-96-5	1.44E-04	1.44E-04
			Molybdenum (Mo)	7439-98-7	5.26E-06	5.26E-06
			Sodium (Na)	7440-23-5	2.73E-02	2.73E-02
			Niobium (Nb)	7440--03-1	5.45E-06	5.45E-06
			Nickel (Ni)	7440-02-0	1.39E-05	1.39E-05
			Phosphorus (P)	7723-14-0	5.81E-04	5.81E-04
			Lead (Pb)	7439-92-1	1.34E-05	1.34E-05
			Rubidium (Rb)	7440-17-7	7.22E-05	7.22E-05
			Sulphur (S)	7704-34-9	2.54E-03	2.54E-03
			Antimony (Sb)	7440-36-0	4.84E-06	4.84E-06
			Scandium (Sc)	7440-20-2	1.25E-05	1.25E-05
			Selenium (Se)	7782-49-2	3.31E-07	3.31E-07
			Tin (Sn)	7440-31-5	8.76E-06	8.76E-06
			Strontium (Sr)	7440-24-6	2.90E-04	2.90E-04
			Tantalum (Ta)	7440-25-7	8.91E-07	8.91E-07
			Terbium (Tb)	7440-27-9	5.84E-07	5.84E-07
			Tellurium (Te)	13494-80-9	1.93E-07	1.93E-07
			Titanium (Ti)	7440-32-6	1.00E-03	1.00E-03
			Thallium (Tl)	7440-28-0	9.60E-07	9.60E-07
			Uranium (U)	7440-61-1	1.34E-06	1.34E-06
			Vanadium (v)	7440-62-2	1.12E-04	1.12E-04
			Tungsten (W)	7440-33-7	2.55E-05	2.55E-05
			Yttrium (Y)	7440-65-5	1.44E-05	1.44E-05
			Ytterbium (Yb)	7440-64-4	1.66E-06	1.66E-06
			Zinc (Zn)	7440-66-6	1.01E-04	1.01E-04
			Zirconium (Zr)	7440-67-7	9.03E-05	9.03E-05
			Silicon Dioxide (SiO2)	7631-86-9	5.92E-01	5.92E-01
			Aluminum Oxide (Al2O3)	1344-28-1	1.42E-01	1.42E-01
			Iron Oxide (Fe2O3)	1309-37-1	6.25E-02	6.25E-02
			Magnesium Oxide (MgO)	1309-48-4	2.55E-02	2.55E-02
			Calcium Oxide (CaO)	1305-78-8	4.45E-02	4.45E-02
			Sodium Oxide (Na2O)	1313-59-3	3.20E-02	3.20E-02
			Potassium Oxide (K2O)	12136-45-7	1.86E-02	1.86E-02
			Titanium dioxide (TiO2)	13463-67-7	1.68E-03	1.68E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	1.22E-03	1.22E-03
			Manganese Oxide (MnO)	1344-43-0	2.22E-04	2.22E-04
			Chromium Oxide (Cr2O3)	1308-38-9	2.76E-04	2.76E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	2.54E-04	2.54E-04
			Chalcopyrite (CuFeS2)	1308-56-1	2.43E-03	2.43E-03
			Bornite (Cu5FeS4)	1308-82-3	8.76E-05	8.76E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	6.75E-05	6.75E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	2.72E-05	2.72E-05
			Cuprite (CU_2O)	1317-39-1	4.74E-05	4.74E-05
			Galena (PbS)	1314-87-0	1.92E-04	1.92E-04
			Sphalerite (ZnS)	1314-98-3	3.93E-04	3.93E-04
			Pyrite (Fe, S2)	1309-36-0	5.68E-03	5.68E-03
			Pyrrhotite (Fe7S8)	12305-96-3	5.98E-03	5.98E-03
			Arsenopyrite (FeAsS)	1303-18-0	2.29E-04	2.29E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	2.01E-03	2.01E-03
			Quartz	14808-60-7	3.19E-02	3.19E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	5.15E-01	5.15E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	2.76E-02	2.76E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	7.82E-02	7.82E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.67E-02	1.67E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	6.14E-03	6.14E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.01E-02	1.01E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	1.59E-02	1.59E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.40E-04	1.40E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	2.34E-03	2.34E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	5.66E-04	5.66E-04
			Calcite (CaCO3)	1317-65-3	4.55E-03	4.55E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.32E-04	1.32E-04
			Titanite (CaTiSiO5)	[TITAN]	7.64E-04	7.64E-04
			Apatite (Ca5(PO4)3)	1306-05-4	2.54E-03	2.54E-03
			Mica	12001-26-2	1.01E-01	1.01E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	5.01E-02	5.01E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	4.09E-02	4.09E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	3.17E-02	3.17E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	1.11E-01	1.11E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	2.41E-01	2.41E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	9.01E-02	9.01E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	1.32E-02	1.32E-02
			Sillimanite (Al2SiO5)	12141-45-6	4.17E-03	4.17E-03
			Carbon Monoxide (CO)	630-08-0	4.58E-04	4.58E-04
			Sulphur Dioxide (SO2)	7446-09-5	3.41E-05	3.41E-05
			Hydrocarbons	[NMHC]	2.23E-04	2.23E-04
			Nitrogen Oxides (NOx)	10102-44-0	2.68E-03	2.68E-03
			1,3-butadiene	106-99-0	1.80E-07	1.80E-07
			Acenaphthene	83-32-9	6.08E-08	6.08E-08
			Acenaphthylene	208-96-8	1.22E-07	1.22E-07
			Acetaldehyde	75-07-0	1.56E-05	1.56E-05
			Acrolein	107-02-8	2.29E-06	2.29E-06
			Anthracene	120-12-7	1.29E-08	1.29E-08
			Benzene	71-43-2	5.25E-06	5.25E-06
			Benzo(a)anthracene	56-55-3	2.31E-09	2.31E-09
			Benzo(a)pyrene	50-32-8	7.79E-10	7.79E-10
			Benzo(b+k)fluoranthene	205-99-2	2.20E-09	2.20E-09
			Benzo(g,h,i)perylene	191-24-2	1.43E-09	1.43E-09
			Chrysene	218-01-9	2.46E-09	2.46E-09
			Fluoranthene	206-44-0	2.16E-08	2.16E-08
			Fluorene	86-73-7	9.03E-08	9.03E-08
			Formaldehyde	50-00-0	8.70E-06	8.70E-06
			Phenanthrene	85-01-8	1.65E-07	1.65E-07
			Pyrene	129-00-0	2.05E-08	2.05E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.46E-04	1.46E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	9.46E-05	9.46E-05
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.88E-09	1.88E-09

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
W1	OB NW Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	3.08E-01	3.08E-01
			PM_{10}	[PM10]	1.54E-01	1.54E-01
			$PM_{2.5}$	[PM2.5]	2.31E-02	2.31E-02
			Silver (Ag)	7440-22-4	1.82E-07	1.82E-07
			Aluminum (Al)	7429-90-5	2.34E-02	2.34E-02
			Arsenic (As)	7440-38-2	4.95E-06	4.95E-06
			Gold (Au)	7440-57-5	2.58E-08	2.58E-08
			Boron (B)	7440-42-8	3.10E-05	3.10E-05
			Barium (Ba)	7440-39-3	1.12E-04	1.12E-04
			Beryllium (Be)	7440-41-7	3.63E-07	3.63E-07
			Bismuth (Bi)	7440-69-9	6.66E-07	6.66E-07
			Carbon (C)	7440-44-0	4.06E-04	4.06E-04
			Calcium (Ca)	7440-70-2	1.01E-02	1.01E-02
			Cadmium (Cd)	7440-43-9	3.61E-07	3.61E-07
			Cerium (Ce)	7440-45-1	2.24E-05	2.24E-05
			Cobalt (Co)	7440-48-4	6.16E-06	6.16E-06
			Chromium (Cr)	7440-47-3	2.66E-05	2.66E-05
			Cesium (Cs)	7440-46-2	1.05E-06	1.05E-06
			Copper (Cu)	7440-50-8	4.16E-05	4.16E-05
			Iron (Fe)	7439-89-6	1.28E-02	1.28E-02
			Gallium (Ga)	7440-55-3	6.25E-06	6.25E-06
			Hafnium (Hf)	7440-58-6	1.31E-06	1.31E-06
			Mercury (Hg)	7439-97-6	7.70E-09	7.70E-09
			Indium (In)	7440-74-6	5.30E-09	5.30E-09
			Potassium (K)	7440-09-7	4.30E-03	4.30E-03
			Lanthanum (La)	7439-91-0	6.03E-06	6.03E-06
			Lithium (Li)	7439-93-2	7.93E-06	7.93E-06
			Lutetium (Lu)	7439-94-3	8.19E-08	8.19E-08
			Magnesium (Mg)	7439-95-4	4.56E-03	4.56E-03
			Manganese (Mn)	7439-96-5	8.09E-05	8.09E-05
			Molybdenum (Mo)	7439-98-7	1.71E-06	1.71E-06
			Sodium (Na)	7440-23-5	8.87E-03	8.87E-03
			Niobium (Nb)	7440--03-1	1.77E-06	1.77E-06
			Nickel (Ni)	7440-02-0	7.84E-06	7.84E-06
			Phosphorus (P)	7723-14-0	1.89E-04	1.89E-04
			Lead (Pb)	7439-92-1	4.36E-06	4.36E-06
			Rubidium (Rb)	7440-17-7	2.35E-05	2.35E-05
			Sulphur (S)	7704-34-9	8.24E-04	8.24E-04
			Antimony (Sb)	7440-36-0	1.57E-06	1.57E-06
			Scandium (Sc)	7440-20-2	4.05E-06	4.05E-06
			Selenium (Se)	7782-49-2	1.08E-07	1.08E-07
			Tin (Sn)	7440-31-5	2.85E-06	2.85E-06
			Strontium (Sr)	7440-24-6	9.41E-05	9.41E-05
			Tantalum (Ta)	7440-25-7	2.90E-07	2.90E-07
			Terbium (Tb)	7440-27-9	1.90E-07	1.90E-07
			Tellurium (Te)	13494-80-9	6.27E-08	6.27E-08
			Titanium (Ti)	7440-32-6	5.65E-04	5.65E-04
			Thallium (Tl)	7440-28-0	3.12E-07	3.12E-07
			Uranium (U)	7440-61-1	4.37E-07	4.37E-07
			Vanadium (v)	7440-62-2	3.63E-05	3.63E-05
			Tungsten (W)	7440-33-7	8.30E-06	8.30E-06
			Yttrium (Y)	7440-65-5	4.69E-06	4.69E-06
			Ytterbium (Yb)	7440-64-4	5.41E-07	5.41E-07
			Zinc (Zn)	7440-66-6	3.28E-05	3.28E-05
			Zirconium (Zr)	7440-67-7	2.94E-05	2.94E-05
			Silicon Dioxide (SiO2)	7631-86-9	1.92E-01	1.92E-01
			Aluminum Oxide (Al2O3)	1344-28-1	4.62E-02	4.62E-02
			Iron Oxide (Fe2O3)	1309-37-1	2.03E-02	2.03E-02
			Magnesium Oxide (MgO)	1309-48-4	8.30E-03	8.30E-03
			Calcium Oxide (CaO)	1305-78-8	1.45E-02	1.45E-02
			Sodium Oxide (Na2O)	1313-59-3	1.04E-02	1.04E-02
			Potassium Oxide (K2O)	12136-45-7	6.04E-03	6.04E-03
			Titanium dioxide (TiO2)	13463-67-7	9.49E-04	9.49E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.95E-04	3.95E-04
			Manganese Oxide (MnO)	1344-43-0	1.25E-04	1.25E-04
			Chromium Oxide (Cr2O3)	1308-38-9	8.97E-05	8.97E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	8.27E-05	8.27E-05
			Chalcopyrite (CuFeS2)	1308-56-1	7.90E-04	7.90E-04
			Bornite (Cu5FeS4)	1308-82-3	2.85E-05	2.85E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.19E-05	2.19E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	8.84E-06	8.84E-06
			Cuprite (CU_2O)	1317-39-1	1.54E-05	1.54E-05
			Galena (PbS)	1314-87-0	6.23E-05	6.23E-05
			Sphalerite (ZnS)	1314-98-3	1.28E-04	1.28E-04
			Pyrite (Fe, S2)	1309-36-0	1.85E-03	1.85E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.94E-03	1.94E-03
			Arsenopyrite (FeAsS)	1303-18-0	7.43E-05	7.43E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.13E-03	1.13E-03
			Quartz	14808-60-7	1.80E-02	1.80E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.67E-01	1.67E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	8.99E-03	8.99E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.54E-02	2.54E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.42E-03	5.42E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.46E-03	3.46E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.29E-03	3.29E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	5.18E-03	5.18E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.89E-05	7.89E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.60E-04	7.60E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.84E-04	1.84E-04
			Calcite (CaCO3)	1317-65-3	1.48E-03	1.48E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.43E-05	7.43E-05
			Titanite (CaTiSiO5)	[TITAN]	4.31E-04	4.31E-04
			Apatite (Ca5(PO4)3)	1306-05-4	8.24E-04	8.24E-04
			Mica	12001-26-2	3.30E-02	3.30E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.63E-02	1.63E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.33E-02	1.33E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.03E-02	1.03E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.60E-02	3.60E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	7.85E-02	7.85E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	2.93E-02	2.93E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.28E-03	4.28E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.35E-03	1.35E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
W2	OB West Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	2.62E-01	2.62E-01
			PM_{10}	[PM10]	1.31E-01	1.31E-01
			$PM_{2.5}$	[PM2.5]	1.97E-02	1.97E-02
			Silver (Ag)	7440-22-4	1.55E-07	1.55E-07
			Aluminum (Al)	7429-90-5	1.99E-02	1.99E-02
			Arsenic (As)	7440-38-2	4.22E-06	4.22E-06
			Gold (Au)	7440-57-5	2.19E-08	2.19E-08
			Boron (B)	7440-42-8	2.64E-05	2.64E-05
			Barium (Ba)	7440-39-3	9.54E-05	9.54E-05
			Beryllium (Be)	7440-41-7	3.09E-07	3.09E-07
			Bismuth (Bi)	7440-69-9	5.67E-07	5.67E-07
			Carbon (C)	7440-44-0	3.46E-04	3.46E-04
			Calcium (Ca)	7440-70-2	8.63E-03	8.63E-03
			Cadmium (Cd)	7440-43-9	3.07E-07	3.07E-07
			Cerium (Ce)	7440-45-1	1.90E-05	1.90E-05
			Cobalt (Co)	7440-48-4	5.24E-06	5.24E-06
			Chromium (Cr)	7440-47-3	2.26E-05	2.26E-05
			Cesium (Cs)	7440-46-2	8.94E-07	8.94E-07
			Copper (Cu)	7440-50-8	3.54E-05	3.54E-05
			Iron (Fe)	7439-89-6	1.09E-02	1.09E-02
			Gallium (Ga)	7440-55-3	5.32E-06	5.32E-06
			Hafnium (Hf)	7440-58-6	1.12E-06	1.12E-06
			Mercury (Hg)	7439-97-6	6.56E-09	6.56E-09
			Indium (In)	7440-74-6	4.52E-09	4.52E-09
			Potassium (K)	7440-09-7	3.67E-03	3.67E-03
			Lanthanum (La)	7439-91-0	5.13E-06	5.13E-06
			Lithium (Li)	7439-93-2	6.76E-06	6.76E-06
			Lutetium (Lu)	7439-94-3	6.97E-08	6.97E-08
			Magnesium (Mg)	7439-95-4	3.88E-03	3.88E-03
			Manganese (Mn)	7439-96-5	6.89E-05	6.89E-05
			Molybdenum (Mo)	7439-98-7	1.46E-06	1.46E-06
			Sodium (Na)	7440-23-5	7.55E-03	7.55E-03
			Niobium (Nb)	7440--03-1	1.51E-06	1.51E-06
			Nickel (Ni)	7440-02-0	6.67E-06	6.67E-06
			Phosphorus (P)	7723-14-0	1.61E-04	1.61E-04
			Lead (Pb)	7439-92-1	3.71E-06	3.71E-06
			Rubidium (Rb)	7440-17-7	2.00E-05	2.00E-05
			Sulphur (S)	7704-34-9	7.02E-04	7.02E-04
			Antimony (Sb)	7440-36-0	1.34E-06	1.34E-06
			Scandium (Sc)	7440-20-2	3.45E-06	3.45E-06
			Selenium (Se)	7782-49-2	9.18E-08	9.18E-08
			Tin (Sn)	7440-31-5	2.43E-06	2.43E-06
			Strontium (Sr)	7440-24-6	8.02E-05	8.02E-05
			Tantalum (Ta)	7440-25-7	2.47E-07	2.47E-07
			Terbium (Tb)	7440-27-9	1.62E-07	1.62E-07
			Tellurium (Te)	13494-80-9	5.34E-08	5.34E-08
			Titanium (Ti)	7440-32-6	4.82E-04	4.82E-04
			Thallium (Tl)	7440-28-0	2.66E-07	2.66E-07
			Uranium (U)	7440-61-1	3.72E-07	3.72E-07
			Vanadium (v)	7440-62-2	3.09E-05	3.09E-05
			Tungsten (W)	7440-33-7	7.07E-06	7.07E-06
			Yttrium (Y)	7440-65-5	3.99E-06	3.99E-06
			Ytterbium (Yb)	7440-64-4	4.61E-07	4.61E-07
			Zinc (Zn)	7440-66-6	2.80E-05	2.80E-05
			Zirconium (Zr)	7440-67-7	2.50E-05	2.50E-05
			Silicon Dioxide (SiO2)	7631-86-9	1.64E-01	1.64E-01
			Aluminum Oxide (Al2O3)	1344-28-1	3.94E-02	3.94E-02
			Iron Oxide (Fe2O3)	1309-37-1	1.73E-02	1.73E-02
			Magnesium Oxide (MgO)	1309-48-4	7.07E-03	7.07E-03
			Calcium Oxide (CaO)	1305-78-8	1.23E-02	1.23E-02
			Sodium Oxide (Na2O)	1313-59-3	8.86E-03	8.86E-03
			Potassium Oxide (K2O)	12136-45-7	5.14E-03	5.14E-03
			Titanium dioxide (TiO2)	13463-67-7	8.09E-04	8.09E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.37E-04	3.37E-04
			Manganese Oxide (MnO)	1344-43-0	1.07E-04	1.07E-04
			Chromium Oxide (Cr2O3)	1308-38-9	7.64E-05	7.64E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	7.04E-05	7.04E-05
			Chalcopyrite (CuFeS2)	1308-56-1	6.73E-04	6.73E-04
			Bornite (Cu5FeS4)	1308-82-3	2.43E-05	2.43E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.87E-05	1.87E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	7.53E-06	7.53E-06
			Cuprite (CU_2O)	1317-39-1	1.31E-05	1.31E-05
			Galena (PbS)	1314-87-0	5.30E-05	5.30E-05
			Sphalerite (ZnS)	1314-98-3	1.09E-04	1.09E-04
			Pyrite (Fe, S2)	1309-36-0	1.57E-03	1.57E-03
			Pyrrhotite (Fe7S8)	12305-96-3	1.66E-03	1.66E-03
			Arsenopyrite (FeAsS)	1303-18-0	6.33E-05	6.33E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	9.64E-04	9.64E-04
			Quartz	14808-60-7	1.53E-02	1.53E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.43E-01	1.43E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	7.66E-03	7.66E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.17E-02	2.17E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	4.61E-03	4.61E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.95E-03	2.95E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	2.81E-03	2.81E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	4.41E-03	4.41E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	6.72E-05	6.72E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	6.47E-04	6.47E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.57E-04	1.57E-04
			Calcite (CaCO3)	1317-65-3	1.26E-03	1.26E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	6.33E-05	6.33E-05
			Titanite (CaTiSiO5)	[TITAN]	3.67E-04	3.67E-04
			Apatite (Ca5(PO4)3)	1306-05-4	7.02E-04	7.02E-04
			Mica	12001-26-2	2.81E-02	2.81E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.39E-02	1.39E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.13E-02	1.13E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	8.78E-03	8.78E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.07E-02	3.07E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	6.69E-02	6.69E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	2.49E-02	2.49E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	3.64E-03	3.64E-03
			Sillimanite (Al2SiO5)	12141-45-6	1.15E-03	1.15E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
W3	WD SW Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	3.01E+00	3.01E+00
			PM_{10}	[PM10]	1.50E+00	1.50E+00
			$PM_{2.5}$	[PM2.5]	2.25E-01	2.25E-01
			Silver (Ag)	7440-22-4	1.78E-06	1.78E-06
			Aluminum (Al)	7429-90-5	2.28E-01	2.28E-01
			Arsenic (As)	7440-38-2	4.84E-05	4.84E-05
			Gold (Au)	7440-57-5	2.52E-07	2.52E-07
			Boron (B)	7440-42-8	3.02E-04	3.02E-04
			Barium (Ba)	7440-39-3	1.09E-03	1.09E-03
			Beryllium (Be)	7440-41-7	3.55E-06	3.55E-06
			Bismuth (Bi)	7440-69-9	6.51E-06	6.51E-06
			Carbon (C)	7440-44-0	3.97E-03	3.97E-03
			Calcium (Ca)	7440-70-2	9.90E-02	9.90E-02
			Cadmium (Cd)	7440-43-9	3.52E-06	3.52E-06
			Cerium (Ce)	7440-45-1	2.18E-04	2.18E-04
			Cobalt (Co)	7440-48-4	6.01E-05	6.01E-05
			Chromium (Cr)	7440-47-3	2.60E-04	2.60E-04
			Cesium (Cs)	7440-46-2	1.02E-05	1.02E-05
			Copper (Cu)	7440-50-8	4.06E-04	4.06E-04
			Iron (Fe)	7439-89-6	1.25E-01	1.25E-01
			Gallium (Ga)	7440-55-3	6.10E-05	6.10E-05
			Hafnium (Hf)	7440-58-6	1.28E-05	1.28E-05
			Mercury (Hg)	7439-97-6	7.52E-08	7.52E-08
			Indium (In)	7440-74-6	5.18E-08	5.18E-08
			Potassium (K)	7440-09-7	4.20E-02	4.20E-02
			Lanthanum (La)	7439-91-0	5.89E-05	5.89E-05
			Lithium (Li)	7439-93-2	7.75E-05	7.75E-05
			Lutetium (Lu)	7439-94-3	8.00E-07	8.00E-07
			Magnesium (Mg)	7439-95-4	4.45E-02	4.45E-02
			Manganese (Mn)	7439-96-5	7.91E-04	7.91E-04
			Molybdenum (Mo)	7439-98-7	1.67E-05	1.67E-05
			Sodium (Na)	7440-23-5	8.66E-02	8.66E-02
			Niobium (Nb)	7440--03-1	1.73E-05	1.73E-05
			Nickel (Ni)	7440-02-0	7.65E-05	7.65E-05
			Phosphorus (P)	7723-14-0	1.84E-03	1.84E-03
			Lead (Pb)	7439-92-1	4.26E-05	4.26E-05
			Rubidium (Rb)	7440-17-7	2.29E-04	2.29E-04
			Sulphur (S)	7704-34-9	8.05E-03	8.05E-03
			Antimony (Sb)	7440-36-0	1.54E-05	1.54E-05
			Scandium (Sc)	7440-20-2	3.96E-05	3.96E-05
			Selenium (Se)	7782-49-2	1.05E-06	1.05E-06
			Tin (Sn)	7440-31-5	2.78E-05	2.78E-05
			Strontium (Sr)	7440-24-6	9.19E-04	9.19E-04
			Tantalum (Ta)	7440-25-7	2.83E-06	2.83E-06
			Terbium (Tb)	7440-27-9	1.85E-06	1.85E-06
			Tellurium (Te)	13494-80-9	6.12E-07	6.12E-07
			Titanium (Ti)	7440-32-6	5.52E-03	5.52E-03
			Thallium (Tl)	7440-28-0	3.05E-06	3.05E-06
			Uranium (U)	7440-61-1	4.27E-06	4.27E-06
			Vanadium (v)	7440-62-2	3.55E-04	3.55E-04
			Tungsten (W)	7440-33-7	8.10E-05	8.10E-05
			Yttrium (Y)	7440-65-5	4.58E-05	4.58E-05
			Ytterbium (Yb)	7440-64-4	5.28E-06	5.28E-06
			Zinc (Zn)	7440-66-6	3.21E-04	3.21E-04
			Zirconium (Zr)	7440-67-7	2.87E-04	2.87E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.88E+00	1.88E+00
			Aluminum Oxide (Al2O3)	1344-28-1	4.51E-01	4.51E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.99E-01	1.99E-01
			Magnesium Oxide (MgO)	1309-48-4	8.11E-02	8.11E-02
			Calcium Oxide (CaO)	1305-78-8	1.41E-01	1.41E-01
			Sodium Oxide (Na2O)	1313-59-3	1.02E-01	1.02E-01
			Potassium Oxide (K2O)	12136-45-7	5.90E-02	5.90E-02
			Titanium dioxide (TiO2)	13463-67-7	9.27E-03	9.27E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.86E-03	3.86E-03
			Manganese Oxide (MnO)	1344-43-0	1.22E-03	1.22E-03
			Chromium Oxide (Cr2O3)	1308-38-9	8.76E-04	8.76E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	8.08E-04	8.08E-04
			Chalcopyrite (CuFeS2)	1308-56-1	7.71E-03	7.71E-03
			Bornite (Cu5FeS4)	1308-82-3	2.78E-04	2.78E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.14E-04	2.14E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	8.64E-05	8.64E-05
			Cuprite (CU_2O)	1317-39-1	1.50E-04	1.50E-04
			Galena (PbS)	1314-87-0	6.08E-04	6.08E-04
			Sphalerite (ZnS)	1314-98-3	1.25E-03	1.25E-03
			Pyrite (Fe, S2)	1309-36-0	1.80E-02	1.80E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.90E-02	1.90E-02
			Arsenopyrite (FeAsS)	1303-18-0	7.26E-04	7.26E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.10E-02	1.10E-02
			Quartz	14808-60-7	1.76E-01	1.76E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.63E+00	1.63E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	8.78E-02	8.78E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.48E-01	2.48E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.29E-02	5.29E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.38E-02	3.38E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.22E-02	3.22E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	5.06E-02	5.06E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.71E-04	7.71E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.42E-03	7.42E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.80E-03	1.80E-03
			Calcite (CaCO3)	1317-65-3	1.44E-02	1.44E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.26E-04	7.26E-04
			Titanite (CaTiSiO5)	[TITAN]	4.21E-03	4.21E-03
			Apatite (Ca5(PO4)3)	1306-05-4	8.05E-03	8.05E-03
			Mica	12001-26-2	3.22E-01	3.22E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.59E-01	1.59E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.30E-01	1.30E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.01E-01	1.01E-01
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.51E-01	3.51E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	7.67E-01	7.67E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	2.86E-01	2.86E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.18E-02	4.18E-02
			Sillimanite (Al2SiO5)	12141-45-6	1.32E-02	1.32E-02

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
W4	OB SW Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	4.56E-02	4.56E-02
			PM_{10}	[PM10]	2.28E-02	2.28E-02
			$PM_{2.5}$	[PM2.5]	3.42E-03	3.42E-03
			Silver (Ag)	7440-22-4	2.70E-08	2.70E-08
			Aluminum (Al)	7429-90-5	3.46E-03	3.46E-03
			Arsenic (As)	7440-38-2	7.34E-07	7.34E-07
			Gold (Au)	7440-57-5	3.82E-09	3.82E-09
			Boron (B)	7440-42-8	4.59E-06	4.59E-06
			Barium (Ba)	7440-39-3	1.66E-05	1.66E-05
			Beryllium (Be)	7440-41-7	5.38E-08	5.38E-08
			Bismuth (Bi)	7440-69-9	9.87E-08	9.87E-08
			Carbon (C)	7440-44-0	6.01E-05	6.01E-05
			Calcium (Ca)	7440-70-2	1.50E-03	1.50E-03
			Cadmium (Cd)	7440-43-9	5.34E-08	5.34E-08
			Cerium (Ce)	7440-45-1	3.31E-06	3.31E-06
			Cobalt (Co)	7440-48-4	9.12E-07	9.12E-07
			Chromium (Cr)	7440-47-3	3.94E-06	3.94E-06
			Cesium (Cs)	7440-46-2	1.55E-07	1.55E-07
			Copper (Cu)	7440-50-8	6.16E-06	6.16E-06
			Iron (Fe)	7439-89-6	1.89E-03	1.89E-03
			Gallium (Ga)	7440-55-3	9.26E-07	9.26E-07
			Hafnium (Hf)	7440-58-6	1.95E-07	1.95E-07
			Mercury (Hg)	7439-97-6	1.14E-09	1.14E-09
			Indium (In)	7440-74-6	7.86E-10	7.86E-10
			Potassium (K)	7440-09-7	6.38E-04	6.38E-04
			Lanthanum (La)	7439-91-0	8.93E-07	8.93E-07
			Lithium (Li)	7439-93-2	1.17E-06	1.17E-06
			Lutetium (Lu)	7439-94-3	1.21E-08	1.21E-08
			Magnesium (Mg)	7439-95-4	6.75E-04	6.75E-04
			Manganese (Mn)	7439-96-5	1.20E-05	1.20E-05
			Molybdenum (Mo)	7439-98-7	2.53E-07	2.53E-07
			Sodium (Na)	7440-23-5	1.31E-03	1.31E-03
			Niobium (Nb)	7440--03-1	2.63E-07	2.63E-07
			Nickel (Ni)	7440-02-0	1.16E-06	1.16E-06
			Phosphorus (P)	7723-14-0	2.80E-05	2.80E-05
			Lead (Pb)	7439-92-1	6.46E-07	6.46E-07
			Rubidium (Rb)	7440-17-7	3.47E-06	3.47E-06
			Sulphur (S)	7704-34-9	1.22E-04	1.22E-04
			Antimony (Sb)	7440-36-0	2.33E-07	2.33E-07
			Scandium (Sc)	7440-20-2	6.00E-07	6.00E-07
			Selenium (Se)	7782-49-2	1.60E-08	1.60E-08
			Tin (Sn)	7440-31-5	4.22E-07	4.22E-07
			Strontium (Sr)	7440-24-6	1.39E-05	1.39E-05
			Tantalum (Ta)	7440-25-7	4.29E-08	4.29E-08
			Terbium (Tb)	7440-27-9	2.81E-08	2.81E-08
			Tellurium (Te)	13494-80-9	9.28E-09	9.28E-09
			Titanium (Ti)	7440-32-6	8.38E-05	8.38E-05
			Thallium (Tl)	7440-28-0	4.62E-08	4.62E-08
			Uranium (U)	7440-61-1	6.47E-08	6.47E-08
			Vanadium (v)	7440-62-2	5.38E-06	5.38E-06
			Tungsten (W)	7440-33-7	1.23E-06	1.23E-06
			Yttrium (Y)	7440-65-5	6.94E-07	6.94E-07
			Ytterbium (Yb)	7440-64-4	8.01E-08	8.01E-08
			Zinc (Zn)	7440-66-6	4.86E-06	4.86E-06
			Zirconium (Zr)	7440-67-7	4.35E-06	4.35E-06
			Silicon Dioxide (SiO2)	7631-86-9	2.85E-02	2.85E-02
			Aluminum Oxide (Al2O3)	1344-28-1	6.84E-03	6.84E-03
			Iron Oxide (Fe2O3)	1309-37-1	3.01E-03	3.01E-03
			Magnesium Oxide (MgO)	1309-48-4	1.23E-03	1.23E-03
			Calcium Oxide (CaO)	1305-78-8	2.14E-03	2.14E-03
			Sodium Oxide (Na2O)	1313-59-3	1.54E-03	1.54E-03
			Potassium Oxide (K2O)	12136-45-7	8.94E-04	8.94E-04
			Titanium dioxide (TiO2)	13463-67-7	1.41E-04	1.41E-04
			Phosphorus Pentoxide (P2O5)	1314-56-3	5.85E-05	5.85E-05
			Manganese Oxide (MnO)	1344-43-0	1.86E-05	1.86E-05
			Chromium Oxide (Cr2O3)	1308-38-9	1.33E-05	1.33E-05
			Vanadium Pentoxide (V2O5)	1314-62-1	1.23E-05	1.23E-05
			Chalcopyrite (CuFeS2)	1308-56-1	1.17E-04	1.17E-04
			Bornite (Cu5FeS4)	1308-82-3	4.22E-06	4.22E-06
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.25E-06	3.25E-06
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.31E-06	1.31E-06
			Cuprite (CU_2O)	1317-39-1	2.28E-06	2.28E-06
			Galena (PbS)	1314-87-0	9.22E-06	9.22E-06
			Sphalerite (ZnS)	1314-98-3	1.89E-05	1.89E-05
			Pyrite (Fe, S2)	1309-36-0	2.74E-04	2.74E-04
			Pyrrhotite (Fe7S8)	12305-96-3	2.88E-04	2.88E-04
			Arsenopyrite (FeAsS)	1303-18-0	1.10E-05	1.10E-05
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.68E-04	1.68E-04
			Quartz	14808-60-7	2.66E-03	2.66E-03
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.48E-02	2.48E-02
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.33E-03	1.33E-03
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	3.77E-03	3.77E-03
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	8.03E-04	8.03E-04
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.13E-04	5.13E-04
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	4.88E-04	4.88E-04
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	7.67E-04	7.67E-04
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.17E-05	1.17E-05
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.13E-04	1.13E-04
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	2.73E-05	2.73E-05
			Calcite (CaCO3)	1317-65-3	2.19E-04	2.19E-04
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.10E-05	1.10E-05
			Titanite (CaTiSiO5)	[TITAN]	6.38E-05	6.38E-05
			Apatite (Ca5(PO4)3)	1306-05-4	1.22E-04	1.22E-04
			Mica	12001-26-2	4.88E-03	4.88E-03
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.41E-03	2.41E-03
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.97E-03	1.97E-03
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.53E-03	1.53E-03
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	5.33E-03	5.33E-03
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.16E-02	1.16E-02
			Albite (NaAlSi 3O 8)	[ALBITE]	4.34E-03	4.34E-03
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	6.34E-04	6.34E-04
			Sillimanite (Al2SiO5)	12141-45-6	2.01E-04	2.01E-04

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
W5	WD 87 Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	2.94E+00	2.94E+00
			PM_{10}	[PM10]	1.47E+00	1.47E+00
			$PM_{2.5}$	[PM2.5]	2.20E-01	2.20E-01
			Silver (Ag)	7440-22-4	1.74E-06	1.74E-06
			Aluminum (Al)	7429-90-5	2.23E-01	2.23E-01
			Arsenic (As)	7440-38-2	4.72E-05	4.72E-05
			Gold (Au)	7440-57-5	2.46E-07	2.46E-07
			Boron (B)	7440-42-8	2.95E-04	2.95E-04
			Barium (Ba)	7440-39-3	1.07E-03	1.07E-03
			Beryllium (Be)	7440-41-7	3.46E-06	3.46E-06
			Bismuth (Bi)	7440-69-9	6.35E-06	6.35E-06
			Carbon (C)	7440-44-0	3.87E-03	3.87E-03
			Calcium (Ca)	7440-70-2	9.67E-02	9.67E-02
			Cadmium (Cd)	7440-43-9	3.44E-06	3.44E-06
			Cerium (Ce)	7440-45-1	2.13E-04	2.13E-04
			Cobalt (Co)	7440-48-4	5.87E-05	5.87E-05
			Chromium (Cr)	7440-47-3	2.54E-04	2.54E-04
			Cesium (Cs)	7440-46-2	1.00E-05	1.00E-05
			Copper (Cu)	7440-50-8	3.97E-04	3.97E-04
			Iron (Fe)	7439-89-6	1.22E-01	1.22E-01
			Gallium (Ga)	7440-55-3	5.96E-05	5.96E-05
			Hafnium (Hf)	7440-58-6	1.25E-05	1.25E-05
			Mercury (Hg)	7439-97-6	7.34E-08	7.34E-08
			Indium (In)	7440-74-6	5.06E-08	5.06E-08
			Potassium (K)	7440-09-7	4.10E-02	4.10E-02
			Lanthanum (La)	7439-91-0	5.75E-05	5.75E-05
			Lithium (Li)	7439-93-2	7.56E-05	7.56E-05
			Lutetium (Lu)	7439-94-3	7.81E-07	7.81E-07
			Magnesium (Mg)	7439-95-4	4.35E-02	4.35E-02
			Manganese (Mn)	7439-96-5	7.72E-04	7.72E-04
			Molybdenum (Mo)	7439-98-7	1.63E-05	1.63E-05
			Sodium (Na)	7440-23-5	8.46E-02	8.46E-02
			Niobium (Nb)	7440--03-1	1.69E-05	1.69E-05
			Nickel (Ni)	7440-02-0	7.47E-05	7.47E-05
			Phosphorus (P)	7723-14-0	1.80E-03	1.80E-03
			Lead (Pb)	7439-92-1	4.16E-05	4.16E-05
			Rubidium (Rb)	7440-17-7	2.24E-04	2.24E-04
			Sulphur (S)	7704-34-9	7.86E-03	7.86E-03
			Antimony (Sb)	7440-36-0	1.50E-05	1.50E-05
			Scandium (Sc)	7440-20-2	3.86E-05	3.86E-05
			Selenium (Se)	7782-49-2	1.03E-06	1.03E-06
			Tin (Sn)	7440-31-5	2.72E-05	2.72E-05
			Strontium (Sr)	7440-24-6	8.98E-04	8.98E-04
			Tantalum (Ta)	7440-25-7	2.76E-06	2.76E-06
			Terbium (Tb)	7440-27-9	1.81E-06	1.81E-06
			Tellurium (Te)	13494-80-9	5.98E-07	5.98E-07
			Titanium (Ti)	7440-32-6	5.39E-03	5.39E-03
			Thallium (Tl)	7440-28-0	2.98E-06	2.98E-06
			Uranium (U)	7440-61-1	4.17E-06	4.17E-06
			Vanadium (v)	7440-62-2	3.46E-04	3.46E-04
			Tungsten (W)	7440-33-7	7.91E-05	7.91E-05
			Yttrium (Y)	7440-65-5	4.47E-05	4.47E-05
			Ytterbium (Yb)	7440-64-4	5.16E-06	5.16E-06
			Zinc (Zn)	7440-66-6	3.13E-04	3.13E-04
			Zirconium (Zr)	7440-67-7	2.80E-04	2.80E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.83E+00	1.83E+00
			Aluminum Oxide (Al2O3)	1344-28-1	4.41E-01	4.41E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.94E-01	1.94E-01
			Magnesium Oxide (MgO)	1309-48-4	7.92E-02	7.92E-02
			Calcium Oxide (CaO)	1305-78-8	1.38E-01	1.38E-01
			Sodium Oxide (Na2O)	1313-59-3	9.92E-02	9.92E-02
			Potassium Oxide (K2O)	12136-45-7	5.76E-02	5.76E-02
			Titanium dioxide (TiO2)	13463-67-7	9.06E-03	9.06E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	3.77E-03	3.77E-03
			Manganese Oxide (MnO)	1344-43-0	1.19E-03	1.19E-03
			Chromium Oxide (Cr2O3)	1308-38-9	8.56E-04	8.56E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	7.89E-04	7.89E-04
			Chalcopyrite (CuFeS2)	1308-56-1	7.53E-03	7.53E-03
			Bornite (Cu5FeS4)	1308-82-3	2.72E-04	2.72E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	2.09E-04	2.09E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	8.44E-05	8.44E-05
			Cuprite (CU_2O)	1317-39-1	1.47E-04	1.47E-04
			Galena (PbS)	1314-87-0	5.94E-04	5.94E-04
			Sphalerite (ZnS)	1314-98-3	1.22E-03	1.22E-03
			Pyrite (Fe, S2)	1309-36-0	1.76E-02	1.76E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.85E-02	1.85E-02
			Arsenopyrite (FeAsS)	1303-18-0	7.09E-04	7.09E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.08E-02	1.08E-02
			Quartz	14808-60-7	1.72E-01	1.72E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	1.60E+00	1.60E+00
			K-Feldspars (KAlSi3O8)	[K-FELD]	8.57E-02	8.57E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.42E-01	2.42E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	5.17E-02	5.17E-02
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	3.30E-02	3.30E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	3.14E-02	3.14E-02
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	4.94E-02	4.94E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	7.52E-04	7.52E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	7.24E-03	7.24E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.75E-03	1.75E-03
			Calcite (CaCO3)	1317-65-3	1.41E-02	1.41E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	7.09E-04	7.09E-04
			Titanite (CaTiSiO5)	[TITAN]	4.11E-03	4.11E-03
			Apatite (Ca5(PO4)3)	1306-05-4	7.86E-03	7.86E-03
			Mica	12001-26-2	3.14E-01	3.14E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.55E-01	1.55E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	1.27E-01	1.27E-01
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	9.83E-02	9.83E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	3.43E-01	3.43E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	7.49E-01	7.49E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	2.79E-01	2.79E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	4.08E-02	4.08E-02
			Sillimanite (Al2SiO5)	12141-45-6	1.29E-02	1.29E-02

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
W6	Coarse Ore Storage Area Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	2.27E+00	2.27E+00
			PM_{10}	[PM10]	1.13E+00	1.13E+00
			$PM_{2.5}$	[PM2.5]	1.70E-01	1.70E-01
			Silver (Ag)	7440-22-4	4.39E-06	4.39E-06
			Aluminum (Al)	7429-90-5	1.71E-01	1.71E-01
			Arsenic (As)	7440-38-2	1.87E-04	1.87E-04
			Gold (Au)	7440-57-5	1.18E-06	1.18E-06
			Boron (B)	7440-42-8	2.59E-04	2.59E-04
			Barium (Ba)	7440-39-3	8.52E-04	8.52E-04
			Beryllium (Be)	7440-41-7	2.71E-06	2.71E-06
			Bismuth (Bi)	7440-69-9	7.47E-06	7.47E-06
			Carbon (C)	7440-44-0	3.18E-03	3.18E-03
			Calcium (Ca)	7440-70-2	6.49E-02	6.49E-02
			Cadmium (Cd)	7440-43-9	1.43E-05	1.43E-05
			Cerium (Ce)	7440-45-1	1.65E-04	1.65E-04
			Cobalt (Co)	7440-48-4	6.79E-05	6.79E-05
			Chromium (Cr)	7440-47-3	2.17E-04	2.17E-04
			Cesium (Cs)	7440-46-2	7.72E-06	7.72E-06
			Copper (Cu)	7440-50-8	1.26E-03	1.26E-03
			Iron (Fe)	7439-89-6	1.06E-01	1.06E-01
			Gallium (Ga)	7440-55-3	4.72E-05	4.72E-05
			Hafnium (Hf)	7440-58-6	9.66E-06	9.66E-06
			Mercury (Hg)	7439-97-6	5.66E-08	5.66E-08
			Indium (In)	7440-74-6	3.90E-08	3.90E-08
			Potassium (K)	7440-09-7	3.59E-02	3.59E-02
			Lanthanum (La)	7439-91-0	5.70E-05	5.70E-05
			Lithium (Li)	7439-93-2	5.84E-05	5.84E-05
			Lutetium (Lu)	7439-94-3	6.03E-07	6.03E-07
			Magnesium (Mg)	7439-95-4	3.05E-02	3.05E-02
			Manganese (Mn)	7439-96-5	5.50E-04	5.50E-04
			Molybdenum (Mo)	7439-98-7	1.70E-05	1.70E-05
			Sodium (Na)	7440-23-5	6.58E-02	6.58E-02
			Niobium (Nb)	7440--03-1	1.30E-05	1.30E-05
			Nickel (Ni)	7440-02-0	6.09E-05	6.09E-05
			Phosphorus (P)	7723-14-0	1.29E-03	1.29E-03
			Lead (Pb)	7439-92-1	4.04E-05	4.04E-05
			Rubidium (Rb)	7440-17-7	1.73E-04	1.73E-04
			Sulphur (S)	7704-34-9	1.11E-02	1.11E-02
			Antimony (Sb)	7440-36-0	2.07E-05	2.07E-05
			Scandium (Sc)	7440-20-2	3.48E-05	3.48E-05
			Selenium (Se)	7782-49-2	7.93E-07	7.93E-07
			Tin (Sn)	7440-31-5	2.10E-05	2.10E-05
			Strontium (Sr)	7440-24-6	5.47E-04	5.47E-04
			Tantalum (Ta)	7440-25-7	2.13E-06	2.13E-06
			Terbium (Tb)	7440-27-9	1.40E-06	1.40E-06
			Tellurium (Te)	13494-80-9	4.61E-07	4.61E-07
			Titanium (Ti)	7440-32-6	4.83E-03	4.83E-03
			Thallium (Tl)	7440-28-0	2.30E-06	2.30E-06
			Uranium (U)	7440-61-1	3.22E-06	3.22E-06
			Vanadium (v)	7440-62-2	3.26E-04	3.26E-04
			Tungsten (W)	7440-33-7	6.87E-05	6.87E-05
			Yttrium (Y)	7440-65-5	3.45E-05	3.45E-05
			Ytterbium (Yb)	7440-64-4	3.98E-06	3.98E-06
			Zinc (Zn)	7440-66-6	3.97E-04	3.97E-04
			Zirconium (Zr)	7440-67-7	2.16E-04	2.16E-04
			Silicon Dioxide (SiO2)	7631-86-9	1.42E+00	1.42E+00
			Aluminum Oxide (Al2O3)	1344-28-1	3.40E-01	3.40E-01
			Iron Oxide (Fe2O3)	1309-37-1	1.49E-01	1.49E-01
			Magnesium Oxide (MgO)	1309-48-4	5.99E-02	5.99E-02
			Calcium Oxide (CaO)	1305-78-8	1.03E-01	1.03E-01
			Sodium Oxide (Na2O)	1313-59-3	7.84E-02	7.84E-02
			Potassium Oxide (K2O)	12136-45-7	4.46E-02	4.46E-02
			Titanium dioxide (TiO2)	13463-67-7	7.13E-03	7.13E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.76E-03	2.76E-03
			Manganese Oxide (MnO)	1344-43-0	8.50E-04	8.50E-04
			Chromium Oxide (Cr2O3)	1308-38-9	6.26E-04	6.26E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	5.25E-04	5.25E-04
			Chalcopyrite (CuFeS2)	1308-56-1	5.81E-03	5.81E-03
			Bornite (Cu5FeS4)	1308-82-3	2.10E-04	2.10E-04
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.61E-04	1.61E-04
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	6.51E-05	6.51E-05
			Cuprite (CU_2O)	1317-39-1	1.13E-04	1.13E-04
			Galena (PbS)	1314-87-0	4.58E-04	4.58E-04
			Sphalerite (ZnS)	1314-98-3	9.40E-04	9.40E-04
			Pyrite (Fe, S2)	1309-36-0	1.74E-02	1.74E-02
			Pyrrhotite (Fe7S8)	12305-96-3	1.43E-02	1.43E-02
			Arsenopyrite (FeAsS)	1303-18-0	5.47E-04	5.47E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	8.33E-03	8.33E-03
			Quartz	14808-60-7	1.15E-01	1.15E-01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	9.36E-01	9.36E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.61E-02	6.61E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.68E-01	2.68E-01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.05E-01	1.05E-01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.55E-02	2.55E-02
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.26E-01	1.26E-01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.81E-02	3.81E-02
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	5.81E-04	5.81E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	5.59E-03	5.59E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.35E-03	1.35E-03
			Calcite (CaCO3)	1317-65-3	2.48E-02	2.48E-02
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	5.47E-04	5.47E-04
			Titanite (CaTiSiO5)	[TITAN]	8.16E-03	8.16E-03
			Apatite (Ca5(PO4)3)	1306-05-4	6.07E-03	6.07E-03
			Mica	12001-26-2	2.43E-01	2.43E-01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.20E-01	1.20E-01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	9.79E-02	9.79E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	7.59E-02	7.59E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.65E-01	2.65E-01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.78E-01	5.78E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	2.15E-01	2.15E-01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	3.15E-02	3.15E-02
			Sillimanite (Al2SiO5)	12141-45-6	9.97E-03	9.97E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
W7A-D	Mobile Crusher Piles Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	5.16E-01	5.16E-01
			PM_{10}	[PM10]	2.58E-01	2.58E-01
			$PM_{2.5}$	[PM2.5]	3.87E-02	3.87E-02
			Silver (Ag)	7440-22-4	3.06E-07	3.06E-07
			Aluminum (Al)	7429-90-5	3.92E-02	3.92E-02
			Arsenic (As)	7440-38-2	8.30E-06	8.30E-06
			Gold (Au)	7440-57-5	4.32E-08	4.32E-08
			Boron (B)	7440-42-8	5.19E-05	5.19E-05
			Barium (Ba)	7440-39-3	1.88E-04	1.88E-04
			Beryllium (Be)	7440-41-7	6.08E-07	6.08E-07
			Bismuth (Bi)	7440-69-9	1.12E-06	1.12E-06
			Carbon (C)	7440-44-0	6.81E-04	6.81E-04
			Calcium (Ca)	7440-70-2	1.70E-02	1.70E-02
			Cadmium (Cd)	7440-43-9	6.04E-07	6.04E-07
			Cerium (Ce)	7440-45-1	3.75E-05	3.75E-05
			Cobalt (Co)	7440-48-4	1.03E-05	1.03E-05
			Chromium (Cr)	7440-47-3	4.46E-05	4.46E-05
			Cesium (Cs)	7440-46-2	1.76E-06	1.76E-06
			Copper (Cu)	7440-50-8	6.97E-05	6.97E-05
			Iron (Fe)	7439-89-6	2.14E-02	2.14E-02
			Gallium (Ga)	7440-55-3	1.05E-05	1.05E-05
			Hafnium (Hf)	7440-58-6	2.20E-06	2.20E-06
			Mercury (Hg)	7439-97-6	1.29E-08	1.29E-08
			Indium (In)	7440-74-6	8.89E-09	8.89E-09
			Potassium (K)	7440-09-7	7.21E-03	7.21E-03
			Lanthanum (La)	7439-91-0	1.01E-05	1.01E-05
			Lithium (Li)	7439-93-2	1.33E-05	1.33E-05
			Lutetium (Lu)	7439-94-3	1.37E-07	1.37E-07
			Magnesium (Mg)	7439-95-4	7.64E-03	7.64E-03
			Manganese (Mn)	7439-96-5	1.36E-04	1.36E-04
			Molybdenum (Mo)	7439-98-7	2.87E-06	2.87E-06
			Sodium (Na)	7440-23-5	1.49E-02	1.49E-02
			Niobium (Nb)	7440--03-1	2.97E-06	2.97E-06
			Nickel (Ni)	7440-02-0	1.31E-05	1.31E-05
			Phosphorus (P)	7723-14-0	3.16E-04	3.16E-04
			Lead (Pb)	7439-92-1	7.30E-06	7.30E-06
			Rubidium (Rb)	7440-17-7	3.93E-05	3.93E-05
			Sulphur (S)	7704-34-9	1.38E-03	1.38E-03
			Antimony (Sb)	7440-36-0	2.64E-06	2.64E-06
			Scandium (Sc)	7440-20-2	6.79E-06	6.79E-06
			Selenium (Se)	7782-49-2	1.81E-07	1.81E-07
			Tin (Sn)	7440-31-5	4.77E-06	4.77E-06
			Strontium (Sr)	7440-24-6	1.58E-04	1.58E-04
			Tantalum (Ta)	7440-25-7	4.86E-07	4.86E-07
			Terbium (Tb)	7440-27-9	3.18E-07	3.18E-07
			Tellurium (Te)	13494-80-9	1.05E-07	1.05E-07
			Titanium (Ti)	7440-32-6	9.48E-04	9.48E-04
			Thallium (Tl)	7440-28-0	5.23E-07	5.23E-07
			Uranium (U)	7440-61-1	7.32E-07	7.32E-07
			Vanadium (v)	7440-62-2	6.09E-05	6.09E-05
			Tungsten (W)	7440-33-7	1.39E-05	1.39E-05
			Yttrium (Y)	7440-65-5	7.85E-06	7.85E-06
			Ytterbium (Yb)	7440-64-4	9.06E-07	9.06E-07
			Zinc (Zn)	7440-66-6	5.50E-05	5.50E-05
			Zirconium (Zr)	7440-67-7	4.92E-05	4.92E-05
			Silicon Dioxide (SiO2)	7631-86-9	3.22E-01	3.22E-01
			Aluminum Oxide (Al2O3)	1344-28-1	7.74E-02	7.74E-02
			Iron Oxide (Fe2O3)	1309-37-1	3.41E-02	3.41E-02
			Magnesium Oxide (MgO)	1309-48-4	1.39E-02	1.39E-02
			Calcium Oxide (CaO)	1305-78-8	2.43E-02	2.43E-02
			Sodium Oxide (Na2O)	1313-59-3	1.74E-02	1.74E-02
			Potassium Oxide (K2O)	12136-45-7	1.01E-02	1.01E-02
			Titanium dioxide (TiO2)	13463-67-7	1.59E-03	1.59E-03
			Phosphorus Pentoxide (P2O5)	1314-56-3	6.62E-04	6.62E-04
			Manganese Oxide (MnO)	1344-43-0	2.10E-04	2.10E-04
			Chromium Oxide (Cr2O3)	1308-38-9	1.50E-04	1.50E-04
			Vanadium Pentoxide (V2O5)	1314-62-1	1.39E-04	1.39E-04
			Chalcopyrite (CuFeS2)	1308-56-1	1.32E-03	1.32E-03
			Bornite (Cu5FeS4)	1308-82-3	4.77E-05	4.77E-05
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	3.68E-05	3.68E-05
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	1.48E-05	1.48E-05
			Cuprite (CU_2O)	1317-39-1	2.58E-05	2.58E-05
			Galena (PbS)	1314-87-0	1.04E-04	1.04E-04
			Sphalerite (ZnS)	1314-98-3	2.14E-04	2.14E-04
			Pyrite (Fe, S2)	1309-36-0	3.10E-03	3.10E-03
			Pyrrhotite (Fe7S8)	12305-96-3	3.26E-03	3.26E-03
			Arsenopyrite (FeAsS)	1303-18-0	1.25E-04	1.25E-04
			Ilmenite (Fe,Ti)2O3	12168-52-4	1.90E-03	1.90E-03
			Quartz	14808-60-7	3.01E-02	3.01E-02
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	2.80E-01	2.80E-01
			K-Feldspars (KAlSi3O8)	[K-FELD]	1.51E-02	1.51E-02
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	4.26E-02	4.26E-02
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	9.08E-03	9.08E-03
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	5.80E-03	5.80E-03
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	5.52E-03	5.52E-03
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	8.68E-03	8.68E-03
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	1.32E-04	1.32E-04
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	1.27E-03	1.27E-03
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	3.08E-04	3.08E-04
			Calcite (CaCO3)	1317-65-3	2.48E-03	2.48E-03
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	1.25E-04	1.25E-04
			Titanite (CaTiSiO5)	[TITAN]	7.22E-04	7.22E-04
			Apatite (Ca5(PO4)3)	1306-05-4	1.38E-03	1.38E-03
			Mica	12001-26-2	5.53E-02	5.53E-02
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	2.73E-02	2.73E-02
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	2.23E-02	2.23E-02
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	1.73E-02	1.73E-02
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	6.03E-02	6.03E-02
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	1.32E-01	1.32E-01
			Albite (NaAlSi 3O 8)	[ALBITE]	4.91E-02	4.91E-02
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	7.17E-03	7.17E-03
			Sillimanite (Al2SiO5)	12141-45-6	2.27E-03	2.27E-03

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
W9	TSF Wind Erosion	Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects	TSP	[PM]	2.30E+02	2.30E+02
			PM_{10}	[PM10]	1.15E+02	1.15E+02
			$PM_{2.5}$	[PM2.5]	1.72E+01	1.72E+01
			Silver (Ag)	7440-22-4	9.05E-05	9.05E-05
			Aluminum (Al)	7429-90-5	1.79E+01	1.79E+01
			Arsenic (As)	7440-38-2	1.27E-03	1.27E-03
			Gold (Au)	7440-57-5	0.00E+00	0.00E+00
			Boron (B)	7440-42-8	2.63E-02	2.63E-02
			Barium (Ba)	7440-39-3	1.05E-01	1.05E-01
			Beryllium (Be)	7440-41-7	1.94E-04	1.94E-04
			Bismuth (Bi)	7440-69-9	8.37E-05	8.37E-05
			Carbon (C)	7440-44-0	3.23E-01	3.23E-01
			Calcium (Ca)	7440-70-2	5.98E+00	5.98E+00
			Cadmium (Cd)	7440-43-9	1.56E-05	1.56E-05
			Cerium (Ce)	7440-45-1	1.67E-02	1.67E-02
			Cobalt (Co)	7440-48-4	4.77E-03	4.77E-03
			Chromium (Cr)	7440-47-3	5.68E-02	5.68E-02
			Cesium (Cs)	7440-46-2	7.84E-04	7.84E-04
			Copper (Cu)	7440-50-8	1.02E-02	1.02E-02
			Iron (Fe)	7439-89-6	1.10E+01	1.10E+01
			Gallium (Ga)	7440-55-3	4.82E-03	4.82E-03
			Hafnium (Hf)	7440-58-6	9.81E-04	9.81E-04
			Mercury (Hg)	7439-97-6	5.75E-06	5.75E-06
			Indium (In)	7440-74-6	3.96E-06	3.96E-06
			Potassium (K)	7440-09-7	3.84E+00	3.84E+00
			Lanthanum (La)	7439-91-0	8.11E-03	8.11E-03
			Lithium (Li)	7439-93-2	5.92E-03	5.92E-03
			Lutetium (Lu)	7439-94-3	6.12E-05	6.12E-05
			Magnesium (Mg)	7439-95-4	3.37E+00	3.37E+00
			Manganese (Mn)	7439-96-5	5.31E-02	5.31E-02
			Molybdenum (Mo)	7439-98-7	5.12E-04	5.12E-04
			Sodium (Na)	7440-23-5	6.92E+00	6.92E+00
			Niobium (Nb)	7440--03-1	1.32E-03	1.32E-03
			Nickel (Ni)	7440-02-0	7.36E-03	7.36E-03
			Phosphorus (P)	7723-14-0	1.09E-01	1.09E-01
			Lead (Pb)	7439-92-1	2.46E-03	2.46E-03
			Rubidium (Rb)	7440-17-7	1.75E-02	1.75E-02
			Sulphur (S)	7704-34-9	1.13E+00	1.13E+00
			Antimony (Sb)	7440-36-0	1.86E-04	1.86E-04
			Scandium (Sc)	7440-20-2	4.22E-03	4.22E-03
			Selenium (Se)	7782-49-2	8.05E-05	8.05E-05
			Tin (Sn)	7440-31-5	2.13E-03	2.13E-03
			Strontium (Sr)	7440-24-6	4.22E-02	4.22E-02
			Tantalum (Ta)	7440-25-7	2.16E-04	2.16E-04
			Terbium (Tb)	7440-27-9	1.42E-04	1.42E-04
			Tellurium (Te)	13494-80-9	4.68E-05	4.68E-05
			Titanium (Ti)	7440-32-6	4.50E-01	4.50E-01
			Thallium (Tl)	7440-28-0	2.33E-04	2.33E-04
			Uranium (U)	7440-61-1	3.26E-04	3.26E-04
			Vanadium (v)	7440-62-2	3.45E-02	3.45E-02
			Tungsten (W)	7440-33-7	5.84E-04	5.84E-04
			Yttrium (Y)	7440-65-5	3.50E-03	3.50E-03
			Ytterbium (Yb)	7440-64-4	4.04E-04	4.04E-04
			Zinc (Zn)	7440-66-6	1.38E-02	1.38E-02
			Zirconium (Zr)	7440-67-7	2.19E-02	2.19E-02
			Silicon Dioxide (SiO2)	7631-86-9	1.48E+02	1.48E+02
			Aluminum Oxide (Al2O3)	1344-28-1	3.40E+01	3.40E+01
			Iron Oxide (Fe2O3)	1309-37-1	1.49E+01	1.49E+01
			Magnesium Oxide (MgO)	1309-48-4	5.56E+00	5.56E+00
			Calcium Oxide (CaO)	1305-78-8	8.42E+00	8.42E+00
			Sodium Oxide (Na2O)	1313-59-3	9.08E+00	9.08E+00
			Potassium Oxide (K2O)	12136-45-7	4.63E+00	4.63E+00
			Titanium dioxide (TiO2)	13463-67-7	8.13E-01	8.13E-01
			Phosphorus Pentoxide (P2O5)	1314-56-3	2.47E-01	2.47E-01
			Manganese Oxide (MnO)	1344-43-0	7.08E-02	7.08E-02
			Chromium Oxide (Cr2O3)	1308-38-9	7.78E-02	7.78E-02
			Vanadium Pentoxide (V2O5)	1314-62-1	6.29E-02	6.29E-02
			Chalcopyrite (CuFeS2)	1308-56-1	5.90E-01	5.90E-01
			Bornite (Cu5FeS4)	1308-82-3	2.13E-02	2.13E-02
			Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	1.64E-02	1.64E-02
			Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	6.61E-03	6.61E-03
			Cuprite (CU_2O)	1317-39-1	1.15E-02	1.15E-02
			Galena (PbS)	1314-87-0	4.65E-02	4.65E-02
			Sphalerite (ZnS)	1314-98-3	9.54E-02	9.54E-02
			Pyrite (Fe, S2)	1309-36-0	1.76E+00	1.76E+00
			Pyrrhotite (Fe7S8)	12305-96-3	1.45E+00	1.45E+00
			Arsenopyrite (FeAsS)	1303-18-0	5.55E-02	5.55E-02
			Ilmenite (Fe,Ti)2O3	12168-52-4	8.45E-01	8.45E-01
			Quartz	14808-60-7	1.16E+01	1.16E+01
			Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	[PLAG]	9.50E+01	9.50E+01
			K-Feldspars (KAlSi3O8)	[K-FELD]	6.71E+00	6.71E+00
			Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	[BIO]	2.72E+01	2.72E+01
			Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	1.07E+01	1.07E+01
			Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	2.58E+00	2.58E+00
			Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.28E+01	1.28E+01
			Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	[EPID]	3.87E+00	3.87E+00
			Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	[AUG]	5.89E-02	5.89E-02
			Andradite (Ca3Fe2(SiO4)3)	15078-96-3	5.67E-01	5.67E-01
			Kaolinite (Al2Si2O5(OH)4)	1318-74-7	1.37E-01	1.37E-01
			Calcite (CaCO3)	1317-65-3	2.52E+00	2.52E+00
			Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	5.55E-02	5.55E-02
			Titanite (CaTiSiO5)	[TITAN]	8.28E-01	8.28E-01
			Apatite (Ca5(PO4)3)	1306-05-4	6.16E-01	6.16E-01
			Mica	12001-26-2	2.46E+01	2.46E+01
			Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	1.22E+01	1.22E+01
			Bytownite (Ca,Na)(Si,Al)4O8	[BYT]	9.93E+00	9.93E+00
			Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	[LAB]	7.70E+00	7.70E+00
			Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	2.69E+01	2.69E+01
			Oligoclase (Na,Ca)(Si,Al)4O8	[OLIGO]	5.86E+01	5.86E+01
			Albite (NaAlSi 3O 8)	[ALBITE]	2.19E+01	2.19E+01
			Phlogopite (KMg3AlSi3O10(F,OH)2)	[PHLOG]	3.20E+00	3.20E+00
			Sillimanite (Al2SiO5)	12141-45-6	1.01E+00	1.01E+00

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
CP1	Pit 87 Mining - Mobile Equipment	MOVES	PM_{10}	[PM10]	3.10E-02	2.49E-02
			$PM_{2.5}$	[PM2.5]	3.01E-02	2.42E-02
			PM	[PM]	3.10E-02	2.49E-02
			Carbon Monoxide (CO)	630-08-0	1.28E-01	1.00E-01
			Sulphur Dioxide (SO2)	7446-09-5	1.76E-03	1.40E-03
			Hydrocarbons	[NMHC]	4.16E-02	3.32E-02
			Nitrogen Oxides (NOx)	10102-44-0	2.21E+00	1.84E+00
			1,3-butadiene	106-99-0	8.29E-05	6.65E-05
			Acenaphthene	83-32-9	2.74E-05	2.19E-05
			Acenaphthylene	208-96-8	5.33E-05	4.29E-05
			Acetaldehyde	75-07-0	4.62E-03	3.70E-03
			Acrolein	107-02-8	8.56E-04	6.84E-04
			Anthracene	120-12-7	4.80E-06	3.85E-06
			Benzene	71-43-2	2.32E-03	1.87E-03
			Benzo(a)anthracene	56-55-3	5.65E-07	4.55E-07
			Benzo(a)pyrene	50-32-8	1.90E-07	1.54E-07
			Benzo(b+k)fluoranthene	205-99-2	5.33E-07	4.31E-07
			Benzo(g,h,i)perylene	191-24-2	4.55E-07	3.67E-07
			Chrysene	218-01-9	7.10E-07	5.72E-07
			Fluoranthene	206-44-0	7.78E-06	6.27E-06
			Fluorene	86-73-7	3.82E-05	3.06E-05
			Formaldehyde	50-00-0	3.75E-03	3.02E-03
			Phenanthrene	85-01-8	6.50E-05	5.21E-05
			Pyrene	129-00-0	7.49E-06	6.02E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	3.01E-02	2.42E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.96E-02	1.57E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	5.59E-07	4.50E-07
CP2	Pit J Mining - Mobile Equipment	MOVES	PM_{10}	[PM10]	1.69E-02	1.45E-02
			$PM_{2.5}$	[PM2.5]	1.63E-02	1.41E-02
			PM	[PM]	1.69E-02	1.45E-02
			Carbon Monoxide (CO)	630-08-0	7.03E-02	5.87E-02
			Sulphur Dioxide (SO2)	7446-09-5	9.75E-04	8.32E-04
			Hydrocarbons	[NMHC]	2.30E-02	1.95E-02
			Nitrogen Oxides (NOx)	10102-44-0	1.23E+00	1.09E+00
			1,3-butadiene	106-99-0	4.59E-05	3.90E-05
			Acenaphthene	83-32-9	1.49E-05	1.26E-05
			Acenaphthylene	208-96-8	3.03E-05	2.58E-05
			Acetaldehyde	75-07-0	2.59E-03	2.20E-03
			Acrolein	107-02-8	4.63E-04	3.93E-04
			Anthracene	120-12-7	2.63E-06	2.24E-06
			Benzene	71-43-2	1.32E-03	1.12E-03
			Benzo(a)anthracene	56-55-3	3.19E-07	2.72E-07
			Benzo(a)pyrene	50-32-8	1.07E-07	9.20E-08
			Benzo(b+k)fluoranthene	205-99-2	3.00E-07	2.59E-07
			Benzo(g,h,i)perylene	191-24-2	2.59E-07	2.22E-07
			Chrysene	218-01-9	3.99E-07	3.42E-07
			Fluoranthene	206-44-0	4.44E-06	3.79E-06
			Fluorene	86-73-7	2.07E-05	1.76E-05
			Formaldehyde	50-00-0	2.16E-03	1.84E-03
			Phenanthrene	85-01-8	3.54E-05	3.01E-05
			Pyrene	129-00-0	4.17E-06	3.56E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.63E-02	1.41E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	1.06E-02	9.15E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	3.11E-07	2.67E-07
CP3	Pit SW Mining - Mobile Equipment and Generator	MOVES	PM_{10}	[PM10]	7.68E-02	7.16E-02
			$PM_{2.5}$	[PM2.5]	7.58E-02	7.07E-02
			PM	[PM]	7.68E-02	7.16E-02
			Carbon Monoxide (CO)	630-08-0	8.34E-01	8.06E-01
			Sulphur Dioxide (SO2)	7446-09-5	4.34E-03	4.07E-03
			Hydrocarbons	[NMHC]	1.96E-01	1.89E-01
			Nitrogen Oxides (NOx)	10102-44-0	6.32E+00	6.14E+00
			1,3-butadiene	106-99-0	8.57E-05	7.32E-05
			Acenaphthene	83-32-9	3.56E-05	3.15E-05
			Acenaphthylene	208-96-8	6.93E-05	6.17E-05
			Acetaldehyde	75-07-0	4.84E-03	4.14E-03
			Acrolein	107-02-8	8.98E-04	7.65E-04
			Anthracene	120-12-7	6.94E-06	6.20E-06
			Benzene	71-43-2	3.62E-03	3.28E-03
			Benzo(a)anthracene	56-55-3	1.58E-06	1.50E-06
			Benzo(a)pyrene	50-32-8	6.14E-07	5.84E-07
			Benzo(b+k)fluoranthene	205-99-2	2.34E-06	2.26E-06
			Benzo(g,h,i)perylene	191-24-2	1.36E-06	1.29E-06
			Chrysene	218-01-9	3.18E-06	3.07E-06
			Fluoranthene	206-44-0	1.45E-05	1.33E-05
			Fluorene	86-73-7	5.98E-05	5.39E-05
			Formaldehyde	50-00-0	3.97E-03	3.44E-03
			Phenanthrene	85-01-8	1.32E-04	1.22E-04
			Pyrene	129-00-0	1.37E-05	1.26E-05
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	7.58E-02	7.07E-02
			Elemental Carbon (from diesel exhaust)	7440-44-0	4.93E-02	4.60E-02
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.45E-06	1.36E-06
CM1	Coarse Ore Pile - Mobile Equipment	MOVES	PM_{10}	[PM10]	7.68E-03	6.40E-03
			$PM_{2.5}$	[PM2.5]	7.45E-03	6.20E-03
			PM	[PM]	7.68E-03	6.40E-03
			Carbon Monoxide (CO)	630-08-0	2.39E-02	2.00E-02
			Sulphur Dioxide (SO2)	7446-09-5	4.66E-04	3.88E-04
			Hydrocarbons	[NMHC]	1.04E-02	8.67E-03
			Nitrogen Oxides (NOx)	10102-44-0	7.27E-01	6.06E-01
			1,3-butadiene	106-99-0	2.15E-05	1.79E-05
			Acenaphthene	83-32-9	7.01E-06	5.84E-06
			Acenaphthylene	208-96-8	1.43E-05	1.20E-05
			Acetaldehyde	75-07-0	1.20E-03	1.00E-03
			Acrolein	107-02-8	2.16E-04	1.80E-04
			Anthracene	120-12-7	1.24E-06	1.03E-06
			Benzene	71-43-2	6.26E-04	5.22E-04
			Benzo(a)anthracene	56-55-3	1.48E-07	1.23E-07
			Benzo(a)pyrene	50-32-8	4.97E-08	4.14E-08
			Benzo(b+k)fluoranthene	205-99-2	1.40E-07	1.17E-07
			Benzo(g,h,i)perylene	191-24-2	1.22E-07	1.02E-07
			Chrysene	218-01-9	1.86E-07	1.55E-07
			Fluoranthene	206-44-0	2.09E-06	1.74E-06
			Fluorene	86-73-7	9.73E-06	8.11E-06
			Formaldehyde	50-00-0	1.02E-03	8.54E-04
			Phenanthrene	85-01-8	1.66E-05	1.38E-05
			Pyrene	129-00-0	1.96E-06	1.63E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	7.45E-03	6.20E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	4.84E-03	4.03E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.46E-07	1.21E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s)	
					Year 6	
					1 hr	24 hr
CM2	OB NW - Mobile Equipment	MOVES	PM_{10}	[PM10]	6.65E-04	6.65E-04
			$PM_{2.5}$	[PM2.5]	6.45E-04	6.45E-04
			PM	[PM]	6.65E-04	6.65E-04
			Carbon Monoxide (CO)	630-08-0	2.07E-03	2.07E-03
			Sulphur Dioxide (SO2)	7446-09-5	4.04E-05	4.04E-05
			Hydrocarbons	[NMHC]	9.02E-04	9.02E-04
			Nitrogen Oxides (NOx)	10102-44-0	6.30E-02	6.30E-02
			1,3-butadiene	106-99-0	1.86E-06	1.86E-06
			Acenaphthene	83-32-9	6.07E-07	6.07E-07
			Acenaphthylene	208-96-8	1.24E-06	1.24E-06
			Acetaldehyde	75-07-0	1.04E-04	1.04E-04
			Acrolein	107-02-8	1.87E-05	1.87E-05
			Anthracene	120-12-7	1.07E-07	1.07E-07
			Benzene	71-43-2	5.42E-05	5.42E-05
			Benzo(a)anthracene	56-55-3	1.28E-08	1.28E-08
			Benzo(a)pyrene	50-32-8	4.30E-09	4.30E-09
			Benzo(b+k)fluoranthene	205-99-2	1.21E-08	1.21E-08
			Benzo(g,h,i)perylene	191-24-2	1.06E-08	1.06E-08
			Chrysene	218-01-9	1.61E-08	1.61E-08
			Fluoranthene	206-44-0	1.81E-07	1.81E-07
			Fluorene	86-73-7	8.43E-07	8.43E-07
			Formaldehyde	50-00-0	8.88E-05	8.88E-05
			Phenanthrene	85-01-8	1.44E-06	1.44E-06
			Pyrene	129-00-0	1.70E-07	1.70E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	6.45E-04	6.45E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	4.19E-04	4.19E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.26E-08	1.26E-08
CM3	OB West - Mobile Equipment	MOVES	PM_{10}	[PM10]	5.74E-04	5.74E-04
			$PM_{2.5}$	[PM2.5]	5.57E-04	5.57E-04
			PM	[PM]	5.74E-04	5.74E-04
			Carbon Monoxide (CO)	630-08-0	1.79E-03	1.79E-03
			Sulphur Dioxide (SO2)	7446-09-5	3.49E-05	3.49E-05
			Hydrocarbons	[NMHC]	7.79E-04	7.79E-04
			Nitrogen Oxides (NOx)	10102-44-0	5.44E-02	5.44E-02
			1,3-butadiene	106-99-0	1.61E-06	1.61E-06
			Acenaphthene	83-32-9	5.24E-07	5.24E-07
			Acenaphthylene	208-96-8	1.07E-06	1.07E-06
			Acetaldehyde	75-07-0	9.00E-05	9.00E-05
			Acrolein	107-02-8	1.62E-05	1.62E-05
			Anthracene	120-12-7	9.24E-08	9.24E-08
			Benzene	71-43-2	4.68E-05	4.68E-05
			Benzo(a)anthracene	56-55-3	1.11E-08	1.11E-08
			Benzo(a)pyrene	50-32-8	3.72E-09	3.72E-09
			Benzo(b+k)fluoranthene	205-99-2	1.05E-08	1.05E-08
			Benzo(g,h,i)perylene	191-24-2	9.14E-09	9.14E-09
			Chrysene	218-01-9	1.39E-08	1.39E-08
			Fluoranthene	206-44-0	1.57E-07	1.57E-07
			Fluorene	86-73-7	7.28E-07	7.28E-07
			Formaldehyde	50-00-0	7.67E-05	7.67E-05
			Phenanthrene	85-01-8	1.24E-06	1.24E-06
			Pyrene	129-00-0	1.47E-07	1.47E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	5.57E-04	5.57E-04
			Elemental Carbon (from diesel exhaust)	7440-44-0	3.62E-04	3.62E-04
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.09E-08	1.09E-08
CM4	OB SW - Mobile Equipment	MOVES	PM_{10}	[PM10]	6.00E-04	9.30E-05
			$PM_{2.5}$	[PM2.5]	5.82E-04	9.02E-05
			PM	[PM]	6.00E-04	9.30E-05
			Carbon Monoxide (CO)	630-08-0	1.87E-03	2.90E-04
			Sulphur Dioxide (SO2)	7446-09-5	3.64E-05	5.64E-06
			Hydrocarbons	[NMHC]	8.13E-04	1.26E-04
			Nitrogen Oxides (NOx)	10102-44-0	5.68E-02	8.81E-03
			1,3-butadiene	106-99-0	1.68E-06	2.61E-07
			Acenaphthene	83-32-9	5.48E-07	8.49E-08
			Acenaphthylene	208-96-8	1.12E-06	1.74E-07
			Acetaldehyde	75-07-0	9.40E-05	1.46E-05
			Acrolein	107-02-8	1.69E-05	2.62E-06
			Anthracene	120-12-7	9.65E-08	1.50E-08
			Benzene	71-43-2	4.89E-05	7.58E-06
			Benzo(a)anthracene	56-55-3	1.16E-08	1.79E-09
			Benzo(a)pyrene	50-32-8	3.88E-09	6.02E-10
			Benzo(b+k)fluoranthene	205-99-2	1.09E-08	1.70E-09
			Benzo(g,h,i)perylene	191-24-2	9.54E-09	1.48E-09
			Chrysene	218-01-9	1.46E-08	2.26E-09
			Fluoranthene	206-44-0	1.64E-07	2.54E-08
			Fluorene	86-73-7	7.60E-07	1.18E-07
			Formaldehyde	50-00-0	8.01E-05	1.24E-05
			Phenanthrene	85-01-8	1.30E-06	2.01E-07
			Pyrene	129-00-0	1.53E-07	2.38E-08
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	5.82E-04	9.02E-05
			Elemental Carbon (from diesel exhaust)	7440-44-0	3.78E-04	5.86E-05
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.14E-08	1.76E-09
CM5	WD SW - Mobile Equipment	MOVES	PM_{10}	[PM10]	1.14E-02	9.35E-03
			$PM_{2.5}$	[PM2.5]	1.11E-02	9.07E-03
			PM	[PM]	1.14E-02	9.35E-03
			Carbon Monoxide (CO)	630-08-0	3.62E-02	2.96E-02
			Sulphur Dioxide (SO2)	7446-09-5	8.31E-04	6.66E-04
			Hydrocarbons	[NMHC]	1.54E-02	1.26E-02
			Nitrogen Oxides (NOx)	10102-44-0	9.87E-01	8.20E-01
			1,3-butadiene	106-99-0	3.01E-05	2.49E-05
			Acenaphthene	83-32-9	9.83E-06	8.13E-06
			Acenaphthylene	208-96-8	2.01E-05	1.66E-05
			Acetaldehyde	75-07-0	1.72E-03	1.42E-03
			Acrolein	107-02-8	3.06E-04	2.53E-04
			Anthracene	120-12-7	1.75E-06	1.44E-06
			Benzene	71-43-2	8.76E-04	7.25E-04
			Benzo(a)anthracene	56-55-3	2.15E-07	1.77E-07
			Benzo(a)pyrene	50-32-8	7.26E-08	5.97E-08
			Benzo(b+k)fluoranthene	205-99-2	2.05E-07	1.68E-07
			Benzo(g,h,i)perylene	191-24-2	1.75E-07	1.44E-07
			Chrysene	218-01-9	2.68E-07	2.21E-07
			Fluoranthene	206-44-0	2.96E-06	2.45E-06
			Fluorene	86-73-7	1.37E-05	1.13E-05
			Formaldehyde	50-00-0	1.44E-03	1.19E-03
			Phenanthrene	85-01-8	2.34E-05	1.93E-05
			Pyrene	129-00-0	2.78E-06	2.30E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	1.11E-02	9.07E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	7.19E-03	5.90E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.09E-07	1.72E-07

Source Emission Inventory Summary

Operations Phase - Year 6

Source ID	Source	Emission Estimation Method	Contaminant	CAS #	Emission Rate (g/s) Year 6	
					1 hr	24 hr
CM6	TSF - Mobile Equipment	MOVES	PM_{10}	[PM10]	8.53E-03	6.34E-03
			$PM_{2.5}$	[PM2.5]	8.27E-03	6.15E-03
			PM	[PM]	8.53E-03	6.34E-03
			Carbon Monoxide (CO)	630-08-0	3.69E-02	2.50E-02
			Sulphur Dioxide (SO2)	7446-09-5	8.28E-04	6.36E-04
			Hydrocarbons	[NMHC]	1.37E-02	9.74E-03
			Nitrogen Oxides (NOx)	10102-44-0	4.84E-01	3.90E-01
			1,3-butadiene	106-99-0	2.39E-05	1.68E-05
			Acenaphthene	83-32-9	7.82E-06	5.51E-06
			Acenaphthylene	208-96-8	1.60E-05	1.12E-05
			Acetaldehyde	75-07-0	1.42E-03	1.01E-03
			Acrolein	107-02-8	2.48E-04	1.75E-04
			Anthracene	120-12-7	1.37E-06	9.77E-07
			Benzene	71-43-2	6.96E-04	4.89E-04
			Benzo(a)anthracene	56-55-3	1.71E-07	1.23E-07
			Benzo(a)pyrene	50-32-8	5.23E-08	3.88E-08
			Benzo(b+k)fluoranthene	205-99-2	1.47E-07	1.09E-07
			Benzo(g,h,i)perylene	191-24-2	1.33E-07	9.55E-08
			Chrysene	218-01-9	2.04E-07	1.48E-07
			Fluoranthene	206-44-0	2.32E-06	1.65E-06
			Fluorene	86-73-7	1.09E-05	7.66E-06
			Formaldehyde	50-00-0	1.14E-03	8.04E-04
			Phenanthrene	85-01-8	1.85E-05	1.31E-05
			Pyrene	129-00-0	2.17E-06	1.54E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	8.27E-03	6.15E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	5.38E-03	4.00E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.59E-07	1.15E-07
CM7	WD 87 - Mobile Equipment	MOVES	PM_{10}	[PM10]	9.48E-03	9.13E-03
			$PM_{2.5}$	[PM2.5]	9.20E-03	8.86E-03
			PM	[PM]	9.48E-03	9.13E-03
			Carbon Monoxide (CO)	630-08-0	3.03E-02	2.90E-02
			Sulphur Dioxide (SO2)	7446-09-5	7.15E-04	6.52E-04
			Hydrocarbons	[NMHC]	1.28E-02	1.23E-02
			Nitrogen Oxides (NOx)	10102-44-0	8.05E-01	8.00E-01
			1,3-butadiene	106-99-0	2.48E-05	2.43E-05
			Acenaphthene	83-32-9	8.07E-06	7.93E-06
			Acenaphthylene	208-96-8	1.65E-05	1.62E-05
			Acetaldehyde	75-07-0	1.42E-03	1.38E-03
			Acrolein	107-02-8	2.52E-04	2.46E-04
			Anthracene	120-12-7	1.44E-06	1.41E-06
			Benzene	71-43-2	7.20E-04	7.07E-04
			Benzo(a)anthracene	56-55-3	1.78E-07	1.73E-07
			Benzo(a)pyrene	50-32-8	6.02E-08	5.83E-08
			Benzo(b+k)fluoranthene	205-99-2	1.70E-07	1.64E-07
			Benzo(g,h,i)perylene	191-24-2	1.44E-07	1.40E-07
			Chrysene	218-01-9	2.22E-07	2.16E-07
			Fluoranthene	206-44-0	2.44E-06	2.39E-06
			Fluorene	86-73-7	1.13E-05	1.10E-05
			Formaldehyde	50-00-0	1.18E-03	1.16E-03
			Phenanthrene	85-01-8	1.93E-05	1.89E-05
			Pyrene	129-00-0	2.29E-06	2.24E-06
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	9.20E-03	8.86E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	5.98E-03	5.76E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	1.73E-07	1.68E-07
CPLANT	Mill Area - Mobile Equipment	MOVES	PM_{10}	[PM10]	4.48E-03	3.10E-03
			$PM_{2.5}$	[PM2.5]	4.35E-03	3.01E-03
			PM	[PM]	4.48E-03	3.10E-03
			Carbon Monoxide (CO)	630-08-0	2.54E-02	1.68E-02
			Sulphur Dioxide (SO2)	7446-09-5	3.31E-04	2.50E-04
			Hydrocarbons	[NMHC]	5.28E-03	3.46E-03
			Nitrogen Oxides (NOx)	10102-44-0	7.71E-02	4.79E-02
			1,3-butadiene	106-99-0	9.04E-06	5.64E-06
			Acenaphthene	83-32-9	2.93E-06	1.83E-06
			Acenaphthylene	208-96-8	5.91E-06	3.68E-06
			Acetaldehyde	75-07-0	5.37E-04	3.41E-04
			Acrolein	107-02-8	9.38E-05	5.91E-05
			Anthracene	120-12-7	5.48E-07	3.50E-07
			Benzene	71-43-2	2.58E-04	1.60E-04
			Benzo(a)anthracene	56-55-3	7.22E-08	4.79E-08
			Benzo(a)pyrene	50-32-8	2.69E-08	1.85E-08
			Benzo(b+k)fluoranthene	205-99-2	7.51E-08	5.20E-08
			Benzo(g,h,i)perylene	191-24-2	5.70E-08	3.76E-08
			Chrysene	218-01-9	9.07E-08	6.04E-08
			Fluoranthene	206-44-0	9.22E-07	5.90E-07
			Fluorene	86-73-7	4.16E-06	2.62E-06
			Formaldehyde	50-00-0	4.22E-04	2.63E-04
			Phenanthrene	85-01-8	7.28E-06	4.62E-06
			Pyrene	129-00-0	8.78E-07	5.64E-07
			Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	4.35E-03	3.01E-03
			Elemental Carbon (from diesel exhaust)	7440-44-0	2.82E-03	1.96E-03
			Total PAHs (as equivalent B(a)P)	<<BaPET>>	7.07E-08	4.69E-08

Source: Mobile Emissions Sources

Equipment	Example Make/Model	Engine Emissions Tier Level	Average Power (kW) = Max Power x Load Factor	Average Power (HP)	Utilization	Utilization - Operating Hours per Shift	MOVES hpID	MOVES Fuel ID	Moves Equipment ID	Emission Factors (g/hp-hr)																				Diesel Particulate Matter (PM2.5 from Diesel Combustion)
										PM_{10}	$PM_{2.5}$	CO	SO_2	Hydrocarbons	NOx	1,3-butadiene	Acenaphthene	Acenaphthylene	Acetaldehyde	Acrolein	Anthracene	Benzene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Fluoranthene	Fluorene	Formaldehyde	Phenanthrene	Pyrene	
										100	110	2	31	1	3	24	70+170	71+171	26	27	72+172	20	73+173	74+174	75+77+175+17	76+176	78+178	69+169	81+181	5	83+183	84+184	110
Drill (165 mm)	SmartROC D65	Tier 4	282	378	71%	17	600	23	14	4.177E-02	4.052E-02	2.498E-01	1.501E-03	5.285E-02	8.016E-01	9.816E-05	3.654E-05	4.906E-05	1.060E-03	1.174E-03	5.967E-06	2.132E-03	5.736E-07	1.937E-07	5.232E-07	4.038E-07	7.290E-07	6.878E-06	5.129E-05	2.985E-03	8.533E-05	8.204E-06	4.052E-02
Drill (203 mm)	PV-235	Electric	449	602	71%	17	750																									
Loader (23 m3)	Cat 990VL Loader-2.9m3 (200-240 t)	Tier 4	976	1309	85%	20	2000	23	20	3.073E-02	2.981E-02	1.305E-01	1.439E-03	3.924E-02	2.291E+00	8.107E-05	2.617E-05	5.325E-05	4.506E-03	8.123E-04	4.653E-06	2.324E-03	5.632E-07	1.952E-07	5.492E-07	4.640E-07	7.157E-07	7.857E-06	3.649E-05	3.784E-03	6.257E-05	7.409E-06	2.981E-02
Hydraulic Shovel (34 m3)	Cat 6060 shovel - 34 m3 (2400 +)	Electric	1260	1690	85%	20	2000																									
Hydraulics Excav (6.5m3)	Cat 395	Tier 4	284	380	85%	20	600	23	77	6.728E-03	6.526E-03	2.228E-02	1.415E-03	9.627E-03	1.176E-01	8.302E-06	2.787E-06	5.613E-06	6.898E-04	1.029E-04	5.873E-07	2.414E-04	1.028E-07	3.574E-08	1.007E-07	6.588E-08	1.120E-07	9.891E-07	4.134E-06	4.031E-04	7.537E-06	9.406E-07	6.526E-03
Truck (229t)	Cat 793	Tier 4	1383	1855	85%	20	2000	23	79	2.328E-02	2.258E-02	7.261E-02	1.413E-03	3.157E-02	2.205E+00	6.526E-05	2.126E-05	4.350E-05	3.649E-03	6.562E-04	3.746E-06	1.898E-03	4.492E-07	1.506E-07	4.245E-07	3.705E-07	5.653E-07	6.350E-06	2.952E-05	3.108E-03	5.027E-05	5.950E-06	2.258E-02
Truck (810)	Cat 777	Tier 4	536	718	85%	20	750	23	3	6.229E-03	6.039E-03	1.902E-02	1.413E-03	8.260E-03	1.313E-01	7.490E-06	2.524E-06	5.073E-06	6.455E-04	9.487E-05	5.342E-07	2.178E-04	9.594E-08	3.233E-08	9.111E-08	5.953E-08	1.021E-07	8.975E-07	3.749E-06	3.612E-04	6.858E-06	8.526E-07	6.039E-03
Truck (40t)	Cat 740GC	Tier 4	236	316	85%	20	600	23	79	6.229E-03	6.039E-03	1.902E-02	1.413E-03	9.260E-03	1.113E-01	7.490E-06	2.524E-06	5.073E-06	6.455E-04	9.487E-05	5.342E-07	2.178E-04	9.594E-08	3.233E-08	9.111E-08	5.953E-08	1.021E-07	8.975E-07	3.749E-06	3.612E-04	6.858E-06	8.526E-07	6.039E-03
Truck Dozer	Truck Dozer - D10	Tier 4	400	536	71%	17	600	23	81	7.969E-03	7.730E-03	2.943E-02	1.417E-03	1.043E-02	1.315E-01	1.092E-05	3.366E-06	6.757E-06	7.845E-04	2.201E-04	7.028E-07	2.954E-04	1.233E-07	4.309E-08	1.215E-07	7.938E-08	1.361E-07	1.195E-06	4.950E-06	4.948E-04	9.010E-06	1.136E-06	7.730E-03
Grader	Grader - Cat 16	Tier 4	190	255	71%	17	300	23	78	6.245E-03	6.058E-03	1.904E-02	1.413E-03	9.262E-03	1.113E-01	7.491E-06	2.524E-06	5.074E-06	6.456E-04	9.489E-05	5.347E-07	2.178E-04	9.614E-08	3.242E-08	9.138E-08	5.964E-08	1.023E-07	8.984E-07	3.751E-06	3.613E-04	6.863E-06	8.536E-07	6.058E-03
Crusher Loader	Cat 992K HL	Tier 4	470	630	71%	17	750	23	20	1.602E-02	1.553E-02	1.060E-01	1.434E-03	1.555E-02	2.123E-01	2.099E-05	6.839E-06	1.300E-05	1.649E-03	6.078E-04	1.351E-06	5.556E-04	2.491E-07	8.738E-08	2.341E-07	1.445E-06	2.678E-07	1.728E-07	2.814E-07	1.429E-04	1.121E-05	1.025E-03	1.838E-05	2.374E-06	1.553E-02
Support Backhoe	Cat 336	Tier 4	158	211	71%	17	300	23	21	4.758E-02	4.616E-02	2.105E-01	1.708E-03	5.254E-02	4.203E-01	9.769E-05	2.988E-05	5.771E-05	6.407E-03	9.789E-04	5.511E-06	2.523E-03	7.036E-07	2.670E-07	7.423E-07	5.505E-07	8.112E-07	8.949E-06	4.252E-05	3.968E-03	7.602E-05	8.791E-06	4.616E-02
Water Truck	N/A	Tier 4	134	180	71%	17	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Lube/Fuel Truck	N/A	Tier 4	157	211	33%	8	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Mechanic's Truck	N/A	Tier 4	101	135	58%	14	175	23	79	1.099E-02	1.066E-02	4.923E-02	1.414E-03	7.691E-03	1.683E-01	1.133E-05	3.716E-06	7.567E-06	7.213E-04	1.215E-04	8.536E-07	3.291E-04	1.336E-07	6.963E-08	1.960E-07	1.133E-07	1.848E-07	1.482E-06	5.709E-06	5.713E-04	1.050E-05	1.445E-06	1.066E-02
Welding Truck	N/A	Tier 4	101	135	33%	8	175	23	79	1.099E-02	1.066E-02	4.923E-02	1.414E-03	7.691E-03	1.683E-01	1.133E-05	3.716E-06	7.567E-06	7.213E-04	1.215E-04	8.536E-07	3.291E-04	1.336E-07	6.963E-08	1.960E-07	1.133E-07	1.848E-07	1.482E-06	5.709E-06	5.713E-04	1.050E-05	1.445E-06	1.066E-02
Blasting Loader	N/A	Tier 4	101	135	33%	8	175	23	79	1.099E-02	1.066E-02	4.923E-02	1.414E-03	7.691E-03	1.683E-01	1.133E-05	3.716E-06	7.567E-06	7.213E-04	1.215E-04	8.536E-07	3.291E-04	1.336E-07	6.963E-08	1.960E-07	1.133E-07	1.848E-07	1.482E-06	5.709E-06	5.713E-04	1.050E-05	1.445E-06	1.066E-02
Blaster's Truck	N/A	Tier 4	101	135	33%	8	175	23	79	1.099E-02	1.066E-02	4.923E-02	1.414E-03	7.691E-03	1.683E-01	1.133E-05	3.716E-06	7.567E-06	7.213E-04	1.215E-04	8.536E-07	3.291E-04	1.336E-07	6.963E-08	1.960E-07	1.133E-07	1.848E-07	1.482E-06	5.709E-06	5.713E-04	1.050E-05	1.445E-06	1.066E-02
Integrated Tool Carrier	WA200-7	Tier 4	67	89	17%	4	100	23	20	1.271E-02	1.232E-02	5.640E-02	1.571E-03	7.246E-03	8.611E-01	1.207E-05	3.953E-06	8.065E-06	7.315E-04	1.262E-04	9.301E-07	3.510E-04	1.257E-07	7.175E-08	1.821E-07	1.072E-07	1.787E-07	1.616E-06	6.074E-06	5.750E-04	1.195E-05	1.562E-06	1.232E-02
Compactor	Hamm 3411	Tier 4	81	108	17%	4	175	23	3	1.137E-02	1.103E-02	5.119E-02	1.414E-03	7.986E-03	1.740E-01	1.050E-05	3.443E-06	7.017E-06	7.561E-04	1.174E-04	8.044E-07	3.395E-04	1.152E-07	7.149E-08	2.030E-07	1.181E-07	1.927E-07	1.532E-06	6.007E-06	6.024E-04	1.102E-05	1.532E-06	1.103E-02
Lighting Plants	N/A	?	9	50%	12	11	23	12	2.346E-01	2.276E-01	2.444E+00	2.162E-03	7.523E-01	4.182E+00	1.556E-03	5.070E-04	1.037E-03	8.702E-02	1.565E-02	8.031E-05	4.526E-02	8.301E-06	1.518E-06	4.279E-06	6.488E-06	9.467E-06	1.340E-04	6.791E-04	7.373E-02	1.123E-03	1.228E-04	2.276E-01
Pickup Trucks	N/A	?	151	203	42%	10	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Dump Truck	N/A	?	249	333	71%	17	600	23	79	6.229E-03	6.039E-03	1.902E-02	1.413E-03	9.260E-03	1.113E-01	7.490E-06	2.524E-06	5.073E-06	6.455E-04	9.487E-05	5.342E-07	2.178E-04	9.594E-08	3.233E-08	9.111E-08	5.953E-08	1.021E-07	8.975E-07	3.749E-06	3.612E-04	6.858E-06	8.526E-07	6.039E-03
Tire Manipulator	WA500-7	Tier 4	186	250	71%	17	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Road Maint Loader	Cat 988	Tier 4	258	319	71%	17	600	23	24	2.863E-02	2.777E-02	1.524E-01	1.462E-03	2.443E-02	2.421E-01	3.721E-05	3.990E-05	1.277E-05	2.527E-05	2.386E-03	4.166E-06	1.101E-03	3.808E-07	1.690E-07	4.736E-07	3.035E-07	5.004E-07	4.387E-06	1.882E-05	1.789E-03	3.394E-05	4.295E-06	2.777E-02
Crane - 30T	N/A	Tier 4	122	163	71%	17	175	23	17	1.132E-02	1.098E-02	5.115E-02	1.400E-03	8.138E-03	1.790E-01	1.228E-05	4.025E-06	8.201E-06	7.239E-04	1.320E-04	9.083E-07	3.568E-04	1.395E-07	7.182E-08	2.014E-07	1.187E-07	1.936E-07	1.574E-06	6.140E-06	6.199E-04	1.123E-05	1.531E-06	1.098E-02
Crane - 80T	N/A	Tier 4	96	129	71%	17	175	23	17	1.132E-02	1.098E-02	5.115E-02	1.400E-03	8.138E-03	1.790E-01	1.228E-05	4.025E-06	8.201E-06	7.239E-04	1.320E-04	9.083E-07	3.568E-04	1.395E-07	7.182E-08	2.014E-07	1.187E-07	1.936E-07	1.574E-06	6.140E-06	6.199E-04	1.123E-05	1.531E-06	1.098E-02
Man Bus	N/A	Tier 4	136	182	71%	17	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Pusher Truck	N/A	Tier 4	183	245	71%	17	300	23	79	6.320E-03	6.130E-03	1.912E-02	1.413E-03	9.270E-03	1.114E-01	7.497E-06	2.526E-06	5.078E-06	6.462E-04	9.497E-05	5.367E-07	2.180E-04	9.691E-08	3.280E-08	9.245E-08	6.009E-08	1.032E-07	9.022E-07	3.758E-06	3.615E-04	6.882E-06	8.577E-07	6.130E-03
Lowboy and tractor	N/A	Tier 4	128	171	71%	17	175	23	31	1.084E-02	1.051E-02	4.899E-02	1.414E-03	7.683E-03	1.683E-01	1.131E-05	3.712E-06	7.560E-06	7.206E-04	1.213E-04	8.490E-07	3.288E-04	1.324E-07	6.869E-08	1.933E-07	1.122E-07	1.829E-07	1.473E-06	5.694E-06	5.707E-04	1.048E-05	1.435E-06	1.051E-02
Concretebale Truck	Cat 740B	Tier 4	253	339	71%	17	600	23	79	6.229E-03	6.039E-03	1.902E-02	1.413E-03	9.260E-03	1.113E-01	7.490E-06	2.524E-06	5.073E-06	6.455E-04	9.487E-05	5.342E-07	2.178E-04	9.594E-08	3.233E-08	9.111E-08	5.953E-08	1.021E-07	8.975E-07	3.749E-06	3.612E-04	6.858E-06	8.526E-07	6.039E-03

Source			CP1											CP2											CP3										
Description			PSI B7 Mining (Year 6)											PSI J Mining (Year 6)											PSI SW Mining (Year 6)										
Equipment			Drill (165 mm)		Truck (229t)		Loader (23 m3)		Truck Dozer		Blasting Loader		Lighting Plants		Total		Truck Dozer		Truck (229t)		Lighting Plants		Total		Drill (165 mm)		Track Dozer		Truck (229t)		Lighting Plants		Diesel Genset		Loader (23 m3)	
			1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h
Equipment #			2	2	7	7	4	4	10	10	18	18	22	22			10	10	7	7	22	22			2	2	10	10	7	7	22	22			4	4
Average Horsepower			378	378	1855	1855	1309	1309	536	536	135	135	9	9			536	536	1855	1855	9	9			378	378	536	536	1855	1855	9	9	Emissions from generator		1309	1309
Equipment Operating Time			1	17	20	20	1	20	1	17	1	8	1	12			1	17	20	20	1	12			1	17	17	17	20	20	1	12	emission calculation		1	8
Source Operating Time			1	24	20	24	1	24	1	24	1	24	1	24			1	24	24	24	1	24			1	24	24	24	24	24	1	24	spreadsheet		1	24
Number of Equipment			1	1	0				1	1	1	1	1	1			1	1			1	1			1	1	1	1			1	1			1	1
Other Parameters																																			
Pit Depth																																			
Ramp Grade																																			
Number of Trips					442	442													155	155									442	442					
Average Speed (km/hr)																																			
Idling Time (hr/truck)					0.03	0.03													0.03	0.03									0.03	0.03					
Loading/Unloading Time (hr/truck)					0.02	0.02													0.02	0.02									0.02	0.02					
Travel time # PF. or Storage (hr)					22.1	22.1													7.8	7.8									22.1	22.1					
COPC	**CAS**	**MOVES ID**																																	
PM_{10}	[PM10]	100	4.39E-03	3.10E-03	1.33E-02	1.10E-02	1.12E-02	9.50E-03	1.19E-03	8.37E-04	4.13E-04	1.38E-04	6.12E-04	3.06E-04	**3.10E-02**	**2.49E-02**	1.19E-03	8.37E-04	3.88E-03	3.88E-03	6.12E-04	3.06E-04	**1.69E-02**	**1.45E-02**	4.39E-03	3.10E-03	8.37E-04	8.37E-04	1.10E-02	1.10E-02	6.12E-04	3.06E-04	4.27E-02	4.27E-02	1.12E-02	9.50E-03	4.13E-04	1.38E-04	2.80E-03	1.98E-03	2.79E-03	1.97E-03	**7.68E-02**	**7.16E-02**
$PM_{2.5}$	[PM2.5]	110	4.24E-03	3.01E-03	1.29E-02	9.21E-03	1.15E-02	8.12E-03	1.16E-03	8.12E-04	4.00E-04	1.34E-04	5.93E-04	2.97E-04	**3.01E-02**	**2.42E-02**	1.15E-03	8.12E-04	3.77E-03	3.77E-03	5.93E-04	2.97E-04	**1.63E-02**	**1.41E-02**	4.24E-03	3.01E-03	8.12E-04	8.12E-04	9.21E-03	9.21E-03	5.93E-04	2.97E-04	4.24E-02	4.24E-02	1.08E-02	7.98E-03	4.00E-04	1.34E-04	2.72E-03	1.92E-03	2.71E-03	1.91E-03	**7.58E-02**	**7.07E-02**
CO	630-08-0	2	2.63E-02	1.85E-02	4.14E-02	3.45E-02	4.74E-02	4.03E-02	4.38E-03	3.09E-03	1.85E-03	6.16E-04	6.37E-03	3.19E-03	**1.28E-01**	**1.00E-01**	4.38E-03	3.09E-03	1.21E-02	1.21E-02	6.37E-03	3.19E-03	**7.03E-02**	**5.87E-02**	2.63E-02	1.85E-02	3.09E-03	3.09E-03	3.45E-02	3.45E-02	6.37E-03	3.19E-03	6.84E-01	6.84E-01	4.74E-02	4.03E-02	1.85E-03	6.16E-04	1.86E-02	1.31E-02	1.23E-02	8.69E-03	**6.34E-01**	**8.06E-01**
SO_2	7446-09-5	31	1.58E-04	1.11E-04	8.05E-04	6.71E-04	5.23E-04	4.45E-04	2.11E-04	1.49E-04	5.31E-05	1.77E-05	3.56E-04	1.78E-04	**1.76E-03**	**1.40E-03**	2.11E-04	1.49E-04	2.36E-04	2.36E-04	3.56E-04	1.78E-04	**9.73E-04**	**8.12E-04**	1.58E-04	1.11E-04	1.49E-04	1.49E-04	6.71E-04	6.71E-04	3.56E-04	1.78E-04	5.31E-03	5.31E-03	5.23E-04	4.45E-04	5.31E-05	1.77E-05	2.51E-04	7.77E-04	1.00E-04	7.06E-05	**4.34E-03**	**4.07E-03**
Hydrocarbons	[NMHC]	1	5.55E-03	3.92E-03	1.80E-02	1.50E-02	1.43E-02	1.21E-02	1.55E-03	1.09E-03	2.89E-04	9.63E-05	1.96E-03	9.81E-04	**4.16E-02**	**3.32E-02**	1.55E-03	1.09E-03	5.26E-03	5.26E-03	1.96E-03	9.81E-04	**2.30E-02**	**1.95E-02**	5.55E-03	3.92E-03	1.09E-03	1.09E-03	1.50E-02	1.50E-02	1.96E-03	9.81E-04	1.52E-01	1.52E-01	1.43E-02	1.21E-02	2.89E-04	9.63E-05	2.72E-03	1.92E-03	3.08E-03	2.17E-03	**1.96E-01**	**1.89E-01**
NOx	10102-44-0	3	6.42E-02	3.96E-02	2.68E-01	1.73E-01	8.33E-01	7.08E-01	1.96E-02	1.38E-02	6.32E-03	2.11E-03	1.09E-02	5.45E-03	**2.21E+00**	**1.84E+00**	1.96E-02	1.38E-02	8.24E-02	8.24E-02	1.09E-02	5.45E-03	**1.20E+00**	**1.09E+00**	6.42E-02	3.96E-02	1.38E-02	1.38E-02	1.73E-01	1.73E-01	1.09E-02	5.45E-03	4.26E+00	4.26E+00	8.33E-01	7.08E-01	6.32E-03	2.11E-03	1.73E-02	2.63E-02	2.27E-02	1.74E-02	**6.32E+00**	**6.04E+00**
1,3-butadiene	106-99-0	24	1.03E-05	7.27E-06	3.72E-05	3.10E-05	2.95E-05	2.50E-05	1.49E-06	1.05E-06	4.25E-07	1.42E-07	2.06E-06	2.03E-06	**8.29E-05**	**6.65E-05**	1.49E-06	1.05E-06	1.09E-05	1.09E-05	4.06E-06	2.03E-06	**4.59E-05**	**3.90E-05**	1.03E-05	7.27E-06	1.05E-06	1.05E-06	3.10E-05	3.10E-05	4.06E-06	2.03E-06	0.00E+00	0.00E+00	2.95E-05	2.50E-05	4.25E-07	1.42E-07	3.67E-06	2.83E-05	5.74E-06	4.04E-06	**8.57E-05**	**7.32E-05**
Acenaphthene	83-32-9	70+170	3.84E-06	2.71E-06	1.21E-05	9.51E-06	8.09E-06	6.98E-07	5.51E-07	3.91E-07	1.46E-07	4.87E-08	1.12E-06	6.61E-07	**2.74E-05**	**2.19E-05**	4.98E-07	3.51E-07	1.54E-06	1.54E-06	1.12E-06	6.61E-07	**1.26E-05**	**1.04E-05**	3.84E-06	2.71E-06	3.51E-07	3.51E-07	9.51E-06	9.09E-06	1.12E-06	6.61E-07	7.43E-06	7.43E-06	3.51E-06	6.98E-07	1.46E-07	4.87E-08	1.23E-06	8.51E-07	1.75E-06	1.24E-06	**3.56E-05**	**3.15E-05**
Acenaphthylene	208-96-8	71+171	5.31E-06	3.64E-06	2.48E-05	2.06E-05	1.94E-05	1.65E-05	1.01E-06	7.09E-07	2.84E-07	9.47E-08	2.71E-06	1.35E-06	**5.33E-05**	**4.29E-05**	1.01E-06	7.09E-07	2.25E-06	2.25E-06	2.71E-06	1.35E-06	**3.03E-05**	**2.58E-05**	5.31E-06	3.64E-06	7.09E-07	7.09E-07	2.06E-05	2.06E-05	2.71E-06	1.35E-06	3.46E-05	3.46E-05	1.94E-05	1.65E-05	2.84E-07	9.47E-08	2.45E-06	1.73E-06	3.39E-06	2.39E-06	**6.93E-05**	**6.17E-05**
Acetaldehyde	75-07-0	26	5.32E-04	3.75E-04	2.08E-03	1.73E-03	1.14E-03	1.39E-03	1.17E-04	8.24E-05	2.76E-05	9.01E-06	2.27E-04	1.13E-04	**4.23E-03**	**3.29E-03**	1.17E-04	8.24E-05	4.24E-04	4.24E-04	2.27E-04	1.13E-04	**2.59E-03**	**2.22E-03**	5.32E-04	3.75E-04	8.24E-05	8.24E-05	1.73E-03	1.73E-03	2.27E-04	1.13E-04	4.00E-05	4.00E-05	1.64E-03	1.39E-03	2.76E-05	9.01E-06	2.43E-04	1.73E-04	3.37E-04	2.47E-04	**4.64E-03**	**4.14E-03**
Acrolein	107-02-8	27	1.23E-04	8.70E-05	3.74E-04	3.11E-04	2.95E-04	2.51E-04	1.79E-05	1.26E-05	4.68E-06	2.44E-06	4.08E-05	2.04E-05	**8.56E-04**	**6.64E-04**	1.79E-05	1.26E-05	4.07E-05	4.07E-05	4.08E-05	2.04E-05	**4.64E-04**	**3.93E-04**	1.23E-04	8.70E-05	1.26E-05	1.26E-05	3.11E-04	3.11E-04	4.08E-05	2.04E-05	1.51E-04	1.51E-04	2.51E-04	2.51E-04	4.68E-06	2.44E-06	5.12E-05	4.03E-05	4.05E-05	4.05E-05	**8.98E-04**	**7.65E-04**
Anthracene	120-12-7	72+172	6.27E-07	4.42E-07	2.13E-06	1.78E-06	1.69E-06	1.44E-06	1.05E-07	7.39E-08	2.69E-08	1.05E-07	**4.80E-06**	**3.85E-06**	1.05E-07	7.39E-08	4.25E-07	4.25E-07	**2.03E-06**	**2.24E-06**	6.27E-07	4.42E-07	7.39E-08	7.39E-08	1.78E-06	1.78E-06	2.09E-07	1.05E-07	1.95E-06	1.95E-06	1.69E-06	1.44E-06	3.23E-08	1.07E-08	2.53E-07	1.78E-07	3.23E-07	2.28E-07	**6.94E-06**	**6.20E-06**
Benzene	71-43-2	20	2.24E-04	1.58E-04	7.58E-04	6.31E-04	4.15E-04	3.39E-03	4.34E-05	3.06E-05	1.68E-05	5.48E-06	8.26E-05	4.13E-05	**1.56E-03**	**1.21E-03**	4.34E-05	3.06E-05	1.54E-04	1.54E-04	8.26E-05	4.13E-05	**9.41E-04**	**7.97E-04**	2.24E-04	1.58E-04	3.06E-05	3.06E-05	6.31E-04	6.31E-04	8.26E-05	4.13E-05	1.23E-03	1.23E-03	3.39E-03	4.15E-04	1.68E-05	5.48E-06	1.25E-05	7.50E-06	1.38E-05	1.05E-05	**2.82E-04**	**2.52E-04**
Benzo(a)anthracene	56-55-3	73+173	6.03E-08	4.25E-08	2.56E-07	2.15E-07	2.05E-07	1.74E-07	1.77E-08	1.25E-08	5.94E-09	2.13E-09	1.08E-07	1.08E-07	**5.65E-07**	**4.55E-07**	1.77E-08	1.25E-08	7.49E-08	7.49E-08	2.16E-07	1.08E-07	**3.19E-07**	**2.72E-07**	6.03E-08	4.25E-08	1.25E-08	1.25E-08	2.15E-07	2.15E-07	2.16E-07	1.08E-07	9.87E-07	9.87E-07	2.05E-07	2.06E-07	5.02E-09	1.67E-09	3.92E-08	2.76E-08	1.14E-07	8.72E-08	**1.58E-06**	**1.50E-06**
Benzo(b+k)fluoranthene	50-32-8	74+174	3.00E-08	8.01E-08	1.27E-07	4.05E-07	1.02E-07	3.28E-07	8.81E-09	2.35E-08	2.95E-09	4.01E-09	5.38E-08	2.04E-07	**2.81E-07**	**8.56E-07**	8.81E-09	2.35

Source: Mobile Emissions Sources

Source Description	CM7						CM5								CM6										CM1		CM2		CM3		CM4		CPLANT											
	Waste Dump 8F						Waste Dump 5W								Tailings Construction										Unloading Ore at Coarse Ore		Unloading OVB at OB NW		Unloading OVB at OB West		Unloading OVB at OB SW		Processing Plant Mobile Equipment											
Equipment	Track Dozer		Truck (129t)		Total		Track Dozer		Truck (129t)		Total		Track Dozer		Truck (129t)		Hydraulic Excav (6.5m3)		Compactor		Lighting Plants		Total		Truck (129t)		Truck (129t)		Truck (129t)		Truck (129t)		Integrated Tool Carrier		Tire Manipulator		Road Maint Loader		Crane - 60T		Crane - 30T		Lighting Plants		Total	
	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h	1h	24h
Equipment #	10	10	7	7			10	10	7	7			10	10	7	7	6	6	21	21	22	22			7	7	7	7	7	7	7	7	20	20	25	25	26	26	27	27	28	28	22	22		
Average Horsepower	536	536	1855	1855			536	536	1855	1855			536	536	1855	1855	380	380	108	108	9	9			1855	1855	1854.6712	1855	1855	1855	1855	1855	89	89	250	250	319	319	163	163	129	129	9	9		
Equipment Operating Time	1	17	20	20			1	17	20	20			1	17	20	20	1	20	1	4	1	12			20	20	20.4	20	20	20	20	20	17	4	17	17	1	17	1	17	17	17	1	12		
Source Operating Time	1	24	24	24			1	24	20	24			1	24	20	24	1	24	1	24	1	24			20	24	24	24	24	24	24	24	24	24	24	24	1	24	1	24	24	24	1	24		
Number of Equipment	1	1					1	1					1	1			1	2	1	2	1	2											1	1	1	1	1	1	1	1	1	1				
Other Parameters																																											
Pit Depth																																											
Ramp Grade																																											
Number of Trips			332	332					341	341					145	145									256	256	27	27	23	23	4	4												
Average Speed (km/hr)																																												
Idling Time (hr/truck)			0.03	0.03					0.03	0.03					0.03	0.03									0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03												
Loading/Unloading Time (hr/truck)			0.02	0.02					0.02	0.02					0.02	0.02									0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02												
Travel time in Pit or Storage (hr)			16.6	16.6					17.0	17.0															12.8	12.8	1.3	1.3	1.1	1.1	0.2	0.2												
COPC																																											
PM_{10}	1.19E-03	8.37E-04	8.30E-03	8.30E-03	**9.48E-03**	**9.13E-03**	1.19E-03	8.37E-04	1.02E-02	8.51E-03	**1.14E-02**	**9.35E-03**	1.19E-03	8.37E-04	4.35E-03	3.63E-03	1.42E-03	1.21E-03	3.41E-04	5.68E-05	1.22E-03	6.12E-04	**8.33E-03**	**6.34E-03**	**7.68E-03**	**6.40E-03**	**6.65E-04**	**6.65E-04**	**5.74E-04**	**5.74E-04**	**6.00E-04**	**9.30E-05**	2.23E-04	5.25E-05	3.09E-04	3.09E-04	2.54E-03	1.79E-03	5.12E-04	3.61E-04	2.86E-04	2.85E-04	6.12E-04	3.06E-04	**4.48E-03**	**3.19E-03**
$PM_{2.5}$	1.15E-03	8.12E-04	8.05E-03	8.05E-03	**9.20E-03**	**8.86E-03**	1.15E-03	8.12E-04	9.91E-03	8.26E-03	**1.11E-02**	**9.07E-03**	1.15E-03	8.12E-04	4.22E-03	3.52E-03	1.38E-03	1.17E-03	3.31E-04	5.51E-05	1.19E-03	5.93E-04	**8.27E-03**	**6.15E-03**	**7.45E-03**	**6.20E-03**	**6.45E-04**	**6.45E-04**	**5.57E-04**	**5.57E-04**	**5.82E-04**	**9.02E-05**	2.16E-04	5.09E-05	3.00E-04	3.00E-04	2.46E-03	1.74E-03	4.97E-04	3.51E-04	2.78E-04	2.77E-04	5.93E-04	2.97E-04	**4.35E-03**	**3.01E-03**
CO	4.38E-03	3.09E-03	2.59E-02	2.59E-02	**3.03E-02**	**2.90E-02**	4.38E-03	3.09E-03	3.19E-02	2.66E-02	**3.62E-02**	**2.96E-02**	4.38E-03	3.09E-03	1.36E-02	1.13E-02	4.71E-03	4.00E-03	1.53E-03	2.56E-04	1.27E-02	6.37E-03	**3.69E-02**	**2.50E-02**	**2.39E-02**	**2.00E-02**	**2.07E-03**	**2.07E-03**	**1.79E-03**	**1.79E-03**	**1.87E-03**	**2.90E-04**	9.90E-04	2.33E-04	9.35E-04	9.35E-04	1.31E-02	9.53E-03	2.32E-03	1.63E-03	1.29E-03	1.29E-03	6.37E-03	3.19E-03	**2.54E-02**	**1.68E-02**
SO_2	2.11E-04	1.49E-04	5.04E-04	5.04E-04	**7.15E-04**	**6.52E-04**	2.11E-04	1.49E-04	6.20E-04	5.17E-04	**8.31E-04**	**6.66E-04**	2.11E-04	1.49E-04	2.64E-04	2.20E-04	2.99E-04	2.54E-04	4.24E-05	7.07E-06	1.13E-05	5.64E-06	**8.28E-04**	**6.36E-04**	**4.66E-04**	**3.88E-04**	**4.04E-05**	**4.04E-05**	**3.49E-05**	**3.49E-05**	**3.64E-05**	**5.64E-06**	2.76E-05	6.48E-06	6.91E-05	6.91E-05	1.30E-04	9.14E-05	6.33E-05	4.47E-05	3.54E-05	3.52E-05	5.64E-06	2.82E-06	**3.31E-04**	**2.50E-04**
Hydrocarbons	1.55E-03	1.09E-03	1.13E-02	1.13E-02	**1.28E-02**	**1.23E-02**	1.55E-03	1.09E-03	1.39E-02	1.15E-02	**1.54E-02**	**1.26E-02**	1.55E-03	1.09E-03	5.90E-03	4.92E-03	2.03E-03	1.73E-03	2.39E-04	3.99E-05	3.92E-03	1.96E-03	**1.37E-02**	**9.74E-03**	**1.04E-02**	**8.67E-03**	**9.02E-04**	**9.02E-04**	**7.79E-04**	**7.79E-04**	**8.13E-04**	**1.26E-04**	1.27E-04	2.99E-05	4.53E-04	4.53E-04	2.16E-03	1.53E-03	3.68E-04	2.60E-04	2.06E-04	2.05E-04	1.96E-03	9.81E-04	**5.28E-03**	**3.46E-03**
NOx	1.96E-02	1.38E-02	7.84E-01	7.86E-01	**8.05E-01**	**8.00E-01**	1.96E-02	1.38E-02	9.68E-01	8.06E-01	**9.87E-01**	**8.20E-01**	1.96E-02	1.38E-02	4.12E-01	3.44E-01	2.48E-02	2.11E-02	5.22E-03	8.69E-04	2.18E-02	1.09E-02	**4.84E-01**	**3.90E-01**	**2.27E-01**	**6.09E-01**	**6.30E-02**	**6.30E-02**	**5.44E-02**	**5.44E-02**	**5.68E-02**	**8.81E-03**	1.51E-02	4.56E-03	5.45E-03	5.45E-03	3.30E-02	2.33E-02	8.10E-03	5.71E-03	4.53E-03	4.51E-03	1.09E-02	5.45E-03	**7.71E-02**	**4.79E-02**
1,3-butadiene	1.49E-06	1.05E-06	2.33E-05	2.33E-05	**2.48E-05**	**2.43E-05**	1.49E-06	1.05E-06	2.86E-05	2.39E-05	**3.01E-05**	**2.49E-05**	1.49E-06	1.05E-06	1.22E-05	1.02E-05	1.75E-06	1.49E-06	3.59E-07	5.98E-08	8.12E-06	4.06E-06	**2.39E-05**	**1.68E-05**	**2.15E-05**	**1.79E-05**	**1.86E-06**	**1.86E-06**	**1.61E-06**	**1.61E-06**	**1.68E-06**	**2.61E-07**	2.12E-07	4.98E-08	3.67E-07	3.67E-07	3.54E-06	2.49E-06	5.56E-07	3.92E-07	3.11E-07	3.09E-07	4.06E-06	2.03E-06	**9.04E-06**	**5.64E-06**
Acenaphthene	4.98E-07	3.51E-07	7.58E-06	7.58E-06	**8.07E-06**	**7.93E-06**	4.98E-07	3.51E-07	9.33E-06	7.77E-06	**9.83E-06**	**8.13E-06**	4.98E-07	3.51E-07	9.33E-06	7.77E-06	9.98E-06	3.31E-06	5.89E-07	1.68E-07	1.96E-08	2.44E-06	**7.82E-06**	**5.51E-06**	**7.01E-06**	**5.84E-06**	**6.07E-07**	**6.07E-07**	**5.24E-07**	**5.24E-07**	**5.48E-07**	**8.49E-08**	6.94E-08	1.63E-08	1.24E-07	1.24E-07	1.13E-06	7.98E-07	1.82E-07	1.28E-07	1.02E-07	1.01E-07	1.33E-06	6.61E-07	**2.95E-06**	**1.83E-06**
Acenaphthylene	1.01E-06	7.09E-07	1.55E-05	1.55E-05	**1.65E-05**	**1.62E-05**	1.01E-06	7.09E-07	1.91E-05	1.59E-05	**2.01E-05**	**1.66E-05**	1.01E-06	7.09E-07	8.13E-06	6.78E-06	1.19E-06	1.01E-06	2.40E-07	3.99E-08	5.41E-06	2.71E-06	**1.60E-05**	**1.12E-05**	**1.43E-05**	**1.20E-05**	**1.24E-06**	**1.24E-06**	**1.07E-06**	**1.07E-06**	**1.12E-06**	**1.74E-07**	1.42E-07	3.33E-08	2.48E-07	2.48E-07	2.24E-06	1.58E-06	3.71E-07	2.62E-07	2.07E-07	2.06E-07	2.71E-06	1.35E-06	**5.91E-06**	**3.68E-06**
Acetaldehyde	1.17E-04	8.24E-05	1.30E-03	1.30E-03	**1.42E-03**	**1.38E-03**	1.17E-04	8.24E-05	1.60E-03	1.33E-03	**1.72E-03**	**1.42E-03**	1.17E-04	8.24E-05	6.82E-04	5.68E-04	1.46E-04	1.24E-04	2.27E-05	3.78E-06	4.54E-04	2.27E-04	**1.42E-03**	**1.01E-03**	**1.20E-03**	**1.00E-03**	**1.04E-04**	**1.04E-04**	**9.00E-05**	**9.00E-05**	**9.40E-05**	**1.46E-05**	1.28E-05	5.02E-06	3.16E-05	3.16E-05	2.12E-04	1.49E-04	3.50E-05	2.47E-05	1.96E-05	1.95E-05	2.27E-04	1.13E-04	**5.37E-04**	**3.41E-04**
Acrolein	1.79E-05	1.26E-05	2.34E-04	2.34E-04	**2.52E-04**	**2.46E-04**	1.79E-05	1.26E-05	2.88E-04	2.40E-04	**3.06E-04**	**2.53E-04**	1.79E-05	1.26E-05	1.23E-04	1.02E-04	2.17E-05	1.85E-05	3.83E-06	6.39E-07	8.16E-05	4.08E-05	**2.48E-04**	**1.75E-04**	**2.16E-04**	**1.80E-04**	**1.87E-05**	**1.87E-05**	**1.62E-05**	**1.62E-05**	**1.69E-05**	**2.62E-06**	2.21E-06	5.21E-07	4.65E-06	4.65E-06	3.49E-05	2.60E-05	5.93E-06	4.18E-06	3.31E-06	3.30E-06	4.08E-05	2.04E-05	**9.38E-05**	**5.91E-05**
Anthracene	1.05E-07	7.39E-08	1.34E-06	1.34E-06	**1.44E-06**	**1.41E-06**	1.05E-07	7.39E-08	1.64E-06	1.37E-06	**1.75E-06**	**1.44E-06**	1.05E-07	7.39E-08	7.00E-07	5.84E-07	1.24E-07	1.05E-07	2.68E-08	4.47E-09	4.19E-07	2.09E-07	**1.37E-06**	**9.77E-07**	**1.24E-06**	**1.03E-06**	**1.07E-07**	**1.07E-07**	**9.24E-08**	**9.24E-08**	**9.65E-08**	**1.50E-08**	1.63E-08	3.84E-09	2.63E-08	2.63E-08	2.32E-07	1.64E-07	4.11E-08	2.90E-08	2.30E-08	2.29E-08	2.09E-07	1.05E-07	**5.48E-07**	**3.50E-07**
Benzene	4.34E-05	3.05E-05	6.76E-04	6.76E-04	**7.20E-04**	**7.07E-04**	4.34E-05	3.05E-05	8.31E-04	6.94E-04	**8.76E-04**	**7.25E-04**	4.34E-05	3.05E-05	3.55E-04	2.96E-04	5.10E-05	4.33E-05	1.04E-05	1.74E-06	2.36E-04	1.18E-04	**6.96E-04**	**4.89E-04**	**6.26E-04**	**5.22E-04**	**5.42E-05**	**5.42E-05**	**4.68E-05**	**4.68E-05**	**4.89E-05**	**7.58E-06**	6.16E-06	1.45E-06	1.07E-05	1.07E-05	9.76E-05	6.86E-05	1.61E-05	1.14E-05	9.03E-06	8.98E-06	1.18E-04	5.90E-05	**2.58E-04**	**1.60E-04**
Benzo(a)anthracene	1.77E-08	1.25E-08	1.60E-07	1.60E-07	**1.73E-07**	**1.71E-07**	1.77E-08	1.25E-08	1.97E-07	1.64E-07	**2.15E-07**	**1.77E-07**	1.77E-08	1.25E-08	8.40E-08	7.00E-08	2.17E-08	1.85E-08	4.47E-09	4.95E-10	4.33E-08	2.16E-08	**1.71E-07**	**1.21E-07**	**1.48E-07**	**1.23E-07**	**1.28E-08**	**1.28E-08**	**1.11E-08**	**1.11E-08**	**1.16E-08**	**1.79E-09**	2.20E-09	5.19E-10	4.74E-09	4.74E-09	3.38E-08	2.38E-08	6.33E-09	4.47E-09	3.54E-09	3.52E-09	2.16E-08	1.08E-08	**7.22E-08**	**4.79E-08**
Benzo(a)pyrene	6.53E-09	4.61E-09	5.37E-08	5.37E-08	**5.83E-08**	**5.81E-08**	6.53E-09	4.61E-09	6.61E-08	5.51E-08	**7.26E-08**	**5.97E-08**	6.53E-09	4.61E-09	2.82E-08	2.35E-08	7.55E-09	6.42E-09	2.16E-09	3.61E-10	7.92E-09	3.96E-09	**5.26E-08**	**3.88E-08**	**4.97E-08**	**4.14E-08**	**4.30E-09**	**4.30E-09**	**3.72E-09**	**3.72E-09**	**3.88E-09**	**6.02E-10**	1.26E-09	2.96E-10	1.60E-09	1.60E-09	1.50E-08	1.06E-08	3.25E-09	2.29E-09	1.82E-09	1.81E-09	3.96E-09	1.98E-09	**2.49E-08**	**1.85E-08**
Benzo(b+k)fluoranthene	1.84E-08	1.30E-08	1.51E-07	1.51E-07	**1.70E-07**	**1.64E-07**	1.84E-08	1.30E-08	1.86E-07	1.55E-07	**2.05E-07**	**1.68E-07**	1.84E-08	1.30E-08	7.94E-08	6.62E-08	2.13E-08	1.81E-08	6.09E-09	1.01E-09	2.23E-08	1.12E-08	**1.47E-07**	**1.09E-07**	**1.40E-07**	**1.17E-07**	**1.21E-08**	**1.21E-08**	**1.05E-08**	**1.05E-08**	**1.09E-08**	**1.70E-09**	3.19E-09	7.52E-10	4.52E-09	4.52E-09	4.20E-08	2.96E-08	9.15E-09	6.45E-09	5.11E-09	5.09E-09	1.12E-08	5.58E-09	**7.51E-08**	**5.20E-08**
Benzo(j,k,l)perylene	1.20E-08	8.43E-09	1.33E-07	1.32E-07	**1.44E-07**	**1.40E-07**	1.20E-08	8.43E-09	1.63E-07	1.35E-07	**1.75E-07**	**1.44E-07**	1.20E-08	8.43E-09	6.93E-08	5.77E-08	1.39E-08	1.18E-08	3.64E-09	5.90E-10	3.38E-08	1.69E-08	**1.31E-07**	**9.55E-08**	**1.22E-07**	**1.02E-07**	**1.06E-08**	**1.06E-08**	**9.14E-09**	**9.14E-09**	**9.54E-09**	**1.48E-09**	1.88E-09	4.43E-10	2.94E-09	2.94E-09	2.69E-08	1.90E-08	5.37E-09	3.79E-09	3.00E-09	2.99E-09	6.69E-09	8.44E-09	**5.76E-08**	**3.76E-08**
Chrysene	2.01E-08	1.42E-08	2.01E-07	2.01E-07	**2.22E-07**	**2.16E-07**	2.01E-08	1.42E-08	2.48E-07	2.07E-07	**2.68E-07**	**2.21E-07**	2.01E-08	1.42E-08	1.06E-07	8.81E-08	2.37E-08	2.01E-08	5.77E-09	9.61E-10	4.91E-08	2.45E-08	**2.04E-07**	**1.48E-07**	**1.86E-07**	**1.55E-07**	**1.61E-08**	**1.61E-08**	**1.39E-08**	**1.39E-08**	**1.46E-08**	**2.26E-09**	3.14E-09	7.38E-10	5.05E-09	5.05E-09	4.44E-08	3.13E-08	8.73E-09	6.16E-09	4.88E-09	4.86E-09	2.45E-08	1.23E-08	**9.07E-08**	**6.04E-08**
Fluoranthene	1.77E-07	1.25E-07	2.26E-06	2.26E-06	**2.44E-06**	**2.39E-06**	1.77E-07	1.25E-07	2.79E-06	2.32E-06	**2.96E-06**	**2.45E-06**	1.77E-07	1.25E-07	1.19E-06	9.89E-07	2.09E-07	1.78E-07	4.65E-08	7.75E-09	6.99E-07	3.50E-07	**2.32E-06**	**1.65E-06**	**2.09E-06**	**1.74E-06**	**1.81E-07**	**1.81E-07**	**1.57E-07**	**1.57E-07**	**1.64E-07**	**2.54E-08**	2.84E-08	6.67E-09	4.41E-08	4.41E-08	3.80E-07	2.74E-07	7.12E-08	5.31E-08	3.98E-08	3.96E-08	3.50E-07	1.75E-07	**1.25E-06**	**8.29E-07**
Fluorene	7.38E-07	5.21E-07	1.05E-05	1.05E-05	**1.13E-05**	**1.10E-05**	7.38E-07	5.21E-07	1.30E-05	1.08E-05	**1.37E-05**	**1.13E-05**	7.38E-07	5.21E-07	5.52E-06	4.60E-06	8.73E-07	7.42E-07	1.80E-07	3.00E-08	3.54E-06	1.77E-06	**1.09E-05**	**7.66E-06**	**9.73E-06**	**8.11E-06**	**8.43E-07**	**8.43E-07**	**7.28E-07**	**7.28E-07**	**7.60E-07**	**1.18E-07**	1.07E-07	2.51E-08	1.84E-07	1.84E-07	1.67E-06	1.18E-06	2.78E-07	1.96E-07	1.55E-07	1.55E-07	1.77E-06	8.85E-07	**4.16E-06**	**2.62E-06**
Formaldehyde	7.37E-05	5.20E-05	1.11E-03	1.11E-03	**1.18E-03**	**1.16E-03**	7.37E-05	5.20E-05	1.36E-03	1.14E-03	**1.44E-03**	**1.19E-03**	7.37E-05	5.20E-05	5.81E-04	4.84E-04	8.51E-05	7.24E-05	1.81E-05	3.01E-06	3.84E-04	1.92E-04	**1.14E-03**	**8.04E-04**	**1.02E-03**	**8.54E-04**	**8.88E-05**	**8.88E-05**	**7.67E-05**	**7.67E-05**	**8.01E-05**	**1.24E-05**	1.01E-05	2.37E-06	1.77E-05	1.77E-05	1.58E-04	1.12E-04	2.81E-05	1.85E-05	1.57E-05	1.56E-05	1.93E-04	9.61E-05	**4.22E-04**	**2.63E-04**
Phenanthrene	1.34E-06	9.46E-07	1.79E-05	1.79E-05	**1.93E-05**	**1.89E-05**	1.34E-06	9.46E-07	2.21E-05	1.84E-05	**2.34E-05**	**1.93E-05**	1.34E-06	9.46E-07	9.40E-06	7.83E-06	1.59E-06	1.35E-06	3.30E-07	5.51E-08	5.87E-06	2.93E-06	**1.85E-05**	**1.31E-05**	**1.66E-05**	**1.38E-05**	**1.44E-06**	**1.44E-06**	**1.24E-06**	**1.24E-06**	**1.30E-06**	**2.01E-07**	2.10E-07	4.93E-08	3.37E-07	3.37E-07	3.01E-06	2.12E-06	5.08E-07	3.59E-07	2.84E-07	2.83E-07	2.93E-06	1.47E-06	**7.28E-06**	**4.62E-06**
Pyrene	1.69E-07	1.19E-07	2.12E-06	2.12E-06	**2.29E-06**	**2.24E-06**	1.69E-07	1.19E-07	2.61E-06	2.18E-06	**2.78E-06**	**2.30E-06**	1.69E-07	1.19E-07	1.11E-06	9.27E-07	1.99E-07	1.69E-07	4.53E-08	7.55E-09	6.40E-07	3.20E-07	**2.17E-06**	**1.54E-06**	**1.96E-06**	**1.63E-06**	**1.70E-07**	**1.70E-07**	**1.47E-07**	**1.47E-07**	**1.53E-07**	**2.38E-08**	2.74E-08	6.45E-09	4.20E-08	4.20E-08	3.80E-07	2.68E-07	6.93E-08	4.89E-08	3.87E-08	3.86E-08	3.20E-07	1.60E-07	**8.78E-07**	**5.64E-07**
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	1.15E-03	8.12E-04	8.05E-03	8.05E-03	**9.20E-03**	**8.86E-03**	1.15E-03	8.12E-04	9.91E-03	8.26E-03	**1.11E-02**	**9.07E-03**	1.15E-03	8.12E-04	4.22E-03	3.52E-03	1.38E-03	1.17E-03	3.31E-04	5.51E-05	1.19E-03	5.93E-04	**8.27E-03**	**6.15E-03**	**7.45E-03**	**6.20E-03**	**6.45E-04**	**6.45E-04**	**5.57E-04**	**5.57E-04**	**5.82E-04**	**9.02E-05**	2.16E-04	5.09E-05	3.00E-04	3.00E-04	2.46E-03	1.74E-03	4.97E-04	3.51E-04	2.78E-04	2.77E-04	5.93E-04	2.97E-04	**4.35E-03**	**3.01E-03**
Elemental Carbon (from diesel exhaust)	7.48E-04	5.28E-04	5.23E-03	5.23E-03	**5.98E-03**	**5.76E-03**	7.48E-04	5.28E-04	6.44E-03	5.37E-03	**7.19E-03**	**5.90E-03**	7.48E-04	5.28E-04	2.74E-03	2.29E-03	8.96E-04	7.62E-04	2.15E-04	3.58E-05	7.72E-04	3.86E-04	**5.38E-03**	**4.00E-03**	**4.84E-03**	**4.03E-03**	**4.19E-04**	**4.19E-04**	**3.62E-04**	**3.62E-04**	**3.78E-04**	**5.86E-05**	1.41E-04	3.31E-05	1.95E-04	1.95E-04	1.60E-03	1.13E-03	3.23E-04	2.28E-04	1.81E-04	1.80E-04	3.86E-04	1.93E-04	**2.82E-03**	**1.96E-03**

Source: Mobile Crushing in Pit SW
Source ID: S11, S12, S13

Description:
Mobile crushing using jaw and cone crushers

Methodology: Emission Factor (EF)
Emission factors for mobile crushing were based on US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing (high-moisture ore). Emission factor is for a typical primary crusher unit operation including hopper, screens, crusher, surge bin, apron feeder and conveyor belt systems. Emission factors for high moisture content ore (>= 4%) used.

Equipment	Model	Value	Units	Source
Primary Crusher - Jaw Crusher Throughput	n/a	2500	tonnes/day	Troilus
Secondary Crusher - Cone Throughput	n/a	2500	tonnes/day	Troilus
Tertiary Crusher - Cone Throughput	n/a	2500	tonnes/day	Troilus

CoPC	Emission Factor (kg/MT)			Emission Rate (g/s)			Notes
	Primary Crushing	Secondary Crushing	Tertiary Crushing	Primary Crushing	Secondary Crushing	Tertiary Crushing	
PM	0.01	0.03	0.03	2.89E-01	8.68E-01	8.68E-01	AP-42, Table 11.24-1
PM10	0.004	0.012	0.01	1.16E-01	3.47E-01	2.89E-01	AP-42, Table 11.24-1
PM2.5	0.001	0.002	0.002	2.14E-02	6.43E-02	5.36E-02	PM2.5/PM10 for tertiary crushing, USEPA Crushed Stone Processing, Table 11.19.2-1

Source: Mobile Generator for Crushing Plant
Source IDs: included in CP3

Description:
Combustion emissions from generator.

Methodology: Emission Factor (EF) and Mass Balance (MB)
The emissions were estimated using the emission factors for large stationary diesel engine provided in US EPA AP-42 Chap 3.4 (Large Stationary Diesel And All Stationary Dual-fuel Engines), Tables 3.4-1, 3.4-3 and 3.4-4, manufacturer specifications and applicable sulphur regulations.

Inputs	Value	Units	Source
Number of units	1	ea.	Trolius
Capacity	1.275	MW	Equipment Specs
Power Output:	1709.8	hp	Specs
Fuel Input:	12.57	MMBTU/hour	Calculation
Max Fuel Flow	91.7	USG/hr	Equipment Specs
Heating Value (Diesel)	137,030	BTU/USG	U.S.EPA
Running in 1 hr - Mobile Crusher	60	min/hr	Trolius
Running in 24 hr - Mobile Crusher	24	hr/day	Trolius
Exhaust Temp	459.9	C	Equipment Specs
Exhaust Gas Flow Rate	300.7	m3/min	Equipment Specs
Exhaust flange size	0.2	m	Assumption

Estimated Emission Rates

Contaminant	CAS	EF (USEPA AP-42 Section 3.4)	EF (USEPA AP-42 Section 3.4)	EF (Equipment specs)	Rating	Emission Rate (g/s)	Comments
		(lb/hp-hr) Power Output	(lb/MMBTU) Power Input	(g/hp-hr) or (g SO2/gal)		1 hr	
NOx	10102-44-0	0.024	3.2	8.97	D	4.26E+00	
CO	630-08-0	5.50E-03	0.85	1.44	D	6.84E-01	
SOx	7446-09-5			0.0953	D	2.43E-03	Mass balance based on max S content in diesel regualation and max diesel consumption. EF Factor calculated below.
TSP						4.27E-02	
PM10	[PM10]	0.0007	0.1	0.09	D	4.27E-02	
PM2.5	[PM2.5]					4.27E-02	Assumed PM2.5 = PM10 = TSP
CO2		1.16	165		B	2.50E+02	
Aldehydes		0.000463	0.07		D	1.00E-01	
TOC (Methane)	[NMHC]	7.05E-04	0.09		D	1.52E-01	
Benzene	71-43-2		7.76E-04		E	1.23E-03	
Toluene			2.81E-04		E	4.46E-04	
Xylenes			1.93E-04		E	3.06E-04	
Propylene			2.79E-03		E	4.43E-03	
1,3-Butadiene	106-99-0				E	0.00E+00	
Formaldehyde	50-00-0		7.89E-05		E	1.25E-04	
Acetaldehyde	75-07-0		2.52E-05		E	4.00E-05	
Acrolein	107-02-8		7.88E-06		E	1.25E-05	
Naphthalene			1.30E-04		E	2.06E-04	
Acenaphthylene	208-96-8		9.23E-06		E	1.46E-05	
Acenaphthene	83-32-9		4.68E-06		E	7.43E-06	
Fluorene	86-73-7		1.28E-05		E	2.03E-05	
Phenanthrene	85-01-8		4.08E-05		E	6.47E-05	
Anthracene	120-12-7		1.23E-06		E	1.95E-06	
Fluoranthene	206-44-0		4.03E-06		E	6.39E-06	
Pyrene	129-00-0		3.71E-06		E	5.89E-06	
Benzo(a)anthracene	56-55-3		6.22E-07		E	9.87E-07	
Chrysene	218-01-9		1.53E-06		E	2.43E-06	
Benzo(b)fluoranthene	205-99-2		1.11E-06		E	1.76E-06	
Benzo(k)fluoranthene			2.18E-07		E	3.46E-07	
Benzo(a)pyrene	50-32-8		2.57E-07		E	4.08E-07	
Indeno(1,2,3-cd)pyrene			4.14E-07		E	6.57E-07	
Dibenz(a,h)perylene			3.46E-07		E	5.49E-07	
Benzo(g,h,i)perylene	191-24-2		5.56E-07		E	8.82E-07	
Total PAH			2.12E-04		E	3.36E-04	

SO_2 emission is based on the maximum allowable sulfur content in diesel and fuel consumption of the equipment. SO_2 emission factor is calculated below.

SO2 Emission Factor Calculation:

Data	Value	Unit	Reference
Sulphur content in diesel	15	ppm	Highway, Nonroad, Locomotive, and Marine Diesel Fuel Sulfur Standards
Lower Heating Value	137,030	BTU/gal	U.S.EPA
Unit Conversion	0.00029	kWh/BTU	-
	454	g/lb	-
Density of diesel	7.00	lb/gal	-
SO_2/ gallon of diesel	0.0953	g SO_2/gal	A factor of 2 is applied to convert sulfur to SO_2, assuming all the sulfur will be oxidized to SO_2

Source: Primary Crusher Building
Source ID: S1

Description:
Primary crushing of ore.

Methodology: Emission Factor (EF)
Emission factors for primary crushing were based on US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing. Emission factor is for a typical primary crusher unit operation including hopper, screens, crusher, surge bin, apron feeder and converyor belt systems. Emission factors for high moisture content ore (>= 4%) used.

Input	Value	Units	Source
Material throughput	52000	tonnes/day	Troilus
Quantity of Baghouse	1	Unit	Troilus
Operating Time	24	hr/day	Troilus
Mitigation	90	%	Rock Crushing Plants: Technical Guidance for Rock Crushing Plants (TCEQ, 2002)

CoPC	Emission Factor (kg/MT)	Rating	Emission Rate (g/s)	Comments
TSP	0.01	C	6.02E-01	
PM10	0.004	C	2.41E-01	
PM2.5	0.0007	D	4.46E-02	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for tertiary crushing of crushed stone, which is expected to be conservative for this process.

Source: Primary Crusher Baghouse
Source ID: S2

Description:

Particulate emissions from the material handling from the Primary Crusher.

Methodology: Emission Factor (EF)

Particulate emissions are emitted as fugitives from handling operations and controlled by a baghouse. Emission factor for TSP is estimated at 20 or 10 mg/m3 as per the MECP document "Procedure for Preparing an ESDM Report" Appendix C.

Input Data:	Value	Units	Source
Operating time	24	hr/day	Troilus
CFM of Baghouse	20,000	m3/h	Troilus
	333.33	m3/min	Calculation
EF (TSP)	20	mg/m3	MECP
Ratio PM10/TSP	0.48	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)
Ratio PM2.5/TSP	0.1	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)

CoPC	Emission Rate	Units
TSP	0.111	g/s
PM10	0.053	g/s
PM2.5	0.011	g/s

Source: Secondary Crusher Building
Source ID: S3

Description:
Secondary crushing of ore.

Methodology: Emission Factor (EF)
Emission factors for secondary crushing were based on US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing. Emission factor is for a typical secondary crusher unit operation including hopper, screens, crusher, surge bin, apron feeder and converyor belt systems. Emission factors for high moisture content ore (>= 4%) used.

Input	Value	Units	Source
Material throughput	52000	tonnes/day	Troilus
Quantity of Baghouse	1	Unit	Troilus
Operating Time	24	hr/day	Troilus
Mitigation	90	%	Rock Crushing Plants: Technical Guidance for Rock Crushing Plants (TCEQ, 2002)

CoPC	Emission Factor (kg/MT)	Rating	Emission Rate (g/s)	Comments
TSP	0.03	D	1.81E+00	
PM10	0.012	D	7.22E-01	
PM2.5	0.0022	E	1.34E-01	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for tertiary crushing of crushed stone, which is expected to be conservative for this process.

Source: Secondary Crusher Baghouse
Source ID: S4

Description:

Particulate emissions from the material handling from the Secondary Crusher.

Methodology: Emission Factor (EF)

Particulate emissions are emitted as fugitives from handling operations and controlled by a baghouse. Emission factor for TSP is estimated at 20 or 10 mg/m3 as per the MECP document "Procedure for Preparing an ESDM Report" Appendix C.

Input Data:	Value	Units	Source
Operating time	24	hr/day	Troilus
CFM of Baghouse	20,000	m3/h	Troilus
	333.33	m3/min	Calculation
EF (TSP)	10	mg/m3	MECP
Ratio PM10/TSP	0.48	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)
Ratio PM2.5/TSP	0.1	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)

CoPC	Emission Rate	Units
TSP	0.056	g/s
PM10	0.027	g/s
PM2.5	0.006	g/s

Source: Secondary Crusher Screen Baghouse
Source ID: S5

Description:

Particulate emissions from the material handling from the Secondary Crusher Screen.

Methodology: Emission Factor (EF)

Particulate emissions are emitted as fugitives from handling operations and controlled by a baghouse. Emission factor for TSP is estimated at 20 or 10 mg/m3 as per the MECP document "Procedure for Preparing an ESDM Report" Appendix C.

Input Data:	Value	Units	Source
Operating time	24	hr/day	Troilus
CFM of Baghouse	20,000	m3/h	Troilus
	333.33	m3/min	Calculation
EF (TSP)	10	mg/m3	MECP
Ratio PM10/TSP	0.48	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)
Ratio PM2.5/TSP	0.1	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)

CoPC	Emission Rate	Units
TSP	0.056	g/s
PM10	0.027	g/s
PM2.5	0.006	g/s

Source: HPGR Building
Source ID: S8

Description:
HPGR

Methodology: Emission Factor (EF)
Emission factors for tertiary crushing were based on US EPA AP-42 document Chapter 11.24 (Metallic Minerals Processing) Table 11.24-1 Emission Factors for Metallic Minerals Processing. Emission factor is for a typical tertiary crusher unit operation including hopper, screens, crusher, surge bin, apron feeder and converyor belt systems. Emission factors for high moisture content ore (>= 4%) used.

Input	Value	Units	Source
Material throughput	52000	tonnes/day	Troilus
Quantity of Baghouse	1	Unit	Troilus
Operating Time	24	hr/day	Troilus
Mitigation	90	%	Rock Crushing Plants: Technical Guidance for Rock Crushing Plants (TCEQ, 2002)

CoPC	Emission Factor (kg/MT)	Rating	Emission Rate (g/s)	Comments
TSP	0.03	D	1.81E+00	
PM10	0.01	D	6.02E-01	
PM2.5	0.0019	E	1.11E-01	PM2.5 EF estimated based on the ratio of PM2.5/PM10 provided in AP-42 for tertiary crushing of crushed stone, which is expected to be conservative for this process.

Source: HPGR Baghouse
Source ID: S9

Description:

Particulate emissions from the material handling from the HPGR.

Methodology: Emission Factor (EF)

Particulate emissions are emitted as fugitives from handling operations and controlled by a baghouse. Emission factor for TSP is estimated at 20 or 10 mg/m3 as per the MECP document "Procedure for Preparing an ESDM Report" Appendix C.

Input Data:	Value	Units	Source
Operating time	24	hr/day	Troilus
CFM of Baghouse	20,000	m3/h	Troilus
	333.33	m3/min	Troilus
EF (TSP)	10	mg/m3	MECP
Ratio PM10/TSP	0.48	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)
Ratio PM2.5/TSP	0.1	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)

CoPC	Emission Rate	Units
TSP	0.056	g/s
PM10	0.027	g/s
PM2.5	0.006	g/s

Source: Mill Building Solid Reagent Transfers
Source ID: S10A

Description:

Transferring Solid Reagents to Storage Containers and Process

Methodology: Emission Factor (EF)

Emission factors for product transfer were based on US EPA AP-42 document Lime Manufacturing, Table 11.17-3. Product transfer and conveying

Equipment	Material Throughput (MT/day)	Source
Magnafloc 10 Transfer	1	Troilus
Lime Transfer	72.8	Troilus
Potassium Amyl Xanthate (PAX) Transfer	2.9	Troilus
PAX dust collector reduction	75%	Western Regional Air Partnership Report (WRAP, 2006)
Sodium sulphite	20.8	Troilus
Sodium sulphite dust collector reduction	75%	Western Regional Air Partnership Report (WRAP, 2006)
Zinc sulphate	1.0	Troilus
Zinc sulphate dust collector reduction	75%	Western Regional Air Partnership Report (WRAP, 2006)
Sodium trithiocarbonate	1.2	Troilus
Sodium trithiocarbonate dust collector reduction	75%	Western Regional Air Partnership Report (WRAP, 2006)

CoPC	CAS Number	Emission Factor (kg/MT)	Emission Rate (g/s)	Notes
Magnafloc 10	N/A	1.10E+00	1.27E-02	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Calcium Oxide	1305-78-8	1.10E+00	9.27E-01	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Potassium Amyl Xanthate (PAX)	2720-73-2	1.10E+00	9.27E-03	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Sodium sulphite	7757-83-7	1.10E+00	6.62E-02	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Zinc sulphate	7733-02-0	1.10E+00	3.18E-03	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Sodium trithiocarbonate	534-18-9	1.10E+00	3.82E-03	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.

Source: Mill Building Solid Reagent Transfer Dust Collectors
Source ID: S10A

Description:

Dust Collectors for Transferring Solid Reagents to Storage Containers and Process

Methodology: Emission Factor (EF)

Emission factors for product transfer were based on US EPA AP-42 document Lime Manufacturing, Table 11.17-3. Crushed material conveyor transfer with fabric filter

Equipment	Material Throughput (MT/day)	Source
Lime Delivery	509.6	Troilus
PAX Transfer	2.9	Troilus
Sodium Sulphite Transfer	20.8	Troilus
Zinc sulphate Transfer	1.0	Troilus
Sodium trithiocarbonate Transfer	1.2	Troilus

CoPC	Emission Factor (kg/MT)	Emission Rate (g/s)	Notes
Calcium Oxide	4.40E-05	2.60E-04	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Potassium Amyl Xanthate (PAX)	4.40E-05	1.48E-06	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Sodium Sulphite	4.40E-05	1.06E-05	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Zinc sulphate	4.40E-05	5.09E-07	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.
Sodium trithiocarbonate	4.40E-05	6.11E-07	US EPA AP-42 document Lime Manufacturing, Table 11.17-3.

Source: Mill Building Concentrate Loadout
Source ID: S10B

Description:
Concentrate Transfer to Storage Pile and Front End Loader Transferring into 20 ft Shipping Containers (enclosed)

Methodology: Emission Factor (EF)
Emission factor for material unloading/dropping was calculated using Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles).

$$E = k(0.0016)\ \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}\ \text{(kg/megagram [Mg])}$$

where:
E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s)
M = material moisture content (%)
The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1 (US EPA AP-42 document Chapter 13.2.4)	< 30 um	0.74	Note: It is assumed that k=0.74 for total particulate matter (<30 µm) consistent with the assumption in U.S. EPA AP-42 Chapter 13.2.2
	< 10 um	0.35	
	< 2.5 um	0.053	

Emission calculation for material drop:

Inputs	Value	Units	Source
Operating Hours	24	hours/day	
Material moisture content (M)	9	%	Troilus
Mean wind speed (U)	1	m/s	Indoor area, assumed 1 m/s as per Procedure for Preparing an Emission Summary and Dispersion Modelling Report (MECP, 2018)
Calculated emission factor (E)	0.00007	kg/tonne	Calculated
Material Handling Rate Transfer to Storage Pile	8.7	tonnes/h	Troilus
Material Handling Rate Transfer to Storage Containers	8.7	tonnes/h	Troilus
Emission Control	0%	%	Troilus
E/k (hourly)	1.22E-03	kg/h	Calculated
PM Emissions (short-term)	2.50E-04	g/s	Calculated
PM10 emission	1.18E-04	g/s	0.35 Multiplier from US EPA AP-42, Chapter 13.2.4.
PM2.5 emission	1.79E-05	g/s	0.053 Multiplier from US EPA AP-42, Chapter 13.2.4.

Contaminant	CAS#	Emission Rate (g/s)
PM	*PM*	2.50E-04
PM_{10}	*PM10*	1.18E-04
$PM_{2.5}$	*PM2.5*	1.79E-05

Source: Mill Building Smelting
Source ID: S10C

Description:

Gold and silver bearing gravity concentrates from the future rougher, scavenger, and regrind shaking table circuit will be collected in the shaking table concentrate storage hopper, where it will be filtered using a vacuum sludge pan filter and dried in an oven. Once the dried concentrate cake has cooled, it will be mixed with fluxes and loaded into the smelting furnace. The fluxes will react with base metal oxides to form a slag, whilst the gold and silver will remain as molten metal. The molten metal will be poured into moulds, to form doré ingots, which will be cleaned, assayed, stamped, and stored in a secure vault ready for dispatch.

Methodology: Emission Factor (EF)

Emission factors for smelting were based on US EPA AP-42 document Primary Copper Smelting, Table 12.3-2. Concentrate Dryer Followed by Electric Furnace. Table 12.3-10. Smelting Furnace Fugitive Emissions

Equipment	Quantity	Units	Reference
Quantity Smelted	70	kg/h	Troilus
Quantity Smelted	420.8	kg/day	Troilus
Mitigation	90	%	Rock Crushing Plants: Technical Guidance for Rock Crushing Plants (TCEQ, 2002)

CoPC	Smelting Emission Factor (kg/MT)	Fugitive Emission Factor (kg/MT)	Rating	Emission Rate (g/s) - 1 hour	Emission Rate (g/s) - 24 hour	Comments
PM	55	0.2	B	1.08E-01	2.69E-02	
PM10	14.96	0.2	B	2.95E-02	7.38E-03	PM10/PM ratio: PM10 - 6.8 kg/tonne from table 12.3-6 (reverberatory smelter) and TSP - 25 kg/tonne from table 12.3-2
PM2.5	11.66	0.2	B	2.31E-02	5.78E-03	PM2.5/PM ratio: PM2.5 - 5.3 kg/tonne from table 12.3-6 (reverberatory smelter) and TSP - 25 kg/tonne from table 12.3-2
Lead	0.036	0	B	7.01E-05	1.75E-05	Smelting emission factor includes fugitive emissions
SO2	120.5	2	B	2.39E+00	5.97E-01	

Source: Mill Building Smelting Baghouse
Source ID: S10D

Description:
Particulate emissions from smelting

Methodology: Emission Factor (EF)

Particulate emissions are emitted as fugitives from handling operations and controlled by a baghouse. Emission factor for TSP is estimated at 20 or 10 mg/m3 as per the MECP document "Procedure for Preparing an ESDM Report" Appendix C.

Input Data:	Value	Units	Source
Operating time	24	hr/day	Troilus
CFM of Baghouse	5000	m3/h	Troilus
	83.33	m3/min	Calculation
EF (TSP)	10	mg/m3	MECP
Ratio PM10/TSP	0.48	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)
Ratio PM2.5/TSP	0.1	N/A	AP-42, App B-1, Section 11.xx (fluorspar ore drum dryer with fabric filter)

CoPC	Emission Rate	Units	Notes
PM	0.014	g/s	
PM10	0.007	g/s	
PM2.5	0.001	g/s	
Lead	9.06E-06	g/s	Ratio of Lead/PM smelting emissions

Source: Pit Drilling - Pit 87, Pit J and Pit SW
Source ID: P1A, P2A, P3A

Description:

Explosives are placed in various holes for blasting. The blast holes are drilled continuously.

Methodology: Emission Factor (EF)

Drilling emissions were estimated using emission factors for particulates from US EPA AP-42, Chapter 11.9, Table 11.9-4 (Western Surface Coal Mining).

E = EF (kg/hole) x Number of holes drilled /day

Where E = kg of emissions /day

Inputs	Value	Units	Source
Pit 87 drill holes	140.8	holes/day	Troilus
Pit J drill holes	49.5	holes/day	Troilus
Pit SW drill holes	140.8	holes/day	Troilus
Mitigation	85	%	US Office of Mine Safety and Health Research (2014) estimates wet drilling eliminates up to 97% of respirable dust. Control of 85% equivalent to a moderate water flow rate of 0.6 gpm assumed for control efficiency.
Operating Hours	24	hrs/day	Troilus

Contaminant	EF	Rating	Emission Rate (g/s)		
	(kg/hole)		Pit 87 Drill (P1A)	Pit J Drill (P2A)	Pit SW Drill (P3A)
PM	0.59	C	1.44E-01	5.07E-02	1.44E-01
PM10	0.31	C	7.58E-02	2.66E-02	7.58E-02
PM2.5	0.06	PM2.5/PM10	1.40E-02	4.92E-03	1.40E-02

Source: Pit Blasting - Pit 87, Pit J and Pit SW
Source ID: P1B, P2B, P3B

Description:
Blasting is used to loosen ore and waste rock. These emissions are intermittent and non-continuous.

Methodology: Emission Factor (EF)
Emission factors for blasting from US EPA AP-42, Chapter 11.9, Table 11.9-2 (Western Surface Coal Mining) were used to estimate particulate emissions from blasting. Emission factors for blasting from the Australia Government NPI Guide "Explosives Detonation and Firing Ranges" (Australian NPI 2016) were used to estimate combustion products (CO, NOX, SO2) emissions.

$E = 0.00022(A)^{1.5}$
where:
E=Emissions of TSP (kg/blast) (<=30um)
A=horizontal area (m^2)

Input	Value	Unit	Source
Type of Explosive:	100% Emulsion		Troilus
Blasting Explosive (Year 6)	22.0	tonnes/blast	Troilus
Maximum Blasting Explosive	28.2	tonnes/blast	Troilus
Pit 87 Blasting	1.0	blast/h	Troilus
Pit 87 Blasting	1.5	blast/day	Troilus
Pit J Blasting	0.5	blast/h	Troilus
Pit J Blasting	0.5	blast/day	Troilus
Pit SW Blasting	1.0	blast/h	Troilus
Pit SW Blasting	1.5	blast/day	Troilus
Blast Area	3,355	m2	Troilus
Control	20	%	A 20% emission reduction was considered since particulate emissions are controlled by optimizing each blast through techniques (e.g. type, timing sequence and blast patterns). The USEPA blasting data is outdated and primarily based on measurements of blasting coal and current blasting practices and technologies are improved.

CoPC	Emission Rate (kg/blast)	Emission Factor (kg/tonne explosive)	Pit 87 (P1B)		Pit J (P2B)		Pit SW (P3B)		Reference
			Emission Rate in 1-Hour (g/s)	Emission Rate in 24-Hour (g/s)	Emission Rate in 1-Hour (g/s)	Emission Rate in 24-Hour (g/s)	Emission Rate in 1-Hour (g/s)	Emission Rate in 24-Hour (g/s)	
PM	42.75	--	9.50E+00	5.79E-01	4.88E+00	2.04E-01	9.50E+00	5.79E-01	U.S.EPA AP-42, Ch. 11.9 "Western Surface Coal Mining" Table 11.9-2
PM10	22.23	--	4.94E+00	3.01E-01	2.54E+00	1.06E-01	4.94E+00	3.01E-01	
PM2.5	1.28	--	2.85E-01	1.74E-02	1.47E-01	6.11E-03	2.85E-01	1.74E-02	
CO	--	2.3	1.80E+01	8.58E-01	9.26E+00	3.02E-01	1.80E+01	8.58E-01	Austrailia Government - NPI - Explosives Detonation and Firing Ranges Appendix C. EFs for CO and NOx are for emulsion explosives. EF for SO2 is for ANFO (on site mix) and was used as being the most representative of the data available.
NOx	--	0.2	1.57E+00	7.46E-02	8.05E-01	2.62E-02	1.57E+00	7.46E-02	
SO2	--	0.06	4.70E-01	2.24E-02	2.42E-01	7.87E-03	4.70E-01	2.24E-02	

Source: Material Movement
Source IDs: P1C, P2C, P3C, M8, M9, M10

Description:
Ore, Overburden, and Waste Rock is moved with various bulldozers.

Methodology: Emission Factor (EF)
Emission factor for bulldozing of material other than coal in the US EPA AP-42 document Chapter 11.9 (Western Surface Coal Mining) Table 11.9-2 was used to estimate the dust emissions.

$E = 2.6 \times s^{1.2} / M^{1.3}$ $E\ (PM10) = 0.34 \times s^{1.5} / M^{1.4}$

where:
E = emission factor (kg/h)
s = material silt content (%)
M = material moisture content (%)
The emission calculation for each unit is listed in the following table.

Exponents for Equations	TSP	PM10
k	2.6	0.34
a	1.2	1.5
b	1.3	1.4

Input	Value	Units	Source
Ore/WR Silt Content	5.8	%	Taconite mining and processing, haul road to and from pit - USEPA AP42 Section 13.2 - Table 13.2.2-1
Overburden Silt Content	7.5	%	Typical Silt and Moisture Contents of Materials at Various Industries (Overburden), USEPA AP42 Section 13.2 Table 13.2.4-1
Moisture Content	4	%	Troilus
Open Pits (87, J, SW)			
Dozer Operating Hrs	24	hrs/day	Troilus
Number of dozers in each pit	1	unit	Troilus
Waste Dump (WD87)			
Dozer Operating Hrs	24	hr/day	Troilus
Number of dozers in each pit	1	unit	Troilus
Waste Dump (WDSW)			
Operating Hrs	24	hr/day	Troilus
Number of Dozers	1	unit	Troilus
Tailings Construction			
Operating Hrs	24	hr/day	Troilus
Number of Dozers	1	unit	Troilus
Number of Excavators	2	unit	Troilus
Number of Compactors	1	unit	Troilus

CoPC	OVB Emission Factor (kg/hr-vehicle)	Ore/WR Emission Factor (kg/hr-vehicle)	Emission Rate (g/s)				Notes
			Open Pits (P1C, P2C, P3C)	WD87 (M8)	WDSW (M9)	Tailings Construction (M10)	
TSP	4.812	3.535	9.82E-01	9.82E-01	9.82E-01	3.93E+00	
PM10	1.003	0.682	1.89E-01	1.89E-01	1.89E-01	7.58E-01	
PM2.5	0.105	0.105	1.03E-01	1.03E-01	1.03E-01	4.12E-01	EF is scaling factor for PM2.5/TSP from AP-42 Table 11.9-2

Source: Pit Loading
Source IDs: P1D, P2D, P3D

Methodology: Emission Factor (EF)
Emission factor for material unloading/dropping was calculated using Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles).

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])}$$

where:
E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s)
M = material moisture content (%)
The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1 (US EPA AP-42 document Chapter 13.2.4)	< 30 µm	0.74	Note: It is assumed that k=0.74 for total particulate matter (<30 µm) consistent with the assumption in U.S. EPA AP-42 Chapter 13.2.2.
	< 10 µm	0.35	
	< 2.5 µm	0.053	

Inputs	Value	Units	Source
Moisture Content	4	%	Troilus
Mean Wind Speed	2.32	m/s	WS at 2-m height assumed to account for lower wind speeds in the pit.
Mean Wind Speed	3.64	m/s	ECCC Climate Normals
Loading in Pit 87 (P1D)			
Loading amount	101,256	MT/day	Troilus
Loading in Pit J (P2D)			
Loading amount	35,569	MT/day	Troilus
Loading in Pit SW (P3D)			
Loading amount	101,256	MT/day	Troilus

CoPC	Emission Factor (kg/MT)	Pit 87 (P1D) Emission Rate (g/s)	Pit J (P2D) Emission Rate (g/s)	Pit SW (P3D) Emission Rate (g/s)
TSP	4.81E-04	5.63E-01	1.98E-01	5.63E-01
PM10	2.27E-04	2.66E-01	9.36E-02	2.66E-01
PM2.5	3.44E-05	4.03E-02	1.42E-02	4.03E-02

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Emission Factor (kg/MT)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	2.82E-04	0.327
3.09	6.98E-04	0.808
5.14	1.35E-03	1.566
8.23	2.49E-03	2.888
10.8	3.55E-03	4.112
Mean Wind Speed		
3.64	8.63E-04	1.000

Source: Ore/Waste Rock/Overburden UnLoading
Source ID: S6, S7, M1, M2, M3, M4, M5, M6, M7

Methodology: Emission Factor (EF)
Emission factor for material unloading/dropping was calculated using Equation (1) in the US EPA AP-42 document Chapter 13.2.4 (Aggregate Handling and Storage Piles).

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.5}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/megagram [Mg])}$$

where:
E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, meters per second (m/s)
M = material moisture content (%)
The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1 (US EPA AP-42 document Chapter 13.2.4)	< 30 µm	0.74	Note: It is assumed that k=0.74 for total particulate matter (<30 µm) consistent with the assumption in U.S. EPA AP-42 Chapter 13.2.2
	< 10 µm	0.35	
	< 2.5 µm	0.053	

Inputs	Value	Units	Source
Moisture Content	4	%	Troilus
Mean Wind Speed	3.64	m/s	ECCC Climate Normals
Ore Feed to Mill	52,000	tonnes/day	Troilus
Unloading Ore at Coarse Ore Pile	58,617	tonnes/day	Troilus
Unloading OVB at OB NW	6,094	tonnes/day	Troilus
Unloading OVB at OB West	5,262	tonnes/day	Troilus
Unloading OVB at OB SW	852	tonnes/day	Troilus
Unloading WR at WD SW	78,018	tonnes/day	Troilus
Unloading WR at TSF	13,209	tonnes/day	Troilus
Unloading WR at WD87	76,030	tonnes/day	Troilus

CoPC	Emission Factor (kg/MT)	Emission Rate (g/s)								
		Crushed Ore Stock Load (S6)	Crushed Ore Stock Unload Reclain Tunnel (S7)	Unloading/Loading Ore at Coarse Ore Pile (M1)	Unloading OVB at OB NW (M2)	Unloading OVB at OB West (M3)	Unloading OVB at OB SW (M4)	Unloading WR at WD SW (M5)	Unloading WR at TSF (M6)	Unloading WR at WD87 (M7)
TSP	8.63E-04	5.20E-01	5.20E-01	5.86E-01	6.09E-02	5.26E-02	8.51E-03	7.80E-01	1.32E-01	7.60E-01
PM10	4.08E-04	2.46E-01	2.46E-01	2.77E-01	2.88E-02	2.49E-02	4.03E-03	3.69E-01	6.24E-02	3.59E-01
PM2.5	6.18E-05	3.72E-02	3.72E-02	4.20E-02	4.36E-03	3.77E-03	6.10E-04	5.58E-02	9.45E-03	5.44E-02

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Emission Factor (kg/MT)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	2.82E-04	0.327
3.09	6.98E-04	0.808
5.14	1.35E-03	1.566
8.23	2.49E-03	2.888
10.8	3.55E-03	4.112
Mean Wind Speed		
3.64	8.63E-04	1.000

Source: Wind Erosion
Source IDs: W1, W2, W3, W4, W5, W6, W7A-C, W9

Waste Rock, Overburden, Ore and TSF Erosion due to High Winds

W1	OB NW Wind Erosion
W2	OB West Wind Erosion
W3	WD SW Wind Erosion
W4	OB SW Wind Erosion
W5	WD87 Wind Erosion
W6	Coarse Ore Pile Wind Erosion
W7A-D	Mobile Crusher Piles Wind Erosion
W9	TSF Wind Erosion

Description:
Storage areas will be exposed - high winds can erode and entrain dust from these piles causing particulate emissions. Some areas of the TSF are dry and inactive, it is conservatively assumed that these portions of the TSP are subject to some wind erosion.

Methodology: Emission Factor (EF)
The calculation is based on emission estimation methodology from Section 3.10.2.5 of the MELCCFP Instruction Guide for Preparation and Realization of Air Emission Dispersion Modelling – Mining Projects.

The particle size multiplier (J) varies with aerodynamic particle size, listed as follows:

J for Equation		
TPM	<10 um	<2.5 um
1	0.5	0.075

EF (g/m 2.s) = 1.52 x 10-5 x J x s; when the wind speed is greater than 19.3 km/h and EF = 0; when the wind speed is less than 19.3 km/h

Inputs	Value	Unit	Reference
Operating hours	24	hrs/day	Daily operating hours
Ore/WR Silt Content	5.8	%	Taconite mining and processing, haul road to and from pit - USEPA AP42 Section 13.2 - Table 13.2.2-1
Overburden Silt Content	7.5	%	Typical Silt and Moisture Contents of Materials at Various Industries (Overburden), USEPA AP42 Section 13.2 Table 13.2.4-1
Tailings Silt Content	41	%	Troilus
TSF Mitigation	50	%	Water / surfactant application or limiting the size of the active cell (Australian NPI, 2012)
OB NW Wind Erosion	2,700	m2	Calculated
OB West Wind Erosion	2,300	m2	Calculated
WD SW Wind Erosion	34,100	m2	Calculated
OB SW Wind Erosion	400	m2	Calculated
WD 87 Wind Erosion	33,300	m2	Calculated
Coarse Ore Storage Area Wind Erosion	25,700	m2	Calculated
Mobile Crusher Piles Wind Erosion	5,852	m2	Calculated
TSF Wind Erosion	737,930	m2	Calculated

Wind Erosion emissions summary (wind speed category > 5.36 m/s)

Source	Contaminant	Emission Rate (g/s)	Unit
OB NW Wind Erosion (W1)	TSP	3.08E-01	g/s
	PM10	1.54E-01	
	PM2.5	2.31E-02	
OB West Wind Erosion (W2)	TSP	2.62E-01	
	PM10	1.31E-01	
	PM2.5	1.97E-02	
WD SW Wind Erosion (W3)	TSP	3.01E+00	
	PM10	1.50E+00	
	PM2.5	2.25E-01	
OB SW Wind Erosion (W4)	TSP	4.56E-02	
	PM10	2.28E-02	
	PM2.5	3.42E-03	
WD 87 Wind Erosion (W5)	TSP	2.94E+00	
	PM10	1.47E+00	
	PM2.5	2.20E-01	
Coarse Ore Storage Area Wind Erosion (W6)	TSP	2.27E+00	
	PM10	1.13E+00	
	PM2.5	1.70E-01	
Mobile Crusher Piles Wind Erosion (W7)	TSP	5.16E-01	
	PM10	2.58E-01	
	PM2.5	3.87E-02	
TSF Wind Erosion (W9)	TSP	229.94	
	PM10	114.97	
	PM2.5	17.25	

Emissions - Wind Speed Dependent Factors to Use in Modelling

Wind Speed (m/s)	Wind Speed Dependent Factor for Dispersion Modelling
1.54	0
3.09	0
5.14	1
8.23	1
10.8	1

Source: Grading
Source IDs: R1, R3, R4

Description:
A Grader maintains haul roads for efficient operation of trucks moving on the roads.

Methodology: Emission Factor (EF)
Emission factor for grading operations are found in the US EPA AP42 document Chapter 11 in Table 11.9-2

$E=0.0034(S)^{2.5}$ (TSP<=30um)

where:
S = mean vehicle speed (km/h)
E = emission factor (kg/VKT)

Grading Roads Source: USEPA AP42 Section 11.9-1

$$EF = 0.0034 * S^{a}$$

a(TSP)=	2.5	K(TSP)	0.0034
a(PM10)=	2	K(PM10)	0.0056
PM2.5/TSP	0.031		

Input	Value	Units	Source
Main Road Mitigation	90	%	Use of surfactants
Haul Road Migitation	90	%	Use of surfactants
Grader Speed	4.5	km/h	Manufacturer
Main Access Road	13.6	km	Troilius
Main Access Road to Highway (Partial)	24.8	km	Troilius
Road from Pit J to Plant	15.7	km	Troilius
Road from Pit SW to Plant	16.2	km	Troilius

CoPC	Emission Factor (Kg/VKT)
TSP	1.46E-01
PM10	1.13E-01
PM2.5	4.53E-03

Average Emissions per Road Segment

Segment	ID	TSP (g/s)		PM10 (g/s)		PM2.5 (g/s)	
		1 hr	24 h	1 hr	24 h	1 hr	24 h
Main Access Road	R1	1.83E-02	2.30E-03	1.42E-02	1.79E-03	5.66E-04	7.13E-05
Main Access Road toward Route du Nord	R1B	1.83E-02	4.19E-03	1.42E-02	3.26E-03	5.66E-04	1.30E-04
Road from Pit J to Plant	R3	1.83E-02	2.66E-03	1.42E-02	2.07E-03	5.66E-04	8.25E-05
Road from Pit SW to Plant	R4	1.83E-02	2.62E-02	1.42E-02	2.13E-03	5.66E-04	8.49E-05

Source: Road Dust **R1** **Main Access Road**

Input	Value	Units	Source
Silt Content (%)	4.3	%	US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Table 13.2.2-1, Taconite mining and processing, service road
Round Trip Road Length (m)	13.6	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	0	trips/hour	Troilus
Trips per day	0	trips/day	Troilus
Speed	50	km/h	Troilus
Transport			
Trips per hour	1	trips/hour	Troilus
Trips per day	3	trips/day	Troilus
Speed	50	km/h	Troilus
Bus			
Trips per hour	2	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus
Dump Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	25	trips/day	Troilus
Speed	50	km/h	Troilus
Concentrate Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	6	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{s_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b}\ \left\{\frac{kg}{VKT}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight (kg)	Empty Weight (kg)	Average Weight (kg)	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	0.0	93.1	0	0	0.000	0.000	-	-	0.0	0.0
Transport	Various	Various	Diesel	350	62,000	30,000	46,000	50	0.8	93.1	1	3	0.143	0.079	6,571	3,632	13.6	40.8
Bus	Various	Various	Diesel	540	29,000	29,000	29,000	50	1.1	93.1	2	4	0.286	0.105	8,286	3,052.6	27.2	54.4
Dump Truck	Various	Various	Diesel	490	74,000	34,400	54,200	50	6.8	93.1	3	25	0.429	0.658	23,229	35,657.9	40.8	340.0
Concentrate Truck	Caterpillar	740B	Diesel	490	74,000	34,400	54,200	50	1.6	93.1	1	6	0.143	0.158	7,743	8,558	13.6	81.6
TOTAL											**7**	**38**	**1.000**	**1.000**	**45,829**	**50,900**	**95.2**	**516.8**

	1h	24h
Uncontrolled TSP Emission Factor (kg/VKT)	2.40	2.51
Uncontrolled PM10 Emission Factor (kg/VKT)	0.59	0.62
Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.06	0.06

	Summer		Winter	
	1h	24h	1h	24h
Controlled Emission Rate PM (g/s)	4.38	1.04	3.17	0.75
Controlled Emission Rate PM10 (g/s)	1.08	0.26	0.79	0.19
Controlled Emission Rate PM2.5 (g/s)	0.11	0.03	0.08	0.02

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)						Emissions (g/s)											
			Pick up trucks	Transport	Bus	Dump Truck	Concentrate Truck		Pick up trucks (1h)	Pick up trucks (24h)	Transport (1h)	Transport (24h)	Bus (1h)	Bus (24h)	Dump Truck (1h)	Dump Truck (24h)	Concentrate Truck (1h)	Concentrate Truck (24h)	Total (1h)	Total (24h)
								Operating Time (hours)	0.00	0.00	0.27	0.82	0.54	1.09	0.82	6.80	0.27	1.63		
								Horsepower (hp)	203	203	316	316	182	182	333	333	339	339		
PM_{10}	[PM10]	100	6.32E-03	1.08E-02	6.32E-03	6.23E-03	6.23E-03		0.00E+00	0.00E+00	2.59E-04	3.24E-05	1.74E-04	1.45E-05	4.70E-04	1.63E-04	1.59E-04	3.99E-05	1.06E-03	2.50E-04
$PM_{2.5}$	[PM2.5]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.04E-03		0.00E+00	0.00E+00	2.51E-04	3.14E-05	1.69E-04	1.41E-05	4.56E-04	1.58E-04	1.55E-04	3.87E-05	1.03E-03	2.43E-04
CO	630-08-0	2	1.91E-02	4.90E-02	1.91E-02	1.90E-02	1.90E-02		0.00E+00	0.00E+00	1.17E-03	1.46E-04	5.26E-04	4.38E-05	1.44E-03	4.99E-04	4.87E-04	1.22E-04	3.62E-03	8.11E-04
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03		0.00E+00	0.00E+00	3.38E-05	4.22E-06	3.89E-05	3.24E-06	1.07E-04	3.71E-05	3.62E-05	9.05E-06	2.16E-04	5.36E-05
Hydrocarbons	[NMHC]	1	9.27E-03	7.68E-03	9.27E-03	9.26E-03	9.26E-03		0.00E+00	0.00E+00	1.84E-04	2.30E-05	2.55E-04	2.13E-05	6.99E-04	2.43E-04	2.37E-04	5.93E-05	1.38E-03	3.46E-04
NOx	10102-44-0	3	1.11E-01	1.68E-01	1.11E-01	1.11E-01	1.11E-01		0.00E+00	0.00E+00	4.02E-03	5.03E-04	3.06E-03	2.55E-04	8.41E-03	2.92E-03	2.85E-03	7.13E-04	1.83E-02	4.39E-03
1,3-butadiene	106-99-0	24	7.50E-06	1.13E-05	7.50E-06	7.49E-06	7.49E-06		0.00E+00	0.00E+00	2.70E-07	3.38E-08	2.06E-07	1.72E-08	5.66E-07	1.96E-07	1.92E-07	4.79E-08	1.23E-06	2.95E-07
Acenaphthene	83-32-9	70+170	2.53E-06	3.71E-06	2.53E-06	2.52E-06	2.52E-06		0.00E+00	0.00E+00	8.87E-08	1.11E-08	6.95E-08	5.79E-09	1.91E-07	6.62E-08	6.46E-08	1.62E-08	4.13E-07	9.92E-08
Acenaphthylene	208-96-8	71+171	5.08E-06	7.56E-06	5.08E-06	5.07E-06	5.07E-06		0.00E+00	0.00E+00	1.81E-07	2.26E-08	1.40E-07	1.16E-08	3.83E-07	1.33E-07	1.30E-07	3.25E-08	8.34E-07	2.00E-07
Acetaldehyde	75-07-0	26	6.46E-04	7.21E-04	6.46E-04	6.45E-04	6.45E-04		0.00E+00	0.00E+00	1.72E-05	2.15E-06	1.78E-05	1.48E-06	4.88E-05	1.69E-05	1.65E-05	4.13E-06	1.00E-04	2.47E-05
Acrolein	107-02-8	27	9.50E-05	1.21E-04	9.50E-05	9.49E-05	9.49E-05		0.00E+00	0.00E+00	2.90E-06	3.63E-07	2.61E-06	2.18E-07	7.17E-06	2.49E-06	2.43E-06	6.07E-07	1.51E-05	3.68E-06
Anthracene	120-12-7	72+172	5.37E-07	8.49E-07	5.37E-07	5.34E-07	5.34E-07		0.00E+00	0.00E+00	2.03E-08	2.54E-09	1.48E-08	1.23E-09	4.04E-08	1.40E-08	1.37E-08	3.42E-09	8.91E-08	2.12E-08
Benzene	71-43-2	20	2.18E-04	3.29E-04	2.18E-04	2.18E-04	2.18E-04		0.00E+00	0.00E+00	7.86E-06	9.82E-07	6.00E-06	5.00E-07	1.64E-05	5.71E-06	5.58E-06	1.39E-06	3.59E-05	8.59E-06
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	1.32E-07	9.69E-08	9.59E-08	9.59E-08		0.00E+00	0.00E+00	3.16E-09	3.96E-10	2.67E-09	2.22E-10	7.25E-09	2.52E-09	2.46E-09	6.14E-10	1.55E-08	3.75E-09
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	6.87E-08	3.28E-08	3.23E-08	3.23E-08		0.00E+00	0.00E+00	1.64E-09	2.05E-10	9.03E-10	7.52E-11	2.44E-09	8.48E-10	8.28E-10	2.07E-10	5.81E-09	1.34E-09
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	1.93E-07	9.24E-08	9.11E-08	9.11E-08		0.00E+00	0.00E+00	4.62E-09	5.78E-10	2.54E-09	2.12E-10	6.88E-09	2.39E-09	2.33E-09	5.83E-10	1.64E-08	3.76E-09
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	1.12E-07	6.01E-08	5.95E-08	5.95E-08		0.00E+00	0.00E+00	2.68E-09	3.35E-10	1.65E-09	1.38E-10	4.50E-09	1.56E-09	1.52E-09	3.81E-10	1.04E-08	2.42E-09
Chrysene	218-01-9	78+178	1.03E-07	1.83E-07	1.03E-07	1.02E-07	1.02E-07		0.00E+00	0.00E+00	4.37E-09	5.47E-10	2.84E-09	2.37E-10	7.71E-09	2.68E-09	2.61E-09	6.54E-10	1.75E-08	4.11E-09
Fluoranthene	206-44-0	69+169	9.02E-07	1.47E-06	9.02E-07	8.97E-07	8.97E-07		0.00E+00	0.00E+00	3.52E-08	4.40E-09	2.48E-08	2.07E-09	6.78E-08	2.35E-08	2.30E-08	5.74E-09	1.51E-07	3.58E-08
Fluorene	86-73-7	81+181	3.76E-06	5.69E-06	3.76E-06	3.75E-06	3.75E-06		0.00E+00	0.00E+00	1.36E-07	1.70E-08	1.03E-07	8.62E-09	2.83E-07	9.83E-08	9.60E-08	2.40E-08	6.19E-07	1.48E-07
Formaldehyde	50-00-0	5	3.62E-04	5.71E-04	3.62E-04	3.61E-04	3.61E-04		0.00E+00	0.00E+00	1.36E-05	1.71E-06	9.95E-06	8.29E-07	2.73E-05	9.47E-06	9.25E-06	2.31E-06	6.01E-05	1.43E-05
Phenanthrene	85-01-8	83+183	6.88E-06	1.05E-05	6.88E-06	6.86E-06	6.86E-06		0.00E+00	0.00E+00	2.50E-07	3.12E-08	1.89E-07	1.58E-08	5.18E-07	1.80E-07	1.76E-07	4.39E-08	1.13E-06	2.71E-07
Pyrene	129-00-0	84+184	8.58E-07	1.44E-06	8.58E-07	8.53E-07	8.53E-07		0.00E+00	0.00E+00	3.43E-08	4.29E-09	2.36E-08	1.97E-09	6.44E-08	2.24E-08	2.18E-08	5.46E-09	1.44E-07	3.41E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.04E-03		0.00E+00	0.00E+00	2.51E-04	3.14E-05	1.69E-04	1.41E-05	4.56E-04	1.58E-04	1.55E-04	3.87E-05	1.03E-03	2.43E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	6.83E-03	3.98E-03	3.93E-03	3.93E-03		0.00E+00	0.00E+00	1.63E-04	2.04E-05	1.10E-04	9.14E-06	2.97E-04	1.03E-04	1.01E-04	2.51E-05	6.70E-04	1.58E-04

Source: Road Dust **R1B** **Main Access Road Toward Route du Nord**

Input	Value	Units	Source
Silt Content (%)	4.3	%	US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Table 13.2.2-1, Taconite mining and processing, service road
Round Trip Road Length (m)	24.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	0	trips/hour	Troilus
Trips per day	0	trips/day	Troilus
Speed	50	km/h	Troilus
Transport			
Trips per hour	1	trips/hour	Troilus
Trips per day	3	trips/day	Troilus
Speed	50	km/h	Troilus
Bus			
Trips per hour	2	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus
Dump Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	25	trips/day	Troilus
Speed	50	km/h	Troilus
Concentrate Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	6	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{s(\%)}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b}\ \left\{\frac{kg}{VKT}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight (kg)	Empty Weight (kg)	Average Weight (kg)	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	0.0	93.1	0	0	0.000	0.000	-	-	0.0	0.0
Transport	Various	Various	Diesel	350	62,000	30,000	46,000	50	1.5	93.1	1	3	0.143	0.079	6,571	3,632	24.8	74.4
Bus	Various	Various	Diesel	540	29,000	29,000	29,000	50	2.0	93.1	2	4	0.286	0.105	8,286	3,052.6	49.6	99.2
Dump Truck	Various	Various	Diesel	490	74,000	34,400	54,200	50	12.4	93.1	3	25	0.429	0.658	23,229	35,657.9	74.4	620.0
Concentrate Truck	Caterpillar	740B	Diesel	490	74,000	34,400	54,200	50	3.0	93.1	1	6	0.143	0.158	7,743	8,558	24.8	148.8
TOTAL											**7**	**38**	**1.000**	**1.000**	**45,829**	**50,900**	**173.6**	**942.4**

	1h	24h
Uncontrolled TSP Emission Factor (kg/VKT)	2.40	2.51
Uncontrolled PM10 Emission Factor (kg/VKT)	0.59	0.62
Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.06	0.06

	Summer		Winter	
	1h	24h	1h	24h
Controlled Emission Rate PM (g/s)	7.98	1.89	5.78	1.37
Controlled Emission Rate PM10 (g/s)	1.98	0.47	1.43	0.34
Controlled Emission Rate PM2.5 (g/s)	0.20	0.05	0.14	0.03

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)						Emissions (g/s)											
			Pick up trucks	Transport	Bus	Dump Truck	Concentrate Truck		Pick up trucks (1h)	Pick up trucks (24h)	Transport (1h)	Transport (24h)	Bus (1h)	Bus (24h)	Dump Truck (1h)	Dump Truck (24h)	Concentrate Truck (1h)	Concentrate Truck (24h)	Total (1h)	Total (24h)
								Operating Time (hours)	0.00	0.00	0.50	1.49	0.99	1.98	1.49	12.40	0.50	2.98		
								Horsepower (hp)	203	203	316	316	182	182	333	333	339	339		
PM_{10}	[PM10]	100	6.32E-03	1.08E-02	6.32E-03	6.23E-03	6.23E-03		0.00E+00	0.00E+00	4.72E-04	5.91E-05	3.17E-04	2.64E-05	8.58E-04	2.98E-04	2.91E-04	7.27E-05	1.94E-03	4.56E-04
$PM_{2.5}$	[PM2.5]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.04E-03		0.00E+00	0.00E+00	4.58E-04	5.73E-05	3.08E-04	2.56E-05	8.32E-04	2.89E-04	2.82E-04	7.05E-05	1.88E-03	4.42E-04
CO	630-08-0	2	1.91E-02	4.90E-02	1.91E-02	1.90E-02	1.90E-02		0.00E+00	0.00E+00	2.14E-03	2.67E-04	9.60E-04	8.00E-05	2.62E-03	9.10E-04	8.88E-04	2.22E-04	6.60E-03	1.48E-03
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03		0.00E+00	0.00E+00	6.16E-05	7.70E-06	7.09E-05	5.91E-06	1.95E-04	6.76E-05	6.60E-05	1.65E-05	3.93E-04	9.77E-05
Hydrocarbons	[NMHC]	1	9.27E-03	7.68E-03	9.27E-03	9.26E-03	9.26E-03		0.00E+00	0.00E+00	3.35E-04	4.19E-05	4.65E-04	3.88E-05	1.28E-03	4.43E-04	4.32E-04	1.08E-04	2.51E-03	6.32E-04
NOx	10102-44-0	3	1.11E-01	1.68E-01	1.11E-01	1.11E-01	1.11E-01		0.00E+00	0.00E+00	7.33E-03	9.17E-04	5.59E-03	4.66E-04	1.53E-02	5.32E-03	5.20E-03	1.30E-03	3.35E-02	8.01E-03
1,3-butadiene	106-99-0	24	7.50E-06	1.13E-05	7.50E-06	7.49E-06	7.49E-06		0.00E+00	0.00E+00	4.93E-07	6.16E-08	3.76E-07	3.14E-08	1.03E-06	3.58E-07	3.50E-07	8.74E-08	2.25E-06	5.39E-07
Acenaphthene	83-32-9	70+170	2.53E-06	3.71E-06	2.53E-06	2.52E-06	2.52E-06		0.00E+00	0.00E+00	1.62E-07	2.02E-08	1.27E-07	1.06E-08	3.48E-07	1.21E-07	1.18E-07	2.95E-08	7.54E-07	1.81E-07
Acenaphthylene	208-96-8	71+171	5.08E-06	7.56E-06	5.08E-06	5.07E-06	5.07E-06		0.00E+00	0.00E+00	3.30E-07	4.12E-08	2.55E-07	2.12E-08	6.99E-07	2.43E-07	2.37E-07	5.92E-08	1.52E-06	3.64E-07
Acetaldehyde	75-07-0	26	6.46E-04	7.21E-04	6.46E-04	6.45E-04	6.45E-04		0.00E+00	0.00E+00	3.14E-05	3.93E-06	3.24E-05	2.70E-06	8.89E-05	3.09E-05	3.01E-05	7.53E-06	1.83E-04	4.50E-05
Acrolein	107-02-8	27	9.50E-05	1.21E-04	9.50E-05	9.49E-05	9.49E-05		0.00E+00	0.00E+00	5.29E-06	6.61E-07	4.77E-06	3.97E-07	1.31E-05	4.54E-06	4.43E-06	1.11E-06	2.76E-05	6.70E-06
Anthracene	120-12-7	72+172	5.37E-07	8.49E-07	5.37E-07	5.34E-07	5.34E-07		0.00E+00	0.00E+00	3.70E-08	4.63E-09	2.69E-08	2.24E-09	7.36E-08	2.55E-08	2.49E-08	6.24E-09	1.62E-07	3.87E-08
Benzene	71-43-2	20	2.18E-04	3.29E-04	2.18E-04	2.18E-04	2.18E-04		0.00E+00	0.00E+00	1.43E-05	1.79E-06	1.09E-05	9.12E-07	3.00E-05	1.04E-05	1.02E-05	2.54E-06	6.54E-05	1.57E-05
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	1.32E-07	9.69E-08	9.59E-08	9.59E-08		0.00E+00	0.00E+00	5.77E-09	7.21E-10	4.86E-09	4.05E-10	1.32E-08	4.59E-09	4.48E-09	1.12E-09	2.83E-08	6.84E-09
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	6.87E-08	3.28E-08	3.23E-08	3.23E-08		0.00E+00	0.00E+00	2.99E-09	3.74E-10	1.65E-09	1.37E-10	4.45E-09	1.55E-09	1.51E-09	3.77E-10	1.06E-08	2.43E-09
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	1.93E-07	9.24E-08	9.11E-08	9.11E-08		0.00E+00	0.00E+00	8.43E-09	1.05E-09	4.64E-09	3.87E-10	1.25E-08	4.36E-09	4.25E-09	1.06E-09	2.99E-08	6.86E-09
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	1.12E-07	6.01E-08	5.95E-08	5.95E-08		0.00E+00	0.00E+00	4.89E-09	6.11E-10	3.02E-09	2.51E-10	8.20E-09	2.85E-09	2.78E-09	6.95E-10	1.89E-08	4.40E-09
Chrysene	218-01-9	78+178	1.03E-07	1.83E-07	1.03E-07	1.02E-07	1.02E-07		0.00E+00	0.00E+00	7.97E-09	9.97E-10	5.18E-09	4.31E-10	1.41E-08	4.88E-09	4.77E-09	1.19E-09	3.20E-08	7.50E-09
Fluoranthene	206-44-0	69+169	9.02E-07	1.47E-06	9.02E-07	8.97E-07	8.97E-07		0.00E+00	0.00E+00	6.42E-08	8.02E-09	4.53E-08	3.77E-09	1.24E-07	4.29E-08	4.19E-08	1.05E-08	2.75E-07	6.52E-08
Fluorene	86-73-7	81+181	3.76E-06	5.69E-06	3.76E-06	3.75E-06	3.75E-06		0.00E+00	0.00E+00	2.48E-07	3.10E-08	1.89E-07	1.57E-08	5.16E-07	1.79E-07	1.75E-07	4.38E-08	1.13E-06	2.70E-07
Formaldehyde	50-00-0	5	3.62E-04	5.71E-04	3.62E-04	3.61E-04	3.61E-04		0.00E+00	0.00E+00	2.49E-05	3.11E-06	1.81E-05	1.51E-06	4.97E-05	1.73E-05	1.69E-05	4.22E-06	1.10E-04	2.61E-05
Phenanthrene	85-01-8	83+183	6.88E-06	1.05E-05	6.88E-06	6.86E-06	6.86E-06		0.00E+00	0.00E+00	4.56E-07	5.70E-08	3.45E-07	2.88E-08	9.45E-07	3.28E-07	3.20E-07	8.01E-08	2.07E-06	4.94E-07
Pyrene	129-00-0	84+184	8.58E-07	1.44E-06	8.58E-07	8.53E-07	8.53E-07		0.00E+00	0.00E+00	6.25E-08	7.82E-09	4.30E-08	3.59E-09	1.17E-07	4.08E-08	3.98E-08	9.95E-09	2.63E-07	6.21E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	1.05E-02	6.13E-03	6.04E-03	6.04E-03		0.00E+00	0.00E+00	4.58E-04	5.73E-05	3.08E-04	2.56E-05	8.32E-04	2.89E-04	2.82E-04	7.05E-05	1.88E-03	4.42E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	6.83E-03	3.98E-03	3.93E-03	3.93E-03		0.00E+00	0.00E+00	2.98E-04	3.72E-05	2.00E-04	1.67E-05	5.41E-04	1.88E-04	1.83E-04	4.58E-05	1.22E-03	2.87E-04

Source: Road Dust **HR2** **Road from Pit 87 to Plant**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	11.6	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	10	trips/hour	Troilus
Trips per day	20	trips/day	Troilus
Speed	50	km/h	Troilus
Haul Truck			
Trips per hour	5	trips/hour	Troilus
Trips per day	109	trips/day	Troilus
Speed	50	km/h	Troilus
Fuel Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus
Mechanic/Blaster Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	6	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	4.6	93.1	10	20	0.539	0.144	1,504.7	401.4	115.8	231.6
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	25.2	93.1	5	109	0.245	0.784	67,971.9	217,608	52.6	1262.2
Fuel Truck	Caterpillar		Diesel	350	30,000	30,000	30,000	50	0.9	93.1	1	4	0.054	0.029	1,618.0	863.3	11.6	46.3
Mechanic/Blaster Truck	Various	Various	Gasoline	450	2,790	2,790	2,790	50	1.4	93.1	3	6	0.162	0.043	451.4	120.4	34.7	69.5
TOTAL											**19**	**139**	**1.000**	**1.000**	**71,546**	**218,993**	**214.7**	**1609.6**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										4.97	8.22							
Uncontrolled PM10 Emission Factor (kg/VKT)										1.43	2.37							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.14	0.24							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										20.44	10.56	14.81	7.65					
Controlled Emission Rate PM10 (g/s)										5.89	3.04	4.27	2.21					
Controlled Emission Rate PM2.5 (g/s)										0.59	0.30	0.43	0.22					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)					Emissions (g/s)									
			Pick up trucks	Haul truck	Fuel Truck	Mechanic/Blaster Truck		Pick up trucks (1h)	Pick up trucks (24h)	Haul truck (1h)	Haul truck (24h)	Fuel Truck (1h)	Fuel Truck (24h)	Mechanic/Blaster Truck (1h)	Mechanic/Blaster Truck (24h)	Total (1h)	Total (24h)
							Operating Time (hours)	2.32	4.63	1.05	25.24	0.23	0.93	0.69	1.39		
							Horsepower (hp)	203	203	1855	1855	211	211	135	135		
PM_{10}	[PM10]	100	6.32E-03	2.33E-02	6.32E-03	1.10E-02		8.24E-04	6.87E-05	1.26E-02	1.26E-02	8.56E-05	1.43E-05	2.87E-04	2.39E-05	1.38E-02	1.27E-02
$PM_{2.5}$	[PM2.5]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02		8.00E-04	6.66E-05	1.22E-02	1.22E-02	8.31E-05	1.38E-05	2.78E-04	2.32E-05	1.34E-02	1.23E-02
CO	630-08-0	2	1.91E-02	7.26E-02	1.91E-02	4.92E-02		2.49E-03	2.08E-04	3.94E-02	3.94E-02	2.59E-04	4.32E-05	1.28E-03	1.07E-04	4.34E-02	3.97E-02
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03		1.84E-04	1.54E-05	7.66E-04	7.66E-04	1.92E-05	3.19E-06	3.69E-05	3.07E-06	1.01E-03	7.88E-04
Hydrocarbons	[NMHC]	1	9.27E-03	3.16E-02	9.27E-03	7.69E-03		1.21E-03	1.01E-04	1.71E-02	1.71E-02	1.26E-04	2.09E-05	2.01E-04	1.67E-05	1.86E-02	1.72E-02
NOx	10102-44-0	3	1.11E-01	2.21E+00	1.11E-01	1.68E-01		1.45E-02	1.21E-03	1.20E+00	1.20E+00	1.51E-03	2.51E-04	4.39E-03	3.66E-04	1.22E+00	1.20E+00
1,3-butadiene	106-99-0	24	7.50E-06	6.53E-05	7.50E-06	1.13E-05		9.78E-07	8.15E-08	3.54E-05	3.54E-05	1.02E-07	1.69E-08	2.95E-07	2.46E-08	3.67E-05	3.55E-05
Acenaphthene	83-32-9	70+170	2.53E-06	2.13E-05	2.53E-06	3.72E-06		3.30E-07	2.75E-08	1.15E-05	1.15E-05	3.42E-08	5.70E-09	9.69E-08	8.08E-09	1.20E-05	1.16E-05
Acenaphthylene	208-96-8	71+171	5.08E-06	4.35E-05	5.08E-06	7.57E-06		6.62E-07	5.52E-08	2.36E-05	2.36E-05	6.88E-08	1.15E-08	1.97E-07	1.65E-08	2.45E-05	2.37E-05
Acetaldehyde	75-07-0	26	6.46E-04	3.65E-03	6.46E-04	7.21E-04		8.43E-05	7.02E-06	1.98E-03	1.98E-03	8.75E-06	1.46E-06	1.88E-05	1.57E-06	2.09E-03	1.99E-03
Acrolein	107-02-8	27	9.50E-05	6.56E-04	9.50E-05	1.21E-04		1.24E-05	1.03E-06	3.56E-04	3.56E-04	1.29E-06	2.14E-07	3.17E-06	2.64E-07	3.72E-04	3.57E-04
Anthracene	120-12-7	72+172	5.37E-07	3.75E-06	5.37E-07	8.54E-07		7.00E-08	5.83E-09	2.03E-06	2.03E-06	7.27E-09	1.21E-09	2.23E-08	1.86E-09	2.13E-06	2.04E-06
Benzene	71-43-2	20	2.18E-04	1.90E-03	2.18E-04	3.29E-04		2.84E-05	2.37E-06	1.03E-03	1.03E-03	2.95E-06	4.92E-07	8.59E-06	7.15E-07	1.07E-03	1.03E-03
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	4.49E-07	9.69E-08	1.34E-07		1.26E-08	1.05E-09	2.43E-07	2.43E-07	1.31E-09	2.19E-10	3.49E-09	2.90E-10	2.61E-07	2.45E-07
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	1.51E-07	3.28E-08	6.96E-08		4.28E-09	3.57E-10	8.16E-08	8.16E-08	4.44E-10	7.41E-11	1.82E-09	1.51E-10	8.82E-08	8.22E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	4.25E-07	9.24E-08	1.96E-07		1.21E-08	1.00E-09	2.30E-07	2.30E-07	1.25E-09	2.09E-10	5.11E-09	4.26E-10	2.49E-07	2.32E-07
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	3.70E-07	6.01E-08	1.13E-07		7.84E-09	6.53E-10	2.01E-07	2.01E-07	8.14E-10	1.36E-10	2.96E-09	2.46E-10	2.12E-07	2.02E-07
Chrysene	218-01-9	78+178	1.03E-07	5.65E-07	1.03E-07	1.85E-07		1.35E-08	1.12E-09	3.06E-07	3.06E-07	1.40E-09	2.33E-10	4.82E-09	4.02E-10	3.26E-07	3.08E-07
Fluoranthene	206-44-0	69+169	9.02E-07	6.35E-06	9.02E-07	1.48E-06		1.18E-07	9.81E-09	3.44E-06	3.44E-06	1.22E-08	2.04E-09	3.87E-08	3.22E-09	3.61E-06	3.46E-06
Fluorene	86-73-7	81+181	3.76E-06	2.95E-05	3.76E-06	5.71E-06		4.90E-07	4.09E-08	1.60E-05	1.60E-05	5.09E-08	8.49E-09	1.49E-07	1.24E-08	1.67E-05	1.61E-05
Formaldehyde	50-00-0	5	3.62E-04	3.11E-03	3.62E-04	5.71E-04		4.72E-05	3.93E-06	1.68E-03	1.68E-03	4.90E-06	8.16E-07	1.49E-05	1.24E-06	1.75E-03	1.69E-03
Phenanthrene	85-01-8	83+183	6.88E-06	5.03E-05	6.88E-06	1.05E-05		8.98E-07	7.48E-08	2.72E-05	2.72E-05	9.32E-08	1.55E-08	2.74E-07	2.28E-08	2.85E-05	2.74E-05
Pyrene	129-00-0	84+184	8.58E-07	5.95E-06	8.58E-07	1.44E-06		1.12E-07	9.32E-09	3.22E-06	3.22E-06	1.16E-08	1.94E-09	3.77E-08	3.14E-09	3.39E-06	3.24E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02		8.00E-04	6.66E-05	1.22E-02	1.22E-02	8.31E-05	1.38E-05	2.78E-04	2.32E-05	1.34E-02	1.23E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	1.47E-02	3.98E-03	6.93E-03		5.20E-04	4.33E-05	7.96E-03	7.96E-03	5.40E-05	9.00E-06	1.81E-04	1.51E-05	8.71E-03	8.02E-03

Source: Road Dust **HR3** **Road from Pit J to Plant**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	15.7	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	5	trips/hour	Troilus
Trips per day	10	trips/day	Troilus
Speed	50	km/h	Troilus
Haul Truck			
Trips per hour	2	trips/hour	Troilus
Trips per day	39	trips/day	Troilus
Speed	50	km/h	Troilus
Water Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	1	trips/day	Troilus
Speed	15	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	3.1	93.1	5	10	0.656	0.200	1,829.5	558.0	78.7	157.4
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	12.3	93.1	2	39	0.213	0.780	59,139.3	216,450	25.6	613.9
Water Truck			Diesel	350	30,000	30,000	30,000	15	1.0	97.9	1	1	0.131	0.020	3,934.4	600	15.7	15.7
TOTAL											**8**	**50**	**1.000**	**1.000**	**64,903**	**217,608**	**120.0**	**787.0**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										4.75	8.19							
Uncontrolled PM10 Emission Factor (kg/VKT)										1.37	2.36							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.14	0.24							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										10.94	5.15	7.92	3.73					
Controlled Emission Rate PM10 (g/s)										3.15	1.48	2.28	1.08					
Controlled Emission Rate PM2.5 (g/s)										0.32	0.15	0.23	0.11					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)				Emissions (g/s)							
			Pick up trucks	Haul Truck	Water Truck		Pick up trucks (1h)	Pick up trucks (24h)	Haul truck (1h)	Haul truck (24h)	Water Truck (1h)	Water Truck (24h)	Total (1h)	Total (24h)
						Operating Time (hours)	**1.57**	**3.15**	**0.51**	**12.28**	**1.05**	**1.05**		
						Horsepower (hp)	**203**	**203**	**1855**	**1855**	**180**	**180**		
PM_{10}	[PM10]	100	6.32E-03	2.33E-02	6.32E-03		5.60E-04	4.67E-05	6.14E-03	6.14E-03	3.31E-04	1.38E-05	7.03E-03	6.20E-03
$PM_{2.5}$	[PM2.5]	110	6.13E-03	2.26E-02	6.13E-03		5.43E-04	4.53E-05	5.95E-03	5.95E-03	3.21E-04	1.34E-05	6.82E-03	6.01E-03
CO	630-08-0	2	1.91E-02	7.26E-02	1.91E-02		1.70E-03	1.41E-04	1.91E-02	1.91E-02	1.00E-03	4.18E-05	2.18E-02	1.93E-02
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03		1.25E-04	1.04E-05	3.72E-04	3.72E-04	7.41E-05	3.09E-06	5.72E-04	3.86E-04
Hydrocarbons	[NMHC]	1	9.27E-03	3.16E-02	9.27E-03		8.22E-04	6.85E-05	8.32E-03	8.32E-03	4.86E-04	2.02E-05	9.63E-03	8.41E-03
NOx	10102-44-0	3	1.11E-01	2.21E+00	1.11E-01		9.87E-03	8.23E-04	5.81E-01	5.81E-01	5.84E-03	2.43E-04	5.97E-01	5.82E-01
1,3-butadiene	106-99-0	24	7.50E-06	6.53E-05	7.50E-06		6.65E-07	5.54E-08	1.72E-05	1.72E-05	3.93E-07	1.64E-08	1.83E-05	1.73E-05
Acenaphthene	83-32-9	70+170	2.53E-06	2.13E-05	2.53E-06		2.24E-07	1.87E-08	5.60E-06	5.60E-06	1.32E-07	5.52E-09	5.96E-06	5.63E-06
Acenaphthylene	208-96-8	71+171	5.08E-06	4.35E-05	5.08E-06		4.50E-07	3.75E-08	1.15E-05	1.15E-05	2.66E-07	1.11E-08	1.22E-05	1.15E-05
Acetaldehyde	75-07-0	26	6.46E-04	3.65E-03	6.46E-04		5.73E-05	4.77E-06	9.62E-04	9.62E-04	3.39E-05	1.41E-06	1.05E-03	9.68E-04
Acrolein	107-02-8	27	9.50E-05	6.56E-04	9.50E-05		8.42E-06	7.02E-07	1.73E-04	1.73E-04	4.98E-06	2.07E-07	1.86E-04	1.74E-04
Anthracene	120-12-7	72+172	5.37E-07	3.75E-06	5.37E-07		4.76E-08	3.97E-09	9.87E-07	9.87E-07	2.81E-08	1.17E-09	1.06E-06	9.92E-07
Benzene	71-43-2	20	2.18E-04	1.90E-03	2.18E-04		1.93E-05	1.61E-06	5.00E-04	5.00E-04	1.14E-05	4.76E-07	5.31E-04	5.02E-04
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	4.49E-07	9.69E-08		8.59E-09	7.16E-10	1.18E-07	1.18E-07	5.08E-09	2.12E-10	1.32E-07	1.19E-07
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	1.51E-07	3.28E-08		2.91E-09	2.42E-10	3.97E-08	3.97E-08	1.72E-09	7.16E-11	4.43E-08	4.00E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	4.25E-07	9.24E-08		8.20E-09	6.83E-10	1.12E-07	1.12E-07	4.85E-09	2.02E-10	1.25E-07	1.13E-07
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	3.70E-07	6.01E-08		5.33E-09	4.44E-10	9.76E-08	9.76E-08	3.15E-09	1.31E-10	1.06E-07	9.82E-08
Chrysene	218-01-9	78+178	1.03E-07	5.65E-07	1.03E-07		9.15E-09	7.62E-10	1.49E-07	1.49E-07	5.41E-09	2.25E-10	1.64E-07	1.50E-07
Fluoranthene	206-44-0	69+169	9.02E-07	6.35E-06	9.02E-07		8.00E-08	6.67E-09	1.67E-06	1.67E-06	4.73E-08	1.97E-09	1.80E-06	1.68E-06
Fluorene	86-73-7	81+181	3.76E-06	2.95E-05	3.76E-06		3.33E-07	2.78E-08	7.78E-06	7.78E-06	1.97E-07	8.21E-09	8.31E-06	7.82E-06
Formaldehyde	50-00-0	5	3.62E-04	3.11E-03	3.62E-04		3.21E-05	2.67E-06	8.19E-04	8.19E-04	1.90E-05	7.90E-07	8.70E-04	8.23E-04
Phenanthrene	85-01-8	83+183	6.88E-06	5.03E-05	6.88E-06		6.10E-07	5.08E-08	1.32E-05	1.32E-05	3.61E-07	1.50E-08	1.42E-05	1.33E-05
Pyrene	129-00-0	84+184	8.58E-07	5.95E-06	8.58E-07		7.60E-08	6.34E-09	1.57E-06	1.57E-06	4.50E-08	1.87E-09	1.69E-06	1.58E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	2.26E-02	6.13E-03		5.43E-04	4.53E-05	5.95E-03	5.95E-03	3.21E-04	1.34E-05	6.82E-03	6.01E-03
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	1.47E-02	3.98E-03		3.53E-04	2.94E-05	3.87E-03	3.87E-03	2.09E-04	8.70E-06	4.43E-03	3.91E-03

Source: Road Dust **HR4** **Road from Pit SW to Plant**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	16.2	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Pick up trucks			
Trips per hour	10	trips/hour	Troilus
Trips per day	20	trips/day	Troilus
Speed	50	km/h	Troilus
Haul Truck			
Trips per hour	5	trips/hour	Troilus
Trips per day	109	trips/day	Troilus
Speed	50	km/h	Troilus
Fuel Truck/Pump Truck			
Trips per hour	3	trips/hour	Troilus
Trips per day	6	trips/day	Troilus
Speed	50	km/h	Troilus
Mechanic/Blaster Truck/Welding			
Trips per hour	3	trips/hour	Troilus
Trips per day	8	trips/day	Troilus
Speed	50	km/h	Troilus
Water Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	1	trips/day	Troilus
Speed	15	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

Heavy Duty Vehicle: $EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b}$ $\begin{Bmatrix} kg \\ VKT \end{Bmatrix}$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs/day)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Pick up trucks	Various	Various	Gasoline	450	2,790	2,790	2,790	50	6.5	93.1	10	20	0.464	0.139	1,295.2	387.5	162.0	324.0
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	35.3	93.1	5	109	0.211	0.757	58,505.8	210,052	73.6	1765.8
Fuel/Pump Truck	Caterpillar		Diesel	350	30,000	30,000	30,000	50	1.9	93.1	3	6	0.139	0.042	4,177.9	1,250.0	48.6	97.2
Mechanic/Blaster Truck	Various	Various	Gasoline	450	2,790	2,790	2,790	50	2.6	93.1	3	8	0.139	0.056	388.5	155.0	48.6	129.6
Water Truck			Diesel	350	30,000	30,000	30,000	15	1.1	97.9	1	1	0.046	0.007	1,392.6	208.3	16.2	16.2
TOTAL											**22**	**144**	**1.000**	**1.000**	**65,760**	**212,053**	**349.0**	**2332.8**
											1h	**24h**						
Uncontrolled TSP Emission Factor (kg/VKT)										4.78	8.10							
Uncontrolled PM10 Emission Factor (kg/VKT)										1.38	2.33							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.14	0.23							
											Summer		**Winter**					
											1h	**24h**	**1h**	**24h**				
Controlled Emission Rate PM (g/s)											31.99	15.09	23.17	10.93				
Controlled Emission Rate PM10 (g/s)											9.22	4.35	6.68	3.15				
Controlled Emission Rate PM2.5 (g/s)											0.92	0.43	0.67	0.32				

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)						Emissions (g/s)									
			Pick up trucks	Haul truck	Fuel/Pump Truck	Mechanic/Blaster Truck	Water Truck		Pick up trucks (1h)	Pick up trucks (24h)	Haul truck (1h)	Haul truck (24h)	Fuel/Pump Truck (1h)	Fuel/Pump Truck (24h)	Mechanic/Blaster Truck (1h)	Mechanic/Blaster Truck (24h)	Water Truck (1h)	Water Truck (24h)	Total (1h)	Total (24h)
								Operating Time (hours)	**3.24**	**6.48**	**1.47**	**35.32**	**0.97**	**1.94**	**0.97**	**2.59**	**1.08**	**1.08**		
								Horsepower (hp)	**203**	**203**	**1855**	**1855**	**211**	**211**	**135**	**135**	**180**	**180**		
PM_{10}	[PM10]	100	6.32E-03	2.33E-02	6.32E-03	1.10E-02	6.32E-03		1.15E-03	9.61E-05	1.77E-02	1.77E-02	3.59E-04	2.99E-05	4.01E-04	4.46E-05	3.41E-04	1.42E-05	1.99E-02	1.78E-02
$PM_{2.5}$	[PM2.5]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02	6.13E-03		1.12E-03	9.32E-05	1.71E-02	1.71E-02	3.49E-04	2.90E-05	3.89E-04	4.32E-05	3.31E-04	1.38E-05	1.93E-02	1.73E-02
CO	630-08-0	2	1.91E-02	7.26E-02	1.91E-02	4.92E-02	1.91E-02		3.49E-03	2.91E-04	5.51E-02	5.51E-02	1.09E-03	9.06E-05	1.80E-03	2.00E-04	1.03E-03	4.30E-05	6.25E-02	5.57E-02
SO_2	7446-09-5	31	1.41E-03	1.41E-03	1.41E-03	1.41E-03	1.41E-03		2.58E-04	2.15E-05	1.07E-03	1.07E-03	8.04E-05	6.70E-06	5.16E-05	5.73E-06	7.63E-05	3.18E-06	1.54E-03	1.11E-03
Hydrocarbons	[NMHC]	1	9.27E-03	3.16E-02	9.27E-03	7.69E-03	9.27E-03		1.69E-03	1.41E-04	2.39E-02	2.39E-02	5.27E-04	4.39E-05	2.81E-04	3.12E-05	5.00E-04	2.08E-05	2.69E-02	2.42E-02
NOx	10102-44-0	3	1.11E-01	2.21E+00	1.11E-01	1.68E-01	1.11E-01		2.03E-02	1.69E-03	1.67E+00	1.67E+00	6.33E-03	5.28E-04	6.14E-03	6.83E-04	6.01E-03	2.50E-04	1.71E+00	1.67E+00
1,3-butadiene	106-99-0	24	7.50E-06	6.53E-05	7.50E-06	1.13E-05	7.50E-06		1.37E-06	1.14E-07	4.95E-05	4.95E-05	4.26E-07	3.55E-08	4.13E-07	4.59E-08	4.04E-07	1.69E-08	5.21E-05	4.97E-05
Acenaphthene	83-32-9	70+170	2.53E-06	2.13E-05	2.53E-06	3.72E-06	2.53E-06		4.61E-07	3.84E-08	1.61E-05	1.61E-05	1.44E-07	1.20E-08	1.36E-07	1.51E-08	1.36E-07	5.68E-09	1.70E-05	1.62E-05
Acenaphthylene	208-96-8	71+171	5.08E-06	4.35E-05	5.08E-06	7.57E-06	5.08E-06		9.27E-07	7.72E-08	3.30E-05	3.30E-05	2.89E-07	2.41E-08	2.76E-07	3.07E-08	2.74E-07	1.14E-08	3.47E-05	3.31E-05
Acetaldehyde	75-07-0	26	6.46E-04	3.65E-03	6.46E-04	7.21E-04	6.46E-04		1.18E-04	9.83E-06	2.77E-03	2.77E-03	3.67E-05	3.06E-06	2.63E-05	2.92E-06	3.49E-05	1.45E-06	2.98E-03	2.78E-03
Acrolein	107-02-8	27	9.50E-05	6.56E-04	9.50E-05	1.21E-04	9.50E-05		1.73E-05	1.44E-06	4.97E-04	4.97E-04	5.40E-06	4.50E-07	4.43E-06	4.93E-07	5.12E-06	2.13E-07	5.30E-04	5.00E-04
Anthracene	120-12-7	72+172	5.37E-07	3.75E-06	5.37E-07	8.54E-07	5.37E-07		9.79E-08	8.16E-09	2.84E-06	2.84E-06	3.05E-08	2.54E-09	3.12E-08	3.46E-09	2.90E-08	1.21E-09	3.03E-06	2.86E-06
Benzene	71-43-2	20	2.18E-04	1.90E-03	2.18E-04	3.29E-04	2.18E-04		3.98E-05	3.32E-06	1.44E-03	1.44E-03	1.24E-05	1.03E-06	1.20E-05	1.33E-06	1.18E-05	4.90E-07	1.52E-03	1.45E-03
Benzo(a)anthracene	56-55-3	73+173	9.69E-08	4.49E-07	9.69E-08	1.34E-07	9.69E-08		1.77E-08	1.47E-09	3.41E-07	3.41E-07	5.51E-09	4.59E-10	4.88E-09	5.42E-10	5.23E-09	2.18E-10	3.74E-07	3.43E-07
Benzo(a)pyrene	50-32-8	74+174	3.28E-08	1.51E-07	3.28E-08	6.96E-08	3.28E-08		5.99E-09	4.99E-10	1.14E-07	1.14E-07	1.87E-09	1.55E-10	2.54E-09	2.82E-10	1.77E-09	7.37E-11	1.26E-07	1.15E-07
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.24E-08	4.25E-07	9.24E-08	1.96E-07	9.24E-08		1.69E-08	1.41E-09	3.22E-07	3.22E-07	5.26E-09	4.38E-10	7.15E-09	7.95E-10	4.99E-09	2.08E-10	3.56E-07	3.25E-07
Benzo(g,h,i)perylene	191-24-2	76+176	6.01E-08	3.70E-07	6.01E-08	1.13E-07	6.01E-08		1.10E-08	9.14E-10	2.81E-07	2.81E-07	3.42E-09	2.85E-10	4.14E-09	4.59E-10	3.24E-09	1.35E-10	3.03E-07	2.83E-07
Chrysene	218-01-9	78+178	1.03E-07	5.65E-07	1.03E-07	1.85E-07	1.03E-07		1.88E-08	1.57E-09	4.29E-07	4.29E-07	5.87E-09	4.89E-10	6.75E-09	7.50E-10	5.57E-09	2.32E-10	4.66E-07	4.32E-07
Fluoranthene	206-44-0	69+169	9.02E-07	6.35E-06	9.02E-07	1.48E-06	9.02E-07		1.65E-07	1.37E-08	4.81E-06	4.81E-06	5.13E-08	4.28E-09	5.41E-08	6.01E-09	4.87E-08	2.03E-09	5.13E-06	4.84E-06
Fluorene	86-73-7	81+181	3.76E-06	2.95E-05	3.76E-06	5.71E-06	3.76E-06		6.86E-07	5.71E-08	2.24E-05	2.24E-05	2.14E-07	1.78E-08	2.08E-07	2.32E-08	2.03E-07	8.45E-09	2.37E-05	2.25E-05
Formaldehyde	50-00-0	5	3.62E-04	3.11E-03	3.62E-04	5.71E-04	3.62E-04		6.60E-05	5.50E-06	2.36E-03	2.36E-03	2.06E-05	1.71E-06	2.08E-05	2.32E-06	1.95E-05	8.13E-07	2.48E-03	2.37E-03
Phenanthrene	85-01-8	83+183	6.88E-06	5.03E-05	6.88E-06	1.05E-05	6.88E-06		1.26E-06	1.05E-07	3.81E-05	3.81E-05	3.91E-07	3.26E-08	3.83E-07	4.26E-08	3.71E-07	1.55E-08	4.05E-05	3.83E-05
Pyrene	129-00-0	84+184	8.58E-07	5.95E-06	8.58E-07	1.44E-06	8.58E-07		1.57E-07	1.30E-08	4.51E-06	4.51E-06	4.88E-08	4.06E-09	5.27E-08	5.86E-09	4.63E-08	1.93E-09	4.82E-06	4.54E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.13E-03	2.26E-02	6.13E-03	1.07E-02	6.13E-03		1.12E-03	9.32E-05	1.71E-02	1.71E-02	3.49E-04	2.90E-05	3.89E-04	4.32E-05	3.31E-04	1.38E-05	1.93E-02	1.73E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.98E-03	1.47E-02	3.98E-03	6.93E-03	3.98E-03		7.27E-04	6.06E-05	1.11E-02	1.11E-02	2.27E-04	1.89E-05	2.53E-04	2.81E-05	2.15E-04	8.96E-06	1.26E-02	1.12E-02

Source: Road Dust **HR5** **Road from Pit J to OB NW**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	6.0	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	27	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b}\ \left\{\frac{kg}{VKT}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	3.2	93.1	1	27	1.000	1.000	277,500	277,500	6.8	162.0
TOTAL											**1**	**27**	**1.000**	**1.000**	**277,500**	**277,500**	**6.8**	**162.0**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										9.14	9.14							
Uncontrolled PM10 Emission Factor (kg/VKT)										2.63	2.63							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.26	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										1.18	1.18	0.86	0.86					
Controlled Emission Rate PM10 (g/s)										0.34	0.34	0.25	0.25					
Controlled Emission Rate PM2.5 (g/s)										0.03	0.03	0.02	0.02					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
			Haul truck		Haul truck (1h)	Haul truck (24h)	Total (1h)	Total (24h)
				Operating Time (hours)	**0.14**	**3.24**		
				Horsepower (hp)	**1855**	**1855**		
PM_{10}	[PM10]	100	2.33E-02		1.62E-03	1.62E-03	1.62E-03	1.62E-03
$PM_{2.5}$	[PM2.5]	110	2.26E-02		1.57E-03	1.57E-03	1.57E-03	1.57E-03
CO	630-08-0	2	7.26E-02		5.05E-03	5.05E-03	5.05E-03	5.05E-03
SO_2	7446-09-5	31	1.41E-03		9.83E-05	9.83E-05	9.83E-05	9.83E-05
Hydrocarbons	[NMHC]	1	3.16E-02		2.20E-03	2.20E-03	2.20E-03	2.20E-03
NOx	10102-44-0	3	2.21E+00		1.53E-01	1.53E-01	1.53E-01	1.53E-01
1,3-butadiene	106-99-0	24	6.53E-05		4.54E-06	4.54E-06	4.54E-06	4.54E-06
Acenaphthene	83-32-9	70+170	2.13E-05		1.48E-06	1.48E-06	1.48E-06	1.48E-06
Acenaphthylene	208-96-8	71+171	4.35E-05		3.03E-06	3.03E-06	3.03E-06	3.03E-06
Acetaldehyde	75-07-0	26	3.65E-03		2.54E-04	2.54E-04	2.54E-04	2.54E-04
Acrolein	107-02-8	27	6.56E-04		4.56E-05	4.56E-05	4.56E-05	4.56E-05
Anthracene	120-12-7	72+172	3.75E-06		2.61E-07	2.61E-07	2.61E-07	2.61E-07
Benzene	71-43-2	20	1.90E-03		1.32E-04	1.32E-04	1.32E-04	1.32E-04
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		3.12E-08	3.12E-08	3.12E-08	3.12E-08
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		1.05E-08	1.05E-08	1.05E-08	1.05E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		2.95E-08	2.95E-08	2.95E-08	2.95E-08
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		2.58E-08	2.58E-08	2.58E-08	2.58E-08
Chrysene	218-01-9	78+178	5.65E-07		3.93E-08	3.93E-08	3.93E-08	3.93E-08
Fluoranthene	206-44-0	69+169	6.35E-06		4.42E-07	4.42E-07	4.42E-07	4.42E-07
Fluorene	86-73-7	81+181	2.95E-05		2.05E-06	2.05E-06	2.05E-06	2.05E-06
Formaldehyde	50-00-0	5	3.11E-03		2.16E-04	2.16E-04	2.16E-04	2.16E-04
Phenanthrene	85-01-8	83+183	5.03E-05		3.50E-06	3.50E-06	3.50E-06	3.50E-06
Pyrene	129-00-0	84+184	5.95E-06		4.14E-07	4.14E-07	4.14E-07	4.14E-07
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		1.57E-03	1.57E-03	1.57E-03	1.57E-03
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		1.02E-03	1.02E-03	1.02E-03	1.02E-03

Source: Road Dust **HR6** **Road from Pit J to OB West**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	6.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	23	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b}\ \begin{cases} kg \\ VKT \end{cases}$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5)	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793F	Diesel	2650	391,000	164,000	277,500	50	3.1	93.1	1	23	1.000	1.000	277,500	277,500	6.5	156.4
TOTAL											**1**	**23**	**1.000**	**1.000**	**277,500**	**277,500**	**6.5**	**156.4**
										1h	**24h**							
									Uncontrolled TSP Emission Factor (kg/VKT)	9.14	9.14							
									Uncontrolled PM10 Emission Factor (kg/VKT)	2.63	2.63							
									Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.26	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
									Controlled Emission Rate PM (g/s)	1.14	1.14	0.83	0.83					
									Controlled Emission Rate PM10 (g/s)	0.33	0.33	0.24	0.24					
									Controlled Emission Rate PM2.5 (g/s)	0.03	0.03	0.02	0.02					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
			Haul truck		Haul truck (1h)	Haul truck (24h)	Total (1h)	Total (24h)
				Operating Time (hours)	0.13	3.13		
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.33E-02		1.56E-03	1.56E-03	1.56E-03	1.56E-03
$PM_{2.5}$	[PM2.5]	110	2.26E-02		1.52E-03	1.52E-03	1.52E-03	1.52E-03
CO	630-08-0	2	7.26E-02		4.88E-03	4.88E-03	4.88E-03	4.88E-03
SO_2	7446-09-5	31	1.41E-03		9.49E-05	9.49E-05	9.49E-05	9.49E-05
Hydrocarbons	[NMHC]	1	3.16E-02		2.12E-03	2.12E-03	2.12E-03	2.12E-03
NOx	10102-44-0	3	2.21E+00		1.48E-01	1.48E-01	1.48E-01	1.48E-01
1,3-butadiene	106-99-0	24	6.53E-05		4.38E-06	4.38E-06	4.38E-06	4.38E-06
Acenaphthene	83-32-9	70+170	2.13E-05		1.43E-06	1.43E-06	1.43E-06	1.43E-06
Acenaphthylene	208-96-8	71+171	4.35E-05		2.92E-06	2.92E-06	2.92E-06	2.92E-06
Acetaldehyde	75-07-0	26	3.65E-03		2.45E-04	2.45E-04	2.45E-04	2.45E-04
Acrolein	107-02-8	27	6.56E-04		4.41E-05	4.41E-05	4.41E-05	4.41E-05
Anthracene	120-12-7	72+172	3.75E-06		2.52E-07	2.52E-07	2.52E-07	2.52E-07
Benzene	71-43-2	20	1.90E-03		1.27E-04	1.27E-04	1.27E-04	1.27E-04
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		3.02E-08	3.02E-08	3.02E-08	3.02E-08
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		1.01E-08	1.01E-08	1.01E-08	1.01E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		2.85E-08	2.85E-08	2.85E-08	2.85E-08
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		2.49E-08	2.49E-08	2.49E-08	2.49E-08
Chrysene	218-01-9	78+178	5.65E-07		3.80E-08	3.80E-08	3.80E-08	3.80E-08
Fluoranthene	206-44-0	69+169	6.35E-06		4.26E-07	4.26E-07	4.26E-07	4.26E-07
Fluorene	86-73-7	81+181	2.95E-05		1.98E-06	1.98E-06	1.98E-06	1.98E-06
Formaldehyde	50-00-0	5	3.11E-03		2.09E-04	2.09E-04	2.09E-04	2.09E-04
Phenanthrene	85-01-8	83+183	5.03E-05		3.38E-06	3.38E-06	3.38E-06	3.38E-06
Pyrene	129-00-0	84+184	5.95E-06		4.00E-07	4.00E-07	4.00E-07	4.00E-07
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		1.52E-03	1.52E-03	1.52E-03	1.52E-03
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		9.86E-04	9.86E-04	9.86E-04	9.86E-04

Source: Road Dust **HR7** **Road from Pit SW to OB SW**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	6.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	1	trips/hour	Troilus
Trips per day	4	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

Heavy Duty Vehicle: $EF = k\left(\frac{s(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b}$ $\left\{\frac{kg}{VKT}\right.$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	0.5	93.1	1	4	1.000	1.000	277,500	277,500	6.8	27.2
TOTAL											**1**	**4**	**1.000**	**1.000**	**277,500**	**277,500**	**6.8**	**27.2**
										1h	**24h**							
									Uncontrolled TSP Emission Factor (kg/VKT)	9.14	9.14							
									Uncontrolled PM10 Emission Factor (kg/VKT)	2.63	2.63							
									Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.26	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
									Controlled Emission Rate PM (g/s)	1.19	0.20	0.86	0.14					
									Controlled Emission Rate PM10 (g/s)	0.34	0.06	0.25	0.04					
									Controlled Emission Rate PM2.5 (g/s)	0.03	0.01	0.02	0.00					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
			Haul truck		Haul truck (1h)	Haul truck (24h)	Total (1h)	Total (24h)
				Operating Time (hours)	0.14	0.54		
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.33E-02		1.63E-03	2.72E-04	1.63E-03	2.72E-04
$PM_{2.5}$	[PM2.5]	110	2.26E-02		1.58E-03	2.64E-04	1.58E-03	2.64E-04
CO	630-08-0	2	7.26E-02		5.09E-03	8.48E-04	5.09E-03	8.48E-04
SO_2	7446-09-5	31	1.41E-03		9.90E-05	1.65E-05	9.90E-05	1.65E-05
Hydrocarbons	[NMHC]	1	3.16E-02		2.21E-03	3.69E-04	2.21E-03	3.69E-04
NOx	10102-44-0	3	2.21E+00		1.55E-01	2.58E-02	1.55E-01	2.58E-02
1,3-butadiene	106-99-0	24	6.53E-05		4.57E-06	7.62E-07	4.57E-06	7.62E-07
Acenaphthene	83-32-9	70+170	2.13E-05		1.49E-06	2.48E-07	1.49E-06	2.48E-07
Acenaphthylene	208-96-8	71+171	4.35E-05		3.05E-06	5.08E-07	3.05E-06	5.08E-07
Acetaldehyde	75-07-0	26	3.65E-03		2.56E-04	4.26E-05	2.56E-04	4.26E-05
Acrolein	107-02-8	27	6.56E-04		4.60E-05	7.66E-06	4.60E-05	7.66E-06
Anthracene	120-12-7	72+172	3.75E-06		2.62E-07	4.37E-08	2.62E-07	4.37E-08
Benzene	71-43-2	20	1.90E-03		1.33E-04	2.22E-05	1.33E-04	2.22E-05
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		3.15E-08	5.25E-09	3.15E-08	5.25E-09
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		1.06E-08	1.76E-09	1.06E-08	1.76E-09
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		2.97E-08	4.96E-09	2.97E-08	4.96E-09
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		2.60E-08	4.33E-09	2.60E-08	4.33E-09
Chrysene	218-01-9	78+178	5.65E-07		3.96E-08	6.60E-09	3.96E-08	6.60E-09
Fluoranthene	206-44-0	69+169	6.35E-06		4.45E-07	7.42E-08	4.45E-07	7.42E-08
Fluorene	86-73-7	81+181	2.95E-05		2.07E-06	3.45E-07	2.07E-06	3.45E-07
Formaldehyde	50-00-0	5	3.11E-03		2.18E-04	3.63E-05	2.18E-04	3.63E-05
Phenanthrene	85-01-8	83+183	5.03E-05		3.52E-06	5.87E-07	3.52E-06	5.87E-07
Pyrene	129-00-0	84+184	5.95E-06		4.17E-07	6.95E-08	4.17E-07	6.95E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		1.58E-03	2.64E-04	1.58E-03	2.64E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		1.03E-03	1.71E-04	1.03E-03	1.71E-04

Source: Road Dust **HR8** **Road from Pit SW to WD SW**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	5.8	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	14	trips/hour	Troilus
Trips per day	341	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{s_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	39.6	93.1	14	341	1.000	1.000	277,500	277,500	82.4	1977.8
TOTAL											**14**	**341**	**1.000**	**1.000**	**277,500**	**277,500**	**82.4**	**1977.8**

	1h	24h
Uncontrolled TSP Emission Factor (kg/VKT)	9.14	9.14
Uncontrolled PM10 Emission Factor (kg/VKT)	2.63	2.63
Uncontrolled PM2.5 Emission Factor (kg/VKT)	0.26	0.26

	Summer		Winter	
	1h	24h	1h	24h
Controlled Emission Rate PM (g/s)	14.44	14.44	10.46	10.46
Controlled Emission Rate PM10 (g/s)	4.16	4.16	3.01	3.01
Controlled Emission Rate PM2.5 (g/s)	0.42	0.42	0.30	0.30

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
					Haul truck (1h)	Haul truck (24h)		
			Haul truck	Operating Time (hours)	1.65	39.56	Total (1h)	Total (24h)
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.33E-02		1.98E-02	1.98E-02	1.98E-02	1.98E-02
$PM_{2.5}$	[PM2.5]	110	2.26E-02		1.92E-02	1.92E-02	1.92E-02	1.92E-02
CO	630-08-0	2	7.26E-02		6.17E-02	6.17E-02	6.17E-02	6.17E-02
SO_2	7446-09-5	31	1.41E-03		1.20E-03	1.20E-03	1.20E-03	1.20E-03
Hydrocarbons	[NMHC]	1	3.16E-02		2.68E-02	2.68E-02	2.68E-02	2.68E-02
NOx	10102-44-0	3	2.21E+00		1.87E+00	1.87E+00	1.87E+00	1.87E+00
1,3-butadiene	106-99-0	24	6.53E-05		5.54E-05	5.54E-05	5.54E-05	5.54E-05
Acenaphthene	83-32-9	70+170	2.13E-05		1.81E-05	1.81E-05	1.81E-05	1.81E-05
Acenaphthylene	208-96-8	71+171	4.35E-05		3.69E-05	3.69E-05	3.69E-05	3.69E-05
Acetaldehyde	75-07-0	26	3.65E-03		3.10E-03	3.10E-03	3.10E-03	3.10E-03
Acrolein	107-02-8	27	6.56E-04		5.57E-04	5.57E-04	5.57E-04	5.57E-04
Anthracene	120-12-7	72+172	3.75E-06		3.18E-06	3.18E-06	3.18E-06	3.18E-06
Benzene	71-43-2	20	1.90E-03		1.61E-03	1.61E-03	1.61E-03	1.61E-03
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		3.81E-07	3.81E-07	3.81E-07	3.81E-07
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		1.28E-07	1.28E-07	1.28E-07	1.28E-07
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		3.61E-07	3.61E-07	3.61E-07	3.61E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		3.15E-07	3.15E-07	3.15E-07	3.15E-07
Chrysene	218-01-9	78+178	5.65E-07		4.80E-07	4.80E-07	4.80E-07	4.80E-07
Fluoranthene	206-44-0	69+169	6.35E-06		5.39E-06	5.39E-06	5.39E-06	5.39E-06
Fluorene	86-73-7	81+181	2.95E-05		2.51E-05	2.51E-05	2.51E-05	2.51E-05
Formaldehyde	50-00-0	5	3.11E-03		2.64E-03	2.64E-03	2.64E-03	2.64E-03
Phenanthrene	85-01-8	83+183	5.03E-05		4.27E-05	4.27E-05	4.27E-05	4.27E-05
Pyrene	129-00-0	84+184	5.95E-06		5.05E-06	5.05E-06	5.05E-06	5.05E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		1.92E-02	1.92E-02	1.92E-02	1.92E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		1.25E-02	1.25E-02	1.25E-02	1.25E-02

Source: Road Dust **HR9** **Road from Pit 87 to TSF**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	13.4	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	2	trips/hour	Troilus
Trips per day	58	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

Heavy Duty Vehicle: $EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b}$ $\left\{\frac{kg}{VKT}\right.$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793	Diesel	2650	391,000	164,000	277,500	50	15.6	93.1	2	58	1.000	1.000	277,500	277,500	32.5	778.8
TOTAL											**2**	**58**	**1.000**	**1.000**	**277,500**	**277,500**	**32.5**	**778.8**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										9.14	9.14							
Uncontrolled PM10 Emission Factor (kg/VKT)										2.63	2.63							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.26	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										5.69	5.69	4.12	4.12					
Controlled Emission Rate PM10 (g/s)										1.64	1.64	1.19	1.19					
Controlled Emission Rate PM2.5 (g/s)										0.16	0.16	0.12	0.12					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
					Haul truck (1h)	Haul truck (24h)		
			Haul truck	Operating Time (hours)	0.65	15.58	Total (1h)	Total (24h)
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.33E-02		7.79E-03	7.79E-03	7.79E-03	7.79E-03
$PM_{2.5}$	[PM2.5]	110	2.26E-02		7.55E-03	7.55E-03	7.55E-03	7.55E-03
CO	630-08-0	2	7.26E-02		2.43E-02	2.43E-02	2.43E-02	2.43E-02
SO_2	7446-09-5	31	1.41E-03		4.73E-04	4.73E-04	4.73E-04	4.73E-04
Hydrocarbons	[NMHC]	1	3.16E-02		1.06E-02	1.06E-02	1.06E-02	1.06E-02
NOx	10102-44-0	3	2.21E+00		7.37E-01	7.37E-01	7.37E-01	7.37E-01
1,3-butadiene	106-99-0	24	6.53E-05		2.18E-05	2.18E-05	2.18E-05	2.18E-05
Acenaphthene	83-32-9	70+170	2.13E-05		7.11E-06	7.11E-06	7.11E-06	7.11E-06
Acenaphthylene	208-96-8	71+171	4.35E-05		1.45E-05	1.45E-05	1.45E-05	1.45E-05
Acetaldehyde	75-07-0	26	3.65E-03		1.22E-03	1.22E-03	1.22E-03	1.22E-03
Acrolein	107-02-8	27	6.56E-04		2.19E-04	2.19E-04	2.19E-04	2.19E-04
Anthracene	120-12-7	72+172	3.75E-06		1.25E-06	1.25E-06	1.25E-06	1.25E-06
Benzene	71-43-2	20	1.90E-03		6.35E-04	6.35E-04	6.35E-04	6.35E-04
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		1.50E-07	1.50E-07	1.50E-07	1.50E-07
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		5.04E-08	5.04E-08	5.04E-08	5.04E-08
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		1.42E-07	1.42E-07	1.42E-07	1.42E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		1.24E-07	1.24E-07	1.24E-07	1.24E-07
Chrysene	218-01-9	78+178	5.65E-07		1.89E-07	1.89E-07	1.89E-07	1.89E-07
Fluoranthene	206-44-0	69+169	6.35E-06		2.12E-06	2.12E-06	2.12E-06	2.12E-06
Fluorene	86-73-7	81+181	2.95E-05		9.87E-06	9.87E-06	9.87E-06	9.87E-06
Formaldehyde	50-00-0	5	3.11E-03		1.04E-03	1.04E-03	1.04E-03	1.04E-03
Phenanthrene	85-01-8	83+183	5.03E-05		1.68E-05	1.68E-05	1.68E-05	1.68E-05
Pyrene	129-00-0	84+184	5.95E-06		1.99E-06	1.99E-06	1.99E-06	1.99E-06
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		7.55E-03	7.55E-03	7.55E-03	7.55E-03
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		4.91E-03	4.91E-03	4.91E-03	4.91E-03

Source: Road Dust **HR10** **Road from Pit 87 to WD 87**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	12.2	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck			
Trips per hour	14	trips/hour	Troilus
Trips per day	333	trips/day	Troilus
Speed	50	km/h	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S_{(\%)}}{12}\right)^{a}\left(\frac{W_{(t)}}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38	1.38
PM10	0.42	0.42
PM2.5	0.042	0.042
a (PM10/PM2.5)	0.9	
a (TSP)	0.7	
b	0.45	

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	793F	Diesel	2650	391,000	164,000	277,500	50	81.3	93.1	14	333	1.000	1.000	277,500	277,500	169.3	4062.6
TOTAL											**14**	**333**	**1.000**	**1.000**	**277,500**	**277,500**	**169.3**	**4062.6**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										9.14	9.14							
Uncontrolled PM10 Emission Factor (kg/VKT)										2.63	2.63							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.26	0.26							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										29.66	29.66	21.49	21.49					
Controlled Emission Rate PM10 (g/s)										8.55	8.55	6.19	6.19					
Controlled Emission Rate PM2.5 (g/s)										0.85	0.85	0.62	0.62					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)		Emissions (g/s)			
					Haul truck (1h)	Haul truck (24h)		
			Haul truck	Operating Time (hours)	3.39	81.25	Total (1h)	Total (24h)
				Horsepower (hp)	1855	1855		
PM_{10}	[PM10]	100	2.33E-02		4.06E-02	4.06E-02	4.06E-02	4.06E-02
$PM_{2.5}$	[PM2.5]	110	2.26E-02		3.94E-02	3.94E-02	3.94E-02	3.94E-02
CO	630-08-0	2	7.26E-02		1.27E-01	1.27E-01	1.27E-01	1.27E-01
SO_2	7446-09-5	31	1.41E-03		2.47E-03	2.47E-03	2.47E-03	2.47E-03
Hydrocarbons	[NMHC]	1	3.16E-02		5.51E-02	5.51E-02	5.51E-02	5.51E-02
NOx	10102-44-0	3	2.21E+00		3.85E+00	3.85E+00	3.85E+00	3.85E+00
1,3-butadiene	106-99-0	24	6.53E-05		1.14E-04	1.14E-04	1.14E-04	1.14E-04
Acenaphthene	83-32-9	70+170	2.13E-05		3.71E-05	3.71E-05	3.71E-05	3.71E-05
Acenaphthylene	208-96-8	71+171	4.35E-05		7.59E-05	7.59E-05	7.59E-05	7.59E-05
Acetaldehyde	75-07-0	26	3.65E-03		6.37E-03	6.37E-03	6.37E-03	6.37E-03
Acrolein	107-02-8	27	6.56E-04		1.14E-03	1.14E-03	1.14E-03	1.14E-03
Anthracene	120-12-7	72+172	3.75E-06		6.53E-06	6.53E-06	6.53E-06	6.53E-06
Benzene	71-43-2	20	1.90E-03		3.31E-03	3.31E-03	3.31E-03	3.31E-03
Benzo(a)anthracene	56-55-3	73+173	4.49E-07		7.84E-07	7.84E-07	7.84E-07	7.84E-07
Benzo(a)pyrene	50-32-8	74+174	1.51E-07		2.63E-07	2.63E-07	2.63E-07	2.63E-07
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	4.25E-07		7.41E-07	7.41E-07	7.41E-07	7.41E-07
Benzo(g,h,i)perylene	191-24-2	76+176	3.70E-07		6.46E-07	6.46E-07	6.46E-07	6.46E-07
Chrysene	218-01-9	78+178	5.65E-07		9.86E-07	9.86E-07	9.86E-07	9.86E-07
Fluoranthene	206-44-0	69+169	6.35E-06		1.11E-05	1.11E-05	1.11E-05	1.11E-05
Fluorene	86-73-7	81+181	2.95E-05		5.15E-05	5.15E-05	5.15E-05	5.15E-05
Formaldehyde	50-00-0	5	3.11E-03		5.42E-03	5.42E-03	5.42E-03	5.42E-03
Phenanthrene	85-01-8	83+183	5.03E-05		8.77E-05	8.77E-05	8.77E-05	8.77E-05
Pyrene	129-00-0	84+184	5.95E-06		1.04E-05	1.04E-05	1.04E-05	1.04E-05
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	2.26E-02		3.94E-02	3.94E-02	3.94E-02	3.94E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	112	1.47E-02		2.56E-02	2.56E-02	2.56E-02	2.56E-02

Source: Road Dust **HR11** **Road from Mobile Crusher (SW Pit) to TSF**

Input	Value	Units	Source
Silt Content (%)	9.14	%	Literature Review of Current Fugitive Dust Control Practices within the Mining Industry (The Centre for Excellence in Mining Innovation, 2010)
Length (Round trip)	5.2	km	Troilus
Summer Mitigation	90	%	Succarieh 1992 reports dust control of chemical stabilizers can be as high as 90%-95%
Winter Haul Road Mitigation	95	%	Determination of Natural Winter Mitigation of Road Dust Emissions from Mining Operations in Northern Canada (Golder, 2012)
Haul Truck CAT 777			
Trips per hour	1	trips/hour	Troilus
Trips per day	14	trips/day	Troilus
Speed	50	km/h	Troilus
Capacity	91	tonnes	Troilus
Haul Truck Cat 740GC			
Trips per hour	1	trips/hour	Troilus
Trips per day	32	trips/day	Troilus
Speed	50	km/h	Troilus
Capacity	40	tonnes	Troilus

EF Source: US EPA AP-42, Ch. 13.2.2 (Unpaved Roads), Equation 1:

$$\text{Heavy Duty Vehicle: } EF = k\left(\frac{S(\%)}{12}\right)^{a}\left(\frac{W(t)}{3}\right)^{b} \left\{\begin{matrix} kg \\ VKT \end{matrix}\right.$$

PM	1.38
PM10	0.42
PM2.5	0.042
a (PM10/PM2.5	0.9
a (TSP)	0.7
b	0.45

Equipment	Make	Model	Fuel Type	Hp	Full Weight	Empty Weight	Average Weight	Speed (km/hr)	Travel Time (hrs)	Total Mitigation (Speed + Road Treatment) %	Total Vehicle Trips (per hour)	Total Vehicle Trips (per day)	% of vehicles (hour)	% of vehicles (day)	Hour Weight (kg)	Day Weight (kg)	VKT (per hour)	VKT (per day)
Haul truck	Caterpillar	777	Diesel	1025	165,000	74,000	119,500	50	1.4	93.1	1	14	0.304	0.304	36,370	36,370	3.0	72.2
Haul truck	Caterpillar	740GC	Diesel	452	71,900	31,900	51,900	50	3.3	93.1	1	32	0.696	0.696	36,104.3	36,104.3	6.9	165.1
TOTAL											**2**	**46**	**1.000**	**1.000**	**72,474**	**72,474**	**9.9**	**237.4**
										1h	**24h**							
Uncontrolled TSP Emission Factor (kg/VKT)										4.99	4.99							
Uncontrolled PM10 Emission Factor (kg/VKT)										1.44	1.44							
Uncontrolled PM2.5 Emission Factor (kg/VKT)										0.14	0.14							
										Summer		**Winter**						
										1h	**24h**	**1h**	**24h**					
Controlled Emission Rate PM (g/s)										0.95	0.95	0.69	0.69					
Controlled Emission Rate PM10 (g/s)										0.27	0.27	0.20	0.20					
Controlled Emission Rate PM2.5 (g/s)										0.03	0.03	0.02	0.02					

Combustion Emissions

CoPC	CAS	MOVES ID	Emissions Factors (g/hp-hr)			Emissions (g/s)					
			Haul Truck Cat 777	Haul Truck Cat 740G		Haul Truck Cat 777 (1h)	Haul Truck Cat 777 (24h)	Haul Truck Cat 740G (1h)	Haul Truck Cat 740G (24h)	Total (1h)	Total (24h)
					Operating Time (hours)	0.06	1.44	0.14	3.30		
					Horsepower (hp)	718	718	316	316		
PM_{10}	[PM10]	100	6.23E-03	6.23E-03		7.48E-05	7.48E-05	7.53E-05	7.53E-05	1.50E-04	1.50E-04
$PM_{2.5}$	[PM2.5]	110	6.04E-03	6.04E-03		7.25E-05	7.25E-05	7.30E-05	7.30E-05	1.46E-04	1.46E-04
CO	630-08-0	2	1.90E-02	1.90E-02		2.28E-04	2.28E-04	2.30E-04	2.30E-04	4.58E-04	4.58E-04
SO_2	7446-09-5	31	1.41E-03	1.41E-03		1.70E-05	1.70E-05	1.71E-05	1.71E-05	3.41E-05	3.41E-05
Hydrocarbons	[NMHC]	1	9.26E-03	9.26E-03		1.11E-04	1.11E-04	1.12E-04	1.12E-04	2.23E-04	2.23E-04
NOx	10102-44-0	3	1.11E-01	1.11E-01		1.34E-03	1.34E-03	1.35E-03	1.35E-03	2.68E-03	2.68E-03
1,3-butadiene	106-99-0	24	7.49E-06	7.49E-06		8.99E-08	8.99E-08	9.06E-08	9.06E-08	1.80E-07	1.80E-07
Acenaphthene	83-32-9	70+170	2.52E-06	2.52E-06		3.03E-08	3.03E-08	3.05E-08	3.05E-08	6.08E-08	6.08E-08
Acenaphthylene	208-96-8	71+171	5.07E-06	5.07E-06		6.09E-08	6.09E-08	6.13E-08	6.13E-08	1.22E-07	1.22E-07
Acetaldehyde	75-07-0	26	6.45E-04	6.45E-04		7.75E-06	7.75E-06	7.80E-06	7.80E-06	1.56E-05	1.56E-05
Acrolein	107-02-8	27	9.49E-05	9.49E-05		1.14E-06	1.14E-06	1.15E-06	1.15E-06	2.29E-06	2.29E-06
Anthracene	120-12-7	72+172	5.34E-07	5.34E-07		6.41E-09	6.41E-09	6.46E-09	6.46E-09	1.29E-08	1.29E-08
Benzene	71-43-2	20	2.18E-04	2.18E-04		2.62E-06	2.62E-06	2.63E-06	2.63E-06	5.25E-06	5.25E-06
Benzo(a)anthracene	56-55-3	73+173	9.59E-08	9.59E-08		1.15E-09	1.15E-09	1.16E-09	1.16E-09	2.31E-09	2.31E-09
Benzo(a)pyrene	50-32-8	74+174	3.23E-08	3.23E-08		3.88E-10	3.88E-10	3.91E-10	3.91E-10	7.79E-10	7.79E-10
Benzo(b+k)fluoranthene	205-99-2	75+77+175+177	9.11E-08	9.11E-08		1.09E-09	1.09E-09	1.10E-09	1.10E-09	2.20E-09	2.20E-09
Benzo(g,h,i)perylene	191-24-2	76+176	5.95E-08	5.95E-08		7.15E-10	7.15E-10	7.20E-10	7.20E-10	1.43E-09	1.43E-09
Chrysene	218-01-9	78+178	1.02E-07	1.02E-07		1.23E-09	1.23E-09	1.23E-09	1.23E-09	2.46E-09	2.46E-09
Fluoranthene	206-44-0	69+169	8.97E-07	8.97E-07		1.08E-08	1.08E-08	1.09E-08	1.09E-08	2.16E-08	2.16E-08
Fluorene	86-73-7	81+181	3.75E-06	3.75E-06		4.50E-08	4.50E-08	4.53E-08	4.53E-08	9.03E-08	9.03E-08
Formaldehyde	50-00-0	5	3.61E-04	3.61E-04		4.34E-06	4.34E-06	4.37E-06	4.37E-06	8.70E-06	8.70E-06
Phenanthrene	85-01-8	83+183	6.86E-06	6.86E-06		8.24E-08	8.24E-08	8.29E-08	8.29E-08	1.65E-07	1.65E-07
Pyrene	129-00-0	84+184	8.53E-07	8.53E-07		1.02E-08	1.02E-08	1.03E-08	1.03E-08	2.05E-08	2.05E-08
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	[DPM]	110	6.04E-03	6.04E-03		7.25E-05	7.25E-05	7.30E-05	7.30E-05	1.46E-04	1.46E-04
Elemental Carbon (from diesel exhaust)	7440-44-0	112	3.93E-03	3.93E-03		4.71E-05	4.71E-05	4.75E-05	4.75E-05	9.46E-05	9.46E-05

APPENDIX D Rock Metal Composition

Metal	CAS number	Units	Construction (Year -1) Weighted Average		Operations (Year 6) Weighted Average		
			Ore	Waste Rock	Ore	Waste Rock	Tailings
Silver (Ag)	7440-22-4	ppm	2.09	0.62	1.94	0.59	0.39
Aluminum (Al)	7429-90-5	ppm	74756.10	76660.14	75550.43	75884.10	77967.82
Arsenic (As)	7440-38-2	ppm	26.45	7.92	82.66	16.09	5.50
Gold (Au)	7440-57-5	ppm	0.55	0.09	0.52	0.08	0.00
Boron (B)	7440-42-8	ppm	130.11	101.39	114.30	100.59	114.30
Barium (Ba)	7440-39-3	ppm	411.96	372.95	376.20	363.86	458.34
Beryllium (Be)	7440-41-7	ppm	1.18	1.19	1.19	1.18	0.84
Bismuth (Bi)	7440-69-9	ppm	2.96	2.09	3.30	2.16	0.36
Carbon (C)	7440-44-0	ppm	1229.82	916.35	1402.78	1319.01	1402.78
Calcium (Ca)	7440-70-2	ppm	26186.63	32038.84	28659.50	32928.35	26022.99
Cadmium (Cd)	7440-43-9	ppm	6.27	1.19	6.30	1.17	0.07
Cerium (Ce)	7440-45-1	ppm	70.60	70.60	72.64	72.64	72.64
Cobalt (Co)	7440-48-4	ppm	17.38	18.01	29.98	20.00	20.75
Chromium (Cr)	7440-47-3	ppm	100.00	89.72	95.77	86.38	246.92
Cesium (Cs)	7440-46-2	ppm	3.00	3.00	3.41	3.41	3.41
Copper (Cu)	7440-50-8	ppm	592.30	133.59	555.64	135.16	44.44
Iron (Fe)	7439-89-6	ppm	38000.13	34548.77	46921.89	41423.19	47986.21
Gallium (Ga)	7440-55-3	ppm	19.67	20.00	20.84	20.31	20.97
Hafnium (Hf)	7440-58-6	ppm	4.14	4.14	4.27	4.27	4.27
Mercury (Hg)	7439-97-6	ppm	0.03	0.03	0.03	0.03	0.03
Indium (In)	7440-74-6	ppm	0.01	0.01	0.02	0.02	0.02
Potassium (K)	7440-09-7	ppm	17082.23	14806.90	15855.07	13982.80	16719.54
Lanthanum (La)	7439-91-0	ppm	20.68	15.89	25.16	19.58	35.27
Lithium (Li)	7439-93-2	ppm	25.60	25.60	25.76	25.76	25.76
Lutetium (Lu)	7439-94-3	ppm	0.23	0.23	0.27	0.27	0.27
Magnesium (Mg)	7439-95-4	ppm	12237.07	13890.85	13456.54	14808.90	14655.17
Manganese (Mn)	7439-96-5	ppm	486.52	450.75	485.86	525.93	461.91
Molybdenum (Mo)	7439-98-7	ppm	6.25	6.45	7.50	5.56	2.23
Sodium (Na)	7440-23-5	ppm	29601.27	29672.08	29060.43	28802.52	30105.75
Niobium (Nb)	7440--03-1	ppm	5.84	5.84	5.76	5.76	5.76
Nickel (Ni)	7440-02-0	ppm	46.19	50.81	53.77	50.91	64.05
Phosphorus (P)	7723-14-0	ppm	525.33	625.01	567.83	613.08	475.54
Lead (Pb)	7439-92-1	ppm	22.48	20.08	17.83	14.16	10.69
Rubidium (Rb)	7440-17-7	ppm	75.14	75.14	76.19	76.19	76.19
Sulphur (S)	7704-34-9	ppm	4168.59	1870.38	4898.96	2678.01	4898.96
Antimony (Sb)	7440-36-0	ppm	8.13	5.02	9.13	5.11	0.81
Scandium (Sc)	7440-20-2	ppm	11.04	11.08	15.34	13.16	18.34
Selenium (Se)	7782-49-2	ppm	0.35	0.35	0.35	0.35	0.35
Tin (Sn)	7440-31-5	ppm	8.56	8.56	9.25	9.25	9.25
Strontium (Sr)	7440-24-6	ppm	246.65	332.97	241.49	305.80	183.66
Tantalum (Ta)	7440-25-7	ppm	1.01	1.01	0.94	0.94	0.94
Terbium (Tb)	7440-27-9	ppm	0.53	0.53	0.62	0.62	0.62
Tellurium (Te)	13494-80-9	ppm	0.18	0.18	0.20	0.20	0.20
Titanium (Ti)	7440-32-6	ppm	2835.70	3197.43	4265.98	3673.98	3917.93
Thallium (Tl)	7440-28-0	ppm	0.90	0.90	1.01	1.01	1.01
Uranium (U)	7440-61-1	ppm	1.34	1.34	1.42	1.42	1.42
Vanadium (v)	7440-62-2	ppm	90.39	98.32	143.81	117.98	149.98
Tungsten (W)	7440-33-7	ppm	45.65	49.37	30.31	26.95	2.54
Yttrium (Y)	7440-65-5	ppm	13.00	13.00	15.22	15.22	15.22
Ytterbium (Yb)	7440-64-4	ppm	1.50	1.50	1.76	1.76	1.76
Zinc (Zn)	7440-66-6	ppm	231.01	120.43	175.22	106.61	59.90
Zirconium (Zr)	7440-67-7	ppm	96.40	96.40	95.36	95.36	95.36
Silicon Dioxide (SiO2)	7631-86-9	%	65.55	65.34	62.86	62.47	64.36
Aluminum Oxide (Al2O3)	1344-28-1	%	15.02	15.10	14.99	15.01	14.79
Iron Oxide (Fe2O3)	1309-37-1	%	5.06	5.00	6.57	6.60	6.48
Magnesium Oxide (MgO)	1309-48-4	%	2.11	2.11	2.64	2.70	2.42
Calcium Oxide (CaO)	1305-78-8	%	3.53	3.61	4.53	4.70	3.66
Sodium Oxide (Na2O)	1313-59-3	%	3.51	3.43	3.46	3.38	3.95
Potassium Oxide (K2O)	12136-45-7	%	2.41	2.44	1.97	1.96	2.01
Titanium dioxide (TiO2)	13463-67-7	%	0.48	0.49	0.63	0.62	0.71
Phosphorus Pentoxide (P2O5)	1314-56-3	%	0.11	0.12	0.12	0.13	0.11
Manganese Oxide (MnO)	1344-43-0	%	0.06	0.06	0.08	0.08	0.06
Chromium Oxide (Cr2O3)	1308-38-9	%	0.03	0.03	0.03	0.03	0.03
Vanadium Pentoxide (V2O5)	1314-62-1	%	0.02	0.02	0.02	0.03	0.03
Chalcopyrite (CuFeS2)	1308-56-1	%	0.22	0.22	0.26	0.26	0.26
Bornite (Cu5FeS4)	1308-82-3	%	0.00	0.00	0.01	0.01	0.01
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	%	0.01	0.01	0.01	0.01	0.01
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	%	0.00	0.00	0.00	0.00	0.00
Cuprite (CU_2O)	1317-39-1	%	0.01	0.01	0.01	0.01	0.01
Galena (PbS)	1314-87-0	%	0.02	0.02	0.02	0.02	0.02
Sphalerite (ZnS)	1314-98-3	%	0.04	0.04	0.04	0.04	0.04
Pyrite (Fe, S2)	1309-36-0	%	0.57	0.60	0.77	0.60	0.77
Pyrrhotite (Fe7S8)	12305-96-3	%	0.28	0.28	0.63	0.63	0.63
Arsenopyrite (FeAsS)	1303-18-0	%	0.01	0.01	0.02	0.02	0.02
Ilmenite (Fe,Ti)2O3	12168-52-4	%	0.05	0.05	0.73	0.73	0.73
Quartz	14808-60-7	%	11.44	11.69	10.12	11.69	10.12
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	%	39.90	54.35	41.32	54.35	41.32
K-Feldspars (KAlSi3O8)	n/a	%	3.56	3.56	2.92	2.92	2.92
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	%	10.70	8.26	11.83	8.26	11.83
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	%	6.31	1.76	4.64	1.76	4.64
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	%	2.18	2.18	2.25	2.25	2.25
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	%	5.91	1.07	5.58	1.07	5.58
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	%	1.96	1.96	1.68	1.68	1.68
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	%	0.08	0.08	0.05	0.05	0.05
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	%	0.22	0.22	0.25	0.25	0.25
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	%	0.05	0.05	0.06	0.06	0.06
Calcite (CaCO3)	1317-65-3	%	0.73	0.48	1.09	0.48	1.09
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	%	0.01	0.01	0.05	0.05	0.05
Titanite (CaTiSiO5)	n/a	%	0.47	0.28	0.72	0.28	0.72
Apatite (Ca5(PO4)3)	1306-05-4	%	0.22	0.22	0.27	0.27	0.27
Mica	12001-26-2	%	10.71	10.71	10.71	10.71	10.71
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	%	5.29	5.29	5.29	5.29	5.29
Bytownite (Ca,Na)(Si,Al)4O8	n/a	%	4.32	4.32	4.32	4.32	4.32
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	%	3.35	3.35	3.35	3.35	3.35
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	%	11.69	11.69	11.69	11.69	11.69
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	%	25.50	25.50	25.50	25.50	25.50
Albite (NaAlSi 3O 8)	n/a	%	9.51	9.51	9.51	9.51	9.51
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	%	1.39	1.39	1.39	1.39	1.39
Sillimanite (Al2SiO5)	12141-45-6	%	0.44	0.44	0.44	0.44	0.44

APPENDIX E Predicted Concentrations at Modelled Mine Boundary

Table E-1: Maximum Predicted 1-Hour Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	-	-	1927.5	539095	5653342	1927.5
PM10	<<PM10>>	-	-	703.1	537261	5653933	703.1
PM2.5	<<PM2.5>>	-	-	91.6	539091	5653323	91.6
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	-	-	1.92E-03	537261	5653933	1.92E-03
Aluminum (Al)	7429-90-5	-	-	1.47E+02	539095	5653342	1.47E+02
Arsenic (As)	7440-38-2	-	-	2.42E-02	537261	5653933	2.42E-02
Gold (Au)	7440-57-5	-	-	4.22E-04	537245	5653921	4.22E-04
Boron (B)	7440-42-8	-	-	1.99E-01	539095	5653342	1.99E-01
Barium (Ba)	7440-39-3	-	-	7.22E-01	539095	5653342	7.22E-01
Beryllium (Be)	7440-41-7	-	-	2.28E-03	539100	5653362	2.28E-03
Bismuth (Bi)	7440-69-9	-	-	4.14E-03	539095	5653342	4.14E-03
Carbon (C)	7440-44-0	1	0	1.80E+00	539095	5653342	1.80E+00
Calcium (Ca)	7440-70-2	-	-	6.16E+01	539095	5653342	6.16E+01
Cadmium (Cd)	7440-43-9	-	-	5.01E-03	537229	5653909	5.01E-03
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	1.36E-01	539095	5653342	1.36E-01
Cobalt (Co)	7440-48-4	-	-	3.46E-02	539095	5653342	3.46E-02
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	1.74E-01	539095	5653342	1.74E-01
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	5.77E-03	539100	5653362	5.77E-03
Copper (Cu)	7440-50-8	-	-	4.95E-01	537229	5653909	4.95E-01
Iron (Fe)	7439-89-6	-	-	6.69E+01	539095	5653342	6.69E+01
Gallium (Ga)	7440-55-3	-	-	3.84E-02	539100	5653362	3.84E-02
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	7.96E-03	539100	5653362	7.96E-03
Mercury (Hg)	7439-97-6	-	-	4.81E-05	539095	5653342	4.81E-05
Indium (In)	7440-74-6	-	-	9.61E-06	539095	5653342	9.61E-06
Potassium (K)	7440-09-7	-	-	2.88E+01	539095	5653342	2.88E+01
Lanthanum (La)	7439-91-0	-	-	3.12E-02	539095	5653342	3.12E-02
Lithium (Li)	7439-93-2	2	0	4.92E-02	539095	5653342	4.92E-02
Lutetium (Lu)	7439-94-3	-	-	4.50E-04	539100	5653362	4.50E-04
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	2.67E+01	539095	5653342	3.27E+01
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	3.26E-01	537261	5653933	3.26E-01
Molybdenum (Mo)	7439-98-7	-	-	1.24E-02	539100	5653362	1.24E-02
Sodium (Na)	7440-23-5	-	-	5.71E+01	539095	5653342	5.71E+01
Niobium (Nb)	7440--03-1	-	-	1.12E-02	539100	5653362	1.12E-02
Nickel (Ni)	7440-02-0	-	-	3.53E-02	537261	5653933	3.53E-02
Phosphorus (P)	7723-14-0	-	-	1.20E+00	539095	5653342	1.20E+00
Lead (Pb)	7439-92-1	-	-	3.89E-02	539095	5653342	3.89E-02
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	1.44E-01	539095	5653342	1.44E-01
Sulphur (S)	7704-34-9	-	-	4.50E+00	537261	5653933	4.50E+00
Antimony (Sb)	7440-36-0	-	-	1.03E-02	537261	5653933	1.03E-02
Scandium (Sc)	7440-20-2	-	-	2.13E-02	539100	5653362	2.13E-02
Selenium (Se)	7782-49-2	2	0.15	6.73E-04	539100	5653362	1.51E-01
Tin (Sn)	7440-31-5	-	-	1.65E-02	539100	5653362	1.65E-02
Strontium (Sr)	7440-24-6	-	-	6.40E-01	539095	5653342	6.40E-01
Tantalum (Ta)	7440-25-7	-	-	1.93E-03	539100	5653362	1.93E-03
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.02E-03	539100	5653362	1.02E-03
Tellurium (Te)	13494-80-9	1	0	3.36E-04	539104	5653381	3.36E-04
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	2.22E+00	537261	5653933	2.22E+00
Thallium (Tl)	7440-28-0	-	-	1.74E-03	539100	5653362	1.74E-03
Uranium (U)	7440-61-1	-	-	2.58E-03	539095	5653342	2.58E-03
Vanadium (v)	7440-62-2	-	-	1.89E-01	539095	5653342	1.89E-01
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	9.49E-02	539095	5653342	9.49E-02
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	2.50E-02	539095	5653342	2.50E-02
Ytterbium (Yb)	7440-64-4	-	-	2.88E-03	539100	5653362	2.88E-03
Zinc (Zn)	7440-66-6	-	-	2.68E-01	537261	5653933	2.68E-01
Zirconium (Zr)	7440-67-7	-	-	1.85E-01	539095	5653342	1.85E-01
Silicon Dioxide (SiO2)	7631-86-9	-	-	1.26E+03	539095	5653342	1.26E+03
Aluminum Oxide (Al2O3)	1344-28-1	-	-	2.90E+02	539095	5653342	2.90E+02
Iron Oxide (Fe2O3)	1309-37-1	-	-	9.62E+01	539095	5653342	9.62E+01
Magnesium Oxide (MgO)	1309-48-4	-	-	4.05E+01	539095	5653342	4.05E+01
Calcium Oxide (CaO)	1305-78-8	-	-	6.93E+01	539095	5653342	6.93E+01
Sodium Oxide (Na2O)	1313-59-3	-	-	6.61E+01	539095	5653342	6.61E+01
Potassium Oxide (K2O)	12136-45-7	-	-	4.68E+01	539095	5653342	4.68E+01
Titanium dioxide (TiO2)	13463-67-7	-	-	3.42E+00	537261	5653933	3.42E+00
Phosphorus Pentoxide (P2O5)	1314-56-3	-	-	2.26E+00	539095	5653342	2.26E+00
Manganese Oxide (MnO)	1344-43-0	-	-	4.49E-01	537261	5653933	4.49E-01
Chromium Oxide (Cr2O3)	1308-38-9	-	-	5.70E-01	539095	5653342	5.70E-01
Vanadium Pentoxide (V2O5)	1314-62-1	-	-	4.23E-01	539095	5653342	4.23E-01
Chalcopyrite (CuFeS2)	1308-56-1	-	-	4.23E+00	539095	5653342	4.23E+00
Bornite (Cu5FeS4)	1308-82-3	-	-	0.00E+00	540754	5654567	0.00E+00
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	9.61E-02	539095	5653342	9.61E-02
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	0.00E+00	540754	5654567	0.00E+00
Cuprite (CU_2O)	1317-39-1	-	-	9.61E-02	539095	5653342	9.61E-02
Galena (PbS)	1314-87-0	-	-	3.84E-01	539095	5653342	3.84E-01
Sphalerite (ZnS)	1314-98-3	-	-	7.69E-01	539095	5653342	7.69E-01
Pyrite (Fe, S2)	1309-36-0	-	-	1.15E+01	539095	5653342	1.15E+01
Pyrrhotite (Fe7S8)	12305-96-3	-	-	5.38E+00	539095	5653342	5.38E+00
Arsenopyrite (FeAsS)	1303-18-0	-	-	9.61E-02	539095	5653342	9.61E-02
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	3.48E-01	537261	5653933	3.48E-01
Quartz	14808-60-7	23	6	7.87E+01	537261	5653933	8.47E+01
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	1.04E+03	539095	5653342	1.04E+03
K-Feldspars (KAlSi3O8)	n/a	-	-	6.84E+01	539095	5653342	6.84E+01
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	1.62E+02	539095	5653342	1.62E+02
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	-	-	5.64E+01	537245	5653921	5.64E+01
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	1.52E+01	537261	5653933	1.52E+01
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	-	-	4.66E+01	537229	5653909	4.66E+01
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	3.77E+01	539095	5653342	3.77E+01
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	5.56E-01	537261	5653933	5.56E-01
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	4.23E+00	539095	5653342	4.23E+00
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	9.61E-01	539095	5653342	9.61E-01
Calcite (CaCO3)	1317-65-3	-	-	9.57E+00	539095	5653342	9.57E+00
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	-	-	6.95E-02	537261	5653933	6.95E-02
Titanite (CaTiSiO5)	n/a	-	-	2.63E+00	537229	5653909	2.63E+00
Apatite (Ca5(PO4)3)	1306-05-4	-	-	4.23E+00	539095	5653342	4.23E+00
Mica	12001-26-2	30	0	2.05E+02	539100	5653362	2.05E+02
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	-	-	1.02E+02	539095	5653342	1.02E+02
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	8.31E+01	539095	5653342	8.31E+01
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	-	-	6.44E+01	539095	5653342	6.44E+01
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	2.25E+02	539095	5653342	2.25E+02
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	4.90E+02	539095	5653342	4.90E+02
Albite (NaAlSi 3O 8)	n/a	-	-	1.83E+02	539095	5653342	1.83E+02
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	2.67E+01	539095	5653342	2.67E+01
Sillimanite (Al2SiO5)	12141-45-6	-	-	8.46E+00	539095	5653342	8.46E+00

Table E-1: Maximum Predicted 1-Hour Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	34000	600	1.21E+03	537214	5653896	1.81E+03
Sulphur Dioxide (SO2)	7446-09-5	-	-	3.05E+01	537214	5653896	3.05E+01
Hydrocarbons	<<NMHC>>	-	-	2.37E+01	539439	5649848	2.37E+01
Nitrogen Dioxide (NO2) (Note 1)	10102-44-0	414	150	4.75E+02	532916	5647371	6.25E+02
1,3-butadiene	106-99-0	-	-	1.57E-02	532930	5647353	1.57E-02
Acenaphthene	83-32-9	-	-	5.74E-03	532923	5647353	5.74E-03
Acenaphthylene	208-96-8	-	-	1.13E-02	532923	5647353	1.13E-02
Acetaldehyde	75-07-0	-	-	8.81E-01	532923	5647353	8.81E-01
Acrolein	107-02-8	-	-	1.63E-01	532923	5647353	1.63E-01
Anthracene	120-12-7	-	-	1.06E-03	532923	5647353	1.06E-03
Benzene	71-43-2	-	-	5.38E-01	532923	5647353	5.38E-01
Benzo(a)anthracene	56-55-3	-	-	1.88E-04	539439	5649848	1.88E-04
Benzo(a)pyrene	50-32-8	-	-	7.10E-05	539439	5649848	7.10E-05
Benzo(b+k)fluoranthene	205-99-2	-	-	2.73E-04	539439	5649848	2.73E-04
Benzo(g,h,i)perylene	191-24-2	-	-	1.61E-04	539439	5649848	1.61E-04
Chrysene	218-01-9	-	-	3.79E-04	539439	5649848	3.79E-04
Fluoranthene	206-44-0	-	-	1.98E-03	532923	5647353	1.98E-03
Fluorene	86-73-7	-	-	8.76E-03	532923	5647353	8.76E-03
Formaldehyde	50-00-0	-	-	7.28E-01	532930	5647334	7.28E-01
Phenanthrene	85-01-8	-	-	1.72E-02	532916	5647371	1.72E-02
Pyrene	129-00-0	-	-	1.87E-03	532923	5647371	1.87E-03
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	-	9.01E+00	532916	5647371	9.01E+00
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	5.85E+00	532916	5647371	5.85E+00
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	1.72E-04	533293	5648523	1.72E-04

Notes:

1 - Individual model run with OLM

Table E-2 Maximum Predicted 24-Hour Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	120	40	245.5	535959	5651803	285.5
PM10	<<PM10>>	50	13.1	74.0	535959	5651803	87.1
PM2.5	<<PM2.5>>	30	15	9.8	535193	5646626	24.8
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	-	2.60E-04	1.70E-04	535959	5651803	4.30E-04
Aluminum (Al)	7429-90-5	-	0.42	1.87E+01	535959	5651803	1.91E+01
Arsenic (As)	7440-38-2	-	1.26E-03	2.16E-03	535959	5651803	3.42E-03
Gold (Au)	7440-57-5	1.25	-	2.71E-05	535952	5651785	2.71E-05
Boron (B)	7440-42-8	-	2.60E-02	2.51E-02	535959	5651803	5.11E-02
Barium (Ba)	7440-39-3	-	8.60E-03	9.14E-02	535959	5651803	1.00E-01
Beryllium (Be)	7440-41-7	-	-	2.89E-04	535959	5651803	2.89E-04
Bismuth (Bi)	7440-69-9	-	1.30E-03	5.20E-04	535959	5651803	1.82E-03
Carbon (C)	7440-44-0	-	-	2.27E-01	535959	5651803	2.27E-01
Calcium (Ca)	7440-70-2	-	0.68	7.81E+00	535959	5651803	8.49E+00
Cadmium (Cd)	7440-43-9	-	2.60E-04	3.53E-04	535952	5651785	6.13E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	-	-	1.72E-02	535959	5651803	1.72E-02
Cobalt (Co)	7440-48-4	-	-	4.39E-03	535959	5651803	4.39E-03
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	6.00E-03	2.20E-02	535959	5651803	2.80E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	-	-	7.31E-04	535959	5651803	7.31E-04
Copper (Cu)	7440-50-8	2.5	0.2	3.82E-02	535952	5651785	2.38E-01
Iron (Fe)	7439-89-6	-	0.22	8.46E+00	535959	5651803	8.68E+00
Gallium (Ga)	7440-55-3	-	-	4.87E-03	535959	5651803	4.87E-03
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	-	-	1.01E-03	535959	5651803	1.01E-03
Mercury (Hg)	7439-97-6	-	6.40E-05	6.09E-06	535959	5651803	7.01E-05
Indium (In)	7440-74-6	-	-	1.22E-06	535959	5651803	1.22E-06
Potassium (K)	7440-09-7	-	0.13	3.64E+00	535959	5651803	3.76E+00
Lanthanum (La)	7439-91-0	-	-	3.93E-03	535959	5651803	3.93E-03
Lithium (Li)	7439-93-2	-	-	6.24E-03	535959	5651803	6.24E-03
Lutetium (Lu)	7439-94-3	-	-	5.70E-05	535959	5651803	5.70E-05
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.19	3.39E+00	535959	5651803	3.58E+00
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	8.60E-03	3.29E-02	535959	5651803	4.15E-02
Molybdenum (Mo)	7439-98-7	120	7.60E-04	1.57E-03	535959	5651803	2.33E-03
Sodium (Na)	7440-23-5	-	0.52	7.23E+00	535959	5651803	7.75E+00
Niobium (Nb)	7440--03-1	-	-	1.42E-03	535959	5651803	1.42E-03
Nickel (Ni)	7440-02-0	7.00E-02	5.00E-03	3.69E-03	535959	5651803	8.69E-03
Phosphorus (P)	7723-14-0	0.5	-	1.52E-01	535959	5651803	1.52E-01
Lead (Pb)	7439-92-1	-	3.40E-03	4.92E-03	535959	5651803	8.32E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	4	0	1.83E-02	535959	5651803	1.83E-02
Sulphur (S)	7704-34-9	-	-	4.84E-01	535959	5651803	4.84E-01
Antimony (Sb)	7440-36-0	-	1.26E-03	1.26E-03	535959	5651803	2.52E-03
Scandium (Sc)	7440-20-2	-	-	2.70E-03	535959	5651803	2.70E-03
Selenium (Se)	7782-49-2	-	2.60E-03	8.50E-05	535973	5651840	2.69E-03
Tin (Sn)	7440-31-5	-	-	2.09E-03	535959	5651803	2.09E-03
Strontium (Sr)	7440-24-6	-	1.50E-03	8.12E-02	535959	5651803	8.27E-02
Tantalum (Ta)	7440-25-7	25	-	2.45E-04	535966	5651822	2.45E-04
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.30E-04	535959	5651803	1.30E-04
Tellurium (Te)	13494-80-9	-	-	4.26E-05	535959	5651803	4.26E-05
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.5	0	2.32E-01	535959	5651803	2.32E-01
Thallium (Tl)	7440-28-0	-	2.60E-04	2.20E-04	535966	5651822	4.80E-04
Uranium (U)	7440-61-1	0.3	2.60E-04	3.27E-04	535959	5651803	5.87E-04
Vanadium (v)	7440-62-2	-	7.60E-04	2.40E-02	535959	5651803	2.47E-02
Tungsten (W) and Compounds (as W)	7440-33-7	5.4	0	1.20E-02	535959	5651803	1.20E-02
Yttrium (Y) and Compounds (as Y)	7440-65-5	13	0	3.17E-03	535959	5651803	3.17E-03
Ytterbium (Yb)	7440-64-4	-	-	3.65E-04	535959	5651803	3.65E-04
Zinc (Zn)	7440-66-6	2.5	0.1	3.07E-02	535959	5651803	1.31E-01
Zirconium (Zr)	7440-67-7	2.5	0	2.35E-02	535959	5651803	2.35E-02
Silicon Dioxide (SiO2)	7631-86-9	-	-	1.59E+02	535959	5651803	1.59E+02
Aluminum Oxide (Al2O3)	1344-28-1	-	-	3.68E+01	535959	5651803	3.68E+01
Iron Oxide (Fe2O3)	1309-37-1	-	-	1.22E+01	535959	5651803	1.22E+01
Magnesium Oxide (MgO)	1309-48-4	-	-	5.14E+00	535959	5651803	5.14E+00
Calcium Oxide (CaO)	1305-78-8	-	-	8.79E+00	535959	5651803	8.79E+00
Sodium Oxide (Na2O)	1313-59-3	-	-	8.37E+00	535959	5651803	8.37E+00
Potassium Oxide (K2O)	12136-45-7	-	-	5.94E+00	535959	5651803	5.94E+00
Titanium dioxide (TiO2)	13463-67-7	-	-	3.58E-01	535959	5651803	3.58E-01
Phosphorus Pentoxide (P2O5)	1314-56-3	1	-	2.86E-01	535959	5651803	2.86E-01
Manganese Oxide (MnO)	1344-43-0	-	-	4.70E-02	535959	5651803	4.70E-02
Chromium Oxide (Cr2O3)	1308-38-9	-	-	7.23E-02	535959	5651803	7.23E-02
Vanadium Pentoxide (V2O5)	1314-62-1	1	-	5.36E-02	535959	5651803	5.36E-02
Chalcopyrite (CuFeS2)	1308-56-1	-	-	5.36E-01	535959	5651803	5.36E-01
Bornite (Cu5FeS4)	1308-82-3	-	-	0.00E+00	540754	5654567	0.00E+00
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	1.22E-02	535959	5651803	1.22E-02
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	0.00E+00	540754	5654567	0.00E+00
Cuprite (CU_2O)	1317-39-1	-	-	1.22E-02	535959	5651803	1.22E-02
Galena (PbS)	1314-87-0	-	-	4.87E-02	535959	5651803	4.87E-02
Sphalerite (ZnS)	1314-98-3	1	-	9.75E-02	535959	5651803	9.75E-02
Pyrite (Fe, S2)	1309-36-0	120	-	1.46E+00	535959	5651803	1.46E+00
Pyrrhotite (Fe7S8)	12305-96-3	-	-	6.82E-01	535959	5651803	6.82E-01
Arsenopyrite (FeAsS)	1303-18-0	-	-	1.22E-02	535959	5651803	1.22E-02
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	3.63E-02	535959	5651803	3.63E-02
Quartz	14808-60-7	-	0.99	8.52E+00	535959	5651803	9.51E+00
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	1.32E+02	535959	5651803	1.32E+02
K-Feldspars (KAlSi3O8)	n/a	-	-	8.68E+00	535959	5651803	8.68E+00
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	2.04E+01	535959	5651803	2.04E+01
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	8.00E-05	-	4.85E+00	535952	5651785	4.85E+00
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	1.58E+00	535959	5651803	1.58E+00
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.5	-	3.20E+00	535952	5651785	3.20E+00
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	4.78E+00	535959	5651803	4.78E+00
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	5.81E-02	535959	5651803	5.81E-02
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	5.36E-01	535959	5651803	5.36E-01
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	1.22E-01	535959	5651803	1.22E-01
Calcite (CaCO3)	1317-65-3	-	-	1.20E+00	535959	5651803	1.20E+00
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	-	-	7.27E-03	535959	5651803	7.27E-03
Titanite (CaTiSiO5)	n/a	-	-	2.13E-01	535959	5651803	2.13E-01
Apatite (Ca5(PO4)3)	1306-05-4	-	-	5.36E-01	535959	5651803	5.36E-01
Mica	12001-26-2	-	-	2.61E+01	535959	5651803	2.61E+01
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	8.00E-05	-	1.29E+01	535959	5651803	1.29E+01
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	1.05E+01	535959	5651803	1.05E+01
Labradorite ($(Na,Ca)_{1-2}Si_{3-2}O_8$)	n/a	-	-	8.17E+00	535959	5651803	8.17E+00
Andesine ($(Na,Ca)Al_{1-2}Si_{3-2}O_8$)	96158-02-0	-	-	2.85E+01	535959	5651803	2.85E+01
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	6.21E+01	535959	5651803	6.21E+01
Albite (NaAlSi 3O 8)	n/a	-	-	2.32E+01	535959	5651803	2.32E+01
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	3.39E+00	535959	5651803	3.39E+00
Sillimanite (Al2SiO5)	12141-45-6	-	-	1.07E+00	535959	5651803	1.07E+00

Table E-2 Maximum Predicted 24-Hour Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	-	-	1.60E+01	537323	5653982	1.60E+01
Sulphur Dioxide (SO2)	7446-09-5	288	50	2.52E-01	537323	5653982	5.03E+01
Hydrocarbons	<<NMHC>>	-	-	2.45E+00	539275	5649815	2.45E+00
Nitrogen Dioxide (NO2) (Note 1)	10102-44-0	207	100	6.85E+01	535946	5651767	1.69E+02
1,3-butadiene	106-99-0	-	0.6	1.77E-03	537370	5654019	6.02E-01
Acenaphthene	83-32-9	-	4.41E-03	6.45E-04	537370	5654019	5.06E-03
Acenaphthylene	208-96-8	-	8.15E-03	1.29E-03	537370	5654019	9.44E-03
Acetaldehyde	75-07-0	-	-	9.91E-02	537370	5654019	9.91E-02
Acrolein	107-02-8	-	-	1.81E-02	537370	5654019	1.81E-02
Anthracene	120-12-7	-	1.61E-04	1.19E-04	537401	5654044	2.80E-04
Benzene	71-43-2	10	3	6.14E-02	537354	5654007	3.06E+00
Benzo(a)anthracene	56-55-3	-	-	2.11E-05	537323	5653982	2.11E-05
Benzo(a)pyrene	50-32-8	-	5.29E-05	7.79E-06	537323	5653982	6.07E-05
Benzo(b+k)fluoranthene	205-99-2	-	2.79E-04	2.86E-05	539275	5649815	3.08E-04
Benzo(g,h,i)perylene	191-24-2	-	-	1.79E-05	537323	5653982	1.79E-05
Chrysene	218-01-9	-	3.38E-04	3.94E-05	539275	5649815	3.77E-04
Fluoranthene	206-44-0	-	8.15E-04	2.27E-04	537354	5654007	1.04E-03
Fluorene	86-73-7	-	1.47E-03	9.89E-04	537354	5654007	2.46E-03
Formaldehyde	50-00-0	-	-	8.30E-02	537370	5654019	8.30E-02
Phenanthrene	85-01-8	-	2.21E-03	1.96E-03	537339	5653995	4.17E-03
Pyrene	129-00-0	-	-	2.14E-04	537354	5654007	2.14E-04
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	9.40E-02	1.02E+00	537323	5653982	1.11E+00
Elemental Carbon (from diesel exhaust)	7440-44-0	-	-	6.63E-01	537323	5653982	6.63E-01
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	1.97E-05	537323	5653982	1.97E-05

Notes:

1 - Individual model run with OLM

Table E-3 Maximum Predicted Annual Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	-	11.6	8.9	535890	5651619	20.5
PM10	<<PM10>>	-	8.3	2.6	535890	5651619	10.9
PM2.5	<<PM2.5>>	-	6.2	0.5	535890	5651619	6.7
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	0.23	5.00E-03	5.96E-06	535890	5651619	5.01E-03
Aluminum (Al)	7429-90-5	-	0.15	6.78E-01	535890	5651619	8.24E-01
Arsenic (As)	7440-38-2	3.00E-03	2.00E-03	7.57E-05	535890	5651619	2.08E-03
Gold (Au)	7440-57-5	-	-	9.16E-07	535890	5651619	9.16E-07
Boron (B)	7440-42-8	-	2.60E-02	9.05E-04	535890	5651619	2.69E-02
Barium (Ba)	7440-39-3	5.00E-02	2.00E-02	3.31E-03	535890	5651619	2.33E-02
Beryllium (Be)	7440-41-7	4.00E-04	0	1.05E-05	535890	5651619	1.05E-05
Bismuth (Bi)	7440-69-9	-	1.30E-03	1.87E-05	535890	5651619	1.32E-03
Carbon (C)	7440-44-0	0.3	0	8.20E-03	535890	5651619	8.20E-03
Calcium (Ca)	7440-70-2	-	0.30	2.83E-01	535890	5651619	5.83E-01
Cadmium (Cd)	7440-43-9	3.60E-03	5.00E-04	1.21E-05	535890	5651619	5.12E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1	0	6.24E-04	535890	5651619	6.24E-04
Cobalt (Co)	7440-48-4	0.1	0	1.59E-04	535890	5651619	1.59E-04
Chromium (Cr) and Compounds (as Cr)	7440-47-3	0.1	1.00E-02	7.96E-04	535890	5651619	1.08E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	0.4	0	2.66E-05	535897	5651638	2.66E-05
Copper (Cu)	7440-50-8	-	3.20E-03	1.32E-03	535890	5651619	4.52E-03
Iron (Fe)	7439-89-6	-	0.15	3.06E-01	535890	5651619	4.56E-01
Gallium (Ga)	7440-55-3	-	-	1.77E-04	535890	5651619	1.77E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1	0	3.66E-05	535897	5651638	3.66E-05
Mercury (Hg)	7439-97-6	5.00E-03	2.00E-03	2.21E-07	535890	5651619	2.00E-03
Indium (In)	7440-74-6	-	-	4.42E-08	535890	5651619	4.42E-08
Potassium (K)	7440-09-7	-	0.13	1.32E-01	535890	5651619	2.62E-01
Lanthanum (La)	7439-91-0	-	-	1.42E-04	535890	5651619	1.42E-04
Lithium (Li)	7439-93-2	-	-	2.26E-04	535890	5651619	2.26E-04
Lutetium (Lu)	7439-94-3	-	-	2.07E-06	535890	5651619	2.07E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.1	1.23E-01	535890	5651619	2.19E-01
Manganese (Mn) and Compounds (as Mn)	7439-96-5	8.00E-02	5.00E-03	1.16E-03	535890	5651619	6.16E-03
Molybdenum (Mo)	7439-98-7	-	7.80E-04	5.72E-05	535890	5651619	8.37E-04
Sodium (Na)	7440-23-5	-	0.32	2.62E-01	535890	5651619	5.82E-01
Niobium (Nb)	7440--03-1	-	-	5.16E-05	535897	5651638	5.16E-05
Nickel (Ni)	7440-02-0	2.00E-02	2.00E-03	1.30E-04	535890	5651619	2.13E-03
Phosphorus (P)	7723-14-0	-	-	5.52E-03	535890	5651619	5.52E-03
Lead (Pb)	7439-92-1	0.1	4.00E-03	1.78E-04	535890	5651619	4.18E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	6.64E-04	535890	5651619	6.64E-04
Sulphur (S)	7704-34-9	-	-	1.72E-02	535890	5651619	1.72E-02
Antimony (Sb)	7440-36-0	0.17	7.00E-03	4.51E-05	535897	5651638	7.05E-03
Scandium (Sc)	7440-20-2	-	-	9.78E-05	535897	5651638	9.78E-05
Selenium (Se)	7782-49-2	-	2.60E-03	3.09E-06	535890	5651619	2.60E-03
Tin (Sn)	7440-31-5	0.1	0	7.57E-05	535890	5651619	7.57E-05
Strontium (Sr)	7440-24-6	-	1.48E-03	2.94E-03	535890	5651619	4.42E-03
Tantalum (Ta)	7440-25-7	-	-	8.90E-06	535890	5651619	8.90E-06
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	4.70E-06	535890	5651619	4.70E-06
Tellurium (Te)	13494-80-9	-	-	1.55E-06	535890	5651619	1.55E-06
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	8.20E-03	535890	5651619	8.20E-03
Thallium (Tl)	7440-28-0	0.25	5.00E-03	7.99E-06	535890	5651619	5.01E-03
Uranium (U)	7440-61-1	6.00E-02	2.60E-04	1.18E-05	535890	5651619	2.72E-04
Vanadium (v)	7440-62-2	1	1.00E-02	8.69E-04	535890	5651619	1.09E-02
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	4.36E-04	535890	5651619	4.36E-04
Yttrium (Y) and Compounds (as Y)	7440-65-5	3	0	1.15E-04	535890	5651619	1.15E-04
Ytterbium (Yb)	7440-64-4	-	-	1.32E-05	535890	5651619	1.32E-05
Zinc (Zn)	7440-66-6	-	1.40E-02	1.10E-03	535890	5651619	1.51E-02
Zirconium (Zr)	7440-67-7	-	-	8.52E-04	535890	5651619	8.52E-04
Silicon Dioxide (SiO2)	7631-86-9	-	-	5.78E+00	535890	5651619	5.78E+00
Aluminum Oxide (Al2O3)	1344-28-1	-	-	1.34E+00	535890	5651619	1.34E+00
Iron Oxide (Fe2O3)	1309-37-1	-	-	4.42E-01	535890	5651619	4.42E-01
Magnesium Oxide (MgO)	1309-48-4	-	-	1.86E-01	535890	5651619	1.86E-01
Calcium Oxide (CaO)	1305-78-8	-	-	3.19E-01	535890	5651619	3.19E-01
Sodium Oxide (Na2O)	1313-59-3	-	-	3.04E-01	535890	5651619	3.04E-01
Potassium Oxide (K2O)	12136-45-7	-	-	2.15E-01	535890	5651619	2.15E-01
Titanium dioxide (TiO2)	13463-67-7	-	-	1.26E-02	535890	5651619	1.26E-02
Phosphorus Pentoxide (P2O5)	1314-56-3	-	-	1.04E-02	535890	5651619	1.04E-02
Manganese Oxide (MnO)	1344-43-0	-	-	1.66E-03	535890	5651619	1.66E-03
Chromium Oxide (Cr2O3)	1308-38-9	-	-	2.62E-03	535890	5651619	2.62E-03
Vanadium Pentoxide (V2O5)	1314-62-1	-	-	1.94E-03	535890	5651619	1.94E-03
Chalcopyrite (CuFeS2)	1308-56-1	-	-	1.94E-02	535890	5651619	1.94E-02
Bornite (Cu5FeS4)	1308-82-3	-	-	0	540754	5654567	0.00E+00
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	4.42E-04	535890	5651619	4.42E-04
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	0	540754	5654567	0.00E+00
Cuprite (CU_2O)	1317-39-1	-	-	4.42E-04	535890	5651619	4.42E-04
Galena (PbS)	1314-87-0	-	-	1.77E-03	535890	5651619	1.77E-03
Sphalerite (ZnS)	1314-98-3	-	-	3.54E-03	535890	5651619	3.54E-03
Pyrite (Fe, S2)	1309-36-0	-	-	5.30E-02	535890	5651619	5.30E-02
Pyrrhotite (Fe7S8)	12305-96-3	-	-	2.47E-02	535890	5651619	2.47E-02
Arsenopyrite (FeAsS)	1303-18-0	-	-	4.42E-04	535890	5651619	4.42E-04
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	1.28E-03	535890	5651619	1.28E-03
Quartz	14808-60-7	7.00E-02	4.00E-02	1.22E-01	535890	5651619	1.62E-01
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	4.80E+00	535890	5651619	4.80E+00
K-Feldspars (KAlSi3O8)	n/a	-	-	3.15E-01	535890	5651619	3.15E-01
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	7.38E-01	535890	5651619	7.38E-01
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	-	-	1.69E-01	535890	5651619	1.69E-01
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	8.14E-02	535890	5651619	8.14E-02
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	-	-	1.09E-01	535890	5651619	1.09E-01
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	1.73E-01	535890	5651619	1.73E-01
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	2.05E-03	535890	5651619	2.05E-03
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	1.94E-02	535890	5651619	1.94E-02
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	4.42E-03	535890	5651619	4.42E-03
Calcite (CaCO3)	1317-65-3	-	-	4.32E-02	535890	5651619	4.32E-02
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	-	-	2.57E-04	535890	5651619	2.57E-04
Titanite (CaTiSiO5)	n/a	-	-	7.40E-03	535890	5651619	7.40E-03
Apatite (Ca5(PO4)3)	1306-05-4	-	-	1.94E-02	535890	5651619	1.94E-02
Mica	12001-26-2	7	0	9.47E-01	535890	5651619	9.47E-01
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	-	-	4.68E-01	535890	5651619	4.68E-01
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	3.82E-01	535890	5651619	3.82E-01
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	-	-	2.96E-01	535890	5651619	2.96E-01
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	1.03E+00	535890	5651619	1.03E+00
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	2.25E+00	535890	5651619	2.25E+00
Albite (NaAlSi 3O 8)	n/a	-	-	8.41E-01	535890	5651619	8.41E-01
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	1.23E-01	535890	5651619	1.23E-01
Sillimanite (Al2SiO5)	12141-45-6	-	-	3.89E-02	535890	5651619	3.89E-02

Table E-3 Maximum Predicted Annual Average Mine Boundary CoPC Concentrations During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µ/m3)	(µ/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	-	-	8.92E-01	539275	5649815	8.92E-01
Sulphur Dioxide (SO2)	7446-09-5	52	20	9.82E-03	536474	5653044	2.00E+01
Hydrocarbons	<<NMHC>>	-	-	1.87E-01	539275	5649815	1.87E-01
Nitrogen Dioxide (NO2) (Note 1)	10102-44-0	103	30	8.19E+00	539330	5649820	3.82E+01
1,3-butadiene	106-99-0	0.5	0.14	1.02E-04	535897	5651638	1.40E-01
Acenaphthene	83-32-9	-	8.46E-04	3.78E-05	539312	5649816	8.84E-04
Acenaphthylene	208-96-8	-	1.56E-03	7.60E-05	539330	5649820	1.64E-03
Acetaldehyde	75-07-0	1	-	5.73E-03	535890	5651619	5.73E-03
Acrolein	107-02-8	2.00E-02	-	1.04E-03	535890	5651619	1.04E-03
Anthracene	120-12-7	-	3.08E-05	7.21E-06	539312	5649816	3.80E-05
Benzene	71-43-2	-	0.4	3.85E-03	539312	5649816	4.04E-01
Benzo(a)anthracene	56-55-3	-	-	1.55E-06	539275	5649815	1.55E-06
Benzo(a)pyrene	50-32-8	9.00E-04	3.00E-04	5.84E-07	539275	5649815	3.01E-04
Benzo(b+k)fluoranthene	205-99-2	-	5.35E-05	2.20E-06	539275	5649815	5.57E-05
Benzo(g,h,i)perylene	191-24-2	-	-	1.33E-06	539275	5649815	1.33E-06
Chrysene	218-01-9	-	6.49E-05	3.03E-06	539275	5649815	6.79E-05
Fluoranthene	206-44-0	-	1.56E-04	1.49E-05	539294	5649811	1.71E-04
Fluorene	86-73-7	-	2.82E-04	6.10E-05	539330	5649820	3.43E-04
Formaldehyde	50-00-0	-	-	4.83E-03	535890	5651619	4.83E-03
Phenanthrene	85-01-8	-	4.24E-04	1.32E-04	539312	5649816	5.56E-04
Pyrene	129-00-0	13	0	1.39E-05	539294	5649811	1.39E-05
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	1.82E-02	7.15E-02	539275	5649815	8.97E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	0.3	0	4.65E-02	539275	5649815	4.65E-02
Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.40E-03	1.40E-03	1.41E-06	539275	5649815	1.40E-03

Notes:

1 - Individual model run with OLM

Table E-4 Maximum Predicted Mine Boundary CoPC Concentrations for Other Averaging Periods During Construction

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
8-Hour Average							
Carbon Monoxide (CO)	630-08-0	12700	400	699.14	537214	5653896	1099.14
15-Minute Average							
Formaldehyde	50-00-0	37	3	1.00	532930	5647334	4.00
4-Minute Average							
Sulphur Dioxide (SO2)	7446-09-5	1050	150	58.21	537214	5653896	208.21
Acrolein	107-02-8	8.3	-	0.31	532923	5647353	0.31
Acetaldehyde	75-07-0	3	-	1.68	532923	5647353	1.68
Tin (Sn)	7440-31-5	2	0	3.14E-02	539100	5653362	3.14E-02
1,3-butadiene	106-99-0	352	2	3.00E-02	532930	5647353	2.03

Table E-5: Maximum Predicted 1-Hour Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	-	-	2839.7	536270	5646758	2839.7
PM10	<<PM10>>	-	-	1370.3	536270	5646758	1370.3
PM2.5	<<PM2.5>>	-	-	202.5	536251	5646754	202.5
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	-	-	2.78E-03	537339	5653995	2.78E-03
Aluminum (Al)	7429-90-5	-	-	2.21E+02	536270	5646758	2.21E+02
Arsenic (As)	7440-38-2	-	-	1.10E-01	537339	5653995	1.10E-01
Gold (Au)	7440-57-5	-	-	6.72E-04	537339	5653995	6.72E-04
Boron (B)	7440-42-8	-	-	3.21E-01	536270	5646758	3.21E-01
Barium (Ba)	7440-39-3	-	-	1.28E+00	536270	5646758	1.28E+00
Beryllium (Be)	7440-41-7	-	-	2.59E-03	532949	5647316	2.59E-03
Bismuth (Bi)	7440-69-9	-	-	5.84E-03	537323	5653982	5.84E-03
Carbon (C)	7440-44-0	1	0	3.96E+00	536270	5646758	3.96E+00
Calcium (Ca)	7440-70-2	-	-	7.57E+01	536270	5646758	7.57E+01
Cadmium (Cd)	7440-43-9	-	-	8.31E-03	537339	5653995	8.31E-03
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	2.06E-01	536270	5646758	2.06E-01
Cobalt (Co)	7440-48-4	-	-	5.90E-02	536270	5646758	5.90E-02
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	6.60E-01	536251	5646754	6.60E-01
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	9.68E-03	536270	5646758	9.68E-03
Copper (Cu)	7440-50-8	-	-	7.63E-01	537339	5653995	7.63E-01
Iron (Fe)	7439-89-6	-	-	1.35E+02	536270	5646758	1.35E+02
Gallium (Ga)	7440-55-3	-	-	5.94E-02	536270	5646758	5.94E-02
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	1.21E-02	536270	5646758	1.21E-02
Mercury (Hg)	7439-97-6	-	-	7.10E-05	536270	5646758	7.10E-05
Indium (In)	7440-74-6	-	-	4.89E-05	536270	5646758	4.89E-05
Potassium (K)	7440-09-7	-	-	4.68E+01	536270	5646758	4.68E+01
Lanthanum (La)	7439-91-0	-	-	9.63E-02	536251	5646754	9.63E-02
Lithium (Li)	7439-93-2	2	0	7.32E-02	536270	5646758	7.32E-02
Lutetium (Lu)	7439-94-3	-	-	7.55E-04	536270	5646758	7.55E-04
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	4.16E+01	536270	5646758	4.76E+01
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	6.38E-01	536270	5646758	6.38E-01
Molybdenum (Mo)	7439-98-7	-	-	1.39E-02	537323	5653982	1.39E-02
Sodium (Na)	7440-23-5	-	-	8.51E+01	536270	5646758	8.51E+01
Niobium (Nb)	7440--03-1	-	-	1.64E-02	536270	5646758	1.64E-02
Nickel (Ni)	7440-02-0	-	-	8.68E-02	536251	5646754	8.68E-02
Phosphorus (P)	7723-14-0	-	-	1.39E+00	536270	5646758	1.39E+00
Lead (Pb)	7439-92-1	-	-	3.40E-02	537323	5653982	3.40E-02
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	2.16E-01	536270	5646758	2.16E-01
Sulphur (S)	7704-34-9	-	-	1.34E+01	536270	5646758	1.34E+01
Antimony (Sb)	7440-36-0	-	-	1.53E-02	537323	5653982	1.53E-02
Scandium (Sc)	7440-20-2	-	-	5.08E-02	536270	5646758	5.08E-02
Selenium (Se)	7782-49-2	2	0.15	9.94E-04	536270	5646758	1.51E-01
Tin (Sn)	7440-31-5	-	-	2.63E-02	536270	5646758	2.63E-02
Strontium (Sr)	7440-24-6	-	-	6.65E-01	532938	5647316	6.65E-01
Tantalum (Ta)	7440-25-7	-	-	2.67E-03	536270	5646758	2.67E-03
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.75E-03	536270	5646758	1.75E-03
Tellurium (Te)	13494-80-9	1	0	5.78E-04	536270	5646758	5.78E-04
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	5.36E+00	536270	5646758	5.36E+00
Thallium (Tl)	7440-28-0	-	-	2.88E-03	536270	5646758	2.88E-03
Uranium (U)	7440-61-1	-	-	4.03E-03	536270	5646758	4.03E-03
Vanadium (v)	7440-62-2	-	-	4.18E-01	536270	5646758	4.18E-01
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	6.06E-02	537323	5653982	6.06E-02
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	4.32E-02	536270	5646758	4.32E-02
Ytterbium (Yb)	7440-64-4	-	-	4.99E-03	536270	5646758	4.99E-03
Zinc (Zn)	7440-66-6	-	-	3.02E-01	537323	5653982	3.02E-01
Zirconium (Zr)	7440-67-7	-	-	2.71E-01	536270	5646758	2.71E-01
Silicon Dioxide (SiO2)	7631-86-9	-	-	1.82E+03	536270	5646758	1.82E+03
Aluminum Oxide (Al2O3)	1344-28-1	-	-	4.20E+02	536270	5646758	4.20E+02
Iron Oxide (Fe2O3)	1309-37-1	-	-	1.84E+02	536270	5646758	1.84E+02
Magnesium Oxide (MgO)	1309-48-4	-	-	6.94E+01	536270	5646758	6.94E+01
Calcium Oxide (CaO)	1305-78-8	-	-	1.18E+02	532949	5647301	1.18E+02
Sodium Oxide (Na2O)	1313-59-3	-	-	1.11E+02	536270	5646758	1.11E+02
Potassium Oxide (K2O)	12136-45-7	-	-	5.70E+01	536270	5646758	5.70E+01
Titanium dioxide (TiO2)	13463-67-7	-	-	9.61E+00	536251	5646754	9.61E+00
Phosphorus Pentoxide (P2O5)	1314-56-3	-	-	3.10E+00	536270	5646758	3.10E+00
Manganese Oxide (MnO)	1344-43-0	-	-	8.60E-01	536270	5646758	8.60E-01
Chromium Oxide (Cr2O3)	1308-38-9	-	-	9.49E-01	536270	5646758	9.49E-01
Vanadium Pentoxide (V2O5)	1314-62-1	-	-	7.75E-01	536270	5646758	7.75E-01
Chalcopyrite (CuFeS2)	1308-56-1	-	-	7.28E+00	536270	5646758	7.28E+00
Bornite (Cu5FeS4)	1308-82-3	-	-	2.63E-01	536270	5646758	2.63E-01
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	2.02E-01	536270	5646758	2.02E-01
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	8.16E-02	536270	5646758	8.16E-02
Cuprite (CU_2O)	1317-39-1	-	-	1.42E-01	536270	5646758	1.42E-01
Galena (PbS)	1314-87-0	-	-	5.74E-01	536270	5646758	5.74E-01
Sphalerite (ZnS)	1314-98-3	-	-	1.18E+00	536270	5646758	1.18E+00
Pyrite (Fe, S2)	1309-36-0	-	-	2.14E+01	536270	5646758	2.14E+01
Pyrrhotite (Fe7S8)	12305-96-3	-	-	1.79E+01	536270	5646758	1.79E+01
Arsenopyrite (FeAsS)	1303-18-0	-	-	6.85E-01	536270	5646758	6.85E-01
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	1.01E+01	536270	5646758	1.01E+01
Quartz	14808-60-7	23	6	1.40E+02	536270	5646758	1.46E+02
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	1.21E+03	536270	5646758	1.21E+03
K-Feldspars (KAlSi3O8)	n/a	-	-	8.29E+01	536270	5646758	8.29E+01
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	3.28E+02	536270	5646758	3.28E+02
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	-	-	1.25E+02	536251	5646754	1.25E+02
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	3.08E+01	536270	5646758	3.08E+01
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	-	-	1.48E+02	536251	5646754	1.48E+02
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	4.78E+01	536270	5646758	4.78E+01
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	7.02E-01	536270	5646758	7.02E-01
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	7.01E+00	536270	5646758	7.01E+00
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	1.70E+00	536270	5646758	1.70E+00
Calcite (CaCO3)	1317-65-3	-	-	2.96E+01	536251	5646754	2.96E+01
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	-	-	6.61E-01	536270	5646758	6.61E-01
Titanite (CaTiSiO5)	n/a	-	-	9.58E+00	536251	5646754	9.58E+00
Apatite (Ca5(PO4)3)	1306-05-4	-	-	7.60E+00	536270	5646758	7.60E+00
Mica	12001-26-2	30	0	3.04E+02	536270	5646758	3.04E+02
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	-	-	1.50E+02	536270	5646758	1.50E+02
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	1.23E+02	536270	5646758	1.23E+02
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	-	-	9.51E+01	536270	5646758	9.51E+01
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	3.32E+02	536270	5646758	3.32E+02
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	7.24E+02	536270	5646758	7.24E+02
Albite (NaAlSi 3O 8)	n/a	-	-	2.70E+02	536270	5646758	2.70E+02
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	3.95E+01	536270	5646758	3.95E+01
Sillimanite (Al2SiO5)	12141-45-6	-	-	1.25E+01	536270	5646758	1.25E+01

Table E-5: Maximum Predicted 1-Hour Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	34000	600	2.38E+03	537339	5653995	2.98E+03
Sulphur Dioxide (SO2)	7446-09-5	-	-	1.88E+02	539275	5649815	1.88E+02
Hydrocarbons	<<NMHC>>	-	-	3.02E+01	533041	5647186	3.02E+01
Nitrogen Dioxides (NO2) (Note 1)	10102-44-0	414	150	6.68E+02	533045	5647012	8.18E+02
1,3-butadiene	106-99-0	-	-	1.96E-02	533020	5647043	1.96E-02
Acenaphthene	83-32-9	-	-	7.35E-03	533045	5647012	7.35E-03
Acenaphthylene	208-96-8	-	-	1.45E-02	533045	5647012	1.45E-02
Acetaldehyde	75-07-0	-	-	1.10E+00	533020	5647043	1.10E+00
Acrolein	107-02-8	-	-	2.02E-01	533020	5647043	2.02E-01
Anthracene	120-12-7	-	-	1.38E-03	533045	5647012	1.38E-03
Benzene	71-43-2	-	-	7.07E-01	533045	5647012	7.07E-01
Benzo(a)anthracene	56-55-3	-	-	2.62E-04	533069	5647201	2.62E-04
Benzo(a)pyrene	50-32-8	-	-	9.93E-05	533041	5647186	9.93E-05
Benzo(b+k)fluoranthene	205-99-2	-	-	3.64E-04	533041	5647186	3.64E-04
Benzo(g,h,i)perylene	191-24-2	-	-	2.23E-04	533041	5647201	2.23E-04
Chrysene	218-01-9	-	-	4.94E-04	533041	5647186	4.94E-04
Fluoranthene	206-44-0	-	-	2.67E-03	533045	5647012	2.67E-03
Fluorene	86-73-7	-	-	1.15E-02	533045	5647012	1.15E-02
Formaldehyde	50-00-0	-	-	9.13E-01	533020	5647043	9.13E-01
Phenanthrene	85-01-8	-	-	2.35E-02	533045	5647012	2.35E-02
Pyrene	129-00-0	-	-	2.53E-03	533045	5647012	2.53E-03
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	-	1.27E+01	533045	5647012	1.27E+01
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	8.27E+00	533045	5647012	8.27E+00
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	2.43E-04	533057	5647012	2.43E-04
Reagents							
Calcium Oxide	1305-78-8	-	-	1.18E+02	532949	5647301	1.18E+02
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	7.19E-01	539275	5649815	7.19E-01
Sodium sulphite	7757-83-7	-	-	5.13E+00	539275	5649815	5.13E+00
Zinc sulphate	7733-02-0	-	-	2.47E-01	539275	5649815	2.47E-01
Sodium trithiocarbonate	534-18-9	-	-	2.96E-01	539275	5649815	2.96E-01
Magnafloc 10	N/A	-	-	9.87E-01	539275	5649815	9.87E-01

Notes:

1 - Individual model run with OLM

Table E-6: Maximum Predicted 24-Hour Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	120	40	329.4	535959	5651803	369.4
PM10	<<PM10>>	50	13.1	133.7	536251	5646754	146.8
PM2.5	<<PM2.5>>	30	15	20.0	536251	5646754	35.0
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	-	2.60E-04	2.38E-04	537401	5654044	4.98E-04
Aluminum (Al)	7429-90-5	-	0.42	2.49E+01	535959	5651803	2.54E+01
Arsenic (As)	7440-38-2	-	1.26E-03	7.78E-03	537401	5654044	9.04E-03
Gold (Au)	7440-57-5	1.25	-	4.44E-05	537401	5654044	4.44E-05
Boron (B)	7440-42-8	-	2.60E-02	3.34E-02	535959	5651803	5.94E-02
Barium (Ba)	7440-39-3	-	8.60E-03	1.25E-01	536251	5646754	1.33E-01
Beryllium (Be)	7440-41-7	-	-	3.88E-04	535959	5651803	3.88E-04
Bismuth (Bi)	7440-69-9	-	1.30E-03	7.35E-04	535959	5651803	2.04E-03
Carbon (C)	7440-44-0	-	-	4.35E-01	535959	5651803	4.35E-01
Calcium (Ca)	7440-70-2	-	0.68	1.08E+01	535959	5651803	1.15E+01
Cadmium (Cd)	7440-43-9	-	2.60E-04	5.79E-04	537417	5654056	8.39E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	-	-	2.39E-02	535959	5651803	2.39E-02
Cobalt (Co)	7440-48-4	-	-	6.78E-03	535959	5651803	6.78E-03
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	6.00E-03	6.47E-02	536251	5646754	7.07E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	-	-	1.12E-03	535959	5651803	1.12E-03
Copper (Cu)	7440-50-8	2.5	0.2	5.93E-02	537401	5654044	2.59E-01
Iron (Fe)	7439-89-6	-	0.22	1.37E+01	535959	5651803	1.40E+01
Gallium (Ga)	7440-55-3	-	-	6.69E-03	535959	5651803	6.69E-03
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	-	-	1.40E-03	535959	5651803	1.40E-03
Mercury (Hg)	7439-97-6	-	6.40E-05	8.22E-06	535959	5651803	7.22E-05
Indium (In)	7440-74-6	-	-	5.67E-06	535959	5651803	5.67E-06
Potassium (K)	7440-09-7	-	0.13	4.64E+00	535959	5651803	4.76E+00
Lanthanum (La)	7439-91-0	-	-	9.42E-03	536251	5646754	9.42E-03
Lithium (Li)	7439-93-2	-	-	8.47E-03	535959	5651803	8.47E-03
Lutetium (Lu)	7439-94-3	-	-	8.70E-05	535973	5651840	8.70E-05
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.19	4.85E+00	535959	5651803	5.04E+00
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	8.60E-03	6.22E-02	536251	5646754	7.08E-02
Molybdenum (Mo)	7439-98-7	120	7.60E-04	1.87E-03	535959	5651803	2.63E-03
Sodium (Na)	7440-23-5	-	0.52	9.48E+00	535959	5651803	1.00E+01
Niobium (Nb)	7440--03-1	-	-	1.89E-03	535959	5651803	1.89E-03
Nickel (Ni)	7440-02-0	7.00E-02	5.00E-03	8.47E-03	536251	5646754	1.35E-02
Phosphorus (P)	7723-14-0	0.5	-	2.01E-01	535959	5651803	2.01E-01
Lead (Pb)	7439-92-1	-	3.40E-03	4.79E-03	535966	5651822	8.19E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	4	0	2.51E-02	535959	5651803	2.51E-02
Sulphur (S)	7704-34-9	-	-	1.31E+00	536251	5646754	1.31E+00
Antimony (Sb)	7440-36-0	-	1.26E-03	1.76E-03	535959	5651803	3.02E-03
Scandium (Sc)	7440-20-2	-	-	4.97E-03	536251	5646754	4.97E-03
Selenium (Se)	7782-49-2	-	2.60E-03	1.15E-04	535966	5651822	2.72E-03
Tin (Sn)	7440-31-5	-	-	3.04E-03	535959	5651803	3.04E-03
Strontium (Sr)	7440-24-6	-	1.50E-03	9.97E-02	535959	5651803	1.01E-01
Tantalum (Ta)	7440-25-7	25	-	3.10E-04	535959	5651803	3.10E-04
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	2.03E-04	535959	5651803	2.03E-04
Tellurium (Te)	13494-80-9	-	-	6.69E-05	535959	5651803	6.69E-05
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.5	0	5.22E-01	536251	5646754	5.22E-01
Thallium (Tl)	7440-28-0	-	2.60E-04	3.33E-04	535966	5651822	5.93E-04
Uranium (U)	7440-61-1	0.3	2.60E-04	4.67E-04	535959	5651803	7.27E-04
Vanadium (v)	7440-62-2	-	7.60E-04	4.09E-02	536251	5646754	4.16E-02
Tungsten (W) and Compounds (as W)	7440-33-7	5.4	0	8.93E-03	535959	5651803	8.93E-03
Yttrium (Y) and Compounds (as Y)	7440-65-5	13	0	5.01E-03	535959	5651803	5.01E-03
Ytterbium (Yb)	7440-64-4	-	-	5.78E-04	535959	5651803	5.78E-04
Zinc (Zn)	7440-66-6	2.5	0.1	3.65E-02	535959	5651803	1.36E-01
Zirconium (Zr)	7440-67-7	2.5	0	3.14E-02	535959	5651803	3.14E-02
Silicon Dioxide (SiO2)	7631-86-9	-	-	2.06E+02	535959	5651803	2.06E+02
Aluminum Oxide (Al2O3)	1344-28-1	-	-	4.94E+01	535959	5651803	4.94E+01
Iron Oxide (Fe2O3)	1309-37-1	-	-	2.17E+01	535959	5651803	2.17E+01
Magnesium Oxide (MgO)	1309-48-4	-	-	8.86E+00	535959	5651803	8.86E+00
Calcium Oxide (CaO)	1305-78-8	-	-	1.98E+01	539275	5649815	1.98E+01
Sodium Oxide (Na2O)	1313-59-3	-	-	1.11E+01	535959	5651803	1.11E+01
Potassium Oxide (K2O)	12136-45-7	-	-	6.45E+00	535959	5651803	6.45E+00
Titanium dioxide (TiO2)	13463-67-7	-	-	9.39E-01	536251	5646754	9.39E-01
Phosphorus Pentoxide (P2O5)	1314-56-3	1	-	4.21E-01	535959	5651803	4.21E-01
Manganese Oxide (MnO)	1344-43-0	-	-	8.37E-02	536251	5646754	8.37E-02
Chromium Oxide (Cr2O3)	1308-38-9	-	-	9.57E-02	535959	5651803	9.57E-02
Vanadium Pentoxide (V2O5)	1314-62-1	1	-	8.79E-02	535959	5651803	8.79E-02
Chalcopyrite (CuFeS2)	1308-56-1	-	-	8.44E-01	535959	5651803	8.44E-01
Bornite (Cu5FeS4)	1308-82-3	-	-	3.04E-02	535959	5651803	3.04E-02
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	2.34E-02	535959	5651803	2.34E-02
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	9.45E-03	535959	5651803	9.45E-03
Cuprite (CU_2O)	1317-39-1	-	-	1.64E-02	535959	5651803	1.64E-02
Galena (PbS)	1314-87-0	-	-	6.65E-02	535959	5651803	6.65E-02
Sphalerite (ZnS)	1314-98-3	1	-	1.36E-01	535959	5651803	1.36E-01
Pyrite (Fe, S2)	1309-36-0	120	-	2.09E+00	536251	5646754	2.09E+00
Pyrrhotite (Fe7S8)	12305-96-3	-	-	2.08E+00	535959	5651803	2.08E+00
Arsenopyrite (FeAsS)	1303-18-0	-	-	7.94E-02	535959	5651803	7.94E-02
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	9.82E-01	536251	5646754	9.82E-01
Quartz	14808-60-7	-	0.99	1.36E+01	536251	5646754	1.46E+01
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	1.77E+02	535959	5651803	1.77E+02
K-Feldspars (KAlSi3O8)	n/a	-	-	9.60E+00	535959	5651803	9.60E+00
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	3.20E+01	536251	5646754	3.20E+01
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	8.00E-05	-	1.22E+01	536251	5646754	1.22E+01
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	3.01E+00	536251	5646754	3.01E+00
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	1.5	-	1.45E+01	536251	5646754	1.45E+01
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	5.53E+00	535959	5651803	5.53E+00
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	6.85E-02	536251	5646754	6.85E-02
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	8.11E-01	535959	5651803	8.11E-01
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	1.97E-01	535959	5651803	1.97E-01
Calcite (CaCO3)	1317-65-3	-	-	2.90E+00	536251	5646754	2.90E+00
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	-	-	6.45E-02	536251	5646754	6.45E-02
Titanite (CaTiSiO5)	n/a	-	-	9.36E-01	536251	5646754	9.36E-01
Apatite (Ca5(PO4)3)	1306-05-4	-	-	8.80E-01	535959	5651803	8.80E-01
Mica	12001-26-2	-	-	3.52E+01	535959	5651803	3.52E+01
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	8.00E-05	-	1.74E+01	535959	5651803	1.74E+01
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	1.42E+01	535959	5651803	1.42E+01
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	-	-	1.10E+01	535959	5651803	1.10E+01
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	3.84E+01	535959	5651803	3.84E+01
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	8.38E+01	535959	5651803	8.38E+01
Albite (NaAlSi 3O 8)	n/a	-	-	3.13E+01	535959	5651803	3.13E+01
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	4.57E+00	535959	5651803	4.57E+00
Sillimanite (Al2SiO5)	12141-45-6	-	-	1.45E+00	535959	5651803	1.45E+00

Table E-6: Maximum Predicted 24-Hour Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	-	-	2.14E+01	534622	5650265	2.14E+01
Sulphur Dioxide (SO2)	7446-09-5	288	50	6.32E+00	539275	5649815	5.63E+01
Hydrocarbons	<<NMHC>>	-	-	2.59E+00	534633	5650282	2.59E+00
Nitrogen Dioxides (NO2) (Note 1)	10102-44-0	207	100	8.03E+01	533996	5649408	1.80E+02
1,3-butadiene	106-99-0	-	0.6	2.11E-03	537432	5654068	6.02E-01
Acenaphthene	83-32-9	-	4.41E-03	6.87E-04	537432	5654068	5.10E-03
Acenaphthylene	208-96-8	-	8.15E-03	1.39E-03	537432	5654068	9.54E-03
Acetaldehyde	75-07-0	-	-	1.18E-01	537432	5654068	1.18E-01
Acrolein	107-02-8	-	-	2.13E-02	537432	5654068	2.13E-02
Anthracene	120-12-7	-	1.61E-04	1.21E-04	537445	5654084	2.82E-04
Benzene	71-43-2	10	3	6.22E-02	533053	5647172	3.06E+00
Benzo(a)anthracene	56-55-3	-	-	2.27E-05	534633	5650282	2.27E-05
Benzo(a)pyrene	50-32-8	-	5.29E-05	8.56E-06	534633	5650282	6.15E-05
Benzo(b+k)fluoranthene	205-99-2	-	2.79E-04	3.13E-05	534633	5650282	3.10E-04
Benzo(g,h,i)perylene	191-24-2	-	-	1.94E-05	534633	5650282	1.94E-05
Chrysene	218-01-9	-	3.38E-04	4.25E-05	534633	5650282	3.81E-04
Fluoranthene	206-44-0	-	8.15E-04	2.30E-04	533054	5647172	1.05E-03
Fluorene	86-73-7	-	1.47E-03	9.98E-04	533053	5647172	2.47E-03
Formaldehyde	50-00-0	-	-	9.89E-02	537432	5654068	9.89E-02
Phenanthrene	85-01-8	-	2.21E-03	2.00E-03	534633	5650282	4.21E-03
Pyrene	129-00-0	-	-	2.17E-04	533054	5647161	2.17E-04
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	0.09	1.09E+00	534633	5650282	1.18E+00
Elemental Carbon (from diesel exhaust)	7440-44-0	-	-	7.06E-01	534633	5650282	7.06E-01
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	2.09E-05	534633	5650282	2.09E-05
Reagents							
Calcium Oxide	1305-78-8	-	-	1.98E+01	539275	5649815	1.98E+01
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	9.71E-02	539275	5649815	9.71E-02
Sodium sulphite	7757-83-7	0.14	-	6.94E-01	539275	5649815	6.94E-01
Zinc sulphate	7733-02-0	1	-	3.33E-02	539275	5649815	3.33E-02
Sodium trithiocarbonate	534-18-9	-	-	4.00E-02	539275	5649815	4.00E-02
Magnafloc 10	N/A	-	-	1.33E-01	539275	5649815	1.33E-01

Notes:

1 - Individual model run with OLM

Table E-7: Maximum Predicted Annual Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Particulates							
TSP	<<PM>>	-	11.6	18.3	535890	5651619	29.9
PM10	<<PM10>>	-	8.3	6.1	535890	5651619	14.4
PM2.5	<<PM2.5>>	-	6.2	0.8	535890	5651619	7.0
Metals and Metallic Compounds							
Silver (Ag)	7440-22-4	0.23	5.00E-03	1.17E-05	539330	5649820	5.01E-03
Aluminum (Al)	7429-90-5	-	0.15	1.39E+00	535890	5651619	1.54E+00
Arsenic (As)	7440-38-2	3.00E-03	2.00E-03	3.82E-04	539330	5649820	2.38E-03
Gold (Au)	7440-57-5	-	-	2.15E-06	539330	5649820	2.15E-06
Boron (B)	7440-42-8	-	2.60E-02	1.89E-03	535890	5651619	2.79E-02
Barium (Ba)	7440-39-3	5.00E-02	2.00E-02	6.96E-03	535890	5651619	2.70E-02
Beryllium (Be)	7440-41-7	4.00E-04	0	2.04E-05	535890	5651619	2.04E-05
Bismuth (Bi)	7440-69-9	-	1.30E-03	3.45E-05	535890	5651619	1.30E-02
Carbon (C)	7440-44-0	0.3	0	2.44E-02	535890	5651619	2.44E-02
Calcium (Ca)	7440-70-2	-	0.30	5.77E-01	535890	5651619	8.77E-01
Cadmium (Cd)	7440-43-9	3.60E-03	5.00E-04	2.78E-05	539330	5649820	5.28E-04
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1	0	1.33E-03	535890	5651619	1.33E-03
Cobalt (Co)	7440-48-4	0.1	0	3.76E-04	535890	5651619	3.76E-04
Chromium (Cr) and Compounds (as Cr)	7440-47-3	0.1	1.00E-02	2.11E-03	535297	5650915	1.21E-02
Cesium (Cs) and Compounds (as Ce)	7440-46-2	0.4	0	6.22E-05	535890	5651619	6.22E-05
Copper (Cu)	7440-50-8	-	3.20E-03	2.86E-03	539330	5649820	6.06E-03
Iron (Fe)	7439-89-6	-	0.15	7.81E-01	535890	5651619	9.31E-01
Gallium (Ga)	7440-55-3	-	-	3.73E-04	535890	5651619	3.73E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1	0	7.78E-05	535890	5651619	7.78E-05
Mercury (Hg)	7439-97-6	5.00E-03	2.00E-03	4.56E-07	535890	5651619	2.00E-03
Indium (In)	7440-74-6	-	-	3.14E-07	535890	5651619	3.14E-07
Potassium (K)	7440-09-7	-	0.13	2.65E-01	535890	5651619	3.95E-01
Lanthanum (La)	7439-91-0	-	-	4.13E-04	535890	5651619	4.13E-04
Lithium (Li)	7439-93-2	-	-	4.70E-04	535890	5651619	4.70E-04
Lutetium (Lu)	7439-94-3	-	-	4.85E-06	535890	5651619	4.85E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.1	2.69E-01	535890	5651619	3.65E-01
Manganese (Mn) and Compounds (as Mn)	7439-96-5	8.00E-02	5.00E-03	3.06E-03	535890	5651619	8.06E-03
Molybdenum (Mo)	7439-98-7	-	7.80E-04	9.21E-05	535890	5651619	8.72E-04
Sodium (Na)	7440-23-5	-	0.32	5.30E-01	535890	5651619	8.50E-01
Niobium (Nb)	7440--03-1	-	-	1.05E-04	535890	5651619	1.05E-04
Nickel (Ni)	7440-02-0	2.00E-02	2.00E-03	3.30E-04	535297	5650915	2.33E-03
Phosphorus (P)	7723-14-0	-	-	1.07E-02	535890	5651619	1.07E-02
Lead (Pb)	7439-92-1	0.1	4.00E-03	2.52E-04	535890	5651619	4.25E-03
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	1.39E-03	535890	5651619	1.39E-03
Sulphur (S)	7704-34-9	-	-	5.79E-02	535890	5651619	5.79E-02
Antimony (Sb)	7440-36-0	0.17	7.00E-03	8.25E-05	535890	5651619	7.08E-03
Scandium (Sc)	7440-20-2	-	-	2.59E-04	535890	5651619	2.59E-04
Selenium (Se)	7782-49-2	-	2.60E-03	6.38E-06	535890	5651619	2.61E-03
Tin (Sn)	7440-31-5	0.1	0	1.69E-04	535890	5651619	1.69E-04
Strontium (Sr)	7440-24-6	-	1.48E-03	5.16E-03	535890	5651619	6.64E-03
Tantalum (Ta)	7440-25-7	-	-	1.72E-05	535890	5651619	1.72E-05
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.13E-05	535890	5651619	1.13E-05
Tellurium (Te)	13494-80-9	-	-	3.71E-06	535890	5651619	3.71E-06
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	2.28E-02	535890	5651619	2.28E-02
Thallium (Tl)	7440-28-0	0.25	5.00E-03	1.85E-05	535890	5651619	5.02E-03
Uranium (U)	7440-61-1	6.00E-02	2.60E-04	2.59E-05	535890	5651619	2.86E-04
Vanadium (v)	7440-62-2	1	1.00E-02	2.28E-03	535890	5651619	1.23E-02
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	4.15E-04	535890	5651619	4.15E-04
Yttrium (Y) and Compounds (as Y)	7440-65-5	3	0	2.78E-04	535890	5651619	2.78E-04
Ytterbium (Yb)	7440-64-4	-	-	3.20E-05	535890	5651619	3.20E-05
Zinc (Zn)	7440-66-6	-	1.40E-02	1.85E-03	535890	5651619	1.58E-02
Zirconium (Zr)	7440-67-7	-	-	1.74E-03	535890	5651619	1.74E-03
Silicon Dioxide (SiO2)	7631-86-9	-	-	1.15E+01	535890	5651619	1.15E+01
Aluminum Oxide (Al2O3)	1344-28-1	-	-	2.73E+00	535890	5651619	2.73E+00
Iron Oxide (Fe2O3)	1309-37-1	-	-	1.20E+00	535890	5651619	1.20E+00
Magnesium Oxide (MgO)	1309-48-4	-	-	4.83E-01	535890	5651619	4.83E-01
Calcium Oxide (CaO)	1305-78-8	-	-	9.53E-01	539312	5649816	9.53E-01
Sodium Oxide (Na2O)	1313-59-3	-	-	6.35E-01	535890	5651619	6.35E-01
Potassium Oxide (K2O)	12136-45-7	-	-	3.59E-01	535890	5651619	3.59E-01
Titanium dioxide (TiO2)	13463-67-7	-	-	3.87E-02	535890	5651619	3.87E-02
Phosphorus Pentoxide (P2O5)	1314-56-3	-	-	2.27E-02	535890	5651619	2.27E-02
Manganese Oxide (MnO)	1344-43-0	-	-	4.58E-03	535890	5651619	4.58E-03
Chromium Oxide (Cr2O3)	1308-38-9	-	-	5.47E-03	535890	5651619	1.55E-02
Vanadium Pentoxide (V2O5)	1314-62-1	-	-	4.91E-03	535890	5651619	4.91E-03
Chalcopyrite (CuFeS2)	1308-56-1	-	-	4.68E-02	535890	5651619	4.68E-02
Bornite (Cu5FeS4)	1308-82-3	-	-	1.69E-03	535890	5651619	1.69E-03
Chalcocite (Cu2S)/Covellite (CuS)	22205-45-4,19138-68-2	-	-	1.30E-03	535890	5651619	1.30E-03
Tetrahedrite (Cu12Sb4S13)/Tennantite (Cu12As4S13)	n/a, 12178-49-3	-	-	5.24E-04	535890	5651619	5.24E-04
Cuprite (CU_2O)	1317-39-1	-	-	9.12E-04	535890	5651619	9.12E-04
Galena (PbS)	1314-87-0	-	-	3.69E-03	535890	5651619	3.69E-03
Sphalerite (ZnS)	1314-98-3	-	-	7.57E-03	535890	5651619	7.57E-03
Pyrite (Fe, S2)	1309-36-0	-	-	1.16E-01	535890	5651619	1.16E-01
Pyrrhotite (Fe7S8)	12305-96-3	-	-	1.15E-01	535890	5651619	1.15E-01
Arsenopyrite (FeAsS)	1303-18-0	-	-	4.40E-03	535890	5651619	4.40E-03
Ilmenite (Fe,Ti)2O3	12168-52-4	-	-	4.43E-02	535890	5651619	4.43E-02
Quartz	14808-60-7	7.00E-02	4.00E-02	6.78E-01	535890	5651619	7.18E-01
Plagioclase (NaAlSi3O8 – CaAl2Si2O8)	n/a	-	-	9.45E+00	535890	5651619	9.45E+00
K-Feldspars (KAlSi3O8)	n/a	-	-	5.33E-01	535890	5651619	5.33E-01
Biotite(K(Mg,Fe)3AlSi3O10(F,OH)2)	n/a	-	-	1.65E+00	535890	5651619	1.65E+00
Actinolite (Ca2(Mg4.5–2.5Fe2+0.5–2.5)Si8O22(OH)2)	77536-66-4	-	-	4.38E-01	535890	5651619	4.38E-01
Chlorite (Fe, (Mg, Mn)5,Al)(Si3Al)O10(OH)8	14998-27-7	-	-	1.36E-01	535890	5651619	1.36E-01
Muscovite (KAl2(Si3Al)O10(OH)2)	1318-94-1	-	-	4.52E-01	538299	5647900	4.52E-01
Epidote (Ca2)(Al2Fe3+)O[Si2O7][SiO4](OH)	n/a	-	-	3.07E-01	535890	5651619	3.07E-01
Augite ((Ca,Na)(Mg,Fe,Al,Ti)(Si,Al)2O6)	n/a	-	-	3.09E-03	535890	5651619	3.09E-03
Andradite (Ca3Fe2(SiO4)3)	15078-96-3	-	-	4.50E-02	535890	5651619	4.50E-02
Kaolinite (Al2Si2O5(OH)4)	1318-74-7	-	-	1.09E-02	535890	5651619	1.09E-02
Calcite (CaCO3)	1317-65-3	-	-	1.12E-01	535890	5651619	1.12E-01
Dolomite (CaMg(CO3)2)/Ankerite (Ca(Fe,Mg,Mn)(CO 3)2)	16389-88-1, n/a	0	0	2.91E-03	535890	5651619	2.91E-03
Titanite (CaTiSiO5)	n/a	-	-	2.93E-02	538299	5647900	2.93E-02
Apatite (Ca5(PO4)3)	1306-05-4	-	-	4.88E-02	535890	5651619	4.88E-02
Mica	12001-26-2	7	0	1.95E+00	535890	5651619	1.95E+00
Tremolite (Ca2(Mg5.0-4.5Fe2+0.0-0.5)Si8O22(OH)2)	77536-68-6	-	-	9.65E-01	535890	5651619	9.65E-01
Bytownite (Ca,Na)(Si,Al)4O8	n/a	-	-	7.88E-01	535890	5651619	7.88E-01
Labradorite $(Na,Ca)_{1-2}Si_{3-2}O_8$	n/a	-	-	6.11E-01	535890	5651619	6.11E-01
Andesine $(Na,Ca)Al_{1-2}Si_{3-2}O_8$	96158-02-0	-	-	2.13E+00	535890	5651619	2.13E+00
Oligoclase (Na,Ca)(Si,Al)4O8	n/a	-	-	4.65E+00	535890	5651619	4.65E+00
Albite (NaAlSi 3O 8)	n/a	-	-	1.73E+00	535890	5651619	1.73E+00
Phlogopite (KMg3AlSi3O10(F,OH)2)	n/a	-	-	2.54E-01	535890	5651619	2.54E-01
Sillimanite (Al2SiO5)	12141-45-6	-	-	8.03E-02	535890	5651619	8.03E-02

Table E-7: Maximum Predicted Annual Average Mine Boundary CoPC Concentrations During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
Combustion Gases							
Carbon Monoxide (CO)	630-08-0	-	-	1.14E+00	534108	5649521	1.14E+00
Sulphur Dioxide (SO2)	7446-09-5	52	20	3.73E-01	539255	5649819	2.04E+01
Hydrocarbons	<<NMHC>>	-	-	1.61E-01	534164	5649578	1.61E-01
Nitrogen Dioxides (NO2) (Note 1)	10102-44-0	103	30	9.04E+00	534164	5649578	3.90E+01
1,3-butadiene	106-99-0	0.5	0.14	1.50E-04	534234	5649648	1.40E-01
Acenaphthene	83-32-9	-	8.46E-04	5.30E-05	534220	5649634	8.99E-04
Acenaphthylene	208-96-8	-	1.56E-03	1.07E-04	534220	5649634	1.67E-03
Acetaldehyde	75-07-0	1	-	8.43E-03	534234	5649648	8.43E-03
Acrolein	107-02-8	2.0E-02	-	1.53E-03	534234	5649648	1.53E-03
Anthracene	120-12-7	-	3.08E-05	9.73E-06	534206	5649620	4.05E-05
Benzene	71-43-2	-	0.4	4.99E-03	534220	5649634	4.05E-01
Benzo(a)anthracene	56-55-3	-	-	1.60E-06	534178	5649592	1.60E-06
Benzo(a)pyrene	50-32-8	9.00E-04	3.00E-04	5.82E-07	534178	5649592	3.01E-04
Benzo(b+k)fluoranthene	205-99-2	-	5.35E-05	1.99E-06	534164	5649578	5.55E-05
Benzo(g,h,i)perylene	191-24-2	-	-	1.35E-06	534178	5649592	1.35E-06
Chrysene	218-01-9	-	6.49E-05	2.68E-06	534164	5649578	6.76E-05
Fluoranthene	206-44-0	-	1.56E-04	1.81E-05	534192	5649606	1.74E-04
Fluorene	86-73-7	-	2.82E-04	7.94E-05	534206	5649620	3.61E-04
Formaldehyde	50-00-0	-	-	7.09E-03	534234	5649648	7.09E-03
Phenanthrene	85-01-8	-	4.24E-04	1.53E-04	534192	5649606	5.77E-04
Pyrene	129-00-0	13	0	1.70E-05	534192	5649606	1.70E-05
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	1.82E-02	7.80E-02	534178	5649592	9.62E-02
Elemental Carbon (from diesel exhaust)	7440-44-0	0.3	0	5.07E-02	534178	5649592	5.07E-02
Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.40E-03	1.40E-03	1.51E-06	534178	5649592	1.40E-03
Reagents							
Calcium Oxide	1305-78-8	-	-	9.53E-01	539312	5649816	9.53E-01
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	2.85E-03	539255	5649819	2.85E-03
Sodium sulphite	7757-83-7	-	-	2.03E-02	539255	5649819	2.03E-02
Zinc sulphate	7733-02-0	-	-	9.78E-04	539275	5649819	9.78E-04
Sodium trithiocarbonate	534-18-9	-	-	1.17E-03	539275	5649819	1.17E-03
Magnafloc 10	N/A	-	-	3.91E-03	539255	5649819	3.91E-03

Notes:
1 - Individual model run with OLM

Table E-8: Maximum Predicted Mine Boundary CoPC Concentrations for Other Averaging Periods During Operations

CoPC	CAS	Criteria	Background Concentration	Max Predicted Concentration (Project Alone)	Location of Max Predicted Concentration		Max Cumulative Concentration (Project + Background)
		(µg/m3)	(µg/m3)	(µg/m3)	UTM E (m)	UTM N (m)	(µg/m3)
8-Hour Average							
Carbon Monoxide (CO)	630-08-0	12700	400	1372.75	537339	5653995	1772.75
15-Minute Average							
Formaldehyde	50-00-0	37	3	1.25	533020	5647043	4.25
4-Minute Average							
Sulphur Dioxide (SO2)	7446-09-5	1050	150	359.61	539275	5649815	509.61
Acrolein	107-02-8	8.3	-	0.39	533020	5647043	0.39
Acetaldehyde	75-07-0	3	-	2.11	533020	5647043	2.11
Tin (Sn)	7440-31-5	2	0	5.01E-02	536270	5646758	5.01E-02
1,3-butadiene	106-99-0	352	2	3.74E-02	533020	5647043	2.04

APPENDIX F Predicted Concentrations at Special Receptors

Table F- 1 :Maximum Predicted 1-Hour Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Particulates																														
TSP	<<PM>>	-	-	546.4	634.1	735.8	667.4	553.7	455.7	1390.6	746.7	1146.2	1337.1	283.4	399.5	761.6	558.8	757.3	1348.0	417.7	442.5	857.1	863.0	1161.1	749.9	785.4	832.3	909.3	735.8	-
PM10	<<PM10>>	-	-	150.3	197.1	213.4	196.0	152.3	124.5	435.0	250.0	493.9	404.8	81.8	126.9	248.4	178.2	210.1	434.4	152.9	157.4	307.0	341.4	358.3	298.8	287.3	247.1	315.0	213.4	-
PM2.5	<<PM2.5>>	-	-	27.6	37.6	42.1	34.3	27.9	24.3	71.3	27.9	57.8	57.8	15.6	19.3	39.3	28.6	42.9	73.4	19.3	17.6	35.1	40.1	61.2	36.3	33.6	31.4	34.5	42.1	-
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	-	-	3.09E-04	4.95E-04	5.76E-04	4.93E-04	3.11E-04	2.85E-04	1.06E-03	7.13E-04	1.37E-03	9.42E-04	1.80E-04	3.43E-04	4.91E-04	4.48E-04	5.11E-04	1.11E-03	4.35E-04	4.30E-04	7.89E-04	9.11E-04	8.81E-04	7.15E-04	7.34E-04	5.53E-04	7.75E-04	5.76E-04	-
Aluminum (Al)	7429-90-5	-	-	3.75E+01	4.82E+01	5.02E+01	5.08E+01	3.80E+01	3.09E+01	1.06E+02	5.57E+01	8.77E+01	1.02E+02	1.77E+01	3.01E+01	4.78E+01	4.27E+01	5.80E+01	1.03E+02	3.17E+01	3.33E+01	6.38E+01	6.60E+01	8.88E+01	5.12E+01	6.00E+01	6.36E+01	6.95E+01	5.08E+01	-
Arsenic (As)	7440-38-2	-	-	3.92E-03	6.28E-03	7.30E-03	6.26E-03	3.94E-03	3.61E-03	1.35E-02	9.01E-03	1.73E-02	1.19E-02	2.28E-03	4.34E-03	6.22E-03	5.68E-03	6.49E-03	1.40E-02	5.50E-03	5.45E-03	9.98E-03	1.15E-02	1.12E-02	9.05E-03	9.30E-03	7.01E-03	9.82E-03	7.30E-03	-
Gold (Au)	7440-57-5	-	-	5.30E-05	8.80E-05	1.10E-04	9.40E-05	5.40E-05	4.80E-05	1.83E-04	1.65E-04	3.08E-04	1.51E-04	4.20E-05	6.90E-05	9.50E-05	9.70E-05	7.90E-05	2.29E-04	1.00E-04	9.20E-05	1.59E-04	1.94E-04	1.51E-04	1.53E-04	1.46E-04	1.05E-04	1.54E-04	1.10E-04	-
Boron (B)	7440-42-8	-	-	4.96E-02	6.58E-02	6.96E-02	6.87E-02	5.03E-02	4.09E-02	1.44E-01	7.37E-02	1.29E-01	1.37E-01	2.34E-02	4.09E-02	6.48E-02	5.82E-02	7.74E-02	1.41E-01	4.54E-02	4.72E-02	8.92E-02	9.46E-02	1.21E-01	7.36E-02	8.41E-02	8.48E-02	9.60E-02	6.96E-02	-
Barium (Ba)	7440-39-3	-	-	1.82E-01	2.37E-01	2.48E-01	2.49E-01	1.85E-01	1.50E-01	5.23E-01	2.71E-01	4.44E-01	5.00E-01	8.61E-02	1.48E-01	2.35E-01	2.10E-01	2.83E-01	5.08E-01	1.59E-01	1.66E-01	3.16E-01	3.31E-01	4.36E-01	2.57E-01	2.98E-01	3.10E-01	3.44E-01	2.49E-01	-
Beryllium (Be)	7440-41-7	-	-	5.80E-04	7.46E-04	7.76E-04	7.86E-04	5.88E-04	4.79E-04	1.65E-03	8.61E-04	1.36E-03	1.58E-03	2.74E-04	4.66E-04	7.40E-04	6.61E-04	8.97E-04	1.60E-03	4.91E-04	5.16E-04	9.88E-04	1.02E-03	1.37E-03	7.93E-04	9.28E-04	9.85E-04	1.08E-03	7.86E-04	-
Bismuth (Bi)	7440-69-9	-	-	1.02E-03	1.38E-03	1.47E-03	1.43E-03	1.04E-03	8.44E-04	3.02E-03	1.52E-03	2.78E-03	2.85E-03	4.83E-04	8.54E-04	1.35E-03	1.22E-03	1.61E-03	2.95E-03	9.70E-04	1.00E-03	1.89E-03	2.02E-03	2.51E-03	1.57E-03	1.78E-03	1.76E-03	2.02E-03	1.47E-03	-
Carbon (C) (Note 1)	7440-44-0	1	0	1.38E-01	1.50E-01	2.63E-01	2.64E-01	1.39E-01	1.40E-01	4.31E-01	3.38E-01	4.18E-01	5.69E-01	1.13E-01	1.99E-01	3.03E-01	2.61E-01	3.09E-01	4.17E-01	1.91E-01	2.11E-01	4.35E-01	3.81E-01	4.03E-01	3.51E-01	3.27E-01	4.74E-01	5.03E-01	2.64E-01	26%
Calcium (Ca)	7440-70-2	-	-	1.57E+01	2.02E+01	2.10E+01	2.12E+01	1.59E+01	1.29E+01	4.45E+01	2.33E+01	3.67E+01	4.27E+01	7.39E+00	1.26E+01	2.00E+01	1.78E+01	2.42E+01	4.31E+01	1.33E+01	1.39E+01	2.67E+01	2.76E+01	3.71E+01	2.14E+01	2.51E+01	2.66E+01	2.91E+01	2.12E+01	-
Cadmium (Cd)	7440-43-9	-	-	6.77E-04	1.11E-03	1.36E-03	1.14E-03	6.81E-04	6.12E-04	2.33E-03	1.94E-03	3.63E-03	1.97E-03	4.91E-04	8.36E-04	1.17E-03	1.16E-03	1.04E-03	2.76E-03	1.17E-03	1.08E-03	1.93E-03	2.32E-03	1.93E-03	1.83E-03	1.78E-03	1.26E-03	1.86E-03	1.36E-03	-
Cerium (Ce) and Compounds (as Ce)	7440-45-1	21	0	3.45E-02	4.44E-02	4.62E-02	4.68E-02	3.50E-02	2.85E-02	9.79E-02	5.13E-02	8.08E-02	9.41E-02	1.63E-02	2.77E-02	4.40E-02	3.93E-02	5.34E-02	9.49E-02	2.92E-02	3.07E-02	5.88E-02	6.08E-02	8.18E-02	4.72E-02	5.52E-02	5.86E-02	6.40E-02	4.68E-02	0%
Cobalt (Co)	7440-48-4	-	-	8.80E-03	1.13E-02	1.18E-02	1.19E-02	8.93E-03	7.27E-03	2.50E-02	1.31E-02	2.06E-02	2.40E-02	4.16E-03	7.07E-03	1.12E-02	1.00E-02	1.36E-02	2.42E-02	7.46E-03	7.83E-03	1.50E-02	1.55E-02	2.09E-02	1.20E-02	1.41E-02	1.49E-02	1.63E-02	1.19E-02	-
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	4.39E-02	5.71E-02	5.99E-02	6.00E-02	4.45E-02	3.62E-02	1.26E-01	6.52E-02	1.07E-01	1.20E-01	2.07E-02	3.56E-02	5.65E-02	5.06E-02	6.81E-02	1.22E-01	3.84E-02	4.01E-02	7.61E-02	7.98E-02	1.05E-01	6.20E-02	7.19E-02	7.47E-02	8.28E-02	6.00E-02	-
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	1.47E-03	1.89E-03	1.96E-03	1.99E-03	1.49E-03	1.21E-03	4.16E-03	2.18E-03	3.43E-03	4.00E-03	6.93E-04	1.18E-03	1.87E-03	1.67E-03	2.27E-03	4.03E-03	1.24E-03	1.30E-03	2.50E-03	2.58E-03	3.47E-03	2.00E-03	2.35E-03	2.49E-03	2.72E-03	1.99E-03	0%
Copper (Cu)	7440-50-8	-	-	7.16E-02	1.16E-01	1.40E-01	1.16E-01	7.20E-02	6.52E-02	2.46E-01	1.89E-01	3.58E-01	2.12E-01	4.79E-02	8.49E-02	1.20E-01	1.15E-01	1.13E-01	2.78E-01	1.14E-01	1.08E-01	1.95E-01	2.32E-01	2.04E-01	1.82E-01	1.81E-01	1.26E-01	1.88E-01	1.40E-01	-
Iron (Fe)	7439-89-6	-	-	1.69E+01	2.20E+01	2.30E+01	2.31E+01	1.71E+01	1.39E+01	4.84E+01	2.51E+01	4.11E+01	4.63E+01	7.98E+00	1.37E+01	2.17E+01	1.94E+01	2.62E+01	4.70E+01	1.47E+01	1.54E+01	2.92E+01	3.06E+01	4.04E+01	2.38E+01	2.76E+01	2.87E+01	3.18E+01	2.31E+01	-
Gallium (Ga)	7440-55-3	-	-	9.77E-03	1.26E-02	1.31E-02	1.32E-02	9.91E-03	8.07E-03	2.77E-02	1.45E-02	2.29E-02	2.67E-02	4.62E-03	7.85E-03	1.25E-02	1.11E-02	1.51E-02	2.69E-02	8.28E-03	8.69E-03	1.66E-02	1.72E-02	2.32E-02	1.34E-02	1.56E-02	1.66E-02	1.81E-02	1.32E-02	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	2.02E-03	2.60E-03	2.71E-03	2.74E-03	2.05E-03	1.67E-03	5.74E-03	3.01E-03	4.73E-03	5.52E-03	9.56E-04	1.62E-03	2.58E-03	2.30E-03	3.13E-03	5.56E-03	1.71E-03	1.80E-03	3.44E-03	3.56E-03	4.79E-03	2.77E-03	3.24E-03	3.43E-03	3.75E-03	2.74E-03	0%
Mercury (Hg)	7439-97-6	-	-	1.22E-05	1.57E-05	1.64E-05	1.66E-05	1.24E-05	1.01E-05	3.47E-05	1.82E-05	2.86E-05	3.33E-05	5.77E-06	9.81E-06	1.56E-05	1.39E-05	1.89E-05	3.36E-05	1.04E-05	1.09E-05	2.08E-05	2.15E-05	2.89E-05	1.67E-05	1.96E-05	2.07E-05	2.27E-05	1.66E-05	-
Indium (In)	7440-74-6	-	-	2.44E-06	3.14E-06	3.27E-06	3.31E-06	2.48E-06	2.02E-06	6.93E-06	3.63E-06	5.72E-06	6.67E-06	1.15E-06	1.96E-06	3.12E-06	2.78E-06	3.78E-06	6.72E-06	2.07E-06	2.17E-06	4.16E-06	4.30E-06	5.79E-06	3.34E-06	3.91E-06	4.15E-06	4.53E-06	3.31E-06	-
Potassium (K)	7440-09-7	-	-	7.24E+00	9.47E+00	9.95E+00	9.93E+00	7.34E+00	5.97E+00	2.08E+01	1.08E+01	1.80E+01	1.99E+01	3.42E+00	5.90E+00	9.36E+00	8.38E+00	1.13E+01	2.03E+01	6.40E+00	6.68E+00	1.27E+01	1.33E+01	1.74E+01	1.04E+01	1.20E+01	1.23E+01	1.38E+01	9.95E+00	-
Lanthanum (La)	7439-91-0	-	-	7.77E-03	1.03E-02	1.09E-02	1.08E-02	7.88E-03	6.41E-03	2.27E-02	1.16E-02	2.03E-02	2.16E-02	3.67E-03	6.42E-03	1.02E-02	9.14E-03	1.21E-02	2.22E-02	7.16E-03	7.43E-03	1.40E-02	1.49E-02	1.89E-02	1.16E-02	1.32E-02	1.33E-02	1.51E-02	1.09E-02	-
Lithium (Li)	7439-93-2	2	0	1.25E-02	1.61E-02	1.67E-02	1.70E-02	1.27E-02	1.03E-02	3.55E-02	1.86E-02	2.93E-02	3.41E-02	5.91E-03	1.00E-02	1.60E-02	1.42E-02	1.94E-02	3.44E-02	1.06E-02	1.11E-02	2.13E-02	2.20E-02	2.96E-02	1.71E-02	2.00E-02	2.12E-02	2.32E-02	1.70E-02	1%
Lutetium (Lu)	7439-94-3	-	-	1.14E-04	1.47E-04	1.53E-04	1.55E-04	1.16E-04	9.40E-05	3.25E-04	1.70E-04	2.68E-04	3.12E-04	5.40E-05	9.20E-05	1.46E-04	1.30E-04	1.77E-04	3.14E-04	9.70E-05	1.02E-04	1.95E-04	2.01E-04	2.71E-04	1.56E-04	1.83E-04	1.94E-04	2.12E-04	1.55E-04	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	1.28E+01	1.47E+01	1.51E+01	1.52E+01	1.29E+01	1.16E+01	2.53E+01	1.61E+01	2.19E+01	2.47E+01	9.21E+00	1.15E+01	1.47E+01	1.27E+01	1.65E+01	2.47E+01	1.18E+01	1.20E+01	1.76E+01	1.80E+01	2.21E+01	1.53E+01	1.69E+01	1.75E+01	1.86E+01	1.52E+01	63%
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	5.73E+02	8.72E+02	9.73E+02	8.80E+02	5.82E+02	5.24E+02	1.94E+03	1.15E+03	2.30E+03	1.81E+03	2.83E+02	5.76E+02	8.95E+02	7.94E+02	9.38E+02	1.95E+03	7.02E+02	7.10E+02	1.41E+03	1.58E+03	1.60E+03	1.24E+03	1.31E+03	1.10E+03	1.44E+03	9.73E+02	-
Molybdenum (Mo)	7439-98-7	-	-	3.15E+03	4.05E+03	4.22E+03	4.27E+03	3.20E+03	2.60E+03	8.94E+03	4.68E+03	7.37E+03	8.59E+03	1.49E+03	2.53E+03	4.02E+03	3.59E+03	4.87E+03	8.66E+03	2.67E+03	2.80E+03	5.36E+03	5.55E+03	7.46E+03	4.31E+03	5.04E+03	5.35E+03	5.84E+03	4.27E+03	-
Sodium (Na)	7440-23-5	-	-	1.45E+01	1.87E+01	1.94E+01	1.97E+01	1.47E+01	1.20E+01	4.12E+01	2.15E+01	3.40E+01	3.96E+01	6.85E+00	1.16E+01	1.85E+01	1.65E+01	2.24E+01	3.99E+01	1.23E+01	1.29E+01	2.47E+01	2.55E+01	3.44E+01	1.98E+01	2.32E+01	2.46E+01	2.69E+01	1.97E+01	-
Niobium (Nb)	7440--03-1	-	-	2.85E-03	3.67E-03	3.82E-03	3.87E-03	2.89E-03	2.36E-03	8.10E-03	4.24E-03	6.68E-03	7.79E-03	1.35E-03	2.29E-03	3.64E-03	3.25E-03	4.42E-03	7.85E-03	2.42E-03	2.54E-03	4.86E-03	5.03E-03	6.76E-03	3.90E-03	4.57E-03	4.85E-03	5.30E-03	3.87E-03	-
Nickel (Ni)	7440-02-0	-	-	6.46E-03	9.72E-03	1.07E-02	9.80E-03	6.55E-03	5.86E-03	2.17E-02	1.25E-02	2.48E-02	2.03E-02	3.10E-03	6.32E-03	9.85E-03	8.86E-03	1.05E-02	2.16E-02	7.63E-03	7.78E-03	1.54E-02	1.71E-02	1.78E-02	1.34E-02	1.44E-02	1.24E-02	1.58E-02	1.07E-02	-
Phosphorus (P) (Note 1)	7723-14-0	-	-	9.10E-02	9.65E-02	1.66E-01	1.74E-01	9.14E-02	9.20E-02	2.80E-01	2.04E-01	2.41E-01	3.78E-01	6.78E-02	1.30E-01	1.99E-01	1.67E-01	2.07E-01	2.53E-01	1.14E-01	1.21E-01	2.69E-01	2.29E-01	2.61E-01	2.11E-01	2.02E-01	3.19E-01	3.20E-01	1.74E-01	-
Lead (Pb)	7439-92-1	-	-	9.81E-03	1.28E-02	1.34E-02	1.34E-02	9.95E-03	8.10E-03	2.82E-02	1.46E-02	2.40E-02	2.70E-02	4.64E-03	7.97E-03	1.27E-02	1.13E-02	1.52E-02	2.74E-02	8.60E-03	8.98E-03	1.71E-02	1.79E-02	2.35E-02	1.39E-02	1.61E-02	1.67E-02	1.86E-02	1.34E-02	-
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	3.67E-02	4.72E-02	4.92E-02	4.98E-02	3.72E-02	3.03E-02	1.04E-01	5.46E-02	8.60E-02	1.00E-01	1.73E-02	2.95E-02	4.69E-02	4.18E-02	5.68E-02	1.01E-01	3.11E-02	3.27E-02	6.25E-02	6.47E-02	8.70E-02	5.02E-02	5.88E-02	6.23E-02	6.81E-02	4.98E-02	-
Sulphur (S)	7704-34-9	-	-	9.16E-01	1.34E+00	1.49E+00	1.36E+00	9.29E-01	7.89E-01	2.90E+00	1.60E+00	3.17E+00	2.66E+00	4.33E-01	8.59E-01	1.29E+00	1.18E+00	1.48E+00	2.89E+00	1.05E+00	1.06E+00	1.97E+00	2.19E+00	2.41E+00	1.71E+00	1.85E+00	1.61E+00	2.02E+00	1.49E+00	-
Antimony (Sb)	7440-36-0	-	-	2.46E-03	3.38E-03	3.64E-03	3.50E-03	2.49E-03	2.03E-03	7.38E-03	3.72E-03	7.14E-03	6.93E-03	1.16E-03	2.09E-03	3.30E-03	2.99E-03	3.88E-03	7.27E-03	2.45E-03	2.52E-03	4.73E-03	5.12E-03	6.15E-03	3.99E-03	4.45E-03	4.24E-03	5.00E-03	3.64E-03	-
Scandium (Sc)	7440-20-2	-	-	5.42E-03	6.97E-03	7.25E-03	7.34E-03	5.49E-03	4.47E-03	1.54E-02	8.05E-03	1.27E-02	1.48E-02	2.56E-03	4.35E-03	6.91E-03	6.17E-03	8.38E-03	1.49E-02	4.59E-03	4.82E-03	9.22E-03	9.54E-03	1.28E-02	7.41E-03	8.67E-03	9.20E-03	1.01E-02	7.34E-03	-
Selenium (Se)	7782-49-2	2	0.15	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	8%
Tin (Sn)	7440-31-5	-	-	4.18E-03	5.38E-03	5.60E-03	5.67E-03	4.24E-03	3.45E-03	1.19E-02	6.22E-03	9.79E-03	1.14E-02	1.98E-03	3.36E-03	5.34E-03	4.77E-03	6.47E-03	1.15E-02	3.55E-03	3.72E-03	7.35E-03	7.37E-03	9.91E-03	5.72E-03	6.70E-03	7.10E-03	7.76E-03	5.67E-03	-
Strontium (Sr)	7440-24-6	-	-	1.63E-01	2.09E-01	2.18E-01	2.21E-01	1.65E-01	1.34E-01	4.62E-01	2.42E-01	3.81E-01	4.44E-01	7.68E-02	1.31E-01	2.08E-01	1.85E-01	2.52E-01	4.47E-01	1.38E-01	1.45E-01	2.77E-01	2.86E-01	3.85E-01	2.22E-01	2.60E-01	2.76E-01	3.02E-01	2.21E-01	-
Tantalum (Ta)	7440-25-7	-	-	4.92E-04	6.32E-04	6.58E-04	6.66E-04	4.99E-04	4.06E-04	1.40E-03	7.30E-04	1.15E-03	1.34E-03	2.32E-04	3.95E-04	6.28E-04	5.60E-04	7.61E-04	1.35E-03	4.17E-04	4.37E-04	8.37E-04	8.66E-04	1.17E-03	6.72E-04	7.87E-04	8.35E-04	9.12E-04	6.66E-04	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	2.60E-04	3.34E-04	3.48E-04	3.52E-04	2.64E-04	2.15E-04	7.38E-04	3.86E-04	6.08E-04	7.10E-04	1.23E-04	2.09E-04	3.32E-04	2.96E-04	4.02E-04	7.15E-04	2.20E-04	2.31E-04	4.43E-04	4.58E-04	6.16E-04	3.56E-04	4.16E-04	4.42E-04	4.83E-04	3.52E-04	-
Tellurium (Te)	13494-80-9	1	0	8.50E-05	1.10E-04	1.14E-04	1.16E-04	8.70E-05	7.10E-05	2.43E-04	1.27E-04	2.00E-04	2.33E-04	4.00E-05	6.90E-05	1.09E-04	9.70E-05	1.32E-04	2.35E-04	7.20E-05	7.60E-05	1.46E-04	1.51E-04	2.03E-04	1.17E-04	1.37E-04	1.45E-04	1.59E-04	1.16E-04	0%
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	4.07E-01	6.12E-01	6.75E-01	6.17E-01	4.12E-01	3.69E-01	1.36E+00	7.90E-01	1.56E+00	1.27E+00	1.95E-01	3.98E-01	6.20E-01	5.58E-01	6.63E-01	1.36E+00	4.80E-01	4.89E-01	9.69E-01	1.08E+00	1.12E+00	8.46E-01	9.07E-01	7.81E-01	9.97E-01	6.75E-01	-
Thallium (Tl)	7440-28-0	-	-	4.42E-04	5.68E-04	5.91E-04	5.99E-04	4.48E-04	3.65E-04	1.25E-03	6.57E-04	1.03E-03	1.21E-03	2.09E-04	3.55E-04	5.64E-04	5.03E-04	6.84E-04	1.22E-03	3.74E-04	3.93E-04	7.52E-04	7.78E-04	1.05E-03	6.04E-04	7.07E-04	7.50E-04	8.20E-04	5.99E-04	-
Uranium (U)	7440-61-1	-	-	6.55E-04	8.43E-04	8.77E-04	8.88E-04	6.64E-04	5.41E-04	1.86E-03	9.74E-04	1.53E-03	1.79E-03	3.10E-04	5.26E-04	8.37E-04	7.47E-04	1.01E-03	1.80E-03	5.55E-04	5.83E-04	1.12E-03	1.15E-03	1.55E-03	8.96E-04	1.05E-03	1.11E-03	1.22E-03	8.88E-04	-
Vanadium (v)	7440-62-2	-	-	4.80E-02	6.18E-02	6.43E-02	6.51E-02	4.87E-02	3.97E-02	1.36E-01	7.14E-02	1.12E-01	1.31E-01	2.27E-02	3.86E-02	6.13E-02	5.47E-02	7.43E-02	1.32E-01	4.07E-02	4.27E-02	8.18E-02	8.46E-02	1.14E-01	6.57E-02	7.69E-02	8.16E-02	8.92E-02	6.51E-02	-
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	2.41E-02	3.10E-02	3.23E-02	3.27E-02	2.45E-02	1.99E-02	6.85E-02	3.58E-02	5.65E-02	6.58E-02	1.14E-02	1.94E-02	3.08E-02	2.75E-02	3.73E-02	6.64E-02	2.04E-02	2.15E-02	4.11E-02	4.25E-02	5.72E-02	3.30E-02	3.86E-02	4.10E-02	4.48E-02	3.27E-02	-
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	6.35E-03	8.17E-03	8.51E-03	8.61E-03	6.44E-03	5.24E-03	1.80E-02	9.44E-03	1.49E-02	1.73E-02	3.00E-03	5.10E-03	8.11E-03	7.24E-03	9.83E-03	1.75E-02	5.38E-03	5.65E-03	1.08E-02	1.12E-02	1.51E-02	8.69E-03	1.02E-02	1.08E-02	1.18E-02	8.61E-03	-
Ytterbium (Yb)	7440-64-4	-	-	7.32E-04	9.41E-04	9.80E-04	9.92E-04	7.42E-04	6.04E-04	2.08E-03	1.09E-03	1.71E-03	2.00E-03	3.46E-04	5.88E-04	9.34E-04	8.34E-04	1.13E-03	2.01E-03	6.20E-04	6.51E-04	1.25E-03	1.29E-03	1.73E-03	1.00E-03	1.17E-03	1.24E-03	1.36E-03	9.92E-04	-
Zinc (Zn)	7440-66-6	-	-	5.89E-02	8.35E-02	9.14E-02	8.58E-02	5.98E-02	4.97E-02	1.82E-01	9.59E-02	1.87E-01	1.69E-01	2.79E-02	5.23E-02	8.09E-02	7.37E-02	9.40E-02	1.80E-01	6.31E-02	6.43E-02	1.20E-01	1.32E-01	1.51E-01	1.03E-01	1.13E-01	1.03E-01	1.25E-01	9.14E-02	-
Zirconium (Zr)	7440-67-7	-	-	4.71E-02	6.06E-02	6.31E-02	6.38E-02	4.78E-02	3.89E-02	1.34E-01	7.00E-02	1.10E-01	1.29E-01	2.23E-02	3.78E-02	6.01E-02	5.37E-02	7.29E-02	1.30E-01	3.99E-02	4.19E-02	8.02E-02	8.30E-02	1.12E-01	6.44E-02	7.54E-02	8.00E-02	8.74E-02	6.38E-02	-
Silicon Dioxide (SiO2)	7631-86-9	-	-	3.19E+02	4.11E+02	4.28E+02	4.33E+02	3.24E+02	2.64E+02	9.06E+02	4.74E+02	7.48E+02	8.71E+02	1.51E+02	2.56E+02	4.08E+02	3.64E+02	4.94E+02	8.78E+02	2.71E+02	2.84E+02	5.44E+02	5.63E+02	7.57E+02	4.37E+02	5.11E+02	5.42E+02	5.93E+02	4.33E+02	-
Aluminum Oxide (Al2O3)	1344-28-1	-	-	7.38E+01	9.49E+01	9.88E+01	1.00E+02	7.48E+01	6.09E+01	2.10E+02	1.10E+02	1.73E+02	2.01E+02	3.49E+01	5.93E+01	9.42E+01	8.41E+01	1.14E+02	2.03E+02	6.25E+01	6.56E+01	1.26E+02	1.30E+02	1.75E+02	1.01E+02	1.18E+02	1.25E+02	1.37E+02	1.00E+02	-
Iron Oxide (Fe2O3)	1309-37-1	-	-	2.44E+01	3.15E+01	3.28E+01	3.31E+01	2.48E+01	2.02E+01	6.94E+01	3.63E+01	5.74E+01	6.67E+01	1.15E+01	1.96E+01	3.12E+01	2.79E+01	3.78E+01	6.73E+01	2.08E+01	2.18E+01	4.16E+01	4.32E+01	5.80E+01	3.35E+01	3.92E+01	4.15E+01	4.54E+01	3.31E+01	-
Magnesium Oxide (MgO)	1309-48-4	-	-	1.03E+01	1.33E+01	1.38E+01	1.40E+01	1.04E+01	8.50E

Table F- 1 :Maximum Predicted 1-Hour Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	34000	600	6.94E+02	8.43E+02	7.98E+02	7.98E+02	6.95E+02	6.93E+02	8.94E+02	1.06E+03	1.50E+03	8.75E+02	7.32E+02	7.39E+02	8.07E+02	8.67E+02	6.92E+02	1.16E+03	9.19E+02	8.85E+02	9.68E+02	1.10E+03	1.04E+03	1.03E+03	9.24E+02	8.77E+02	9.92E+02	8.43E+02	2%
Sulphur Dioxide (SO2)	7446-09-5	-	-	2.36E+00	6.10E+00	4.97E+00	4.98E+00	2.37E+00	2.33E+00	7.38E+00	1.15E+01	2.26E+01	6.91E+00	3.32E+00	3.45E+00	5.10E+00	6.68E+00	2.30E+00	1.41E+01	8.04E+00	7.13E+00	9.19E+00	1.26E+01	1.11E+01	1.04E+01	8.07E+00	6.97E+00	9.87E+00	6.10E+00	-
Hydrocarbons	<<NMHC>>	-	-	4.84E+00	8.49E+00	6.28E+00	6.02E+00	4.87E+00	4.14E+00	1.57E+01	5.80E+00	1.18E+01	1.00E+01	3.42E+00	5.50E+00	1.43E+01	6.90E+00	4.92E+00	1.93E+01	4.26E+00	4.07E+00	1.06E+01	8.59E+00	1.35E+01	9.72E+00	7.07E+00	7.90E+00	6.13E+00	8.49E+00		
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	414	150	3.18E+02	4.06E+02	3.42E+02	3.21E+02	3.19E+02	2.94E+02	5.60E+02	3.61E+02	5.07E+02	4.40E+02	2.50E+02	3.36E+02	4.75E+02	3.86E+02	3.47E+02	6.19E+02	3.03E+02	3.01E+02	4.23E+02	4.12E+02	5.13E+02	4.23E+02	3.88E+02	3.77E+02	3.72E+02	4.06E+02	98%
1,3-butadiene	106-99-0	-	-	3.79E-03	6.89E-03	4.50E-03	3.64E-03	3.81E-03	3.31E-03	1.28E-02	4.41E-03	9.31E-03	8.83E-03	2.07E-03	3.98E-03	7.73E-03	5.34E-03	6.13E-03	1.53E-02	3.48E-03	2.95E-03	6.50E-03	6.78E-03	1.17E-02	5.98E-03	5.94E-03	6.06E-03	5.13E-03	6.89E-03	-
Acenaphthene	83-32-9	-	-	1.39E-03	2.52E-03	1.66E-03	1.39E-03	1.40E-03	1.21E-03	4.66E-03	1.59E-03	3.42E-03	3.18E-03	7.89E-04	1.48E-03	3.04E-03	1.97E-03	2.10E-03	5.62E-03	1.27E-03	1.10E-03	2.49E-03	2.49E-03	4.23E-03	2.29E-03	2.08E-03	2.16E-03	1.86E-03	2.52E-03	-
Acenaphthylene	208-96-8	-	-	2.74E-03	4.95E-03	3.37E-03	2.81E-03	2.76E-03	2.39E-03	9.15E-03	3.14E-03	6.71E-03	6.28E-03	1.60E-03	2.91E-03	6.04E-03	3.86E-03	4.21E-03	1.10E-02	2.50E-03	2.15E-03	4.93E-03	4.89E-03	8.35E-03	4.53E-03	4.15E-03	4.28E-03	3.66E-03	4.95E-03	-
Acetaldehyde	75-07-0	-	-	2.13E-01	3.88E-01	2.59E-01	2.11E-01	2.15E-01	1.87E-01	7.17E-01	2.48E-01	5.22E-01	4.96E-01	1.19E-01	2.24E-01	4.37E-01	3.00E-01	3.49E-01	8.61E-01	1.96E-01	1.65E-01	3.67E-01	3.81E-01	6.60E-01	3.37E-01	3.34E-01	3.41E-01	2.88E-01	3.88E-01	-
Acrolein	107-02-8	-	-	3.92E-02	7.14E-02	4.62E-02	3.75E-02	3.95E-02	3.42E-02	1.32E-01	4.55E-02	9.65E-02	9.11E-02	2.12E-02	4.13E-02	8.00E-02	5.54E-02	6.28E-02	1.59E-01	3.60E-02	3.07E-02	6.73E-02	7.03E-02	1.21E-01	6.18E-02	6.09E-02	6.23E-02	5.28E-02	7.14E-02	-
Anthracene	120-12-7	-	-	2.57E-04	4.64E-04	3.07E-04	2.60E-04	2.58E-04	2.23E-04	8.58E-04	2.91E-04	6.31E-04	5.83E-04	1.48E-04	2.75E-04	5.75E-04	3.64E-04	3.76E-04	1.04E-03	2.34E-04	2.04E-04	4.66E-04	4.60E-04	7.76E-04	4.29E-04	3.79E-04	3.94E-04	3.42E-04	4.64E-04	-
Benzene	71-43-2	-	-	1.31E-01	2.36E-01	1.62E-01	1.38E-01	1.32E-01	1.14E-01	4.35E-01	1.48E-01	3.21E-01	2.96E-01	7.89E-02	1.41E-01	3.04E-01	1.85E-01	1.91E-01	5.27E-01	1.19E-01	1.04E-01	2.44E-01	2.33E-01	3.94E-01	2.24E-01	1.92E-01	2.00E-01	1.73E-01	2.36E-01	-
Benzo(a)anthracene	56-55-3	-	-	4.50E-05	8.00E-05	5.70E-05	5.20E-05	4.50E-05	3.90E-05	1.48E-04	5.20E-05	1.10E-04	9.70E-05	2.90E-05	5.00E-05	1.20E-04	6.40E-05	5.40E-05	1.81E-04	4.00E-05	3.70E-05	9.10E-05	8.00E-05	1.30E-04	8.40E-05	6.60E-05	6.40E-05	5.80E-05	8.00E-05	-
Benzo(a)pyrene	50-32-8	-	-	1.70E-05	2.90E-05	2.00E-05	1.90E-05	1.70E-05	1.40E-05	5.40E-05	2.00E-05	4.10E-05	3.60E-05	1.10E-05	1.90E-05	4.50E-05	2.40E-05	1.90E-05	6.70E-05	1.50E-05	1.40E-05	3.40E-05	3.00E-05	4.80E-05	3.10E-05	2.40E-05	2.40E-05	2.10E-05	2.90E-05	-
Benzo(b+k)fluoranthene	205-99-2	-	-	5.80E-05	1.03E-04	7.30E-05	6.90E-05	5.90E-05	5.00E-05	1.90E-04	7.00E-05	1.43E-04	1.22E-04	3.90E-05	6.60E-05	1.67E-04	8.40E-05	6.00E-05	2.34E-04	5.20E-05	4.90E-05	1.25E-04	1.04E-04	1.64E-04	1.15E-04	8.60E-05	9.10E-05	7.50E-05	1.03E-04	-
Benzo(g,h,i)perylene	191-24-2	-	-	3.80E-05	6.70E-05	4.70E-05	4.40E-05	3.80E-05	3.30E-05	1.25E-04	4.40E-05	9.30E-05	8.20E-05	2.50E-05	4.20E-05	1.02E-04	5.40E-05	4.50E-05	1.53E-04	3.40E-05	3.10E-05	7.80E-05	6.80E-05	1.09E-04	7.20E-05	5.60E-05	5.50E-05	4.90E-05	6.70E-05	-
Chrysene	218-01-9	-	-	7.90E-05	1.40E-04	1.01E-04	9.60E-05	8.00E-05	6.80E-05	2.58E-04	9.50E-05	1.95E-04	1.66E-04	5.50E-05	9.00E-05	2.31E-04	1.13E-04	8.10E-05	3.17E-04	7.00E-05	6.70E-05	1.71E-04	1.41E-04	2.22E-04	1.58E-04	1.16E-04	1.27E-04	1.01E-04	1.40E-04	-
Fluoranthene	206-44-0	-	-	4.82E-04	8.64E-04	5.96E-04	5.20E-04	4.85E-04	4.17E-04	1.60E-03	5.42E-04	1.18E-03	1.08E-03	2.96E-04	5.23E-04	1.16E-03	6.82E-04	6.65E-04	1.94E-03	4.36E-04	3.86E-04	9.18E-04	8.59E-04	1.43E-03	8.45E-04	7.07E-04	7.21E-04	6.35E-04	8.64E-04	-
Fluorene	86-73-7	-	-	2.13E-03	3.83E-03	2.55E-03	2.19E-03	2.14E-03	1.84E-03	7.09E-03	2.40E-03	5.23E-03	4.79E-03	1.25E-03	2.30E-03	4.91E-03	3.02E-03	3.03E-03	8.59E-03	1.93E-03	1.70E-03	3.93E-03	3.81E-03	6.39E-03	3.62E-03	3.13E-03	3.23E-03	2.82E-03	3.83E-03	-
Formaldehyde	50-00-0	-	-	1.76E-01	3.20E-01	2.17E-01	1.76E-01	1.77E-01	1.54E-01	5.91E-01	2.05E-01	4.31E-01	4.11E-01	9.99E-02	1.85E-01	3.65E-01	2.47E-01	2.89E-01	7.10E-01	1.62E-01	1.36E-01	3.05E-01	3.14E-01	5.45E-01	2.81E-01	2.78E-01	2.83E-01	2.40E-01	3.20E-01	-
Phenanthrene	85-01-8	-	-	4.21E-03	7.52E-03	5.13E-03	4.54E-03	4.23E-03	3.63E-03	1.39E-02	4.80E-03	1.03E-02	9.28E-03	2.59E-03	4.60E-03	1.04E-02	5.98E-03	5.52E-03	1.69E-02	3.79E-03	3.41E-03	8.14E-03	7.52E-03	1.24E-02	7.49E-03	6.18E-03	6.17E-03	5.51E-03	7.52E-03	-
Pyrene	129-00-0	-	-	4.56E-04	8.18E-04	5.57E-04	4.85E-04	4.59E-04	3.95E-04	1.51E-03	5.15E-04	1.12E-03	1.02E-03	2.76E-04	4.95E-04	1.09E-03	6.47E-04	6.26E-04	1.84E-03	4.13E-04	3.66E-04	8.65E-04	8.14E-04	1.36E-03	7.96E-04	6.70E-04	6.82E-04	6.01E-04	8.18E-04	-
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	-	2.20E+00	3.92E+00	2.61E+00	2.36E+00	2.21E+00	1.88E+00	7.26E+00	2.55E+00	5.42E+00	4.79E+00	1.34E+00	2.43E+00	5.56E+00	3.14E+00	2.67E+00	8.86E+00	1.98E+00	1.81E+00	4.31E+00	3.93E+00	6.39E+00	3.96E+00	3.24E+00	3.15E+00	2.87E+00	3.92E+00	-
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	1.43E+00	2.55E+00	1.70E+00	1.53E+00	1.44E+00	1.22E+00	4.72E+00	1.66E+00	3.52E+00	3.11E+00	8.70E-01	1.58E+00	3.62E+00	2.04E+00	1.74E+00	5.76E+00	1.29E+00	1.17E+00	2.80E+00	2.56E+00	4.15E+00	2.58E+00	2.11E+00	2.05E+00	1.86E+00	2.55E+00	255%
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	4.20E-05	7.50E-05	5.10E-05	4.70E-05	4.20E-05	3.60E-05	1.39E-04	4.90E-05	1.04E-04	9.20E-05	2.70E-05	4.70E-05	1.09E-04	6.00E-05	5.10E-05	1.70E-04	3.80E-05	3.50E-05	8.40E-05	7.50E-05	1.22E-04	7.70E-05	6.20E-05	6.00E-05	5.50E-05	7.50E-05	-

Notes:

1 - Individual model run with plume depletion

2 - Individual model run with OLM

Table F-2: Maximum Predicted 24-Hour Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
Particulates																														
TSP (Note 1)	<<PM>>	120	40	50.4	52.1	65.9	73.5	50.5	49.9	73.1	79.9	62.2	94.0	56.9	61.8	94.6	72.7	98.3	83.3	66.2	64.9	114.4	80.6	89.7	64.0	82.3	140.2	110.1	73.5	61%
PM10	<<PM10>>	50	13.1	22.1	25.2	29.3	32.9	22.2	20.8	37.0	34.9	32.9	41.1	23.5	25.3	40.9	30.5	43.9	48.6	28.1	27.4	57.8	39.8	40.3	28.1	35.7	52.7	45.1	32.9	66%
PM2.5	<<PM2.5>>	30	15	16.6	17.2	17.5	18.1	16.6	16.4	18.6	18.4	18.2	19.1	16.7	16.7	18.5	17.9	21.0	21.1	17.2	17.1	21.9	19.0	19.3	17.1	18.4	20.3	19.6	18.1	60%
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	-	2.60E-04	2.80E-04	2.91E-04	2.99E-04	3.08E-04	2.80E-04	2.79E-04	3.18E-04	3.13E-04	3.10E-04	3.27E-04	2.85E-04	2.89E-04	3.23E-04	3.03E-04	3.36E-04	3.49E-04	2.98E-04	2.95E-04	3.66E-04	3.25E-04	3.25E-04	2.95E-04	3.13E-04	3.51E-04	3.34E-04	3.08E-04	-
Aluminum (Al)	7429-90-5	-	0.42	2.82E+00	3.31E+00	4.62E+00	5.61E+00	2.85E+00	2.40E+00	6.23E+00	5.66E+00	5.17E+00	7.35E+00	2.95E+00	3.46E+00	7.27E+00	4.93E+00	8.89E+00	9.02E+00	4.05E+00	4.00E+00	1.20E+01	6.89E+00	7.34E+00	4.19E+00	6.23E+00	1.07E+01	8.69E+00	5.61E+00	-
Arsenic (As)	7440-38-2	-	1.26E-03	1.51E-03	1.65E-03	1.76E-03	1.87E-03	1.51E-03	1.50E-03	2.00E-03	1.93E-03	1.90E-03	2.11E-03	1.58E-03	1.63E-03	2.06E-03	1.80E-03	2.23E-03	2.39E-03	1.74E-03	1.70E-03	2.61E-03	2.08E-03	2.09E-03	1.71E-03	1.94E-03	2.42E-03	2.20E-03	1.87E-03	-
Gold (Au)	7440-57-5	1.25	-	3.34E-06	5.54E-06	6.35E-06	7.75E-06	3.36E-06	3.18E-06	1.01E-05	9.25E-06	9.05E-06	1.14E-05	4.26E-06	4.95E-06	1.01E-05	7.02E-06	1.19E-05	1.59E-05	6.91E-06	5.85E-06	1.70E-05	1.13E-05	1.10E-05	5.77E-06	9.24E-06	1.42E-05	1.25E-05	7.75E-06	BSL
Boron (B)	7440-42-8	-	2.60E-02	2.92E-02	3.00E-02	3.17E-02	3.30E-02	2.92E-02	2.86E-02	3.39E-02	3.31E-02	3.25E-02	3.54E-02	2.94E-02	3.01E-02	3.52E-02	3.21E-02	3.73E-02	3.78E-02	3.10E-02	3.08E-02	4.15E-02	3.48E-02	3.53E-02	3.11E-02	3.38E-02	3.97E-02	3.71E-02	3.30E-02	-
Barium (Ba)	7440-39-3	-	8.60E-03	2.03E-02	2.29E-02	2.92E-02	3.40E-02	2.04E-02	1.82E-02	3.72E-02	3.44E-02	3.20E-02	4.26E-02	2.10E-02	2.35E-02	4.21E-02	3.07E-02	5.00E-02	5.10E-02	2.65E-02	2.62E-02	6.53E-02	4.04E-02	4.25E-02	2.71E-02	3.70E-02	5.87E-02	4.90E-02	3.40E-02	-
Beryllium (Be)	7440-41-7	-	-	3.70E-05	4.50E-05	6.50E-05	8.00E-05	3.80E-05	3.10E-05	9.00E-05	8.10E-05	7.40E-05	1.07E-04	3.90E-05	4.70E-05	1.06E-04	7.00E-05	1.31E-04	1.33E-04	5.60E-05	5.50E-05	1.79E-04	1.00E-04	1.07E-04	5.80E-05	9.00E-05	1.59E-04	1.28E-04	8.00E-05	-
Bismuth (Bi)	7440-69-9	-	1.30E-03	1.37E-03	1.38E-03	1.42E-03	1.45E-03	1.37E-03	1.36E-03	1.47E-03	1.45E-03	1.44E-03	1.50E-03	1.37E-03	1.39E-03	1.49E-03	1.43E-03	1.54E-03	1.55E-03	1.40E-03	1.40E-03	1.62E-03	1.48E-03	1.49E-03	1.41E-03	1.46E-03	1.58E-03	1.53E-03	1.45E-03	-
Carbon (C)	7440-44-0	-	-	2.87E-02	3.61E-02	5.13E-02	6.33E-02	2.91E-02	2.39E-02	7.18E-02	6.49E-02	5.93E-02	8.51E-02	3.12E-02	3.74E-02	8.34E-02	5.52E-02	1.03E-01	1.07E-01	4.52E-02	4.39E-02	1.41E-01	8.00E-02	8.46E-02	4.61E-02	7.05E-02	1.24E-01	1.00E-01	6.33E-02	-
Calcium (Ca)	7440-70-2	-	0.68	1.68E+00	1.89E+00	2.44E+00	2.85E+00	1.70E+00	1.51E+00	3.11E+00	2.87E+00	2.67E+00	3.57E+00	1.74E+00	1.95E+00	3.54E+00	2.56E+00	4.22E+00	4.27E+00	2.19E+00	2.17E+00	5.52E+00	3.38E+00	3.57E+00	2.26E+00	3.11E+00	4.97E+00	4.14E+00	2.85E+00	-
Cadmium (Cd)	7440-43-9	-	2.60E-04	3.03E-04	3.29E-04	3.42E-04	3.60E-04	3.03E-04	3.01E-04	3.89E-04	3.77E-04	3.73E-04	4.05E-04	3.14E-04	3.23E-04	3.91E-04	3.50E-04	4.16E-04	4.60E-04	3.46E-04	3.35E-04	4.81E-04	4.03E-04	4.00E-04	3.34E-04	3.77E-04	4.46E-04	4.20E-04	3.60E-04	-
Cerium (Ce) and Compounds (as Ce)	7440-45-1	-	-	2.21E-03	2.66E-03	3.87E-03	4.78E-03	2.24E-03	1.82E-03	5.35E-03	4.83E-03	4.38E-03	6.38E-03	2.33E-03	2.80E-03	6.31E-03	4.15E-03	7.80E-03	7.92E-03	3.34E-03	3.29E-03	1.07E-02	5.96E-03	6.37E-03	3.47E-03	5.35E-03	9.45E-03	7.62E-03	4.78E-03	-
Cobalt (Co)	7440-48-4	-	-	5.63E-04	6.79E-04	9.88E-04	1.22E-03	5.71E-04	4.64E-04	1.37E-03	1.23E-03	1.12E-03	1.63E-03	5.94E-04	7.14E-04	1.61E-03	1.06E-03	1.99E-03	2.02E-03	8.52E-04	8.40E-04	2.72E-03	1.52E-03	1.63E-03	8.86E-04	1.37E-03	2.41E-03	1.94E-03	1.22E-03	-
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	6.00E-03	8.81E-03	9.43E-03	1.10E-02	1.21E-02	8.85E-03	8.31E-03	1.29E-02	1.22E-02	1.16E-02	1.42E-02	8.99E-03	9.59E-03	1.41E-02	1.13E-02	1.60E-02	1.62E-02	1.03E-02	1.02E-02	1.96E-02	1.37E-02	1.42E-02	1.04E-02	1.28E-02	1.81E-02	1.57E-02	1.21E-02	-
Cesium (Cs) and Compounds (as Ce)	7440-46-2	-	-	9.40E-05	1.13E-04	1.64E-04	2.03E-04	9.50E-05	7.70E-05	2.27E-04	2.05E-04	1.86E-04	2.71E-04	9.90E-05	1.19E-04	2.68E-04	1.76E-04	3.31E-04	3.36E-04	1.42E-04	1.40E-04	4.53E-04	2.53E-04	2.71E-04	1.48E-04	2.27E-04	4.02E-04	3.24E-04	2.03E-04	-
Copper (Cu)	7440-50-8	2.5	0.2	2.05E-01	2.07E-01	2.09E-01	2.11E-01	2.05E-01	2.04E-01	2.14E-01	2.12E-01	2.12E-01	2.15E-01	2.06E-01	2.07E-01	2.14E-01	2.10E-01	2.17E-01	2.21E-01	2.09E-01	2.08E-01	2.24E-01	2.15E-01	2.15E-01	2.08E-01	2.12E-01	2.20E-01	2.17E-01	2.11E-01	8%
Iron (Fe)	7439-89-6	-	0.22	1.30E+00	1.54E+00	2.13E+00	2.57E+00	1.32E+00	1.11E+00	2.86E+00	2.61E+00	2.39E+00	3.37E+00	1.37E+00	1.60E+00	3.32E+00	2.27E+00	4.05E+00	4.14E+00	1.87E+00	1.84E+00	5.47E+00	3.16E+00	3.36E+00	1.93E+00	2.85E+00	4.86E+00	3.96E+00	2.57E+00	-
Gallium (Ga)	7440-55-3	-	-	6.26E-04	7.54E-04	1.10E-03	1.35E-03	6.34E-04	5.15E-04	1.52E-03	1.37E-03	1.24E-03	1.81E-03	6.60E-04	7.93E-04	1.79E-03	1.18E-03	2.21E-03	2.24E-03	9.46E-04	9.33E-04	3.02E-03	1.69E-03	1.81E-03	9.84E-04	1.52E-03	2.68E-03	2.16E-03	1.35E-03	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	-	-	1.29E-04	1.56E-04	2.27E-04	2.80E-04	1.31E-04	1.07E-04	3.14E-04	2.83E-04	2.57E-04	3.74E-04	1.37E-04	1.64E-04	3.70E-04	2.43E-04	4.57E-04	4.65E-04	1.96E-04	1.93E-04	6.25E-04	3.49E-04	3.74E-04	2.04E-04	3.14E-04	5.54E-04	4.47E-04	2.80E-04	-
Mercury (Hg)	7439-97-6	-	6.40E-05	6.48E-05	6.49E-05	6.54E-05	6.57E-05	6.48E-05	6.46E-05	6.59E-05	6.57E-05	6.55E-05	6.63E-05	6.48E-05	6.50E-05	6.62E-05	6.55E-05	6.68E-05	6.68E-05	6.52E-05	6.52E-05	6.78E-05	6.61E-05	6.63E-05	6.52E-05	6.59E-05	6.73E-05	6.67E-05	6.57E-05	-
Indium (In)	7440-74-6	-	-	1.56E-07	1.88E-07	2.74E-07	3.38E-07	1.58E-07	1.29E-07	3.79E-07	3.42E-07	3.10E-07	4.52E-07	1.65E-07	1.98E-07	4.47E-07	2.94E-07	5.52E-07	5.61E-07	2.37E-07	2.33E-07	7.55E-07	4.22E-07	4.51E-07	2.46E-07	3.79E-07	6.70E-07	5.39E-07	3.38E-07	-
Potassium (K)	7440-09-7	-	0.13	5.89E-01	6.95E-01	9.46E-01	1.14E+00	5.96E-01	5.08E-01	1.27E+00	1.15E+00	1.06E+00	1.48E+00	6.21E-01	7.21E-01	1.46E+00	1.01E+00	1.77E+00	1.82E+00	8.40E-01	8.25E-01	2.38E+00	1.39E+00	1.48E+00	8.62E-01	1.26E+00	2.12E+00	1.73E+00	1.14E+00	-
Lanthanum (La)	7439-91-0	-	-	4.98E-04	6.22E-04	8.87E-04	1.10E-03	5.04E-04	4.13E-04	1.24E-03	1.12E-03	1.02E-03	1.47E-03	5.38E-04	6.46E-04	1.44E-03	9.54E-04	1.78E-03	1.85E-03	7.80E-04	7.60E-04	2.44E-03	1.38E-03	1.46E-03	7.97E-04	1.22E-03	2.15E-03	1.73E-03	1.10E-03	-
Lithium (Li)	7439-93-2	-	-	8.01E-04	9.65E-04	1.40E-03	1.73E-03	8.12E-04	6.60E-04	1.94E-03	1.75E-03	1.59E-03	2.31E-03	8.45E-04	1.02E-03	2.29E-03	1.51E-03	2.83E-03	2.87E-03	1.21E-03	1.19E-03	3.87E-03	2.16E-03	2.31E-03	1.26E-03	1.94E-03	3.43E-03	2.76E-03	1.73E-03	-
Lutetium (Lu)	7439-94-3	-	-	7.32E-06	8.82E-06	1.28E-05	1.58E-05	7.42E-06	6.03E-06	1.77E-05	1.60E-05	1.45E-05	2.11E-05	7.72E-06	9.28E-06	2.09E-05	1.38E-05	2.58E-05	2.62E-05	1.11E-05	1.09E-05	3.53E-05	1.97E-05	2.11E-05	1.15E-05	1.77E-05	3.13E-05	2.52E-05	1.58E-05	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.19	6.24E-01	7.14E-01	9.52E-01	1.13E+00	6.30E-01	5.48E-01	1.24E+00	1.14E+00	1.05E+00	1.44E+00	6.48E-01	7.40E-01	1.43E+00	1.01E+00	1.72E+00	1.75E+00	8.47E-01	8.38E-01	2.29E+00	1.36E+00	1.44E+00	8.72E-01	1.24E+00	2.05E+00	1.69E+00	1.13E+00	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	8.60E-03	1.23E-02	1.40E-02	1.58E-02	1.74E-02	1.24E-02	1.20E-02	1.93E-02	1.81E-02	1.75E-02	2.09E-02	1.30E-02	1.40E-02	2.07E-02	1.62E-02	2.23E-02	2.45E-02	1.53E-02	1.50E-02	2.85E-02	2.05E-02	2.08E-02	1.53E-02	1.86E-02	2.64E-02	2.27E-02	1.74E-02	-
Molybdenum (Mo)	7439-98-7	120	7.60E-04	9.62E-04	1.00E-03	1.11E-03	1.20E-03	9.65E-04	9.26E-04	1.25E-03	1.20E-03	1.16E-03	1.34E-03	9.73E-04	1.02E-03	1.34E-03	1.14E-03	1.47E-03	1.48E-03	1.07E-03	1.06E-03	1.73E-03	1.30E-03	1.34E-03	1.08E-03	1.25E-03	1.62E-03	1.46E-03	1.20E-03	0%
Sodium (Na)	7440-23-5	-	0.52	1.45E+00	1.64E+00	2.15E+00	2.53E+00	1.46E+00	1.28E+00	2.77E+00	2.55E+00	2.36E+00	3.20E+00	1.50E+00	1.70E+00	3.17E+00	2.27E+00	3.80E+00	3.85E+00	1.92E+00	1.90E+00	5.00E+00	3.02E+00	3.20E+00	1.98E+00	2.77E+00	4.49E+00	3.72E+00	2.53E+00	-
Niobium (Nb)	7440--03-1	-	-	1.83E-04	2.20E-04	3.20E-04	3.95E-04	1.85E-04	1.51E-04	4.43E-04	3.99E-04	3.62E-04	5.28E-04	1.93E-04	2.32E-04	5.22E-04	3.44E-04	6.45E-04	6.55E-04	2.76E-04	2.72E-04	8.83E-04	4.93E-04	5.27E-04	2.87E-04	4.43E-04	7.82E-04	6.30E-04	3.95E-04	-
Nickel (Ni)	7440-02-0	7.00E-02	5.00E-03	5.42E-03	5.60E-03	5.81E-03	5.98E-03	5.43E-03	5.38E-03	6.19E-03	6.05E-03	5.99E-03	6.38E-03	5.49E-03	5.60E-03	6.35E-03	5.85E-03	6.54E-03	6.76E-03	5.74E-03	5.71E-03	7.23E-03	6.32E-03	6.36E-03	5.75E-03	6.13E-03	7.00E-03	6.58E-03	5.98E-03	9%
Phosphorus (P)	7723-14-0	0.5	-	1.95E-02	2.36E-02	3.43E-02	4.23E-02	1.98E-02	1.61E-02	4.74E-02	4.27E-02	3.88E-02	5.65E-02	2.06E-02	2.48E-02	5.58E-02	3.68E-02	6.91E-02	7.01E-02	2.96E-02	2.92E-02	9.44E-02	5.28E-02	5.64E-02	3.08E-02	4.74E-02	8.37E-02	6.75E-02	4.23E-02	BSL
Lead (Pb)	7439-92-1	-	3.40E-03	4.03E-03	4.17E-03	4.51E-03	4.77E-03	4.04E-03	3.92E-03	4.94E-03	4.79E-03	4.66E-03	5.23E-03	4.07E-03	4.20E-03	5.21E-03	4.59E-03	5.63E-03	5.68E-03	4.36E-03	4.35E-03	6.45E-03	5.12E-03	5.23E-03	4.40E-03	4.93E-03	6.10E-03	5.58E-03	4.77E-03	-
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	4	0	2.35E-03	2.83E-03	4.12E-03	5.09E-03	2.38E-03	1.94E-03	5.70E-03	5.14E-03	4.66E-03	6.79E-03	2.48E-03	2.98E-03	6.71E-03	4.42E-03	8.30E-03	8.43E-03	3.55E-03	3.51E-03	1.14E-02	6.34E-03	6.78E-03	3.70E-03	5.70E-03	1.01E-02	8.11E-03	5.09E-03	0%
Sulphur (S)	7704-34-9	-	-	5.87E-02	8.15E-02	1.10E-01	1.36E-01	5.96E-02	5.22E-02	1.59E-01	1.44E-01	1.34E-01	1.86E-01	6.84E-02	8.14E-02	1.78E-01	1.19E-01	2.18E-01	2.40E-01	1.02E-01	9.59E-02	3.01E-01	1.77E-01	1.83E-01	9.92E-02	1.49E-01	2.62E-01	2.11E-01	1.36E-01	-
Antimony (Sb)	7440-36-0	-	1.26E-03	1.42E-03	1.46E-03	1.55E-03	1.61E-03	1.42E-03	1.39E-03	1.66E-03	1.63E-03	1.60E-03	1.74E-03	1.44E-03	1.47E-03	1.72E-03	1.57E-03	1.83E-03	1.86E-03	1.52E-03	1.51E-03	2.04E-03	1.71E-03	1.73E-03	1.52E-03	1.65E-03	1.95E-03	1.81E-03	1.61E-03	-
Scandium (Sc)	7440-20-2	-	-	3.47E-04	4.18E-04	6.08E-04	7.51E-04	3.51E-04	2.86E-04	8.40E-04	7.58E-04	6.87E-04	1.00E-03	3.66E-04	4.40E-04	9.90E-04	6.52E-04	1.22E-03	1.24E-03	5.24E-04	5.17E-04	1.68E-03	9.36E-04	1.00E-03	5.45E-04	8.40E-04	1.48E-03	1.20E-03	7.51E-04	-
Selenium (Se)	7782-49-2	-	2.60E-03	2.61E-03	2.61E-03	2.62E-03	2.62E-03	2.61E-03	2.61E-03	2.63E-03	2.62E-03	2.62E-03	2.63E-03	2.61E-03	2.61E-03	2.63E-03	2.62E-03	2.64E-03	2.64E-03	2.62E-03	2.62E-03	2.65E-03	2.63E-03	2.63E-03	2.62E-03	2.63E-03	2.65E-03	2.64E-03	2.62E-03	-
Tin (Sn)	7440-31-5	-	-	2.68E-04	3.23E-04	4.69E-04	5.80E-04	2.71E-04	2.21E-04	6.48E-04	5.85E-04	5.31E-04	7.73E-04	2.82E-04	3.40E-04	7.65E-04	5.03E-04	9.46E-04	9.61E-04	4.05E-04	3.99E-04	1.29E-03	7.23E-04	7.73E-04	4.21E-04	6.49E-04	1.15E-03	9.24E-04	5.80E-04	-
Strontium (Sr)	7440-24-6	-	1.50E-03	1.19E-02	1.41E-02	1.98E-02	2.40E-02	1.21E-02	1.01E-02	2.68E-02	2.43E-02	2.21E-02	3.16E-02	1.25E-02	1.47E-02	3.12E-02	2.11E-02	3.83E-02	3.89E-02	1.73E-02	1.70E-02	5.18E-02	2.96E-02	3.16E-02	1.79E-02	2.67E-02	4.61E-02	3.74E-02	2.40E-02	-
Tantalum (Ta)	7440-25-7	25	-	3.10E-05	3.80E-05	5.50E-05	6.80E-05	3.20E-05	2.60E-05	7.60E-05	6.90E-05	6.20E-05	9.10E-05	3.30E-05	4.00E-05	9.00E-05	5.90E-05	1.11E-04	1.13E-04	4.80E-05	4.70E-05	1.52E-04	8.50E-05	9.10E-05	5.00E-05	7.60E-05	1.35E-04	1.09E-04	6.80E-05	BSL
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	1.70E-05	2.00E-05	2.90E-05	3.60E-05	1.70E-05	1.40E-05	4.00E-05	3.60E-05	3.30E-05	4.80E-05	1.80E-05	2.10E-05	4.80E-05	3.10E-05	5.90E-05	6.00E-05	2.50E-05	2.50E-05	8.00E-05	4.50E-05	4.80E-05	2.60E-05	4.00E-05	7.10E-05	5.70E-05	3.60E-05	-
Tellurium (Te)	13494-80-9	-	-	5.47E-06	6.59E-06	9.59E-06	1.18E-05	5.55E-06	4.51E-06	1.33E-05	1.20E-05	1.08E-05	1.58E-05	5.77E-06	6.94E-06	1.56E-05	1.03E-05	1.93E-05	1.96E-05	8.27E-06	8.16E-06	2.64E-05	1.48E-05	1.58E-05	8.60E-06	1.33E-05	2.34E-05	1.89E-05	1.18E-05	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.5	0	2.64E-02	3.75E-02	5.08E-02	6.18E-02	2.68E-02	2.40E-02	7.50E-02	6.64E-02	6.21E-02	8.67E-02	3.09E-02	3.79E-02	8.52E-02	5.38E-02	9.70E-02	1.11E-01	4.67E-02	4.47E-02	1.40E-01	8.33E-02	8.56E-02	4.73E-02	7.09E-02	1.26E-01	9.96E-02	6.18E-02	2%
Thallium (Tl)	7440-28-0	-	2.60E-04	2.88E-04	2.94E-04	3.10E-04	3.21E-04	2.89E-04	2.83E-04	3.29E-04	3.22E-04	3.16E-04	3.42E-04	2.90E-04	2.96E-04	3.41E-04	3.13E-04	3.60E-04	3.61E-04	3.03E-04	3.02E-04	3.97E-04	3.36E-04	3.42E-04	3.04E-04	3.29E-04	3.81E-04	3.58E-04	3.21E-04	-
Uranium (U)	7440-61-1	0.3	2.60E-04	3.02E-04	3.11E-04	3.33E-04	3.51E-04	3.03E-04	2.95E-04	3.62E-04	3.52E-04	3.43E-04	3.81E-04	3.04E-04	3.13E-04	3.80E-04	3.39E-04	4.08E-04	4.10E-04	3.23E-04	3.23E-04	4.63E-04	3.73E-04	3.81E-04	3.26E-04	3.62E-04	4.40E-04	4.05E-04	3.51E-04	0%
Vanadium (v)	7440-62-2	-	7.60E-04	3.84E-03	4.47E-03	6.15E-03	7.42E-03	3.88E-03	3.29E-03	8.22E-03	7.48E-03	6.86E-03	9.64E-03	4.00E-03	4.66E-03	9.54E-03	6.54E-03	1.16E-02	1.18E-02	5.41E-03	5.35E-03	1.56E-02	9.06E-03	9.63E-03	5.60E-03	8.21E-03	1.39E-02	1.14E-02	7.42E-03	-
Tungsten (W) and Compounds (as W)	7440-33-7	5	0	1.54E-03	1.86E-03	2.71E-03	3.34E-03	1.57E-03	1.27E-03	3.74E-03	3.38E-03	3.06E-03	4.46E-03	1.63E-03	1.96E-03	4.41E-03	2.90E-03	5.45E-03	5.54E-03	2.34E-03	2.30E-03	7.46E-03	4.17E-03	4.46E-03	2.43E-03	3.74E-03	6.61E-03	5.33E-03	3.34E-03	0%
Yttrium (Y) and Compounds (as Y)	7440-65-5	13	0	4.07E-04	4.90E-04	7.13E-04	8.80E-04	4.12E-04	3.35E-04	9.86E-04	8.89E-04	8.06E-04	1.17E-03	4.29E-04	5.16E-04	1.16E-03	7.65E-04	1.44E-03	1.46E-03	6.15E-04	6.06E-04	1.96E-03	1.10E-03	1.17E-03	6.40E-04	9.85E-04	1.74E-03	1.40E-03	8.80E-04	0%
Ytterbium (Yb)	7440-64-4	-	-	4.70E-05	5.60E-05	8.20E-05	1.01E-04	4.70E-05	3.90E-05	1.14E-04	1.02E-04	9.30E-05	1.35E-04	4.90E-05	5.90E-05	1.34E-04	8.80E-05	1.65E-04	1.68E-04	7.10E-05	7.00E-05	2.26E-04	1.26E-04	1.35E-04	7.40E-05	1.13E-04	2.00E-04	1.62E-04	1.01E-04	-
Zinc (Zn)	7440-66-6	2.5	0.1	1.04E-01	1.05E-01	1.07E-01	1.09E-01	1.04E-01	1.03E-01	1.10E-01	1.09E-01	1.08E-01	1.12E-01	1.04E-01	1.05E-01	1.11E-01	1.08E-01	1.14E-01	1.15E-01	1.06E-01	1.06E-01	1.19E-01	1.11E-01	1.12E-01	1.06E-01	1.09E-01	1.17E-01	1.13E-01	1.09E-01	4%
Zirconium (Zr)	7440-67-7	2.5	0	3.02E-03	3.63E-03	5.29E-03	6.53E-03	3.06E-03	2.48E-03	7.31E-03	6.59E-03	5.98E-03	8.71E-03	3.18E-03	3.83E-03	8.61E-03	5.67E-03	1.07E-02	1.08E-02	4.56E-03	4.50E-03	1.46E-02	8.14E-03	8.70E-03	4.74E-03	7.31E-03	1.29E-02	1.04E-02	6.53E-03	0%
Silicon Dioxide (SiO2)	7631-86-9	-	-	2.04E+01	2.46E+01	3.58E+01	4.43E+01	2.07E+01	1.68E+01	4.96E+01	4.47E+01	4.05E+01	5.91E+01	2.16E+01	2.59E+01	5.84E+01	3.84E+01	7.22E+01	7.34E+01	3.09E+01	3.05E+01	9.88E+01	5.52E+01	5.90E+01	3.22E+01	4.95E+01	8.75E+01	7.05E+01	4.43E+01	-
Aluminum Oxide (Al2O3)	1344-28-1	-	-	4.72E+00	5.69E+00	8.28E+00	1.02E+01	4.79E+00	3.89E+00	1.15E+01	1.03E+01	9.36E+00	1.36E+01	4.98E+00	5.99E+00	1.35E+01	8.88E+00	1.67E+01	1.69E+01	7.14E+00	7.05E+00	2.28E+01	1.27E+01	1.36E+01	7.43E+00	1.14E+01	2.02E+01	1.63E+01	1.02E+01	-
Iron Oxide (Fe2O3)	1309-37-1	-	-	1.56E+00	1.89E+00	2.74E+00	3.39E+00	1.59E+00	1.29E+00	3.80E+00	3.42E+00	3.10E+00	4.52E+00	1.65E+00	1.99E+00

Table F-2: Maximum Predicted 24-Hour Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	-	-	1.66E+00	3.51E+00	2.42E+00	2.98E+00	1.67E+00	1.51E+00	5.33E+00	5.45E+00	5.41E+00	5.62E+00	2.57E+00	2.44E+00	7.00E+00	3.43E+00	3.53E+00	9.46E+00	4.03E+00	3.09E+00	7.53E+00	5.95E+00	6.39E+00	3.19E+00	4.92E+00	6.56E+00	5.64E+00	3.51E+00	-
Sulphur Dioxide (SO2)	7446-09-5	288	50	5.00E+01	5.01E+01	5.00E+01	5.00E+01	5.00E+01	5.00E+01	5.01E+01	5.01E+01	5.01E+01	5.01E+01	5.00E+01	5.00E+01	5.01E+01	5.00E+01	5.01E+01	5.02E+01	5.01E+01	5.00E+01	5.01E+01	5.01E+01	5.01E+01	5.00E+01	5.01E+01	5.01E+01	5.01E+01	5.01E+01	17%
Hydrocarbons	<<NMHC>>	-	-	2.66E-01	4.80E-01	3.99E-01	4.68E-01	2.68E-01	2.40E-01	7.24E-01	8.46E-01	7.25E-01	9.03E-01	4.33E-01	4.05E-01	1.32E+00	5.54E-01	6.19E-01	1.31E+00	5.47E-01	4.59E-01	1.19E+00	8.82E-01	9.49E-01	5.32E-01	6.90E-01	1.18E+00	8.69E-01	4.80E-01	-
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	207	100	1.09E+02	1.15E+02	1.14E+02	1.17E+02	1.09E+02	1.08E+02	1.23E+02	1.30E+02	1.22E+02	1.30E+02	1.15E+02	1.14E+02	1.41E+02	1.19E+02	1.26E+02	1.37E+02	1.20E+02	1.17E+02	1.44E+02	1.31E+02	1.30E+02	1.16E+02	1.26E+02	1.41E+02	1.32E+02	1.17E+02	57%
1,3-butadiene	106-99-0	-	0.6	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.00E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.01E-01	6.00E-01	-
Acenaphthene	83-32-9	-	4.41E-03	4.48E-03	4.54E-03	4.52E-03	4.55E-03	4.48E-03	4.47E-03	4.62E-03	4.64E-03	4.62E-03	4.64E-03	4.52E-03	4.52E-03	4.68E-03	4.57E-03	4.65E-03	4.79E-03	4.56E-03	4.54E-03	4.79E-03	4.67E-03	4.68E-03	4.54E-03	4.62E-03	4.72E-03	4.67E-03	4.55E-03	-
Acenaphthylene	208-96-8	-	8.15E-03	8.29E-03	8.42E-03	8.38E-03	8.44E-03	8.30E-03	8.27E-03	8.57E-03	8.60E-03	8.57E-03	8.60E-03	8.37E-03	8.37E-03	8.70E-03	8.47E-03	8.64E-03	8.92E-03	8.46E-03	8.42E-03	8.91E-03	8.68E-03	8.69E-03	8.40E-03	8.58E-03	8.76E-03	8.68E-03	8.44E-03	-
Acetaldehyde	75-07-0	-	-	1.09E-02	2.05E-02	1.78E-02	2.27E-02	1.10E-02	9.62E-03	3.23E-02	3.44E-02	3.24E-02	3.47E-02	1.63E-02	1.69E-02	3.90E-02	2.53E-02	3.99E-02	5.93E-02	2.36E-02	2.11E-02	6.00E-02	4.09E-02	4.16E-02	1.87E-02	3.32E-02	4.89E-02	4.14E-02	2.27E-02	-
Acrolein	107-02-8	-	-	1.95E-03	3.75E-03	3.24E-03	4.11E-03	1.98E-03	1.75E-03	5.91E-03	6.28E-03	5.92E-03	6.32E-03	2.97E-03	3.06E-03	7.09E-03	4.59E-03	7.18E-03	1.08E-02	4.31E-03	3.83E-03	1.09E-02	7.47E-03	7.59E-03	3.40E-03	6.06E-03	8.86E-03	7.55E-03	4.11E-03	-
Anthracene	120-12-7	-	1.61E-04	1.74E-04	1.86E-04	1.82E-04	1.88E-04	1.74E-04	1.73E-04	2.00E-04	2.03E-04	2.00E-04	2.03E-04	1.81E-04	1.81E-04	2.13E-04	1.90E-04	2.05E-04	2.32E-04	1.90E-04	1.86E-04	2.29E-04	2.10E-04	2.11E-04	1.85E-04	2.00E-04	2.18E-04	2.09E-04	1.88E-04	-
Benzene	71-43-2	10	3	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.01E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.01E+00	3.01E+00	3.03E+00	3.02E+00	3.02E+00	3.04E+00	3.01E+00	3.01E+00	3.04E+00	3.03E+00	3.03E+00	3.01E+00	3.02E+00	3.03E+00	3.02E+00	3.01E+00	30%
Benzo(a)anthracene	56-55-3	-	-	2.42E-06	4.45E-06	3.57E-06	4.51E-06	2.44E-06	2.16E-06	6.80E-06	7.72E-06	6.82E-06	7.81E-06	3.86E-06	3.72E-06	1.10E-05	5.02E-06	6.60E-06	1.23E-05	5.09E-06	4.29E-06	1.12E-05	8.40E-06	8.87E-06	4.65E-06	6.65E-06	1.06E-05	8.18E-06	4.51E-06	-
Benzo(a)pyrene	50-32-8	-	5.29E-05	5.38E-05	5.45E-05	5.42E-05	5.45E-05	5.38E-05	5.37E-05	5.54E-05	5.58E-05	5.54E-05	5.58E-05	5.43E-05	5.43E-05	5.71E-05	5.48E-05	5.52E-05	5.74E-05	5.48E-05	5.45E-05	5.70E-05	5.60E-05	5.62E-05	5.46E-05	5.53E-05	5.68E-05	5.59E-05	5.45E-05	-
Benzo(b+k)fluoranthene	205-99-2	-	2.79E-04	2.82E-04	2.85E-04	2.84E-04	2.85E-04	2.82E-04	2.82E-04	2.88E-04	2.89E-04	2.88E-04	2.90E-04	2.84E-04	2.84E-04	2.95E-04	2.86E-04	2.87E-04	2.95E-04	2.86E-04	2.85E-04	2.93E-04	2.90E-04	2.91E-04	2.85E-04	2.87E-04	2.93E-04	2.90E-04	2.85E-04	-
Benzo(g,h,i)perylene	191-24-2	-	-	2.05E-06	3.77E-06	3.02E-06	3.79E-06	2.07E-06	1.83E-06	5.76E-06	6.56E-06	5.77E-06	6.64E-06	3.28E-06	3.15E-06	9.46E-06	4.26E-06	5.49E-06	1.04E-05	4.31E-06	3.63E-06	9.52E-06	7.10E-06	7.51E-06	3.97E-06	5.61E-06	9.04E-06	6.93E-06	3.79E-06	-
Chrysene	218-01-9	-	3.38E-04	3.42E-04	3.46E-04	3.44E-04	3.46E-04	3.42E-04	3.42E-04	3.50E-04	3.52E-04	3.50E-04	3.53E-04	3.45E-04	3.45E-04	3.59E-04	3.47E-04	3.48E-04	3.60E-04	3.47E-04	3.46E-04	3.58E-04	3.53E-04	3.54E-04	3.47E-04	3.49E-04	3.57E-04	3.52E-04	3.46E-04	-
Fluoranthene	206-44-0	-	8.15E-04	8.41E-04	8.62E-04	8.54E-04	8.65E-04	8.41E-04	8.37E-04	8.88E-04	8.96E-04	8.89E-04	8.96E-04	8.55E-04	8.55E-04	9.22E-04	8.70E-04	8.94E-04	9.49E-04	8.69E-04	8.61E-04	9.41E-04	9.07E-04	9.10E-04	8.62E-04	8.88E-04	9.26E-04	9.04E-04	8.65E-04	-
Fluorene	86-73-7	-	1.47E-03	1.58E-03	1.68E-03	1.64E-03	1.69E-03	1.58E-03	1.57E-03	1.79E-03	1.82E-03	1.79E-03	1.82E-03	1.64E-03	1.64E-03	1.91E-03	1.71E-03	1.83E-03	2.06E-03	1.71E-03	1.67E-03	2.03E-03	1.87E-03	1.89E-03	1.67E-03	1.79E-03	1.95E-03	1.86E-03	1.69E-03	-
Formaldehyde	50-00-0	-	-	9.20E-03	1.71E-02	1.49E-02	1.89E-02	9.32E-03	8.02E-03	2.69E-02	2.89E-02	2.70E-02	2.90E-02	1.37E-02	1.43E-02	3.30E-02	2.12E-02	3.33E-02	4.95E-02	1.97E-02	1.77E-02	5.04E-02	3.43E-02	3.48E-02	1.57E-02	2.78E-02	4.12E-02	3.48E-02	1.89E-02	-
Phenanthrene	85-01-8	-	2.21E-03	2.43E-03	2.62E-03	2.55E-03	2.64E-03	2.43E-03	2.40E-03	2.85E-03	2.92E-03	2.85E-03	2.91E-03	2.56E-03	2.55E-03	3.16E-03	2.68E-03	2.87E-03	3.36E-03	2.68E-03	2.61E-03	3.27E-03	3.00E-03	3.03E-03	2.62E-03	2.84E-03	3.17E-03	2.97E-03	2.64E-03	-
Pyrene	129-00-0	-	-	2.40E-05	4.50E-05	3.70E-05	4.70E-05	2.40E-05	2.10E-05	6.90E-05	7.70E-05	6.90E-05	7.60E-05	3.70E-05	3.70E-05	1.00E-04	5.10E-05	7.40E-05	1.26E-04	5.10E-05	4.40E-05	1.18E-04	8.60E-05	9.00E-05	4.40E-05	6.90E-05	1.04E-04	8.30E-05	4.70E-05	-
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	9.40E-02	2.08E-01	3.09E-01	2.66E-01	3.13E-01	2.09E-01	1.95E-01	4.24E-01	4.64E-01	4.25E-01	4.64E-01	2.77E-01	2.71E-01	6.06E-01	3.33E-01	4.18E-01	6.92E-01	3.40E-01	3.01E-01	6.35E-01	5.02E-01	5.22E-01	3.14E-01	4.17E-01	5.98E-01	4.88E-01	3.13E-01	-
Elemental Carbon (from diesel exhaust)	7440-44-0	-	-	7.38E-02	1.40E-01	1.12E-01	1.42E-01	7.46E-02	6.56E-02	2.15E-01	2.41E-01	2.15E-01	2.41E-01	1.19E-01	1.15E-01	3.33E-01	1.56E-01	2.11E-01	3.89E-01	1.60E-01	1.35E-01	3.52E-01	2.65E-01	2.78E-01	1.43E-01	2.10E-01	3.27E-01	2.56E-01	1.42E-01	-
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	2.23E-06	4.14E-06	3.31E-06	4.21E-06	2.25E-06	1.98E-06	6.35E-06	7.16E-06	6.36E-06	7.21E-06	3.56E-06	3.45E-06	1.01E-05	4.64E-06	6.25E-06	1.15E-05	4.74E-06	4.00E-06	1.05E-05	7.85E-06	8.26E-06	4.28E-06	6.22E-06	9.83E-06	7.63E-06	4.21E-06	-

Notes:

1 - Individual model run with plume depletion

2 - Individual model run - no plume depletion

ASL - Above MECP Screening Level

BSL - Below MECP Screening Level

Table F-3: Maximum Predicted Annual Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Particulates																														
TSP (Note 1)	<<PM>>	-	11.6	12.2	12.3	13.2	13.7	12.3	12.1	13.6	14.1	12.5	15.5	12.4	13.0	16.2	13.6	14.1	13.2	12.8	13.0	15.9	13.6	15.0	12.9	13.6	18.4	15.8	13.7	-
PM10	<<PM10>>	-	8.3	8.5	8.6	8.8	9.0	8.5	8.5	9.1	9.3	8.6	9.8	8.6	8.8	9.9	9.0	9.2	8.9	8.8	8.8	9.9	9.1	9.5	8.8	8.9	10.4	9.7	9.0	-
PM2.5	<<PM2.5>>	-	6.2	6.2	6.3	6.3	6.3	6.2	6.2	6.4	6.4	6.3	6.5	6.3	6.3	6.5	6.4	6.4	6.4	6.3	6.3	6.5	6.4	6.5	6.3	6.4	6.6	6.5	6.3	-
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	0.23	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	2%
Aluminum (Al)	7429-90-5	-	0.15	2.09E-01	2.23E-01	2.86E-01	3.36E-01	2.10E-01	1.97E-01	3.42E-01	3.83E-01	2.33E-01	5.18E-01	2.30E-01	2.81E-01	5.38E-01	3.31E-01	3.89E-01	3.06E-01	2.66E-01	2.85E-01	5.44E-01	3.42E-01	4.54E-01	2.76E-01	3.13E-01	6.85E-01	5.10E-01	3.36E-01	-
Arsenic (As)	7440-38-2	3.00E-03	2.00E-03	2.01E-03	2.01E-03	2.02E-03	2.02E-03	2.01E-03	2.01E-03	2.02E-03	2.03E-03	2.01E-03	2.04E-03	2.01E-03	2.02E-03	2.05E-03	2.02E-03	2.03E-03	2.02E-03	2.01E-03	2.02E-03	2.05E-03	2.02E-03	2.04E-03	2.01E-03	2.02E-03	2.06E-03	2.04E-03	2.02E-03	67%
Gold (Au)	7440-57-5	-	-	7.88E-08	1.14E-07	1.72E-07	2.32E-07	7.96E-08	6.52E-08	2.84E-07	3.51E-07	1.16E-07	5.35E-07	1.23E-07	2.01E-07	5.85E-07	2.47E-07	2.98E-07	2.10E-07	1.69E-07	1.97E-07	5.73E-07	2.93E-07	4.45E-07	1.78E-07	2.20E-07	7.43E-07	5.05E-07	2.32E-07	-
Boron (B)	7440-42-8	-	2.60E-02	2.61E-02	2.61E-02	2.62E-02	2.63E-02	2.61E-02	2.61E-02	2.63E-02	2.63E-02	2.61E-02	2.65E-02	2.61E-02	2.62E-02	2.65E-02	2.62E-02	2.63E-02	2.62E-02	2.62E-02	2.62E-02	2.65E-02	2.63E-02	2.64E-02	2.62E-02	2.62E-02	2.67E-02	2.65E-02	2.63E-02	-
Barium (Ba)	7440-39-3	5.00E-02	2.00E-02	2.03E-02	2.04E-02	2.07E-02	2.09E-02	2.03E-02	2.03E-02	2.10E-02	2.12E-02	2.04E-02	2.18E-02	2.04E-02	2.07E-02	2.19E-02	2.09E-02	2.12E-02	2.08E-02	2.06E-02	2.07E-02	2.19E-02	2.10E-02	2.15E-02	2.06E-02	2.08E-02	2.26E-02	2.18E-02	2.09E-02	42%
Beryllium (Be)	7440-41-7	4.00E-04	0	9.76E-07	1.20E-06	2.17E-06	2.93E-06	9.87E-07	7.95E-07	3.03E-06	3.67E-06	1.35E-06	5.75E-06	1.30E-06	2.08E-06	6.07E-06	2.86E-06	3.76E-06	2.48E-06	1.86E-06	2.15E-06	6.16E-06	3.04E-06	4.76E-06	2.01E-06	2.58E-06	8.35E-06	5.63E-06	2.93E-06	1%
Bismuth (Bi)	7440-69-9	-	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.31E-03	1.30E-03	1.30E-03	1.31E-03	1.31E-03	1.30E-03	1.31E-03	1.30E-03	1.30E-03	1.31E-03	1.31E-03	1.31E-03	1.30E-03	1.30E-03	1.30E-03	1.31E-03	1.31E-03	1.31E-03	1.30E-03	1.30E-03	1.31E-03	1.31E-03	1.31E-03	-
Carbon (C)	7440-44-0	0.3	0	7.59E-04	9.43E-04	1.68E-03	2.28E-03	7.68E-04	6.19E-04	2.38E-03	2.89E-03	1.05E-03	4.52E-03	1.02E-03	1.64E-03	4.78E-03	2.24E-03	2.92E-03	1.94E-03	1.46E-03	1.69E-03	4.84E-03	2.39E-03	3.74E-03	1.57E-03	2.02E-03	6.53E-03	4.41E-03	2.28E-03	1%
Calcium (Ca)	7440-70-2	-	0.3	3.26E-01	3.32E-01	3.59E-01	3.79E-01	3.27E-01	3.21E-01	3.82E-01	3.99E-01	3.36E-01	4.55E-01	3.35E-01	3.56E-01	4.63E-01	3.77E-01	4.01E-01	3.67E-01	3.50E-01	3.58E-01	4.66E-01	3.82E-01	4.28E-01	3.54E-01	3.70E-01	5.25E-01	4.52E-01	3.79E-01	-
Cadmium (Cd)	7440-43-9	3.60E-03	5.00E-04	5.01E-04	5.01E-04	5.02E-04	5.03E-04	5.01E-04	5.01E-04	5.04E-04	5.05E-04	5.02E-04	5.07E-04	5.02E-04	5.03E-04	5.08E-04	5.03E-04	5.04E-04	5.03E-04	5.02E-04	5.03E-04	5.07E-04	5.04E-04	5.06E-04	5.02E-04	5.03E-04	5.10E-04	5.07E-04	5.03E-04	14%
Cerium (Ce) and Compounds (as Ce)	7440-45-1	0.7	0	5.82E-05	7.12E-05	1.29E-04	1.74E-04	5.87E-05	4.71E-05	1.80E-04	2.18E-04	8.02E-05	3.42E-04	7.72E-05	1.24E-04	3.61E-04	1.70E-04	2.24E-04	1.48E-04	1.11E-04	1.28E-04	3.67E-04	1.81E-04	2.83E-04	1.20E-04	1.54E-04	4.97E-04	3.35E-04	1.74E-04	0%
Cobalt (Co)	7440-48-4	0.1	0	1.50E-05	1.80E-05	3.31E-05	4.46E-05	1.50E-05	1.20E-05	4.61E-05	5.57E-05	2.06E-05	8.72E-05	1.96E-05	3.16E-05	9.23E-05	4.36E-05	5.72E-05	3.76E-05	2.81E-05	3.26E-05	9.38E-05	4.61E-05	7.22E-05	3.06E-05	3.91E-05	1.27E-04	8.57E-05	4.46E-05	0%
Chromium (Cr) and Compounds (as Cr)	7440-47-3	0.1	1.00E-02	1.01E-02	1.01E-02	1.02E-02	1.02E-02	1.01E-02	1.01E-02	1.02E-02	1.03E-02	1.01E-02	1.04E-02	1.01E-02	1.02E-02	1.05E-02	1.02E-02	1.04E-02	1.02E-02	1.01E-02	1.02E-02	1.05E-02	1.02E-02	1.04E-02	1.02E-02	1.02E-02	1.06E-02	1.04E-02	1.02E-02	10%
Cesium (Cs) and Compounds (as Ce)	7440-46-2	0.4	0	2.47E-06	3.03E-06	5.49E-06	7.42E-06	2.50E-06	2.01E-06	7.67E-06	9.27E-06	3.41E-06	1.45E-05	3.29E-06	5.27E-06	1.53E-05	7.24E-06	9.50E-06	6.28E-06	4.70E-06	5.44E-06	1.56E-05	7.68E-06	1.20E-05	5.08E-06	6.53E-06	2.11E-05	1.42E-05	7.42E-06	0%
Copper (Cu)	7440-50-8	-	3.20E-03	3.32E-03	3.36E-03	3.46E-03	3.54E-03	3.32E-03	3.30E-03	3.60E-03	3.69E-03	3.37E-03	3.96E-03	3.37E-03	3.48E-03	4.02E-03	3.56E-03	3.64E-03	3.51E-03	3.44E-03	3.48E-03	4.01E-03	3.61E-03	3.83E-03	3.46E-03	3.52E-03	4.26E-03	3.92E-03	3.54E-03	-
Iron (Fe)	7439-89-6	-	0.15	1.79E-01	1.85E-01	2.13E-01	2.36E-01	1.79E-01	1.73E-01	2.39E-01	2.57E-01	1.89E-01	3.18E-01	1.88E-01	2.11E-01	3.28E-01	2.34E-01	2.60E-01	2.22E-01	2.04E-01	2.13E-01	3.30E-01	2.39E-01	2.89E-01	2.09E-01	2.25E-01	3.94E-01	3.15E-01	2.36E-01	-
Gallium (Ga)	7440-55-3	-	-	1.65E-05	2.01E-05	3.66E-05	4.96E-05	1.65E-05	1.35E-05	5.11E-05	6.17E-05	2.26E-05	9.68E-05	2.21E-05	3.51E-05	1.02E-04	4.81E-05	6.32E-05	4.16E-05	3.16E-05	3.61E-05	1.04E-04	5.11E-05	8.02E-05	3.41E-05	4.36E-05	1.41E-04	9.48E-05	4.96E-05	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	0.9	0	3.41E-06	4.18E-06	7.58E-06	1.02E-05	3.45E-06	2.78E-06	1.06E-05	1.28E-05	4.71E-06	2.01E-05	4.54E-06	7.27E-06	2.12E-05	9.99E-06	1.31E-05	8.66E-06	6.49E-06	7.51E-06	2.15E-05	1.06E-05	1.66E-05	7.02E-06	9.02E-06	2.91E-05	1.97E-05	1.02E-05	0%
Mercury (Hg)	7439-97-6	5.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	40%
Indium (In)	7440-74-6	-	-	4.12E-09	5.05E-09	9.14E-09	1.24E-08	4.16E-09	3.35E-09	1.28E-08	1.55E-08	5.68E-09	2.42E-08	5.48E-09	8.78E-09	2.56E-08	1.21E-08	1.58E-08	1.05E-08	7.83E-09	9.07E-09	2.60E-08	1.28E-08	2.01E-08	8.47E-09	1.09E-08	3.52E-08	2.37E-08	1.24E-08	-
Potassium (K)	7440-09-7	-	0.13	1.42E-01	1.45E-01	1.57E-01	1.67E-01	1.42E-01	1.40E-01	1.68E-01	1.76E-01	1.47E-01	2.02E-01	1.46E-01	1.56E-01	2.06E-01	1.66E-01	1.77E-01	1.61E-01	1.53E-01	1.57E-01	2.08E-01	1.68E-01	1.90E-01	1.55E-01	1.62E-01	2.35E-01	2.01E-01	1.67E-01	-
Lanthanum (La)	7439-91-0	-	-	1.30E-05	1.65E-05	2.91E-05	3.96E-05	1.35E-05	1.05E-05	4.11E-05	5.01E-05	1.80E-05	7.82E-05	1.75E-05	2.86E-05	8.27E-05	3.86E-05	5.06E-05	3.36E-05	2.51E-05	2.91E-05	8.37E-05	4.16E-05	6.47E-05	2.71E-05	3.51E-05	1.13E-04	7.62E-05	3.96E-05	-
Lithium (Li)	7439-93-2	-	-	2.11E-05	2.61E-05	4.66E-05	6.32E-05	2.16E-05	1.70E-05	6.57E-05	7.92E-05	2.91E-05	1.24E-04	2.81E-05	4.51E-05	1.31E-04	6.17E-05	8.12E-05	5.36E-05	4.01E-05	4.66E-05	1.33E-04	6.57E-05	1.03E-04	4.36E-05	5.57E-05	1.80E-04	1.21E-04	6.32E-05	-
Lutetium (Lu)	7439-94-3	-	-	1.93E-07	2.36E-07	4.28E-07	5.79E-07	1.95E-07	1.57E-07	5.98E-07	7.23E-07	2.66E-07	1.13E-06	2.57E-07	4.11E-07	1.20E-06	5.65E-07	7.41E-07	4.90E-07	3.67E-07	4.24E-07	1.22E-06	5.99E-07	9.38E-07	3.97E-07	5.10E-07	1.65E-06	1.11E-06	5.79E-07	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.1	1.07E-01	1.10E-01	1.21E-01	1.30E-01	1.08E-01	1.05E-01	1.31E-01	1.39E-01	1.12E-01	1.63E-01	1.11E-01	1.20E-01	1.67E-01	1.30E-01	1.40E-01	1.25E-01	1.18E-01	1.21E-01	1.68E-01	1.32E-01	1.52E-01	1.20E-01	1.26E-01	1.94E-01	1.60E-01	1.30E-01	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	8.00E-02	5.00E-03	5.10E-03	5.13E-03	5.22E-03	5.29E-03	5.10E-03	5.08E-03	5.34E-03	5.41E-03	5.14E-03	5.65E-03	5.14E-03	5.23E-03	5.69E-03	5.31E-03	5.38E-03	5.26E-03	5.20E-03	5.24E-03	5.69E-03	5.34E-03	5.53E-03	5.22E-03	5.27E-03	5.92E-03	5.62E-03	5.29E-03	7%
Molybdenum (Mo)	7439-98-7	-	7.80E-04	7.85E-04	7.87E-04	7.92E-04	7.96E-04	7.85E-04	7.84E-04	7.96E-04	8.00E-04	7.87E-04	8.11E-04	7.87E-04	7.91E-04	8.13E-04	7.96E-04	8.00E-04	7.93E-04	7.90E-04	7.92E-04	8.13E-04	7.97E-04	8.06E-04	7.91E-04	7.94E-04	8.25E-04	8.11E-04	7.96E-04	-
Sodium (Na)	7440-23-5	-	0.32	3.44E-01	3.50E-01	3.74E-01	3.93E-01	3.45E-01	3.40E-01	3.96E-01	4.12E-01	3.54E-01	4.64E-01	3.53E-01	3.72E-01	4.72E-01	3.92E-01	4.14E-01	3.82E-01	3.67E-01	3.74E-01	4.74E-01	3.96E-01	4.39E-01	3.70E-01	3.85E-01	5.29E-01	4.61E-01	3.93E-01	-
Niobium (Nb)	7440--03-1	-	-	4.81E-06	5.90E-06	1.07E-05	1.44E-05	4.86E-06	3.91E-06	1.49E-05	1.81E-05	6.64E-06	2.83E-05	6.41E-06	1.03E-05	2.99E-05	1.41E-05	1.85E-05	1.22E-05	9.15E-06	1.06E-05	3.03E-05	1.50E-05	2.34E-05	9.90E-06	1.27E-05	4.11E-05	2.77E-05	1.44E-05	-
Nickel (Ni)	7440-02-0	2.00E-02	2.00E-03	2.01E-03	2.02E-03	2.02E-03	2.03E-03	2.01E-03	2.01E-03	2.04E-03	2.05E-03	2.02E-03	2.07E-03	2.02E-03	2.03E-03	2.08E-03	2.03E-03	2.04E-03	2.03E-03	2.02E-03	2.03E-03	2.08E-03	2.04E-03	2.06E-03	2.02E-03	2.03E-03	2.10E-03	2.07E-03	2.03E-03	10%
Phosphorus (P)	7723-14-0	-	-	5.15E-04	6.31E-04	1.14E-03	1.55E-03	5.20E-04	4.19E-04	1.60E-03	1.93E-03	7.10E-04	3.03E-03	6.85E-04	1.10E-03	3.19E-03	1.51E-03	1.98E-03	1.31E-03	9.79E-04	1.13E-03	3.25E-03	1.60E-03	2.51E-03	1.06E-03	1.36E-03	4.40E-03	2.97E-03	1.55E-03	-
Lead (Pb)	7439-92-1	0.1	4.00E-03	4.02E-03	4.02E-03	4.04E-03	4.05E-03	4.02E-03	4.01E-03	4.05E-03	4.06E-03	4.02E-03	4.10E-03	4.02E-03	4.04E-03	4.10E-03	4.05E-03	4.06E-03	4.04E-03	4.03E-03	4.04E-03	4.10E-03	4.05E-03	4.08E-03	4.03E-03	4.04E-03	4.14E-03	4.10E-03	4.05E-03	4%
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	6.17E-05	7.57E-05	1.37E-04	1.86E-04	6.27E-05	5.01E-05	1.92E-04	2.32E-04	8.52E-05	3.64E-04	8.22E-05	1.32E-04	3.85E-04	1.81E-04	2.38E-04	1.57E-04	1.18E-04	1.36E-04	3.91E-04	1.93E-04	3.01E-04	1.27E-04	1.63E-04	5.28E-04	3.57E-04	1.86E-04	-
Sulphur (S)	7704-34-9	-	-	1.57E-03	2.01E-03	3.48E-03	4.70E-03	1.59E-03	1.29E-03	5.08E-03	6.18E-03	2.21E-03	9.61E-03	2.18E-03	3.52E-03	1.02E-02	4.69E-03	6.03E-03	4.05E-03	3.09E-03	3.58E-03	1.03E-02	5.13E-03	7.96E-03	3.32E-03	4.22E-03	1.38E-02	9.32E-03	4.70E-03	-
Antimony (Sb)	7440-36-0	0.17	7.00E-03	7.00E-03	7.01E-03	7.01E-03	7.01E-03	7.00E-03	7.00E-03	7.01E-03	7.02E-03	7.01E-03	7.03E-03	7.01E-03	7.01E-03	7.03E-03	7.01E-03	7.02E-03	7.01E-03	7.01E-03	7.01E-03	7.03E-03	7.01E-03	7.02E-03	7.01E-03	7.01E-03	7.04E-03	7.02E-03	7.01E-03	4%
Scandium (Sc)	7440-20-2	-	-	9.02E-06	1.10E-05	2.01E-05	2.76E-05	9.02E-06	7.52E-06	2.86E-05	3.41E-05	1.25E-05	5.36E-05	1.20E-05	1.96E-05	5.67E-05	2.66E-05	3.51E-05	2.31E-05	1.75E-05	2.01E-05	5.77E-05	2.86E-05	4.46E-05	1.86E-05	2.41E-05	7.82E-05	5.26E-05	2.76E-05	-
Selenium (Se)	7782-49-2	-	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	-
Tin (Sn)	7440-31-5	0.1	0	7.02E-06	8.52E-06	1.55E-05	2.11E-05	7.02E-06	5.52E-06	2.21E-05	2.66E-05	9.53E-06	4.16E-05	9.51E-06	1.50E-05	4.36E-05	2.06E-05	2.71E-05	1.80E-05	1.35E-05	1.55E-05	4.46E-05	2.21E-05	3.46E-05	1.45E-05	1.86E-05	6.02E-05	4.06E-05	2.11E-05	0%
Strontium (Sr)	7440-24-6	-	1.48E-03	1.75E-03	1.82E-03	2.09E-03	2.30E-03	1.76E-03	1.70E-03	2.33E-03	2.51E-03	1.86E-03	3.09E-03	1.84E-03	2.06E-03	3.18E-03	2.28E-03	2.53E-03	2.18E-03	2.00E-03	2.08E-03	3.21E-03	2.33E-03	2.82E-03	2.04E-03	2.20E-03	3.82E-03	3.06E-03	2.30E-03	-
Tantalum (Ta)	7440-25-7	-	-	8.30E-07	1.02E-06	1.84E-06	2.49E-06	8.39E-07	6.75E-07	2.57E-06	3.11E-06	1.14E-06	4.88E-06	1.10E-06	1.77E-06	5.15E-06	2.43E-06	3.19E-06	2.11E-06	1.58E-06	1.83E-06	5.23E-06	2.58E-06	4.04E-06	1.71E-06	2.19E-06	7.08E-06	4.78E-06	2.49E-06	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	4.38E-07	5.37E-07	9.73E-07	1.32E-06	4.43E-07	3.57E-07	1.36E-06	1.64E-06	6.05E-07	2.58E-06	5.84E-07	9.34E-07	2.72E-06	1.28E-06	1.68E-06	1.11E-06	8.34E-07	9.65E-07	2.76E-06	1.36E-06	2.13E-06	9.02E-07	1.16E-06	3.74E-06	2.53E-06	1.32E-06	-
Tellurium (Te)	13494-80-9	-	-	1.44E-07	1.77E-07	3.20E-07	4.33E-07	1.46E-07	1.17E-07	4.47E-07	5.41E-07	1.99E-07	8.48E-07	1.92E-07	3.07E-07	8.95E-07	4.22E-07	5.54E-07	3.66E-07	2.74E-07	3.17E-07	9.09E-07	4.48E-07	7.02E-07	2.96E-07	3.81E-07	1.23E-06	8.31E-07	4.33E-07	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	7.02E-04	9.44E-04	1.54E-03	2.08E-03	7.10E-04	5.79E-04	2.39E-03	2.90E-03	1.01E-03	4.55E-03	1.02E-03	1.65E-03	4.82E-03	2.16E-03	2.66E-03	1.85E-03	1.43E-03	1.66E-03	4.86E-03	2.41E-03	3.76E-03	1.54E-03	1.94E-03	6.53E-03	4.35E-03	2.08E-03	-
Thallium (Tl)	7440-28-0	0.25	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	2%
Uranium (U)	7440-61-1	6.00E-02	2.60E-04	2.61E-04	2.61E-04	2.62E-04	2.63E-04	2.61E-04	2.61E-04	2.63E-04	2.64E-04	2.62E-04	2.67E-04	2.61E-04	2.62E-04	2.67E-04	2.63E-04	2.64E-04	2.63E-04	2.62E-04	2.62E-04	2.67E-04	2.63E-04	2.65E-04	2.62E-04	2.63E-04	2.69E-04	2.66E-04	2.63E-04	0%
Vanadium (v)	7440-62-2	1	1.00E-02	1.01E-02	1.01E-02	1.02E-02	1.02E-02	1.01E-02	1.01E-02	1.03E-02	1.03E-02	1.01E-02	1.05E-02	1.01E-02	1.02E-02	1.05E-02	1.02E-02	1.03E-02	1.02E-02	1.02E-02	1.02E-02	1.05E-02	1.03E-02	1.04E-02	1.02E-02	1.02E-02	1.07E-02	1.05E-02	1.02E-02	1%
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	4.06E-05	4.96E-05	9.02E-05	1.22E-04	4.11E-05	3.31E-05	1.26E-04	1.52E-04	5.62E-05	2.39E-04	5.41E-05	8.67E-05	2.52E-04	1.19E-04	1.56E-04	1.03E-04	7.72E-05	8.97E-05	2.57E-04	1.26E-04	1.98E-04	8.37E-05	1.07E-04	3.47E-04	2.35E-04	1.22E-04	-
Yttrium (Y) and Compounds (as Y)	7440-65-5	2.8	0	1.05E-05	1.30E-05	2.36E-05	3.21E-05	1.10E-05	8.52E-06	3.31E-05	4.01E-05	1.45E-05	6.32E-05	1.40E-05	2.31E-05	6.67E-05	3.16E-05	4.11E-05	2.71E-05	2.06E-05	2.36E-05	6.77E-05	3.31E-05	5.21E-05	2.21E-05	2.81E-05	9.12E-05	6.17E-05	3.21E-05	0%
Ytterbium (Yb)	7440-64-4	-	-	1.23E-06	1.51E-06	2.74E-06	3.70E-06	1.25E-06	1.00E-06	3.83E-06	4.63E-06	1.70E-06	7.26E-06	1.64E-06	2.63E-06	7.66E-06	3.62E-06	4.74E-06	3.13E-06	2.35E-06	2.72E-06	7.78E-06	3.83E-06	6.01E-06	2.54E-06	3.26E-06	1.05E-05	7.11E-06	3.70E-06	-
Zinc (Zn)	7440-66-6	-	1.40E-02	1.41E-02	1.41E-02	1.42E-02	1.43E-02	1.41E-02	1.41E-02	1.43E-02	1.44E-02	1.41E-02	1.46E-02	1.41E-02	1.42E-02	1.46E-02	1.43E-02	1.44E-02	1.43E-02	1.42E-02	1.42E-02	1.47E-02	1.43E-02	1.45E-02	1.42E-02	1.43E-02	1.49E-02	1.46E-02	1.43E-02	-
Zirconium (Zr)	7440-67-7	-	-	7.92E-05	9.73E-05	1.76E-04	2.39E-04	8.02E-05	6.47E-05	2.47E-04	2.98E-04	1.10E-04	4.67E-04	1.06E-04	1.69E-04	4.93E-04	2.33E-04	3.05E-04	2.02E-04	1.51E-04	1.75E-04	5.01E-04	2.47E-04	3.87E-04	1.63E-04	2.10E-04	6.78E-04	4.58E-04	2.39E-04	-
Silicon Dioxide (SiO2)	7631-86-9	-	-	5.38E-01	6.60E-01	1.20E+00	1.62E+00	5.44E-01	4.38E-01	1.67E+00	2.02E+00	7.43E-01	3.17E+00	7.17E-01	1.15E+00	3.34E+00	1.58E+00	2.07E+00	1.37E+00	1.02E+00	1.19E+00	3.40E+00	1.67E+00	2.62E+00	1.11E+00	1.42E+00	4.60E+00	3.10E+00	1.62E+00	-
Aluminum Oxide (Al2O3)	1344-28-1	-	-	1.24E-01	1.53E-01	2.76E-01	3.74E-01	1.26E-01	1.01E-01	3.86E-01	4.67E-01	1.72E-01	7.32E-01	1.66E-01	2.65E-01	7.73E-01	3.65E-01	4.78E-01	3.16E-01	2.37E-01	2.74E-01	7.85E-01	3.87E-01	6.06E-01	2.56E-01	3.29E-01	1.06E+00	7.17E-01	3.74E-01	-
Iron Oxide (Fe2O3)	1309-37-1	-	-	4.12E-02	5.05E-02	9.15E-02	1.24E-01	4.17

Table F-3: Maximum Predicted Annual Average CoPC Concentrations at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	-	-	2.97E-02	9.10E-02	5.69E-02	7.20E-02	2.99E-02	2.86E-02	2.27E-01	3.03E-01	6.79E-02	4.40E-01	1.01E-01	1.62E-01	5.35E-01	1.67E-01	1.20E-01	1.13E-01	1.19E-01	1.38E-01	4.05E-01	2.32E-01	3.42E-01	1.16E-01	1.27E-01	4.50E-01	3.20E-01	9.10E-02	-
Sulphur Dioxide (SO2)	7446-09-5	52	20	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	38%
Hydrocarbons	<<NMHC>>	-	-	6.02E-03	1.63E-02	1.21E-02	1.56E-02	6.07E-03	5.74E-03	4.18E-02	5.89E-02	1.32E-02	8.32E-02	1.91E-02	2.97E-02	1.08E-01	3.40E-02	2.86E-02	2.32E-02	2.17E-02	2.49E-02	6.97E-02	3.97E-02	6.23E-02	2.21E-02	2.58E-02	8.32E-02	5.87E-02	1.63E-02	-
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	103	30	3.04E+01	3.10E+01	3.07E+01	3.09E+01	3.04E+01	3.04E+01	3.23E+01	3.29E+01	3.09E+01	3.43E+01	3.10E+01	3.16E+01	3.54E+01	3.22E+01	3.18E+01	3.16E+01	3.13E+01	3.14E+01	3.41E+01	3.22E+01	3.37E+01	3.13E+01	3.19E+01	3.48E+01	3.33E+01	3.10E+01	30%
1,3-butadiene	106-99-0	0.5	0.14	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	28%
Acenaphthene	83-32-9	-	8.46E-04	8.48E-04	8.51E-04	8.50E-04	8.51E-04	8.48E-04	8.48E-04	8.58E-04	8.61E-04	8.51E-04	8.69E-04	8.51E-04	8.54E-04	8.72E-04	8.57E-04	8.57E-04	8.55E-04	8.53E-04	8.54E-04	8.69E-04	8.58E-04	8.65E-04	8.53E-04	8.55E-04	8.75E-04	8.67E-04	8.51E-04	-
Acenaphthylene	208-96-8	-	1.56E-03	1.56E-03	1.57E-03	1.57E-03	1.57E-03	1.56E-03	1.56E-03	1.58E-03	1.59E-03	1.57E-03	1.61E-03	1.57E-03	1.58E-03	1.61E-03	1.58E-03	1.58E-03	1.58E-03	1.57E-03	1.58E-03	1.61E-03	1.58E-03	1.60E-03	1.58E-03	1.58E-03	1.62E-03	1.60E-03	1.57E-03	-
Acetaldehyde	75-07-0	0.5	-	3.16E-04	7.42E-04	6.66E-04	8.94E-04	3.19E-04	2.99E-04	1.86E-03	2.36E-03	7.29E-04	3.55E-03	8.27E-04	1.31E-03	3.90E-03	1.73E-03	1.87E-03	1.41E-03	1.12E-03	1.30E-03	3.62E-03	1.90E-03	2.90E-03	1.20E-03	1.53E-03	4.69E-03	3.32E-03	8.94E-04	0%
Acrolein	107-02-8	2.00E-02	-	5.60E-05	1.34E-04	1.18E-04	1.58E-04	5.70E-05	5.30E-05	3.37E-04	4.27E-04	1.31E-04	6.43E-04	1.50E-04	2.38E-04	7.06E-04	3.12E-04	3.33E-04	2.53E-04	2.03E-04	2.36E-04	6.56E-04	3.44E-04	5.25E-04	2.16E-04	2.75E-04	8.49E-04	6.00E-04	1.58E-04	1%
Anthracene	120-12-7	-	3.08E-05	3.12E-05	3.17E-05	3.15E-05	3.18E-05	3.12E-05	3.11E-05	3.30E-05	3.37E-05	3.16E-05	3.51E-05	3.18E-05	3.24E-05	3.57E-05	3.28E-05	3.28E-05	3.24E-05	3.21E-05	3.23E-05	3.50E-05	3.30E-05	3.42E-05	3.22E-05	3.25E-05	3.61E-05	3.46E-05	3.18E-05	-
Benzene	71-43-2	-	0.4	4.00E-01	4.00E-01	4.00E-01	4.01E-01	4.00E-01	4.00E-01	4.01E-01	4.02E-01	4.00E-01	4.02E-01	4.01E-01	4.01E-01	4.03E-01	4.01E-01	4.01E-01	4.01E-01	4.01E-01	4.01E-01	4.02E-01	4.01E-01	4.02E-01	4.01E-01	4.01E-01	4.03E-01	4.02E-01	4.01E-01	-
Benzo(a)anthracene	56-55-3	-	-	5.96E-08	1.54E-07	1.22E-07	1.59E-07	6.01E-08	5.66E-08	3.92E-07	5.35E-07	1.33E-07	7.70E-07	1.78E-07	2.78E-07	9.53E-07	3.33E-07	3.06E-07	2.42E-07	2.14E-07	2.47E-07	6.89E-07	3.81E-07	5.93E-07	2.21E-07	2.67E-07	8.47E-07	5.98E-07	1.59E-07	-
Benzo(a)pyrene	50-32-8	9.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	33%
Benzo(b+k)fluoranthene	205-99-2	-	5.35E-05	5.36E-05	5.37E-05	5.36E-05	5.37E-05	5.36E-05	5.36E-05	5.40E-05	5.42E-05	5.37E-05	5.45E-05	5.37E-05	5.39E-05	5.48E-05	5.39E-05	5.39E-05	5.38E-05	5.38E-05	5.38E-05	5.44E-05	5.40E-05	5.43E-05	5.38E-05	5.38E-05	5.45E-05	5.42E-05	5.37E-05	-
Benzo(g,h,i)perylene	191-24-2	-	-	4.95E-08	1.30E-07	1.00E-07	1.31E-07	4.99E-08	4.72E-08	3.32E-07	4.54E-07	1.11E-07	6.53E-07	1.50E-07	2.36E-07	8.13E-07	2.80E-07	2.53E-07	2.02E-07	1.80E-07	2.07E-07	5.81E-07	3.22E-07	5.01E-07	1.86E-07	2.23E-07	7.12E-07	5.02E-07	1.31E-07	-
Chrysene	218-01-9	-	6.49E-05	6.50E-05	6.52E-05	6.51E-05	6.52E-05	6.50E-05	6.50E-05	6.56E-05	6.59E-05	6.51E-05	6.63E-05	6.52E-05	6.54E-05	6.67E-05	6.55E-05	6.54E-05	6.53E-05	6.53E-05	6.53E-05	6.61E-05	6.56E-05	6.59E-05	6.53E-05	6.53E-05	6.63E-05	6.59E-05	6.52E-05	-
Fluoranthene	206-44-0	-	1.56E-04	1.57E-04	1.58E-04	1.57E-04	1.58E-04	1.57E-04	1.57E-04	1.60E-04	1.62E-04	1.58E-04	1.64E-04	1.58E-04	1.59E-04	1.66E-04	1.60E-04	1.60E-04	1.59E-04	1.58E-04	1.59E-04	1.64E-04	1.60E-04	1.62E-04	1.59E-04	1.59E-04	1.66E-04	1.63E-04	1.58E-04	-
Fluorene	86-73-7	-	2.82E-04	2.85E-04	2.89E-04	2.88E-04	2.90E-04	2.85E-04	2.85E-04	3.00E-04	3.06E-04	2.89E-04	3.17E-04	2.90E-04	2.95E-04	3.23E-04	2.98E-04	2.98E-04	2.95E-04	2.93E-04	2.94E-04	3.16E-04	3.00E-04	3.10E-04	2.93E-04	2.96E-04	3.25E-04	3.13E-04	2.90E-04	-
Formaldehyde	50-00-0	-	-	2.60E-04	6.24E-04	5.46E-04	7.32E-04	2.62E-04	2.48E-04	1.57E-03	1.99E-03	6.10E-04	2.99E-03	6.96E-04	1.11E-03	3.30E-03	1.45E-03	1.56E-03	1.18E-03	9.42E-04	1.10E-03	3.05E-03	1.59E-03	2.44E-03	1.01E-03	1.28E-03	3.95E-03	2.79E-03	7.32E-04	-
Phenanthrene	85-01-8	-	4.24E-04	4.30E-04	4.38E-04	4.35E-04	4.39E-04	4.30E-04	4.29E-04	4.60E-04	4.73E-04	4.37E-04	4.95E-04	4.40E-04	4.50E-04	5.09E-04	4.56E-04	4.54E-04	4.48E-04	4.44E-04	4.48E-04	4.90E-04	4.60E-04	4.79E-04	4.45E-04	4.50E-04	5.06E-04	4.82E-04	4.39E-04	-
Pyrene	129-00-0	13	0	6.24E-07	1.57E-06	1.29E-06	1.70E-06	6.29E-07	5.94E-07	3.98E-06	5.26E-06	1.43E-06	7.72E-06	1.79E-06	2.82E-06	9.11E-06	3.50E-06	3.44E-06	2.67E-06	2.26E-06	2.62E-06	7.32E-06	3.95E-06	6.09E-06	2.37E-06	2.93E-06	9.20E-06	6.50E-06	1.70E-06	0%
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	1.82E-02	2.11E-02	2.56E-02	2.42E-02	2.61E-02	2.12E-02	2.10E-02	3.69E-02	4.35E-02	2.47E-02	5.49E-02	2.67E-02	3.15E-02	6.30E-02	3.42E-02	3.32E-02	3.00E-02	2.85E-02	3.01E-02	5.16E-02	3.66E-02	4.67E-02	2.89E-02	3.12E-02	5.94E-02	4.72E-02	2.61E-02	-
Elemental Carbon (from diesel exhaust)	7440-44-0	0.3	0	1.91E-03	4.80E-03	3.91E-03	5.14E-03	1.92E-03	1.80E-03	1.22E-02	1.65E-02	4.20E-03	2.39E-02	5.50E-03	8.65E-03	2.91E-02	1.04E-02	9.75E-03	7.65E-03	6.72E-03	7.76E-03	2.17E-02	1.20E-02	1.85E-02	6.96E-03	8.42E-03	2.68E-02	1.89E-02	5.14E-03	2%
Total PAHs (as equivalent B(a)P)	<<BaPET>>	2.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	58%

Notes:

1 - Individual model run with plume depletion

2 - Individual model run - with OLM

ASL - Above MECP Screening Level

BSL - Below MECP Screening Level

Table F-4: Maximum Predicted CoPC Concentrations for Other Averaging Periods at Special and Discrete Receptors During Construction - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526821	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535872	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
8-Hour Average																														
Carbon Monoxide (CO)	630-08-0	34000	400	454.4	540.2	514.3	514.5	454.6	453.7	569.7	663.7	919.0	558.7	476.4	479.9	519.1	553.8	453.0	724.6	584.1	564.5	612.4	690.4	654.9	646.2	586.8	559.9	626.0	540.2	2%
15-Minute Average																														
Formaldehyde	50-00-0	37	3	3.2	3.4	3.3	3.2	3.2	3.2	3.8	3.3	3.6	3.6	3.1	3.3	3.5	3.3	3.4	4.0	3.2	3.2	3.4	3.4	3.7	3.4	3.4	3.4	3.3	3.4	9%
4-Minute Average																														
Sulphur Dioxide (SO2)	7446-09-5	1050	150	154.5	161.6	159.5	159.5	154.5	154.4	164.1	171.9	193.1	163.2	156.3	156.6	159.7	162.7	154.4	176.9	165.3	163.6	167.5	174.1	171.1	169.8	165.4	163.3	168.8	161.6	15%
Acrolein	107-02-8	8.3	-	0.07	0.14	0.09	0.07	0.08	0.07	0.25	0.09	0.18	0.17	0.04	0.08	0.15	0.11	0.12	0.30	0.07	0.06	0.13	0.13	0.23	0.12	0.12	0.12	0.10	0.14	2%
Acetaldehyde	75-07-0	3	-	0.41	0.74	0.50	0.40	0.41	0.36	1.37	0.47	1.00	0.95	0.23	0.43	0.84	0.57	0.67	1.64	0.37	0.32	0.70	0.73	1.26	0.64	0.64	0.65	0.55	0.74	25%
Tin (Sn)	7440-31-5	2	0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	1%
1,3-butadiene	106-99-0	352	2	2.01	2.01	2.01	2.01	2.01	2.01	2.02	2.01	2.02	2.02	2.00	2.01	2.01	2.01	2.01	2.03	2.01	2.01	2.01	2.01	2.02	2.01	2.01	2.01	2.01	2.01	1%

Table F-5: Frequencies of Cumulative Concentration Exceedances at Special and Discrete Receptors During Construction

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Frequency of Exceedance
UTM E (m)				526876.99	543079.3	530947.7	532175.7	526930.5	526820.5	540795	540763.4	530613.3	539876.1	543707.8	542376.4	539863	537409.9	534333.3	532594	531575.7	532275.6	535871.5	537944.1	539424.2	532667.3	532779.4	536204.92	534797.4	
UTM N (m)				5640176.31	5659895	5643967	5644751	5640239	5639873	5655416	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652235.98	5650851	
CoPC	**CAS**	**Criteria**																											
Hourly																													
Elemental Carbon (from diesel exhaust)	7440-44-0	1		0.007%	0.005%	0.007%	0.007%	0.007%	0.005%	0.023%	0.037%	0.009%	0.176%	0.000%	0.005%	0.132%	0.032%	0.068%	0.043%	0.009%	0.007%	0.219%	0.034%	0.169%	0.009%	0.053%	0.176%	0.137%	0.007%
Quartz	14808-60-7	23		0.000%	0.000%	0.002%	0.000%	0.000%	0.000%	0.002%	0.002%	0.000%	0.007%	0.000%	0.000%	0.005%	0.000%	0.021%	0.000%	0.000%	0.000%	0.014%	0.002%	0.005%	0.002%	0.002%	0.110%	0.034%	0.002%

Table F-6: Maximum Predicted 1-Hour Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Particulates																														
TSP	<<PM>>	-	-	542.7	478.9	835.1	599.3	545.9	504.0	1168.6	1680.4	1465.0	1257.2	692.3	662.6	1170.9	632.4	647.0	2024.0	705.9	403.3	1030.6	952.4	958.6	767.5	1316.3	1501.8	1327.7	835.1	-
PM10	<<PM10>>	-	-	173.4	186.9	323.9	264.0	174.4	159.4	374.9	511.1	514.9	495.5	306.6	319.5	570.7	309.6	285.6	710.0	342.2	165.3	501.0	330.7	285.4	315.7	640.7	745.7	661.2	323.9	-
PM2.5	<<PM2.5>>	-	-	32.7	32.7	45.6	39.8	33.2	29.7	67.4	76.7	88.5	76.1	45.8	47.4	85.5	46.5	43.8	129.3	51.6	25.0	76.1	49.1	53.4	47.8	97.3	112.2	99.6	45.6	-
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	-	-	4.18E-04	3.75E-04	9.00E-04	5.30E-04	4.20E-04	4.12E-04	8.88E-04	1.20E-03	1.35E-03	7.97E-04	8.53E-04	3.51E-04	9.36E-04	4.45E-04	7.54E-04	1.94E-03	5.33E-04	4.66E-04	7.55E-04	9.17E-04	7.32E-04	8.30E-04	7.88E-04	6.92E-04	1.43E-03	9.00E-04	-
Aluminum (Al)	7429-90-5	-	-	4.09E+01	3.62E+01	6.32E+01	4.53E+01	4.12E+01	3.80E+01	8.82E+01	1.27E+02	1.11E+02	9.52E+01	5.23E+01	5.14E+01	9.11E+01	4.92E+01	4.87E+01	1.53E+02	5.49E+01	3.05E+01	8.02E+01	7.20E+01	7.25E+01	5.81E+01	1.02E+02	1.17E+02	1.03E+02	6.32E+01	-
Arsenic (As)	7440-38-2	-	-	1.35E-02	1.25E-02	3.35E-02	2.03E-02	1.36E-02	1.55E-02	2.86E-02	3.70E-02	5.02E-02	2.29E-02	3.31E-02	1.12E-02	3.42E-02	1.67E-02	2.95E-02	7.69E-02	2.06E-02	1.92E-02	2.48E-02	3.65E-02	2.65E-02	3.33E-02	3.18E-02	2.49E-02	5.64E-02	3.35E-02	-
Gold (Au)	7440-57-5	-	-	8.00E-05	7.80E-05	2.01E-04	1.23E-04	8.00E-05	9.40E-05	1.62E-04	2.06E-04	3.02E-04	1.37E-04	2.02E-04	6.30E-05	2.04E-04	1.00E-04	1.80E-04	4.71E-04	1.25E-04	1.19E-04	1.42E-04	2.24E-04	1.65E-04	2.05E-04	1.96E-04	1.55E-04	3.45E-04	2.01E-04	-
Boron (B)	7440-42-8	-	-	5.53E-02	4.89E-02	8.79E-02	6.23E-02	5.56E-02	5.13E-02	1.19E-01	1.71E-01	1.48E-01	1.27E-01	7.39E-02	7.49E-02	1.33E-01	7.19E-02	6.67E-02	2.05E-01	8.00E-02	4.19E-02	1.17E-01	9.68E-02	9.78E-02	8.08E-02	1.49E-01	1.71E-01	1.52E-01	8.79E-02	-
Barium (Ba)	7440-39-3	-	-	1.97E-01	1.75E-01	3.07E-01	2.47E-01	1.98E-01	1.83E-01	4.25E-01	6.11E-01	5.33E-01	4.71E-01	2.55E-01	2.94E-01	5.28E-01	2.87E-01	2.65E-01	7.36E-01	3.19E-01	1.54E-01	4.66E-01	3.47E-01	3.49E-01	2.91E-01	5.95E-01	6.86E-01	6.07E-01	3.07E-01	-
Beryllium (Be)	7440-41-7	-	-	6.37E-04	5.64E-04	9.86E-04	7.05E-04	6.41E-04	5.92E-04	1.37E-03	1.98E-03	1.73E-03	1.48E-03	8.18E-04	5.94E-04	1.09E-03	5.89E-04	7.58E-04	2.38E-03	6.12E-04	4.76E-04	1.12E-03	1.12E-03	1.13E-03	9.08E-04	1.14E-03	1.27E-03	1.29E-03	9.86E-04	-
Bismuth (Bi)	7440-69-9	-	-	1.25E-03	1.11E-03	2.14E-03	1.34E-03	1.26E-03	1.16E-03	2.68E-03	3.80E-03	3.28E-03	2.76E-03	1.87E-03	1.08E-03	2.31E-03	1.17E-03	1.63E-03	4.54E-03	1.18E-03	9.84E-04	2.22E-03	2.16E-03	2.21E-03	1.97E-03	1.93E-03	2.10E-03	3.01E-03	2.14E-03	-
Carbon (C) (Note 1)	7440-44-0	1	0	2.51E-01	1.92E-01	4.44E-01	3.99E-01	2.53E-01	2.42E-01	4.69E-01	8.44E-01	5.58E-01	6.91E-01	3.55E-01	3.66E-01	7.58E-01	4.09E-01	6.24E-01	1.12E+00	4.19E-01	2.66E-01	6.59E-01	4.99E-01	4.17E-01	4.52E-01	8.27E-01	9.01E-01	9.88E-01	4.44E-01	44%
Calcium (Ca)	7440-70-2	-	-	1.77E+01	1.56E+01	2.74E+01	1.97E+01	1.78E+01	1.64E+01	3.82E+01	5.48E+01	4.79E+01	4.13E+01	2.24E+01	1.79E+01	3.11E+01	1.67E+01	2.11E+01	6.61E+01	1.87E+01	1.32E+01	3.13E+01	3.13E+01	3.14E+01	2.48E+01	3.48E+01	3.92E+01	3.58E+01	2.74E+01	-
Cadmium (Cd)	7440-43-9	-	-	1.01E-03	9.53E-04	2.53E-03	1.54E-03	1.01E-03	1.17E-03	2.12E-03	2.74E-03	3.79E-03	1.72E-03	2.50E-03	8.29E-04	2.57E-03	1.26E-03	2.23E-03	5.82E-03	1.56E-03	1.46E-03	1.85E-03	2.77E-03	2.02E-03	2.53E-03	2.41E-03	1.90E-03	4.27E-03	2.53E-03	-
Cesium (Cs) and Compounds (as Ce)	7440-45-1	21	0	3.92E-03	3.47E-03	6.05E-03	4.34E-03	3.94E-03	3.66E-03	8.44E-03	1.22E-01	1.06E-01	9.12E-02	5.01E-02	4.81E-02	8.50E-02	4.59E-02	4.66E-02	1.48E-01	5.13E-02	2.93E-02	7.48E-02	6.90E-02	6.94E-02	5.57E-02	9.56E-02	1.09E-01	9.64E-02	6.05E-02	0%
Cobalt (Co)	7440-48-4	-	-	1.15E-02	1.02E-02	1.97E-02	1.24E-02	1.16E-02	1.07E-02	2.47E-02	3.50E-02	3.02E-02	2.55E-02	1.71E-02	1.41E-02	2.44E-02	1.31E-02	1.49E-02	4.18E-02	1.46E-02	9.04E-03	2.13E-02	2.00E-02	2.03E-02	1.80E-02	2.73E-02	3.11E-02	2.76E-02	1.97E-02	-
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	-	5.02E-02	8.57E-02	1.45E-01	1.26E-01	5.17E-02	4.39E-02	1.24E-01	2.37E-01	1.64E-01	2.24E-01	1.21E-01	1.47E-01	2.75E-01	1.51E-01	1.39E-01	2.94E-01	1.66E-01	8.00E-02	2.43E-01	1.06E-01	1.28E-01	1.55E-01	3.11E-01	3.67E-01	3.26E-01	1.45E-01	-
Cesium (Cs) and Compounds (as Ce)	7440-46-2	17	0	1.84E-03	1.63E-03	2.84E-03	2.04E-03	1.85E-03	1.71E-03	3.96E-03	5.71E-03	4.98E-03	4.28E-03	2.35E-03	2.26E-03	3.99E-03	2.16E-03	2.19E-03	6.87E-03	2.41E-03	1.37E-03	3.51E-03	3.24E-03	3.26E-03	2.61E-03	4.49E-03	5.12E-03	4.53E-03	2.84E-03	0%
Copper (Cu)	7440-50-8	-	-	1.04E-01	9.33E-02	2.40E-01	1.43E-01	1.04E-01	1.10E-01	2.19E-01	2.90E-01	3.59E-01	1.86E-01	2.32E-01	8.64E-02	2.47E-01	1.19E-01	2.06E-01	5.34E-01	1.45E-01	1.31E-01	1.89E-01	2.53E-01	1.81E-01	2.30E-01	2.19E-01	1.71E-01	3.93E-01	2.40E-01	-
Iron (Fe)	7439-89-6	-	-	2.28E+01	2.01E+01	3.62E+01	2.61E+01	2.29E+01	2.11E+01	4.89E+01	7.02E+01	6.11E+01	5.22E+01	3.04E+01	3.13E+01	5.57E+01	3.01E+01	2.80E+01	8.44E+01	3.35E+01	1.72E+01	4.90E+01	3.99E+01	4.02E+01	3.32E+01	6.26E+01	7.19E+01	6.36E+01	3.62E+01	-
Gallium (Ga)	7440-55-3	-	-	1.10E-02	9.73E-03	1.71E-02	1.22E-02	1.11E-02	1.02E-02	2.37E-02	3.41E-02	2.97E-02	2.55E-02	1.42E-02	1.38E-02	2.45E-02	1.32E-02	1.31E-02	4.10E-02	1.48E-02	8.23E-03	2.16E-02	1.93E-02	1.95E-02	1.57E-02	2.75E-02	3.15E-02	2.78E-02	1.71E-02	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	5	0	2.30E-03	2.04E-03	3.55E-03	2.55E-03	2.32E-03	2.14E-03	4.96E-03	7.15E-03	6.23E-03	3.55E-03	2.94E-03	2.82E-03	4.99E-03	2.70E-03	2.74E-03	8.60E-03	3.01E-03	1.72E-03	4.40E-03	4.05E-03	4.07E-03	3.27E-03	5.61E-03	6.41E-03	5.66E-03	3.55E-03	0%
Mercury (Hg)	7439-97-6	-	-	1.30E-05	1.20E-05	2.10E-05	1.50E-05	1.40E-05	1.30E-05	2.90E-05	4.20E-05	3.70E-05	3.10E-05	1.70E-05	1.70E-05	2.90E-05	1.60E-05	1.60E-05	5.00E-05	1.80E-05	1.00E-05	2.60E-05	2.40E-05	2.40E-05	1.90E-05	3.30E-05	3.80E-05	3.30E-05	2.10E-05	-
Indium (In)	7440-74-6	-	-	9.30E-06	8.22E-06	1.43E-05	1.03E-05	9.35E-06	8.64E-06	2.00E-05	2.89E-05	2.52E-05	2.16E-05	1.19E-05	1.14E-05	2.02E-05	1.09E-05	1.11E-05	3.47E-05	1.22E-05	6.94E-06	1.78E-05	1.64E-05	1.65E-05	1.32E-05	2.27E-05	2.59E-05	2.29E-05	1.43E-05	-
Potassium (K)	7440-09-7	-	-	7.68E+00	6.80E+00	1.22E+01	9.07E+00	7.73E+00	7.13E+00	1.65E+01	2.37E+01	2.06E+01	1.76E+01	1.03E+01	1.09E+01	1.94E+01	1.05E+01	9.72E+00	2.85E+01	1.17E+01	5.82E+00	1.70E+01	1.35E+01	1.36E+01	1.12E+01	2.18E+01	2.50E+01	2.22E+01	1.22E+01	-
Lanthanum (La)	7439-91-0	-	-	1.10E-02	1.29E-02	2.12E-02	1.85E-02	1.10E-02	1.02E-02	2.36E-02	3.52E-02	2.92E-02	3.40E-02	1.82E-02	2.20E-02	4.00E-02	2.18E-02	2.01E-02	4.44E-02	2.41E-02	1.16E-02	3.53E-02	1.91E-02	1.94E-02	2.23E-02	4.51E-02	5.26E-02	4.66E-02	2.12E-02	-
Lithium (Li)	7439-93-2	2	0	1.39E-02	1.23E-02	2.15E-02	1.54E-02	1.40E-02	1.29E-02	2.99E-02	4.32E-02	3.76E-02	3.23E-02	1.78E-02	1.71E-02	3.02E-02	1.63E-02	1.65E-02	5.19E-02	1.82E-02	1.04E-02	2.65E-02	2.45E-02	2.46E-02	1.97E-02	3.39E-02	3.87E-02	3.42E-02	2.15E-02	1%
Lutetium (Lu)	7439-94-3	-	-	1.44E-04	1.27E-04	2.21E-04	1.59E-04	1.44E-04	1.33E-04	3.09E-04	4.45E-04	3.89E-04	3.34E-04	1.83E-04	1.76E-04	3.11E-04	1.68E-04	1.71E-04	5.36E-04	1.88E-04	1.07E-04	2.74E-04	2.53E-04	2.54E-04	2.04E-04	3.50E-04	3.99E-04	3.53E-04	2.21E-04	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	24	6	1.40E+01	1.30E+01	1.83E+01	1.48E+01	1.40E+01	1.34E+01	2.32E+01	3.07E+01	2.76E+01	2.46E+01	1.61E+01	1.57E+01	2.32E+01	1.53E+01	1.55E+01	3.58E+01	1.63E+01	1.19E+01	2.11E+01	2.01E+01	2.01E+01	1.72E+01	2.53E+01	2.80E+01	2.55E+01	1.83E+01	76%
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	-	8.83E-02	8.79E-02	1.69E-01	1.23E-01	8.98E-02	8.21E-02	1.93E-01	2.64E-01	2.46E-01	2.11E-01	1.16E-01	1.11E-01	1.97E-01	1.06E-01	1.08E-01	3.39E-01	1.19E-01	6.77E-02	1.73E-01	1.60E-01	1.61E-01	1.29E-01	2.21E-01	2.53E-01	2.23E-01	1.40E-01	-
Molybdenum (Mo)	7439-98-7	-	-	3.14E-03	2.79E-03	5.22E-03	3.40E-03	3.16E-03	2.91E-03	6.74E-03	9.60E-03	8.31E-03	7.05E-03	4.48E-03	2.72E-03	5.66E-03	2.92E-03	3.95E-03	1.15E-02	2.83E-03	2.43E-03	5.56E-03	5.46E-03	5.55E-03	4.79E-03	4.83E-03	5.28E-03	7.18E-03	5.22E-03	-
Sodium (Na)	7440-23-5	-	-	1.56E+01	1.38E+01	2.41E+01	1.72E+01	1.57E+01	1.45E+01	3.35E+01	4.83E+01	4.21E+01	3.62E+01	1.99E+01	1.98E+01	3.51E+01	1.90E+01	1.85E+01	5.81E+01	2.12E+01	1.16E+01	3.09E+01	2.74E+01	2.75E+01	2.21E+01	3.95E+01	4.52E+01	4.00E+01	2.41E+01	-
Niobium (Nb)	7440--03-1	-	-	3.11E-03	2.75E-03	4.80E-03	3.44E-03	3.13E-03	2.89E-03	6.69E-03	9.65E-03	8.42E-03	7.23E-03	3.97E-03	3.82E-03	6.74E-03	3.64E-03	3.70E-03	1.16E-02	4.07E-03	2.32E-03	5.94E-03	5.47E-03	5.50E-03	4.41E-03	7.58E-03	8.65E-03	7.65E-03	4.80E-03	-
Nickel (Ni)	7440-02-0	-	-	8.75E-03	1.17E-02	1.91E-02	1.67E-02	8.80E-03	8.05E-03	1.89E-02	3.15E-02	2.69E-02	3.05E-02	1.65E-02	2.00E-02	3.62E-02	1.97E-02	1.82E-02	4.08E-02	2.17E-02	1.05E-02	3.18E-02	1.73E-02	1.72E-02	2.01E-02	4.07E-02	4.77E-02	4.23E-02	1.91E-02	-
Phosphorus (P) (Note 1)	7723-14-0	-	-	1.16E-01	8.07E-02	2.00E-01	1.84E-01	1.17E-01	1.11E-01	2.15E-01	3.89E-01	2.52E-01	3.00E-01	1.59E-01	1.44E-01	2.65E-01	1.50E-01	2.80E-01	5.01E-01	1.45E-01	1.20E-01	2.64E-01	2.30E-01	1.91E-01	2.04E-01	2.89E-01	3.29E-01	4.43E-01	2.00E-01	-
Lead (Pb)	7439-92-1	-	-	8.19E-03	7.43E-03	1.30E-02	8.65E-03	8.31E-03	7.58E-03	1.71E-02	2.57E-02	2.19E-02	1.80E-02	1.18E-02	7.71E-03	1.67E-02	7.57E-03	9.82E-03	3.02E-02	7.78E-03	6.35E-03	1.41E-02	1.38E-02	1.40E-02	1.31E-02	1.44E-02	1.61E-02	1.76E-02	1.30E-02	-
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	4.11E-02	3.84E-02	8.34E-02	4.65E-02	4.14E-02	3.82E-02	8.85E-02	1.28E-01	1.11E-01	1.16E-01	5.66E-02	5.05E-02	1.28E-01	5.21E-02	4.89E-02	1.54E-01	5.38E-02	3.07E-02	7.85E-02	7.23E-02	7.28E-02	5.84E-02	1.00E-01	1.14E-01	1.01E-01	6.34E-02	-
Sulphur (S)	7704-34-9	-	-	1.61E+00	1.82E+00	2.97E+00	2.59E+00	1.62E+00	1.48E+00	3.44E+00	4.93E+00	4.33E+00	4.74E+00	2.58E+00	3.11E+00	5.57E+00	3.03E+00	2.80E+00	6.30E+00	3.35E+00	1.62E+00	4.90E+00	2.86E+00	2.83E+00	3.09E+00	6.26E+00	7.30E+00	6.48E+00	2.97E+00	-
Antimony (Sb)	7440-36-0	-	-	3.05E-03	2.72E-03	5.47E-03	3.23E-03	3.07E-03	2.82E-03	6.54E-03	9.17E-03	8.16E-03	6.58E-03	4.85E-03	2.62E-03	5.86E-03	2.87E-03	4.24E-03	1.09E-02	3.05E-03	2.46E-03	5.44E-03	5.40E-03	5.38E-03	5.01E-03	4.70E-03	5.11E-03	7.91E-03	5.47E-03	-
Scandium (Sc)	7440-20-2	-	-	7.26E-03	6.88E-03	1.16E-02	9.81E-03	7.30E-03	6.74E-03	1.56E-02	2.24E-02	1.94E-02	1.85E-02	9.80E-03	1.17E-02	2.10E-02	1.14E-02	1.06E-02	2.69E-02	1.27E-02	6.13E-03	1.85E-02	1.27E-02	1.28E-02	1.16E-02	2.37E-02	2.74E-02	2.43E-02	1.16E-02	-
Selenium (Se)	7782-49-2	2	0.15	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.51E-01	1.51E-01	1.51E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.51E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.50E-01	1.51E-01	1.51E-01	1.50E-01	1.50E-01	8%
Tin (Sn)	7440-31-5	-	-	4.99E-03	4.42E-03	7.70E-03	5.52E-03	5.02E-03	4.64E-03	1.07E-02	1.55E-02	1.35E-02	1.16E-02	6.38E-03	6.13E-03	1.08E-02	5.85E-03	5.94E-03	1.87E-02	6.53E-03	3.73E-03	9.53E-03	8.78E-03	8.84E-03	7.09E-03	1.22E-02	1.39E-02	1.23E-02	7.70E-03	-
Strontium (Sr)	7440-24-6	-	-	1.64E-01	1.44E-01	2.54E-01	1.83E-01	1.65E-01	1.52E-01	3.55E-01	5.07E-01	4.43E-01	3.84E-01	2.06E-01	1.42E-01	2.64E-01	1.52E-01	1.96E-01	6.12E-01	1.49E-01	1.22E-01	2.90E-01	2.90E-01	2.92E-01	2.28E-01	2.52E-01	2.79E-01	3.32E-01	2.54E-01	-
Tantalum (Ta)	7440-25-7	-	-	5.08E-04	4.64E-04	5.62E-04	5.11E-04	4.72E-04	4.26E-04	1.09E-03	1.58E-03	1.38E-03	1.18E-03	6.49E-04	6.22E-04	1.19E-03	5.95E-04	6.04E-04	1.90E-03	5.63E-04	3.79E-04	9.70E-04	8.94E-04	8.89E-04	7.21E-04	1.24E-03	1.41E-03	1.25E-03	7.84E-04	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	3.33E-04	2.94E-04	5.13E-04	3.68E-04	3.35E-04	3.09E-04	7.17E-04	1.03E-03	9.01E-04	7.74E-04	4.25E-04	4.08E-04	7.22E-04	3.90E-04	3.96E-04	1.24E-03	4.35E-04	2.48E-04	6.36E-04	5.86E-04	5.89E-04	4.73E-04	8.12E-04	9.26E-04	8.19E-04	5.13E-04	-
Tellurium (Te)	13494-80-9	1	0	1.10E-04	9.70E-05	1.69E-04	1.22E-04	1.10E-04	1.02E-04	2.36E-04	3.41E-04	2.97E-04	2.55E-04	1.40E-04	1.35E-04	2.38E-04	1.29E-04	1.31E-04	4.10E-04	1.44E-04	8.20E-05	2.10E-04	1.93E-04	1.94E-04	1.56E-04	2.68E-04	3.06E-04	2.70E-04	1.69E-04	0%
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	6.43E-01	7.32E-01	1.28E+00	1.03E+00	6.47E-01	5.91E-01	1.39E+00	1.97E+00	2.05E+00	1.92E+00	1.23E+00	1.25E+00	2.23E+00	1.21E+00	1.12E+00	2.87E+00	1.34E+00	6.46E-01	1.96E+00	1.33E+00	1.10E+00	1.27E+00	2.50E+00	2.92E+00	2.59E+00	1.28E+00	-
Thallium (Tl)	7440-28-0	-	-	5.47E-04	4.84E-04	8.44E-04	6.05E-04	5.50E-04	5.08E-04	1.18E-03	1.70E-03	1.48E-03	1.27E-03	6.99E-04	6.71E-04	1.19E-03	6.41E-04	6.51E-04	2.04E-03	7.16E-04	4.08E-04	1.05E-03	9.63E-04	9.68E-04	7.77E-04	1.33E-03	1.52E-03	1.35E-03	8.44E-04	-
Uranium (U)	7440-61-1	-	-	7.66E-04	6.77E-04	1.18E-03	8.47E-04	7.70E-04	7.11E-04	1.65E-03	2.38E-03	2.07E-03	1.78E-03	9.78E-04	9.40E-04	1.66E-03	8.97E-04	9.11E-04	2.86E-03	1.00E-03	5.71E-04	1.46E-03	1.35E-03	1.36E-03	1.09E-03	1.87E-03	2.13E-03	1.88E-03	1.18E-03	-
Vanadium (v)	7440-62-2	-	-	6.55E-02	5.81E-02	1.06E-01	8.10E-02	6.59E-02	6.08E-02	1.41E-01	2.02E-01	1.75E-01	1.54E-01	8.99E-02	9.71E-02	1.73E-01	9.38E-02	8.69E-02	2.42E-01	1.04E-01	5.04E-02	1.52E-01	1.15E-01	1.16E-01	9.74E-02	1.95E-01	2.24E-01	1.99E-01	1.06E-01	-
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	1.48E-02	1.31E-02	2.35E-02	1.62E-02	1.49E-02	1.37E-02	3.18E-02	4.57E-02	3.97E-02	3.40E-02	1.97E-02	1.29E-02	2.57E-02	1.37E-02	1.77E-02	5.49E-02	1.33E-02	1.12E-02	2.61E-02	2.59E-02	2.62E-02	2.16E-02	2.28E-02	2.49E-02	3.13E-02	2.35E-02	-
Yttrium (Y) and Compounds (as Y)	7440-65-5	-	-	8.22E-03	7.27E-03	1.27E-02	9.09E-03	8.26E-03	7.63E-03	1.77E-02	2.55E-02	2.22E-02	1.91E-02	1.05E-02	1.01E-02	1.78E-02	9.63E-03	9.77E-03	3.07E-02	1.07E-02	6.13E-03	1.57E-02	1.45E-02	1.45E-02	1.17E-02	2.00E-02	2.29E-02	2.02E-02	1.27E-02	-
Ytterbium (Yb)	7440-64-4	-	-	9.48E-04	8.38E-04	1.46E-03	1.05E-03	9.53E-04	8.81E-04	2.04E-03	2.94E-03	2.57E-03	2.20E-03	1.21E-03	1.16E-03	2.06E-03	1.11E-03	1.13E-03	3.54E-03	1.24E-03	7.07E-04	1.81E-03	1.67E-03	1.68E-03	1.35E-03	2.31E-03	2.64E-03	2.33E-03	1.46E-03	-
Zinc (Zn)	7440-66-6	-	-	6.25E-02	5.56E-02	1.10E-01	6.67E-02	6.29E-02	5.78E-02	1.34E-01	1.89E-01	1.63E-01	1.37E-01	9.62E-02	5.38E-02	1.18E-01	5.85E-02	8.38E-02	2.25E-01	6.06E-02	4.97E-02	1.11E-01	1.08E-01	1.10E-01	1.00E-01	9.63E-02	1.05E-01	1.56E-01	1.10E-01	-
Zirconium (Zr)	7440-67-7	-	-	5.15E-02	4.55E-02	7.94E-02	5.69E-02	5.18E-02	4.78E-02	1.11E-01	1.60E-01	1.39E-01	1.20E-01	6.58E-02	6.32E-02	1.12E-01	6.03E-02	6.12E-02	1.92E-01	6.73E-02	3.84E-02	9.83E-02	9.05E-02	9.11E-02	7.31E-02	1.25E-01	1.43E-01	1.27E-01	7.94E-02	-
Silicon Dioxide (SiO2)	7631-86-9	-	-	3.37E+02	2.98E+02	5.21E+02	3.73E+02	3.39E+02	3.13E+02	7.26E+02	1.05E+03	9.13E+02	7.84E+02	4.32E+02	4.24E+02	7.52E+02	4.06E+02	4.01E+02	1.26E+03	4.53E+02	2.52E+02	6.62E+02	5.94E+02	5.97E+02	4.80E+02	8.45E+02	9.66E+02	8.54E+02	5.21E+02	-
Aluminum Oxide (Al2O3)	1344-28-1	-	-	8.10E+01	7.16E+01	1.25E+02	8.96E+01	8.15E+01	7.53E+01	1.74E+02	2.51E+02	2.19E+02	1.88E+02	1.03E+02	9.82E+01	1.73E+02	9.36E+01	9.64E+01	3.03E+02	1.04E+02	6.04E+01	1.53E+02	1.43E+02	1.43E+02	1.15E+02	1.93E+02	2.22E+02	1.96E+02	1.25E+02	-
Iron Oxide (Fe2O3)	1309-37-1	-	-	3.56E+01	3.15E+01	5.50E+01	3.94E+01	3.58E+01	3.31E+01	7.67E+01	1.11E+02	9.65E+01	8.29E+01	4.55E+01	4.30E+01	7.60E+01	4.10E+01	4.24E+01	1.33E+02	4.58E+01	2.66E+01	6.98E+01	6.27E+01	6.31E+01	5.06E+01	8.54E+01	9.73E+01	8.60E+01	5.50E+01	-
Magnesium Oxide (MgO)	1309-48-4	-	-	1.45E+01	1.29E+01	2.25E+01	1.61E+01	1.46E+01	1

Table F-6: Maximum Predicted 1-Hour Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	34000	600	8.35E+02	8.92E+02	1.16E+03	9.81E+02	8.36E+02	8.60E+02	1.08E+03	9.91E+02	1.54E+03	9.64E+02	1.18E+03	7.99E+02	8.23E+02	9.10E+02	1.18E+03	2.20E+03	1.00E+03	1.03E+03	1.01E+03	1.31E+03	1.23E+03	1.40E+03	1.38E+03	1.17E+03	1.89E+03	1.16E+03	3%
Sulphur Dioxide (SO2)	7446-09-5	-	-	2.62E+01	1.39E+01	4.28E+01	4.22E+01	2.64E+01	2.41E+01	3.24E+01	4.59E+01	3.77E+01	6.40E+01	3.88E+01	1.44E+01	8.14E+01	3.43E+01	3.12E+01	6.80E+01	1.16E+01	1.33E+01	5.25E+01	2.75E+01	7.15E+01	5.04E+01	3.02E+01	7.93E+01	4.55E+01	4.28E+01	-
Hydrocarbons	<<NMHC>>	-	-	6.71E+00	2.66E+00	6.40E+00	9.02E+00	6.76E+00	5.70E+00	1.41E+01	1.26E+01	9.13E+00	6.04E+00	6.86E+00	1.99E+00	4.31E+00	7.21E+00	1.26E+01	1.82E+01	6.15E+00	6.35E+00	2.23E+01	7.75E+00	5.90E+00	7.96E+00	8.00E+00	1.18E+01	1.40E+01	9.02E+00	-
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	414	150	3.80E+02	2.83E+02	3.67E+02	3.96E+02	3.81E+02	3.50E+02	5.35E+02	4.72E+02	4.40E+02	3.66E+02	3.87E+02	2.48E+02	2.98E+02	3.65E+02	4.61E+02	6.27E+02	3.54E+02	3.51E+02	6.27E+02	3.71E+02	3.98E+02	4.06E+02	3.94E+02	4.45E+02	5.33E+02	3.96E+02	96%
1,3-butadiene	106-99-0	-	-	5.46E-03	4.92E-03	4.48E-03	5.54E-03	5.50E-03	4.66E-03	1.30E-02	9.14E-03	1.06E-02	5.97E-03	4.58E-03	3.69E-03	5.61E-03	5.51E-03	6.84E-03	1.67E-02	3.99E-03	3.61E-03	1.23E-02	7.86E-03	9.38E-03	4.68E-03	5.73E-03	7.23E-03	7.66E-03	5.54E-03	-
Acenaphthene	83-32-9	-	-	1.99E-03	1.62E-03	1.63E-03	2.13E-03	2.00E-03	1.69E-03	4.65E-03	3.38E-03	3.59E-03	2.04E-03	1.72E-03	1.21E-03	1.84E-03	1.81E-03	2.69E-03	5.94E-03	1.51E-03	1.41E-03	4.82E-03	2.57E-03	3.09E-03	1.68E-03	1.88E-03	2.77E-03	3.01E-03	2.13E-03	-
Acenaphthylene	208-96-8	-	-	3.93E-03	3.23E-03	3.24E-03	4.16E-03	3.95E-03	3.35E-03	9.17E-03	6.73E-03	7.24E-03	4.04E-03	3.41E-03	2.41E-03	3.69E-03	3.60E-03	5.29E-03	1.19E-02	2.99E-03	2.77E-03	9.49E-03	5.15E-03	6.29E-03	3.30E-03	3.79E-03	5.47E-03	5.92E-03	4.16E-03	-
Acetaldehyde	75-07-0	-	-	3.08E-01	2.76E-01	2.53E-01	3.12E-01	3.10E-01	2.63E-01	7.31E-01	5.18E-01	5.97E-01	3.35E-01	2.59E-01	2.07E-01	3.16E-01	3.10E-01	3.86E-01	9.45E-01	2.25E-01	2.04E-01	6.94E-01	4.42E-01	5.30E-01	2.63E-01	3.22E-01	4.08E-01	4.32E-01	3.12E-01	-
Acrolein	107-02-8	-	-	5.64E-02	5.03E-02	4.61E-02	5.76E-02	5.67E-02	4.81E-02	1.34E-01	9.42E-02	1.08E-01	6.09E-02	4.73E-02	3.77E-02	5.72E-02	5.62E-02	7.10E-02	1.71E-01	4.12E-02	3.74E-02	1.28E-01	8.00E-02	9.49E-02	4.77E-02	5.82E-02	7.48E-02	7.95E-02	5.76E-02	-
Anthracene	120-12-7	-	-	3.67E-04	2.87E-04	3.02E-04	4.01E-04	3.70E-04	3.13E-04	8.51E-04	6.32E-04	6.45E-04	3.73E-04	3.24E-04	2.13E-04	3.25E-04	3.17E-04	5.14E-04	1.09E-03	2.84E-04	2.68E-04	9.20E-04	4.53E-04	5.50E-04	3.21E-04	3.31E-04	5.23E-04	5.74E-04	4.01E-04	-
Benzene	71-43-2	-	-	1.87E-01	1.42E-01	1.54E-01	2.05E-01	1.88E-01	1.59E-01	4.29E-01	3.24E-01	3.26E-01	1.88E-01	1.66E-01	1.05E-01	1.61E-01	1.57E-01	2.66E-01	5.57E-01	1.47E-01	1.38E-01	4.76E-01	2.25E-01	2.78E-01	1.66E-01	1.67E-01	2.70E-01	2.97E-01	2.05E-01	-
Benzo(a)anthracene	56-55-3	-	-	6.40E-05	3.50E-05	5.60E-05	7.90E-05	6.40E-05	5.40E-05	1.39E-04	1.15E-04	9.10E-05	6.00E-05	6.10E-05	2.50E-05	3.90E-05	6.20E-05	1.07E-04	1.80E-04	5.50E-05	5.40E-05	1.90E-04	6.70E-05	7.10E-05	6.70E-05	6.70E-05	1.03E-04	1.19E-04	7.90E-05	-
Benzo(a)pyrene	50-32-8	-	-	2.35E-05	1.19E-05	2.13E-05	2.97E-05	2.36E-05	2.00E-05	5.08E-05	4.30E-05	3.20E-05	2.19E-05	2.31E-05	8.55E-06	1.41E-05	2.35E-05	4.08E-05	6.55E-05	2.06E-05	2.07E-05	7.24E-05	2.55E-05	2.45E-05	2.57E-05	2.57E-05	3.90E-05	4.54E-05	2.97E-05	-
Benzo(b+k)fluoranthene	205-99-2	-	-	8.20E-05	3.40E-05	7.70E-05	1.09E-04	8.20E-05	7.00E-05	1.73E-04	1.53E-04	1.10E-04	7.40E-05	8.30E-05	2.40E-05	5.20E-05	8.70E-05	1.51E-04	2.23E-04	7.40E-05	7.60E-05	2.68E-04	9.40E-05	7.50E-05	9.60E-05	9.60E-05	1.42E-04	1.68E-04	1.09E-04	-
Benzo(g,h,i)perylene	191-24-2	-	-	5.40E-05	2.90E-05	4.80E-05	6.70E-05	5.40E-05	4.60E-05	1.17E-04	9.80E-05	7.50E-05	5.00E-05	5.20E-05	2.10E-05	3.20E-05	5.30E-05	9.10E-05	1.51E-04	4.60E-05	4.70E-05	1.62E-04	5.70E-05	5.80E-05	5.70E-05	5.70E-05	8.80E-05	1.02E-04	6.70E-05	-
Chrysene	218-01-9	-	-	1.09E-04	4.00E-05	1.04E-04	1.46E-04	1.10E-04	9.20E-05	2.30E-04	2.07E-04	1.48E-04	1.00E-04	1.08E-04	3.20E-05	6.90E-05	1.16E-04	2.03E-04	2.90E-04	9.70E-05	1.01E-04	3.53E-04	1.25E-04	9.10E-05	1.28E-04	1.29E-04	1.89E-04	2.22E-04	1.46E-04	-
Fluoranthene	206-44-0	-	-	6.87E-04	4.78E-04	5.70E-04	7.84E-04	6.91E-04	5.86E-04	1.56E-03	1.21E-03	1.14E-03	6.80E-04	6.29E-04	3.52E-04	5.42E-04	6.00E-04	1.03E-03	2.02E-03	5.55E-04	5.34E-04	1.85E-03	7.54E-04	9.45E-04	6.48E-04	6.38E-04	1.03E-03	1.15E-03	7.84E-04	-
Fluorene	86-73-7	-	-	3.03E-03	2.27E-03	2.49E-03	3.37E-03	3.05E-03	2.58E-03	6.98E-03	5.24E-03	5.17E-03	3.05E-03	2.70E-03	1.68E-03	2.56E-03	2.53E-03	4.35E-03	8.91E-03	2.38E-03	2.26E-03	7.78E-03	3.58E-03	4.36E-03	2.72E-03	2.71E-03	4.39E-03	4.86E-03	3.37E-03	-
Formaldehyde	50-00-0	-	-	2.54E-01	2.28E-01	2.09E-01	2.56E-01	2.56E-01	2.17E-01	6.02E-01	4.29E-01	4.99E-01	2.78E-01	2.15E-01	1.71E-01	2.62E-01	2.56E-01	3.19E-01	7.89E-01	1.87E-01	1.69E-01	5.74E-01	3.66E-01	4.43E-01	2.18E-01	2.69E-01	3.38E-01	3.57E-01	2.56E-01	-
Phenanthrene	85-01-8	-	-	5.95E-03	3.91E-03	5.05E-03	6.99E-03	5.99E-03	5.07E-03	1.34E-02	1.05E-02	9.35E-03	5.82E-03	5.50E-03	2.87E-03	4.37E-03	5.35E-03	9.23E-03	1.71E-02	4.88E-03	4.75E-03	1.65E-02	6.10E-03	7.61E-03	5.80E-03	5.74E-03	9.10E-03	1.03E-02	6.99E-03	-
Pyrene	129-00-0	-	-	6.50E-04	4.54E-04	5.40E-04	7.44E-04	6.55E-04	5.54E-04	1.48E-03	1.14E-03	1.07E-03	6.44E-04	5.93E-04	3.35E-04	5.14E-04	5.67E-04	9.76E-04	1.90E-03	5.24E-04	5.04E-04	1.74E-03	7.14E-04	8.88E-04	6.12E-04	6.03E-04	9.73E-04	1.09E-03	7.44E-04	-
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	-	3.13E+00	1.82E+00	2.75E+00	3.83E+00	3.15E+00	2.66E+00	6.91E+00	5.62E+00	4.56E+00	2.99E+00	2.99E+00	1.33E+00	2.05E+00	2.97E+00	5.14E+00	8.82E+00	2.64E+00	2.63E+00	9.15E+00	3.25E+00	3.60E+00	3.23E+00	3.22E+00	4.99E+00	5.73E+00	3.83E+00	-
Elemental Carbon (from diesel exhaust)	7440-44-0	1	0	2.04E+00	1.19E+00	1.81E+00	2.51E+00	2.05E+00	1.74E+00	4.50E+00	3.65E+00	2.97E+00	1.94E+00	1.94E+00	8.62E-01	1.34E+00	1.93E+00	3.35E+00	5.74E+00	1.72E+00	1.71E+00	5.95E+00	2.11E+00	2.34E+00	2.10E+00	2.09E+00	3.25E+00	3.73E+00	2.51E+00	251%
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	6.00E-05	3.40E-05	5.20E-05	7.30E-05	6.00E-05	5.10E-05	1.31E-04	1.07E-04	8.70E-05	5.70E-05	5.70E-05	2.50E-05	3.90E-05	5.70E-05	9.80E-05	1.69E-04	5.10E-05	5.00E-05	1.75E-04	6.20E-05	6.90E-05	6.20E-05	6.10E-05	9.50E-05	1.10E-04	7.30E-05	-
Reagents																														
Calcium Oxide	1305-78-8	-	-	3.36E+01	2.74E+01	4.56E+01	3.84E+01	3.41E+01	2.80E+01	5.57E+01	9.63E+01	7.85E+01	5.96E+01	4.17E+01	2.64E+01	7.42E+01	2.61E+01	3.06E+01	1.08E+02	2.68E+01	2.23E+01	4.99E+01	4.51E+01	5.33E+01	5.16E+01	4.95E+01	5.53E+01	5.15E+01	4.56E+01	-
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	1.01E-01	5.38E-02	1.66E-01	1.64E-01	1.02E-01	9.33E-02	1.26E-01	1.77E-01	9.87E-02	2.48E-01	9.42E-02	5.57E-02	3.16E-01	1.33E-01	1.21E-01	1.35E-01	4.14E-02	4.62E-02	2.04E-01	1.02E-01	2.77E-01	1.57E-01	1.17E-01	2.94E-01	1.77E-01	1.66E-01	-
Sodium sulphite	7757-83-7	-	-	7.25E-01	3.84E-01	1.18E+00	1.17E+00	7.31E-01	6.67E-01	8.97E-01	1.26E+00	7.05E-01	1.77E+00	6.73E-01	3.98E-01	2.25E+00	9.52E-01	8.65E-01	9.67E-01	2.96E-01	3.30E-01	1.45E+00	7.28E-01	1.98E+00	1.12E+00	8.38E-01	2.10E+00	1.26E+00	1.18E+00	-
Zinc sulphate	7733-02-0	-	-	3.48E-02	1.85E-02	5.70E-02	5.62E-02	3.51E-02	3.20E-02	4.31E-02	6.07E-02	3.39E-02	8.53E-02	3.24E-02	1.91E-02	1.08E-01	4.58E-02	4.16E-02	4.65E-02	1.42E-02	1.59E-02	6.99E-02	3.50E-02	9.53E-02	5.38E-02	4.03E-02	1.01E-01	6.06E-02	5.70E-02	-
Sodium trithiocarbonate	534-18-9	-	-	4.18E-02	2.22E-02	6.84E-02	6.74E-02	4.22E-02	3.85E-02	5.18E-02	7.29E-02	4.07E-02	1.02E-01	3.88E-02	2.29E-02	1.30E-01	5.49E-02	4.99E-02	5.58E-02	1.71E-02	1.90E-02	8.39E-02	4.20E-02	1.14E-01	6.46E-02	4.83E-02	1.21E-01	7.28E-02	6.84E-02	-
Magnafloc 10	N/A	-	-	1.39E-01	7.38E-02	2.28E-01	2.25E-01	1.40E-01	1.28E-01	1.72E-01	2.43E-01	1.36E-01	3.41E-01	1.29E-01	7.65E-02	4.34E-01	1.83E-01	1.66E-01	1.86E-01	5.69E-02	6.35E-02	2.80E-01	1.40E-01	3.81E-01	2.15E-01	1.61E-01	4.03E-01	2.43E-01	2.28E-01	-

Notes:

1 - Individual model run with plume depletion

2 - Individual model run - with OLM

Table F-7: Maximum Predicted 24-Hour Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Particulates																														
TSP (Note 1)	<<PM>>	120	40	55.3	57.2	79.5	83.3	55.4	54.5	80.6	96.5	80.2	116.3	63.3	71.9	107.2	84.9	114.2	128.9	76.0	74.9	115.8	80.4	102.9	72.6	111.6	145.4	139.3	83.3	69%
PM10	<<PM10>>	50	13.1	28.7	27.7	38.7	41.0	28.9	26.2	40.8	59.5	48.2	58.6	33.7	48.0	73.0	49.7	59.7	77.3	44.8	34.3	63.9	37.8	48.0	34.3	54.0	94.9	91.9	41.0	82%
PM2.5	<<PM2.5>>	30	15	17.7	17.3	18.9	19.4	17.7	17.2	19.3	21.8	20.9	22.8	18.2	20.2	23.9	20.6	23.2	26.0	19.8	18.6	22.8	19.9	21.3	18.2	21.5	27.2	26.8	19.4	65%
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	-	2.60E-04	2.92E-04	2.89E-04	3.22E-04	3.26E-04	2.92E-04	2.89E-04	3.20E-04	3.34E-04	3.33E-04	3.61E-04	3.05E-04	3.08E-04	3.81E-04	3.13E-04	3.70E-04	3.94E-04	3.06E-04	3.11E-04	3.66E-04	3.27E-04	3.52E-04	3.03E-04	3.46E-04	3.74E-04	3.63E-04	3.26E-04	-
Aluminum (Al)	7429-90-5	-	0.42	4.00E+00	3.08E+00	6.68E+00	7.07E+00	4.04E+00	3.38E+00	5.98E+00	9.16E+00	8.22E+00	1.01E+01	4.31E+00	6.36E+00	1.03E+01	6.47E+00	1.10E+01	1.46E+01	5.55E+00	5.59E+00	1.23E+01	6.55E+00	9.16E+00	5.24E+00	9.59E+00	1.36E+01	1.29E+01	7.07E+00	-
Arsenic (As)	7440-38-2	-	1.26E-03	2.24E-03	2.21E-03	3.25E-03	3.36E-03	2.25E-03	2.21E-03	3.24E-03	3.70E-03	3.50E-03	4.62E-03	2.81E-03	2.88E-03	5.66E-03	2.99E-03	4.88E-03	5.40E-03	2.74E-03	2.90E-03	4.44E-03	3.50E-03	4.31E-03	2.61E-03	3.94E-03	5.10E-03	4.57E-03	3.36E-03	-
Gold (Au)	7440-57-5	1.25	-	5.61E-06	5.46E-06	1.12E-05	1.19E-05	5.65E-06	5.40E-06	1.14E-05	1.40E-05	1.22E-05	1.93E-05	9.06E-06	9.34E-06	2.62E-05	1.01E-05	2.06E-05	2.27E-05	8.41E-06	9.25E-06	1.76E-05	1.29E-05	1.75E-05	7.61E-06	1.51E-05	2.21E-05	1.87E-05	1.19E-05	BSL
Boron (B)	7440-42-8	-	2.60E-02	3.09E-02	2.96E-02	3.44E-02	3.50E-02	3.10E-02	3.01E-02	3.36E-02	3.84E-02	3.67E-02	3.92E-02	3.13E-02	3.46E-02	4.03E-02	3.48E-02	4.04E-02	4.54E-02	3.35E-02	3.30E-02	4.19E-02	3.43E-02	3.78E-02	3.26E-02	3.83E-02	4.51E-02	4.43E-02	3.50E-02	-
Barium (Ba)	7440-39-3	-	8.60E-03	2.66E-02	2.25E-02	3.87E-02	4.06E-02	2.68E-02	2.35E-02	3.62E-02	5.56E-02	4.74E-02	5.68E-02	2.79E-02	4.19E-02	6.52E-02	4.32E-02	5.98E-02	7.89E-02	3.82E-02	3.35E-02	6.59E-02	3.82E-02	5.07E-02	3.25E-02	5.27E-02	8.48E-02	8.16E-02	4.06E-02	-
Beryllium (Be)	7440-41-7	-	-	5.20E-05	4.10E-05	9.70E-05	1.04E-04	5.30E-05	4.30E-05	8.70E-05	1.16E-04	1.16E-04	1.48E-04	6.10E-05	7.60E-05	1.40E-04	8.40E-05	1.65E-04	2.12E-04	6.90E-05	8.00E-05	1.85E-04	9.60E-05	1.36E-04	7.20E-05	1.43E-04	1.85E-04	1.59E-04	1.04E-04	-
Bismuth (Bi)	7440-69-9	-	1.30E-03	1.39E-03	1.38E-03	1.49E-03	1.50E-03	1.39E-03	1.39E-03	1.47E-03	1.53E-03	1.51E-03	1.59E-03	1.42E-03	1.43E-03	1.60E-03	1.46E-03	1.63E-03	1.68E-03	1.44E-03	1.46E-03	1.65E-03	1.49E-03	1.57E-03	1.43E-03	1.57E-03	1.66E-03	1.61E-03	1.50E-03	-
Carbon (C)	7440-44-0	-	-	6.30E-02	4.67E-02	1.10E-01	1.17E-01	6.38E-02	5.22E-02	9.79E-02	1.55E-01	1.37E-01	1.70E-01	6.85E-02	1.06E-01	1.77E-01	1.08E-01	1.86E-01	2.49E-01	9.20E-02	9.05E-02	2.08E-01	1.08E-01	1.53E-01	8.46E-02	1.60E-01	2.36E-01	2.25E-01	1.17E-01	-
Calcium (Ca)	7440-70-2	-	0.68	2.15E+00	1.82E+00	3.39E+00	3.55E+00	2.17E+00	1.88E+00	3.06E+00	3.98E+00	3.93E+00	4.72E+00	2.35E+00	2.82E+00	4.43E+00	3.02E+00	5.27E+00	6.63E+00	2.61E+00	2.91E+00	5.84E+00	3.32E+00	4.44E+00	2.70E+00	4.65E+00	5.80E+00	5.12E+00	3.55E+00	-
Cadmium (Cd)	7440-43-9	-	2.60E-04	3.33E-04	3.31E-04	4.07E-04	4.16E-04	3.34E-04	3.30E-04	4.08E-04	4.42E-04	4.21E-04	5.10E-04	3.76E-04	3.81E-04	5.91E-04	3.90E-04	5.29E-04	5.59E-04	3.70E-04	3.82E-04	4.94E-04	4.27E-04	4.87E-04	3.60E-04	4.58E-04	5.46E-04	5.06E-04	4.16E-04	-
Cerium (Ce) and Compounds (as Ce)	7440-45-1	-	-	3.41E-03	2.55E-03	5.99E-03	6.37E-03	3.45E-03	2.82E-03	5.33E-03	8.25E-03	7.44E-03	9.20E-03	3.72E-03	5.57E-03	9.31E-03	5.66E-03	1.02E-02	1.35E-02	4.79E-03	4.95E-03	1.14E-02	5.87E-03	8.37E-03	4.60E-03	8.78E-03	1.23E-02	1.17E-02	6.37E-03	-
Cobalt (Co)	7440-48-4	-	-	9.90E-04	7.59E-04	1.75E-03	1.86E-03	1.00E-03	8.22E-04	1.59E-03	2.40E-03	2.17E-03	2.70E-03	1.14E-03	1.62E-03	2.74E-03	1.62E-03	3.00E-03	3.95E-03	1.37E-03	1.44E-03	3.24E-03	1.76E-03	2.48E-03	1.33E-03	2.52E-03	3.50E-03	3.33E-03	1.86E-03	-
Chromium (Cr) and Compounds (as Cr)	7440-47-3	-	6.00E-03	1.15E-02	1.27E-02	1.48E-02	1.80E-02	1.16E-02	1.07E-02	1.86E-02	2.54E-02	1.74E-02	2.48E-02	1.53E-02	2.17E-02	3.43E-02	2.34E-02	2.75E-02	2.87E-02	2.12E-02	1.58E-02	3.02E-02	1.46E-02	2.12E-02	1.62E-02	2.45E-02	4.57E-02	4.45E-02	1.80E-02	-
Cesium (Cs) and Compounds (as Ce)	7440-46-2	-	-	1.60E-04	1.19E-04	2.81E-04	2.99E-04	1.62E-04	1.32E-04	2.50E-04	3.87E-04	3.49E-04	4.32E-04	1.75E-04	2.62E-04	4.37E-04	2.65E-04	4.77E-04	6.35E-04	2.25E-04	2.32E-04	5.36E-04	2.76E-04	3.93E-04	2.16E-04	4.12E-04	5.76E-04	5.48E-04	2.99E-04	-
Copper (Cu)	7440-50-8	2.5	0.2	2.07E-01	2.07E-01	2.15E-01	2.16E-01	2.08E-01	2.07E-01	2.15E-01	2.19E-01	2.17E-01	2.25E-01	2.12E-01	2.12E-01	2.32E-01	2.13E-01	2.28E-01	2.32E-01	2.11E-01	2.13E-01	2.25E-01	2.17E-01	2.23E-01	2.10E-01	2.21E-01	2.29E-01	2.25E-01	2.16E-01	9%
Iron (Fe)	7439-89-6	-	0.22	2.25E+00	1.71E+00	3.69E+00	3.91E+00	2.27E+00	1.90E+00	3.36E+00	5.36E+00	4.62E+00	5.67E+00	2.40E+00	3.79E+00	6.22E+00	3.89E+00	6.13E+00	8.21E+00	3.34E+00	3.09E+00	6.78E+00	3.65E+00	5.09E+00	2.92E+00	5.28E+00	8.24E+00	7.88E+00	3.91E+00	-
Gallium (Ga)	7440-55-3	-	-	9.61E-04	7.15E-04	1.68E-03	1.79E-03	9.73E-04	7.95E-04	1.50E-03	2.35E-03	2.10E-03	2.59E-03	1.05E-03	1.60E-03	2.66E-03	1.63E-03	2.85E-03	3.81E-03	1.38E-03	1.39E-03	3.20E-03	1.65E-03	2.35E-03	1.29E-03	2.46E-03	3.53E-03	3.36E-03	1.79E-03	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	-	-	2.00E-04	1.50E-04	3.52E-04	3.74E-04	2.03E-04	1.65E-04	3.13E-04	4.84E-04	4.37E-04	5.40E-04	2.19E-04	3.27E-04	5.46E-04	3.32E-04	5.97E-04	7.94E-04	2.81E-04	2.91E-04	6.70E-04	3.45E-04	4.91E-04	2.70E-04	5.16E-04	7.20E-04	6.85E-04	3.74E-04	-
Mercury (Hg)	7439-97-6	-	6.40E-05	6.52E-05	6.49E-05	6.61E-05	6.62E-05	6.52E-05	6.50E-05	6.58E-05	6.68E-05	6.66E-05	6.72E-05	6.53E-05	6.59E-05	6.72E-05	6.59E-05	6.75E-05	6.87E-05	6.56E-05	6.57E-05	6.79E-05	6.60E-05	6.69E-05	6.56E-05	6.70E-05	6.82E-05	6.80E-05	6.62E-05	-
Indium (In)	7440-74-6	-	-	8.08E-07	6.04E-07	1.42E-06	1.51E-06	8.19E-07	6.68E-07	1.26E-06	1.96E-06	1.76E-06	2.18E-06	8.83E-07	1.32E-06	2.21E-06	1.34E-06	2.41E-06	3.21E-06	1.14E-06	1.17E-06	2.71E-06	1.39E-06	1.98E-06	1.09E-06	2.08E-06	2.91E-06	2.77E-06	1.51E-06	-
Potassium (K)	7440-09-7	-	0.13	8.15E-01	6.41E-01	1.30E+00	1.37E+00	8.23E-01	6.98E-01	1.19E+00	1.89E+00	1.62E+00	1.98E+00	8.63E-01	1.36E+00	2.21E+00	1.40E+00	2.12E+00	2.84E+00	1.21E+00	1.09E+00	2.34E+00	1.28E+00	1.77E+00	1.04E+00	1.84E+00	2.92E+00	2.79E+00	1.37E+00	-
Lanthanum (La)	7439-91-0	-	-	1.08E-03	1.01E-03	1.67E-03	1.93E-03	1.10E-03	9.11E-04	1.92E-03	3.20E-03	2.31E-03	3.10E-03	1.41E-03	2.41E-03	4.20E-03	2.58E-03	3.27E-03	4.14E-03	2.23E-03	1.44E-03	3.57E-03	1.66E-03	2.36E-03	1.49E-03	2.82E-03	5.76E-03	5.56E-03	1.93E-03	-
Lithium (Li)	7439-93-2	-	-	1.21E-03	9.03E-04	2.12E-03	2.26E-03	1.22E-03	9.99E-04	1.89E-03	2.93E-03	2.64E-03	3.26E-03	1.32E-03	1.98E-03	3.30E-03	2.01E-03	3.60E-03	4.80E-03	1.70E-03	1.76E-03	4.05E-03	2.08E-03	2.97E-03	1.63E-03	3.12E-03	4.35E-03	4.14E-03	2.26E-03	-
Lutetium (Lu)	7439-94-3	-	-	1.25E-05	9.32E-06	2.19E-05	2.33E-05	1.26E-05	1.03E-05	1.95E-05	3.02E-05	2.72E-05	3.37E-05	1.36E-05	2.04E-05	3.41E-05	2.07E-05	3.72E-05	4.95E-05	1.75E-05	1.81E-05	4.18E-05	2.15E-05	3.06E-05	1.68E-05	3.22E-05	4.49E-05	4.27E-05	2.33E-05	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.19	8.78E-01	7.05E-01	1.41E+00	1.48E+00	8.87E-01	7.58E-01	1.27E+00	1.86E+00	1.70E+00	2.06E+00	9.42E-01	1.31E+00	2.07E+00	1.32E+00	2.26E+00	2.94E+00	1.16E+00	1.19E+00	2.51E+00	1.38E+00	1.88E+00	1.12E+00	1.98E+00	2.67E+00	2.55E+00	1.48E+00	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	-	8.60E-03	1.64E-02	1.55E-02	2.19E-02	2.26E-02	1.65E-02	1.51E-02	2.17E-02	3.09E-02	2.64E-02	3.09E-02	1.83E-02	2.51E-02	3.66E-02	2.57E-02	3.23E-02	4.12E-02	2.33E-02	1.96E-02	3.27E-02	2.14E-02	2.67E-02	1.90E-02	2.80E-02	4.66E-02	4.51E-02	2.26E-02	-
Molybdenum (Mo)	7439-98-7	120	7.60E-04	1.00E-03	9.66E-04	1.24E-03	1.27E-03	1.00E-03	9.73E-04	1.19E-03	1.33E-03	1.30E-03	1.49E-03	1.07E-03	1.10E-03	1.49E-03	1.16E-03	1.58E-03	1.76E-03	1.10E-03	1.15E-03	1.65E-03	1.24E-03	1.44E-03	1.10E-03	1.45E-03	1.66E-03	1.54E-03	1.27E-03	0%
Sodium (Na)	7440-23-5	-	0.52	1.88E+00	1.53E+00	2.90E+00	3.05E+00	1.90E+00	1.65E+00	2.64E+00	3.87E+00	3.49E+00	4.20E+00	2.00E+00	2.80E+00	4.33E+00	2.85E+00	4.55E+00	5.92E+00	2.50E+00	2.48E+00	5.05E+00	2.85E+00	3.84E+00	2.36E+00	4.01E+00	5.59E+00	5.35E+00	3.05E+00	-
Niobium (Nb)	7440--03-1	-	-	2.70E-04	2.02E-04	4.75E-04	5.05E-04	2.74E-04	2.23E-04	4.22E-04	6.54E-04	5.90E-04	7.30E-04	2.95E-04	4.42E-04	7.38E-04	4.48E-04	8.06E-04	1.07E-03	3.80E-04	3.92E-04	9.05E-04	4.66E-04	6.63E-04	3.65E-04	6.96E-04	9.73E-04	9.25E-04	5.05E-04	-
Nickel (Ni)	7440-02-0	7.00E-02	5.00E-03	5.86E-03	5.90E-03	6.30E-03	6.67E-03	5.87E-03	5.72E-03	6.71E-03	7.75E-03	6.89E-03	7.61E-03	6.27E-03	7.15E-03	8.76E-03	7.30E-03	7.88E-03	8.42E-03	7.00E-03	6.29E-03	8.19E-03	6.26E-03	7.05E-03	6.34E-03	7.52E-03	1.02E-02	1.00E-02	6.67E-03	10%
Phosphorus (P)	7723-14-0	0.5	-	2.74E-02	2.14E-02	5.04E-02	5.36E-02	2.77E-02	2.25E-02	4.46E-02	6.12E-02	6.05E-02	7.59E-02	3.12E-02	3.99E-02	7.10E-02	4.36E-02	8.56E-02	1.11E-01	3.59E-02	4.16E-02	9.62E-02	4.94E-02	7.02E-02	3.76E-02	7.40E-02	9.55E-02	8.26E-02	5.36E-02	BSL
Lead (Pb)	7439-92-1	-	3.40E-03	4.07E-03	3.93E-03	4.61E-03	4.69E-03	4.08E-03	3.95E-03	4.51E-03	4.87E-03	4.85E-03	5.32E-03	4.19E-03	4.37E-03	5.34E-03	4.46E-03	5.47E-03	6.05E-03	4.27E-03	4.41E-03	5.69E-03	4.63E-03	5.15E-03	4.31E-03	5.16E-03	5.74E-03	5.38E-03	4.69E-03	-
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	4	0	3.58E-03	2.67E-03	6.28E-03	6.68E-03	3.62E-03	2.96E-03	5.59E-03	8.65E-03	7.80E-03	9.65E-03	3.91E-03	5.85E-03	9.76E-03	5.93E-03	1.07E-02	1.42E-02	5.02E-03	5.19E-03	1.20E-02	6.16E-03	8.77E-03	4.83E-03	9.21E-03	1.29E-02	1.22E-02	6.68E-03	0%
Sulphur (S)	7704-34-9	-	-	1.55E-01	1.42E-01	2.43E-01	2.71E-01	1.57E-01	1.31E-01	2.69E-01	4.55E-01	3.33E-01	4.48E-01	2.00E-01	3.40E-01	5.85E-01	3.59E-01	4.56E-01	5.98E-01	3.10E-01	2.01E-01	4.96E-01	2.48E-01	3.48E-01	2.07E-01	3.94E-01	8.00E-01	7.72E-01	2.71E-01	-
Antimony (Sb)	7440-36-0	-	1.26E-03	1.48E-03	1.46E-03	1.72E-03	1.75E-03	1.48E-03	1.47E-03	1.68E-03	1.81E-03	1.76E-03	1.98E-03	1.57E-03	1.59E-03	2.02E-03	1.64E-03	2.06E-03	2.19E-03	1.59E-03	1.64E-03	2.10E-03	1.73E-03	1.92E-03	1.57E-03	1.92E-03	2.12E-03	2.02E-03	1.75E-03	-
Scandium (Sc)	7440-20-2	-	-	6.73E-04	5.49E-04	1.11E-03	1.18E-03	6.81E-04	5.62E-04	1.04E-03	1.82E-03	1.45E-03	1.84E-03	7.62E-04	1.31E-03	2.24E-03	1.37E-03	1.89E-03	2.62E-03	1.18E-03	9.14E-04	2.09E-03	1.10E-03	1.56E-03	8.86E-04	1.61E-03	3.03E-03	2.91E-03	1.18E-03	-
Selenium (Se)	7782-49-2	-	2.60E-03	2.62E-03	2.61E-03	2.63E-03	2.63E-03	2.62E-03	2.61E-03	2.63E-03	2.64E-03	2.64E-03	2.64E-03	2.62E-03	2.63E-03	2.65E-03	2.63E-03	2.65E-03	2.67E-03	2.62E-03	2.62E-03	2.66E-03	2.63E-03	2.64E-03	2.62E-03	2.64E-03	2.66E-03	2.66E-03	2.63E-03	-
Tin (Sn)	7440-31-5	-	-	4.34E-04	3.24E-04	7.63E-04	8.11E-04	4.40E-04	3.59E-04	6.78E-04	1.05E-03	9.47E-04	1.17E-03	4.74E-04	7.10E-04	1.19E-03	7.20E-04	1.29E-03	1.72E-03	6.10E-04	6.30E-04	1.45E-03	7.48E-04	1.07E-03	5.88E-04	1.12E-03	1.56E-03	1.49E-03	8.11E-04	-
Strontium (Sr)	7440-24-6	-	1.50E-03	1.45E-02	1.20E-02	2.66E-02	2.81E-02	1.47E-02	1.26E-02	2.34E-02	3.13E-02	3.08E-02	3.86E-02	1.68E-02	2.00E-02	3.55E-02	2.28E-02	4.40E-02	5.53E-02	1.93E-02	2.21E-02	4.93E-02	2.59E-02	3.62E-02	1.97E-02	3.83E-02	4.89E-02	4.27E-02	2.81E-02	-
Tantalum (Ta)	7440-25-7	25	-	4.40E-05	3.30E-05	7.80E-05	8.30E-05	4.50E-05	3.70E-05	6.90E-05	1.07E-04	9.60E-05	1.19E-04	4.80E-05	7.20E-05	1.21E-04	7.30E-05	1.32E-04	1.75E-04	6.20E-05	6.40E-05	1.48E-04	7.60E-05	1.08E-04	6.00E-05	1.14E-04	1.59E-04	1.51E-04	8.30E-05	BSL
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	2.90E-05	2.20E-05	5.10E-05	5.40E-05	2.90E-05	2.40E-05	4.50E-05	7.00E-05	6.30E-05	7.80E-05	3.20E-05	4.70E-05	7.90E-05	4.80E-05	8.60E-05	1.15E-04	4.10E-05	4.20E-05	9.70E-05	5.00E-05	7.10E-05	3.90E-05	7.50E-05	1.04E-04	9.90E-05	5.40E-05	-
Tellurium (Te)	13494-80-9	-	-	9.55E-06	7.13E-06	1.68E-05	1.78E-05	9.67E-06	7.89E-06	1.49E-05	2.31E-05	2.08E-05	2.58E-05	1.04E-05	1.56E-05	2.61E-05	1.58E-05	2.85E-05	3.79E-05	1.34E-05	1.39E-05	3.20E-05	1.65E-05	2.34E-05	1.29E-05	2.46E-05	3.44E-05	3.27E-05	1.78E-05	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.5	0	5.93E-02	5.68E-02	9.55E-02	1.07E-01	6.00E-02	4.99E-02	1.08E-01	1.79E-01	1.33E-01	1.75E-01	8.03E-02	1.36E-01	2.34E-01	1.43E-01	1.81E-01	2.42E-01	1.24E-01	8.02E-02	1.98E-01	9.32E-02	1.31E-01	8.27E-02	1.59E-01	3.19E-01	3.08E-01	1.07E-01	4%
Thallium (Tl)	7440-28-0	-	2.60E-04	3.08E-04	2.96E-04	3.44E-04	3.49E-04	3.08E-04	2.99E-04	3.34E-04	3.75E-04	3.64E-04	3.88E-04	3.12E-04	3.38E-04	3.90E-04	3.39E-04	4.02E-04	4.49E-04	3.27E-04	3.29E-04	4.19E-04	3.42E-04	3.77E-04	3.24E-04	3.83E-04	4.31E-04	4.23E-04	3.49E-04	-
Uranium (U)	7440-61-1	0.3	2.60E-04	3.27E-04	3.10E-04	3.77E-04	3.84E-04	3.27E-04	3.15E-04	3.64E-04	4.21E-04	4.05E-04	4.40E-04	3.33E-04	3.69E-04	4.42E-04	3.70E-04	4.59E-04	5.24E-04	3.54E-04	3.57E-04	4.83E-04	3.75E-04	4.23E-04	3.50E-04	4.32E-04	5.00E-04	4.88E-04	3.84E-04	0%
Vanadium (v)	7440-62-2	-	7.60E-04	6.69E-03	5.34E-03	1.07E-02	1.14E-02	6.77E-03	5.70E-03	9.94E-03	1.63E-02	1.36E-02	1.67E-02	7.12E-03	1.17E-02	1.93E-02	1.21E-02	1.78E-02	2.40E-02	1.05E-02	9.01E-03	1.96E-02	1.07E-02	1.48E-02	8.62E-03	1.53E-02	2.57E-02	2.46E-02	1.14E-02	-
Tungsten (W) and Compounds (as W)	7440-33-7	5	0	1.06E-03	9.64E-04	2.26E-03	2.40E-03	1.08E-03	1.00E-03	2.02E-03	2.69E-03	2.50E-03	3.44E-03	1.42E-03	1.56E-03	3.31E-03	1.82E-03	3.84E-03	4.51E-03	1.60E-03	1.86E-03	4.27E-03	2.23E-03	3.16E-03	1.55E-03	3.29E-03	4.26E-03	3.69E-03	2.40E-03	0%
Yttrium (Y) and Compounds (as Y)	7440-65-5	13	0	7.14E-04	5.34E-04	1.26E-03	1.34E-03	7.23E-04	5.90E-04	1.12E-03	1.73E-03	1.56E-03	1.93E-03	7.80E-04	1.17E-03	1.95E-03	1.19E-03	2.13E-03	2.84E-03	1.00E-03	1.04E-03	2.39E-03	1.23E-03	1.75E-03	9.64E-04	1.84E-03	2.57E-03	2.45E-03	1.34E-03	0%
Ytterbium (Yb)	7440-64-4	-	-	8.20E-05	6.20E-05	1.45E-04	1.54E-04	8.30E-05	6.80E-05	1.29E-04	1.99E-04	1.80E-04	2.23E-04	9.00E-05	1.35E-04	2.25E-04	1.37E-04	2.46E-04	3.27E-04	1.16E-04	1.20E-04	2.76E-04	1.42E-04	2.02E-04	1.11E-04	2.12E-04	2.97E-04	2.82E-04	1.54E-04	-
Zinc (Zn)	7440-66-6	2.5	0.1	1.05E-01	1.04E-01	1.09E-01	1.10E-01	1.05E-01	1.04E-01	1.09E-01	1.11E-01	1.11E-01	1.15E-01	1.06E-01	1.07E-01	1.15E-01	1.08E-01	1.16E-01	1.20E-01	1.07E-01	1.08E-01	1.17E-01	1.10E-01	1.14E-01	1.07E-01	1.14E-01	1.18E-01	1.16E-01	1.10E-01	4%
Zirconium (Zr)	7440-67-7	2.5	0	4.47E-03	3.34E-03	7.86E-03	8.36E-03	4.53E-03	3.70E-03	6.99E-03	1.08E-02	9.76E-03	1.21E-02	4.89E-03	7.32E-03	1.22E-02	7.42E-03	1.33E-02	1.78E-02	6.29E-03	6.50E-03	1.50E-02	7.71E-03	1.10E-02	6.04E-03	1.15E-02	1.61E-02	1.53E-02	8.36E-03	0%
Silicon Dioxide (SiO2)	7631-86-9	-	-	2.95E+01	2.19E+01	5.15E+01	5.48E+01	2.99E+01	2.44E+01	4.59E+01	7.21E+01	6.43E+01	7.96E+01	3.21E+01	4.90E+01	8.17E+01	4.99E+01	8.75E+01	1.17E+02	4.23E+01	4.26E+01	9.82E+01	5.06E+01	7.20E+01	3.97E+01	7.56E+01	1.08E+02	1.03E+02	5.48E+01	-
Aluminum Oxide (Al2O3)	1344-28-1	-	-	7.02E+00	5.26E+00	1.24E+01	1.32E+01	7.11E+00	5.80E+00	1.10E+01	1.69E+01	1.53E+01	1.90E+01	7.69E+00	1.14E+01	1.91E+01	1.15E+01	2.10E+01	2.79E+01	9.76E+00	1.02E+01	2.36E+01	1.21E+01	1.73E+01	9.49E+00	1.81E+01	2.50E+01	2.38E+01	1.32E+01	-
Iron Oxide (Fe2O3)	1309-37-1	-	-	3.09E+00	2.31E+00	5.44E+00	5.79E+00	3.13E+00	2.55E+00	4.84E+00	7.42E+00	6.74E+00	8.34E+00	3.38E+00	5.00E+00	8.37E+00	5.

Table F-7: Maximum Predicted 24-Hour Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	-	-	3.24E+00	2.00E+00	5.81E+00	5.57E+00	3.26E+00	2.98E+00	6.84E+00	5.10E+00	5.93E+00	4.84E+00	3.93E+00	2.21E+00	2.50E+00	3.67E+00	1.47E+01	1.32E+01	5.26E+00	4.10E+00	8.00E+00	4.75E+00	4.97E+00	5.39E+00	7.67E+00	8.01E+00	1.55E+01	5.81E+00	-
Sulphur Dioxide (SO2)	7446-09-5	288	50	5.05E+01	5.04E+01	5.07E+01	5.07E+01	5.05E+01	5.04E+01	5.09E+01	5.11E+01	5.05E+01	5.18E+01	5.06E+01	5.07E+01	5.28E+01	5.11E+01	5.07E+01	5.07E+01	5.04E+01	5.04E+01	5.11E+01	5.08E+01	5.13E+01	5.06E+01	5.07E+01	5.24E+01	5.12E+01	5.07E+01	18%
Hydrocarbons	<<NMHC>>	-	-	3.39E-01	2.06E-01	6.56E-01	6.32E-01	3.42E-01	3.16E-01	6.38E-01	7.07E-01	6.46E-01	5.32E-01	4.34E-01	3.19E-01	3.82E-01	4.52E-01	1.86E+00	1.38E+00	6.33E-01	5.06E-01	9.46E-01	4.28E-01	5.86E-01	6.83E-01	1.01E+00	1.07E+00	1.96E+00	6.56E-01	-
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	207	100	1.13E+02	1.09E+02	1.24E+02	1.24E+02	1.13E+02	1.12E+02	1.20E+02	1.21E+02	1.27E+02	1.26E+02	1.17E+02	1.14E+02	1.23E+02	1.17E+02	1.58E+02	1.51E+02	1.23E+02	1.20E+02	1.33E+02	1.22E+02	1.28E+02	1.22E+02	1.39E+02	1.43E+02	1.56E+02	1.24E+02	60%
1,3-butadiene	106-99-0	-	0.6	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.00E-01	6.01E-01	6.01E-01	6.00E-01	6.00E-01	6.01E-01	6.01E-01	6.01E-01	6.00E-01	6.01E-01	6.01E-01	6.01E-01	6.01E-01	-
Acenaphthene	83-32-9	-	4.41E-03	4.51E-03	4.50E-03	4.61E-03	4.60E-03	4.51E-03	4.51E-03	4.63E-03	4.65E-03	4.66E-03	4.68E-03	4.56E-03	4.54E-03	4.66E-03	4.58E-03	4.86E-03	4.91E-03	4.59E-03	4.58E-03	4.73E-03	4.65E-03	4.69E-03	4.57E-03	4.72E-03	4.79E-03	4.87E-03	4.61E-03	-
Acenaphthylene	208-96-8	-	8.15E-03	8.35E-03	8.33E-03	8.55E-03	8.54E-03	8.36E-03	8.34E-03	8.58E-03	8.63E-03	8.66E-03	8.70E-03	8.46E-03	8.41E-03	8.67E-03	8.48E-03	9.05E-03	9.15E-03	8.51E-03	8.50E-03	8.81E-03	8.63E-03	8.72E-03	8.48E-03	8.78E-03	8.91E-03	9.06E-03	8.55E-03	-
Acetaldehyde	75-07-0	-	-	1.59E-02	1.51E-02	3.08E-02	3.03E-02	1.61E-02	1.52E-02	3.40E-02	4.03E-02	4.09E-02	4.61E-02	2.46E-02	2.08E-02	4.36E-02	2.72E-02	6.73E-02	8.04E-02	2.80E-02	2.79E-02	5.48E-02	4.02E-02	4.68E-02	2.44E-02	5.09E-02	6.07E-02	6.71E-02	3.08E-02	-
Acrolein	107-02-8	-	-	2.90E-03	2.74E-03	5.60E-03	5.50E-03	2.92E-03	2.76E-03	6.20E-03	7.27E-03	7.41E-03	8.27E-03	4.45E-03	3.75E-03	7.85E-03	4.91E-03	1.23E-02	1.46E-02	5.09E-03	5.07E-03	9.89E-03	7.27E-03	8.43E-03	4.45E-03	9.18E-03	1.10E-02	1.22E-02	5.60E-03	-
Anthracene	120-12-7	-	1.61E-04	1.80E-04	1.77E-04	1.98E-04	1.97E-04	1.80E-04	1.79E-04	2.00E-04	2.03E-04	2.07E-04	2.09E-04	1.89E-04	1.84E-04	2.06E-04	1.91E-04	2.46E-04	2.52E-04	1.95E-04	1.93E-04	2.18E-04	2.03E-04	2.11E-04	1.92E-04	2.19E-04	2.30E-04	2.47E-04	1.98E-04	-
Benzene	71-43-2	10	3	3.01E+00	3.01E+00	3.02E+00	3.02E+00	3.01E+00	3.01E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	3.01E+00	3.01E+00	3.02E+00	3.02E+00	3.04E+00	3.05E+00	3.02E+00	3.02E+00	3.03E+00	3.02E+00	3.03E+00	3.02E+00	3.03E+00	3.04E+00	3.04E+00	3.02E+00	30%
Benzo(a)anthracene	56-55-3	-	-	3.25E-06	2.30E-06	6.29E-06	6.09E-06	3.27E-06	3.04E-06	6.37E-06	6.72E-06	6.89E-06	6.26E-06	4.44E-06	3.45E-06	5.39E-06	4.31E-06	1.65E-05	1.43E-05	5.95E-06	5.01E-06	8.26E-06	5.43E-06	6.90E-06	6.04E-06	9.81E-06	1.10E-05	1.71E-05	6.29E-06	-
Benzo(a)pyrene	50-32-8	-	5.29E-05	5.41E-05	5.37E-05	5.52E-05	5.51E-05	5.41E-05	5.40E-05	5.52E-05	5.54E-05	5.54E-05	5.51E-05	5.45E-05	5.41E-05	5.47E-05	5.44E-05	5.91E-05	5.80E-05	5.51E-05	5.47E-05	5.60E-05	5.48E-05	5.53E-05	5.52E-05	5.65E-05	5.69E-05	5.94E-05	5.52E-05	-
Benzo(b+k)fluoranthene	205-99-2	-	2.79E-04	2.83E-04	2.82E-04	2.87E-04	2.87E-04	2.83E-04	2.83E-04	2.87E-04	2.88E-04	2.87E-04	2.86E-04	2.84E-04	2.83E-04	2.84E-04	2.84E-04	3.02E-04	2.96E-04	2.87E-04	2.85E-04	2.90E-04	2.85E-04	2.86E-04	2.87E-04	2.91E-04	2.92E-04	3.03E-04	2.87E-04	-
Benzo(g,h,i)perylene	191-24-2	-	-	2.74E-06	1.91E-06	5.31E-06	5.14E-06	2.76E-06	2.57E-06	5.35E-06	5.69E-06	5.76E-06	5.15E-06	3.72E-06	2.88E-06	4.42E-06	3.59E-06	1.41E-05	1.19E-05	5.04E-06	4.21E-06	7.00E-06	4.46E-06	5.72E-06	5.15E-06	8.29E-06	9.23E-06	1.46E-05	5.31E-06	-
Chrysene	218-01-9	-	3.38E-04	3.44E-04	3.41E-04	3.49E-04	3.48E-04	3.44E-04	3.43E-04	3.49E-04	3.50E-04	3.48E-04	3.46E-04	3.45E-04	3.43E-04	3.44E-04	3.45E-04	3.67E-04	3.60E-04	3.48E-04	3.46E-04	3.53E-04	3.45E-04	3.47E-04	3.49E-04	3.54E-04	3.54E-04	3.69E-04	3.49E-04	-
Fluoranthene	206-44-0	-	8.15E-04	8.50E-04	8.43E-04	8.84E-04	8.82E-04	8.51E-04	8.48E-04	8.87E-04	8.88E-04	8.97E-04	8.98E-04	8.66E-04	8.56E-04	8.91E-04	8.68E-04	9.83E-04	9.81E-04	8.79E-04	8.73E-04	9.14E-04	8.87E-04	9.03E-04	8.76E-04	9.23E-04	9.42E-04	9.86E-04	8.84E-04	-
Fluorene	86-73-7	-	1.47E-03	1.63E-03	1.60E-03	1.77E-03	1.76E-03	1.63E-03	1.62E-03	1.79E-03	1.80E-03	1.84E-03	1.85E-03	1.70E-03	1.66E-03	1.82E-03	1.71E-03	2.18E-03	2.21E-03	1.75E-03	1.73E-03	1.93E-03	1.81E-03	1.87E-03	1.73E-03	1.94E-03	2.03E-03	2.19E-03	1.77E-03	-
Formaldehyde	50-00-0	-	-	1.33E-02	1.26E-02	2.58E-02	2.53E-02	1.34E-02	1.26E-02	2.83E-02	3.38E-02	3.42E-02	3.87E-02	2.05E-02	1.75E-02	3.68E-02	2.27E-02	5.64E-02	6.72E-02	2.35E-02	2.34E-02	4.61E-02	3.36E-02	3.93E-02	2.05E-02	4.29E-02	5.10E-02	5.62E-02	2.58E-02	-
Phenanthrene	85-01-8	-	2.21E-03	2.51E-03	2.44E-03	2.80E-03	2.78E-03	2.52E-03	2.50E-03	2.82E-03	2.84E-03	2.90E-03	2.88E-03	2.64E-03	2.55E-03	2.81E-03	2.65E-03	3.68E-03	3.61E-03	2.76E-03	2.70E-03	3.02E-03	2.80E-03	2.93E-03	2.75E-03	3.13E-03	3.28E-03	3.72E-03	2.80E-03	-
Pyrene	129-00-0	-	-	3.30E-05	2.70E-05	6.50E-05	6.30E-05	3.40E-05	3.20E-05	6.80E-05	6.90E-05	7.70E-05	7.80E-05	4.80E-05	3.90E-05	7.10E-05	5.00E-05	1.58E-04	1.56E-04	6.00E-05	5.50E-05	9.30E-05	6.80E-05	8.30E-05	5.80E-05	1.02E-04	1.19E-04	1.61E-04	6.50E-05	-
Diesel Particulate Matter (PM2.5 from Diesel Combustion)	<<DPM>>	-	9.40E-02	2.53E-01	2.09E-01	4.01E-01	3.92E-01	2.54E-01	2.43E-01	4.08E-01	4.20E-01	4.36E-01	4.10E-01	3.13E-01	2.65E-01	3.69E-01	3.09E-01	8.87E-01	7.98E-01	3.83E-01	3.41E-01	5.02E-01	3.70E-01	4.40E-01	3.84E-01	5.72E-01	6.33E-01	9.14E-01	4.01E-01	-
Elemental Carbon (from diesel exhaust)	7440-44-0	-	-	1.03E-01	7.45E-02	2.00E-01	1.94E-01	1.04E-01	9.69E-02	2.04E-01	2.12E-01	2.22E-01	2.06E-01	1.42E-01	1.11E-01	1.79E-01	1.40E-01	5.16E-01	4.58E-01	1.88E-01	1.60E-01	2.65E-01	1.80E-01	2.25E-01	1.88E-01	3.11E-01	3.51E-01	5.33E-01	2.00E-01	-
Total PAHs (as equivalent B(a)P)	<<BaPET>>	-	-	3.04E-06	2.20E-06	5.89E-06	5.71E-06	3.07E-06	2.86E-06	6.02E-06	6.29E-06	6.56E-06	6.06E-06	4.20E-06	3.28E-06	5.30E-06	4.12E-06	1.53E-05	1.35E-05	5.57E-06	4.75E-06	7.85E-06	5.28E-06	6.64E-06	5.58E-06	9.20E-06	1.04E-05	1.58E-05	5.89E-06	-
Reagents																														
Calcium Oxide	1305-78-8	-	-	2.81E+00	2.08E+00	4.20E+00	4.60E+00	2.84E+00	2.38E+00	4.50E+00	5.84E+00	4.97E+00	8.41E+00	3.22E+00	3.73E+00	9.79E+00	4.09E+00	7.07E+00	8.99E+00	3.30E+00	3.71E+00	8.43E+00	4.83E+00	7.30E+00	3.60E+00	6.37E+00	1.00E+01	7.58E+00	4.60E+00	-
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	7.02E-03	5.72E-03	1.15E-02	1.16E-02	7.07E-03	6.52E-03	1.37E-02	1.70E-02	6.31E-03	2.72E-02	8.18E-03	1.08E-02	4.29E-02	1.63E-02	1.09E-02	8.76E-03	5.54E-03	5.09E-03	1.58E-02	1.04E-02	1.89E-02	9.08E-03	8.62E-03	3.56E-02	1.79E-02	1.16E-02	-
Sodium sulphite	7757-83-7	0.14	-	5.01E-02	4.08E-02	8.20E-02	8.27E-02	5.05E-02	4.66E-02	9.81E-02	1.21E-01	4.51E-02	1.94E-01	5.84E-02	7.71E-02	3.06E-01	1.16E-01	7.80E-02	6.26E-02	3.96E-02	3.64E-02	1.13E-01	7.41E-02	1.35E-01	6.49E-02	6.16E-02	2.54E-01	1.28E-01	8.27E-02	BSL
Zinc sulphate	7733-02-0	1	-	2.41E-03	1.96E-03	3.95E-03	3.97E-03	2.43E-03	2.24E-03	4.72E-03	5.82E-03	2.17E-03	9.34E-03	2.81E-03	3.71E-03	1.47E-02	5.59E-03	3.75E-03	3.01E-03	1.90E-03	1.75E-03	5.44E-03	3.56E-03	6.50E-03	3.12E-03	2.96E-03	1.22E-02	6.13E-03	3.97E-03	BSL
Sodium trithiocarbonate	534-18-9	-	-	2.89E-03	2.36E-03	4.73E-03	4.77E-03	2.91E-03	2.69E-03	5.66E-03	6.99E-03	2.60E-03	1.12E-02	3.37E-03	4.45E-03	1.77E-02	6.71E-03	4.50E-03	3.61E-03	2.28E-03	2.10E-03	6.53E-03	4.28E-03	7.80E-03	3.74E-03	3.55E-03	1.47E-02	7.36E-03	4.77E-03	-
Magnafloc 10	N/A	-	-	9.63E-03	7.85E-03	1.58E-02	1.59E-02	9.71E-03	8.96E-03	1.89E-02	2.33E-02	8.67E-03	3.73E-02	1.12E-02	1.48E-02	5.89E-02	2.24E-02	1.50E-02	1.20E-02	7.61E-03	7.00E-03	2.18E-02	1.42E-02	2.60E-02	1.25E-02	1.18E-02	4.89E-02	2.45E-02	1.59E-02	-

Notes:

1 - Individual model run with plume depletion

2 - Individual model run - with OLM

ASL - Above MECP Screening Level

BSL - Below MECP Screening Level

Table F-8: Maximum Predicted Annual Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Particulates																														
TSP (Note 1)	<<PM>>	-	11.6	12.4	12.7	13.6	14.4	12.4	12.3	14.6	16.0	13.1	18.1	12.9	13.6	18.6	14.7	16.2	15.5	13.6	14.0	17.8	14.4	15.9	14.1	16.2	21.8	20.3	14.4	-
PM10	<<PM10>>	-	8.3	8.6	8.9	9.0	9.3	8.6	8.6	9.8	10.4	8.9	11.2	9.0	9.3	11.5	10.0	10.1	9.8	9.2	9.4	11.2	9.7	10.3	9.5	10.1	12.5	11.9	9.3	-
PM2.5	<<PM2.5>>	-	6.2	6.3	6.3	6.4	6.4	6.3	6.3	6.5	6.6	6.4	6.8	6.3	6.4	6.8	6.5	6.6	6.6	6.4	6.4	6.7	6.5	6.6	6.4	6.6	6.9	6.9	6.4	-
Metals and Metallic Compounds																														
Silver (Ag)	7440-22-4	0.23	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.01E-03	5.01E-03	5.00E-03	2%
Aluminum (Al)	7429-90-5	-	0.15	2.31E-01	2.77E-01	3.37E-01	4.12E-01	2.32E-01	2.18E-01	4.76E-01	6.13E-01	2.96E-01	8.09E-01	3.04E-01	3.74E-01	8.71E-01	4.97E-01	5.63E-01	5.05E-01	3.60E-01	4.06E-01	8.09E-01	4.55E-01	6.11E-01	4.06E-01	5.65E-01	1.08E+00	9.34E-01	4.12E-01	-
Arsenic (As)	7440-38-2	3.00E-03	2.00E-03	2.02E-03	2.04E-03	2.05E-03	2.06E-03	2.02E-03	2.02E-03	2.09E-03	2.14E-03	2.04E-03	2.19E-03	2.05E-03	2.07E-03	2.25E-03	2.08E-03	2.11E-03	2.09E-03	2.06E-03	2.07E-03	2.16E-03	2.09E-03	2.13E-03	2.07E-03	2.10E-03	2.22E-03	2.18E-03	2.06E-03	69%
Gold (Au)	7440-57-5	-	-	1.13E-07	1.95E-07	2.49E-07	3.40E-07	1.15E-07	9.82E-08	5.05E-07	7.74E-07	2.11E-07	1.03E-06	2.43E-07	3.83E-07	1.40E-06	4.35E-07	5.84E-07	4.86E-07	3.01E-07	3.58E-07	8.66E-07	4.71E-07	7.21E-07	3.46E-07	5.56E-07	1.14E-06	9.20E-07	3.40E-07	-
Boron (B)	7440-42-8	-	2.60E-02	2.61E-02	2.62E-02	2.63E-02	2.64E-02	2.61E-02	2.61E-02	2.65E-02	2.66E-02	2.62E-02	2.69E-02	2.62E-02	2.63E-02	2.70E-02	2.65E-02	2.66E-02	2.65E-02	2.63E-02	2.64E-02	2.69E-02	2.64E-02	2.66E-02	2.64E-02	2.66E-02	2.73E-02	2.71E-02	2.64E-02	-
Barium (Ba)	7440-39-3	5.00E-02	2.00E-02	2.04E-02	2.07E-02	2.09E-02	2.13E-02	2.04E-02	2.04E-02	2.17E-02	2.23E-02	2.07E-02	2.33E-02	2.08E-02	2.11E-02	2.36E-02	2.18E-02	2.21E-02	2.18E-02	2.11E-02	2.13E-02	2.33E-02	2.15E-02	2.23E-02	2.13E-02	2.21E-02	2.47E-02	2.40E-02	2.13E-02	43%
Beryllium (Be)	7440-41-7	4.00E-04	0	1.30E-06	1.92E-06	2.91E-06	4.05E-06	1.31E-06	1.09E-06	4.87E-06	6.89E-06	2.25E-06	9.87E-06	2.28E-06	3.38E-06	1.08E-05	4.98E-06	6.28E-06	5.39E-06	3.19E-06	3.85E-06	9.73E-06	4.58E-06	6.92E-06	3.82E-06	6.25E-06	1.37E-05	1.14E-05	4.05E-06	1%
Bismuth (Bi)	7440-69-9	-	1.30E-03	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	1.30E-02	-
Carbon (C)	7440-44-0	0.3	0	1.49E-03	2.31E-03	3.35E-03	4.65E-03	1.51E-03	1.26E-03	5.82E-03	8.23E-03	2.62E-03	1.17E-02	2.79E-03	4.01E-03	1.28E-02	6.20E-03	7.31E-03	6.28E-03	3.76E-03	4.57E-03	1.17E-02	5.44E-03	8.18E-03	4.58E-03	7.35E-03	1.65E-02	1.39E-02	4.65E-03	2%
Calcium (Ca)	7440-70-2	-	0.3	3.36E-01	3.54E-01	3.81E-01	4.13E-01	3.37E-01	3.31E-01	4.36E-01	4.92E-01	3.63E-01	5.75E-01	3.64E-01	3.94E-01	5.98E-01	4.41E-01	4.76E-01	4.51E-01	3.90E-01	4.08E-01	5.74E-01	4.29E-01	4.93E-01	4.08E-01	4.76E-01	6.87E-01	6.23E-01	4.13E-01	-
Cadmium (Cd)	7440-43-9	3.60E-03	5.00E-04	5.02E-04	5.03E-04	5.03E-04	5.05E-04	5.02E-04	5.01E-04	5.07E-04	5.10E-04	5.03E-04	5.14E-04	5.03E-04	5.05E-04	5.18E-04	5.06E-04	5.08E-04	5.07E-04	5.04E-04	5.05E-04	5.12E-04	5.06E-04	5.10E-04	5.05E-04	5.07E-04	5.15E-04	5.12E-04	5.05E-04	14%
Cerium (Ce) and Compounds (as Ce)	7440-45-1	0.7	0	8.17E-05	1.25E-04	1.83E-04	2.54E-04	8.22E-05	6.87E-05	3.15E-04	4.45E-04	1.43E-04	6.33E-04	1.50E-04	2.17E-04	6.92E-04	3.33E-04	3.99E-04	3.42E-04	2.05E-04	2.48E-04	6.32E-04	2.95E-04	4.44E-04	2.48E-04	4.00E-04	8.92E-04	7.50E-04	2.54E-04	0%
Cobalt (Co)	7440-48-4	0.1	0	2.31E-05	3.66E-05	5.16E-05	7.17E-05	2.36E-05	1.96E-05	9.18E-05	1.31E-04	4.11E-05	1.85E-04	4.41E-05	6.42E-05	2.08E-04	9.68E-05	1.14E-04	9.78E-05	5.87E-05	7.12E-05	1.81E-04	8.57E-05	1.29E-04	7.12E-05	1.14E-04	2.55E-04	2.14E-04	7.17E-05	0%
Chromium (Cr) and Compounds (as Cr)	7440-47-3	0.1	1.00E-02	1.01E-02	1.02E-02	1.02E-02	1.03E-02	1.01E-02	1.01E-02	1.05E-02	1.07E-02	1.02E-02	1.10E-02	1.03E-02	1.03E-02	1.11E-02	1.06E-02	1.06E-02	1.05E-02	1.03E-02	1.04E-02	1.10E-02	1.05E-02	1.07E-02	1.04E-02	1.06E-02	1.15E-02	1.13E-02	1.03E-02	10%
Cesium (Cs) and Compounds (as Ce)	7440-46-2	0.4	0	3.83E-06	5.86E-06	8.58E-06	1.19E-05	3.87E-06	3.22E-06	1.48E-05	2.09E-05	6.70E-06	2.97E-05	7.05E-06	1.02E-05	3.25E-05	1.57E-05	1.87E-05	1.61E-05	9.59E-06	1.16E-05	2.97E-05	1.38E-05	2.08E-05	1.16E-05	1.88E-05	4.19E-05	3.52E-05	1.19E-05	0%
Copper (Cu)	7440-50-8	-	3.20E-03	3.37E-03	3.48E-03	3.58E-03	3.72E-03	3.37E-03	3.35E-03	3.92E-03	4.27E-03	3.51E-03	4.66E-03	3.54E-03	3.73E-03	5.06E-03	3.86E-03	4.06E-03	3.92E-03	3.64E-03	3.73E-03	4.49E-03	3.87E-03	4.22E-03	3.71E-03	4.03E-03	4.95E-03	4.63E-03	3.72E-03	-
Iron (Fe)	7439-89-6	-	0.15	1.97E-01	2.24E-01	2.56E-01	2.97E-01	1.98E-01	1.90E-01	3.37E-01	4.15E-01	2.34E-01	5.24E-01	2.40E-01	2.79E-01	5.63E-01	3.51E-01	3.83E-01	3.50E-01	2.70E-01	2.96E-01	5.24E-01	3.25E-01	4.12E-01	2.97E-01	3.85E-01	6.79E-01	5.96E-01	2.97E-01	-
Gallium (Ga)	7440-55-3	-	-	2.31E-05	3.51E-05	5.11E-05	7.12E-05	2.31E-05	1.91E-05	8.87E-05	1.25E-04	4.01E-05	1.78E-04	4.26E-05	6.12E-05	1.96E-04	9.43E-05	1.12E-04	9.63E-05	5.77E-05	6.97E-05	1.78E-04	8.32E-05	1.25E-04	6.97E-05	1.12E-04	2.52E-04	2.12E-04	7.12E-05	-
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	0.9	0	4.79E-06	7.33E-06	1.07E-05	1.49E-05	4.84E-06	4.03E-06	1.85E-05	2.61E-05	8.39E-06	3.72E-05	8.82E-06	1.27E-05	4.06E-05	1.96E-05	2.34E-05	2.01E-05	1.20E-05	1.46E-05	3.71E-05	1.73E-05	2.61E-05	1.46E-05	2.35E-05	5.24E-05	4.40E-05	1.49E-05	0%
Mercury (Hg)	7439-97-6	5.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	2.00E-03	40%
Indium (In)	7440-74-6	-	-	1.93E-08	2.96E-08	4.34E-08	6.03E-08	1.96E-08	1.63E-08	7.46E-08	1.06E-07	3.39E-08	1.50E-07	3.56E-08	5.15E-08	1.64E-07	7.91E-08	9.45E-08	8.12E-08	4.85E-08	5.88E-08	1.50E-07	7.00E-08	1.05E-07	5.88E-08	9.48E-08	2.12E-07	1.78E-07	6.03E-08	-
Potassium (K)	7440-09-7	-	0.13	1.46E-01	1.55E-01	1.66E-01	1.80E-01	1.46E-01	1.44E-01	1.93E-01	2.20E-01	1.58E-01	2.57E-01	1.61E-01	1.74E-01	2.70E-01	1.99E-01	2.09E-01	1.98E-01	1.71E-01	1.80E-01	2.57E-01	1.89E-01	2.19E-01	1.80E-01	2.10E-01	3.10E-01	2.82E-01	1.80E-01	-
Lanthanum (La)	7439-91-0	-	-	2.36E-05	4.01E-05	5.26E-05	7.32E-05	2.36E-05	2.01E-05	9.93E-05	1.40E-04	4.26E-05	1.95E-04	4.91E-05	6.77E-05	2.18E-04	1.13E-04	1.18E-04	1.02E-04	6.22E-05	7.62E-05	1.99E-04	9.18E-05	1.37E-04	7.82E-05	1.21E-04	2.83E-04	2.43E-04	7.32E-05	-
Lithium (Li)	7439-93-2	-	-	2.91E-05	4.41E-05	6.47E-05	9.02E-05	2.91E-05	2.46E-05	1.12E-04	1.58E-04	5.06E-05	2.25E-04	5.31E-05	7.72E-05	2.46E-04	1.18E-04	1.41E-04	1.21E-04	7.27E-05	8.77E-05	2.24E-04	1.05E-04	1.57E-04	8.77E-05	1.42E-04	3.16E-04	2.66E-04	9.02E-05	-
Lutetium (Lu)	7439-94-3	-	-	2.99E-07	4.57E-07	6.70E-07	9.31E-07	3.02E-07	2.52E-07	1.15E-06	1.63E-06	5.23E-07	2.32E-06	5.50E-07	7.95E-07	2.53E-06	1.22E-06	1.46E-06	1.25E-06	7.48E-07	9.08E-07	2.31E-06	1.08E-06	1.62E-06	9.08E-07	1.46E-06	3.27E-06	2.75E-06	9.31E-07	-
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	-	0.1	1.13E-01	1.21E-01	1.33E-01	1.48E-01	1.13E-01	1.10E-01	1.60E-01	1.86E-01	1.25E-01	2.24E-01	1.26E-01	1.40E-01	2.35E-01	1.64E-01	1.77E-01	1.66E-01	1.37E-01	1.46E-01	2.24E-01	1.56E-01	1.86E-01	1.46E-01	1.77E-01	2.77E-01	2.48E-01	1.48E-01	-
Manganese (Mn) and Compounds (as Mn)	7439-96-5	8.00E-02	5.00E-03	5.17E-03	5.30E-03	5.38E-03	5.53E-03	5.17E-03	5.15E-03	5.74E-03	6.03E-03	5.32E-03	6.65E-03	5.32E-03	5.61E-03	6.63E-03	5.82E-03	6.04E-03	5.78E-03	5.47E-03	5.58E-03	6.48E-03	5.66E-03	6.03E-03	5.59E-03	5.93E-03	7.09E-03	6.79E-03	5.53E-03	7%
Molybdenum (Mo)	7439-98-7	-	7.80E-04	7.86E-04	7.89E-04	7.94E-04	7.99E-04	7.86E-04	7.85E-04	8.03E-04	8.12E-04	7.91E-04	8.26E-04	7.91E-04	7.96E-04	8.32E-04	8.02E-04	8.10E-04	8.05E-04	7.95E-04	7.98E-04	8.24E-04	8.01E-04	8.12E-04	7.98E-04	8.09E-04	8.42E-04	8.31E-04	7.99E-04	-
Sodium (Na)	7440-23-5	-	0.32	3.52E-01	3.70E-01	3.93E-01	4.21E-01	3.53E-01	3.47E-01	4.46E-01	4.98E-01	3.77E-01	5.73E-01	3.80E-01	4.07E-01	5.97E-01	4.54E-01	4.79E-01	4.56E-01	4.02E-01	4.19E-01	5.73E-01	4.38E-01	4.97E-01	4.19E-01	4.80E-01	6.77E-01	6.21E-01	4.21E-01	-
Niobium (Nb)	7440--03-1	-	-	6.52E-06	1.00E-05	1.45E-05	2.01E-05	6.52E-06	5.52E-06	2.51E-05	3.51E-05	1.15E-05	5.01E-05	1.20E-05	1.70E-05	5.46E-05	2.66E-05	3.16E-05	2.71E-05	1.60E-05	1.96E-05	5.01E-05	2.36E-05	3.51E-05	1.96E-05	3.16E-05	7.07E-05	5.97E-05	2.01E-05	-
Nickel (Ni)	7440-02-0	2.00E-02	2.00E-03	2.02E-03	2.03E-03	2.04E-03	2.05E-03	2.02E-03	2.02E-03	2.08E-03	2.11E-03	2.03E-03	2.16E-03	2.04E-03	2.05E-03	2.18E-03	2.09E-03	2.09E-03	2.08E-03	2.05E-03	2.06E-03	2.16E-03	2.07E-03	2.11E-03	2.06E-03	2.10E-03	2.23E-03	2.20E-03	2.05E-03	10%
Phosphorus (P)	7723-14-0	-	-	6.76E-04	1.00E-03	1.52E-03	2.11E-03	6.84E-04	5.69E-04	2.54E-03	3.59E-03	1.17E-03	5.14E-03	1.19E-03	1.76E-03	5.58E-03	2.63E-03	3.28E-03	2.82E-03	1.67E-03	2.02E-03	5.10E-03	2.39E-03	3.61E-03	2.00E-03	3.27E-03	7.18E-03	5.99E-03	2.11E-03	-
Lead (Pb)	7439-92-1	0.1	4.00E-03	4.02E-03	4.02E-03	4.04E-03	4.05E-03	4.02E-03	4.01E-03	4.06E-03	4.09E-03	4.03E-03	4.12E-03	4.03E-03	4.04E-03	4.14E-03	4.06E-03	4.08E-03	4.07E-03	4.04E-03	4.05E-03	4.12E-03	4.06E-03	4.09E-03	4.05E-03	4.08E-03	4.17E-03	4.14E-03	4.05E-03	4%
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	-	-	8.57E-05	1.31E-04	1.92E-04	2.67E-04	8.57E-05	7.22E-05	3.30E-04	4.67E-04	1.50E-04	6.64E-04	1.57E-04	2.28E-04	7.26E-04	3.50E-04	4.18E-04	3.59E-04	2.14E-04	2.60E-04	5.35E-04	2.47E-04	3.79E-04	2.60E-04	4.19E-04	9.38E-04	7.87E-04	2.67E-04	-
Sulphur (S)	7704-34-9	-	-	3.31E-03	5.74E-03	7.43E-03	1.03E-02	3.35E-03	2.82E-03	1.43E-02	2.04E-02	6.09E-03	2.81E-02	7.14E-03	9.87E-03	3.23E-02	1.61E-02	1.68E-02	1.44E-02	8.86E-03	1.09E-02	2.82E-02	1.32E-02	1.97E-02	1.11E-02	1.72E-02	4.00E-02	3.42E-02	1.03E-02	-
Antimony (Sb)	7440-36-0	0.17	7.00E-03	7.01E-03	7.01E-03	7.02E-03	7.01E-03	7.00E-03	7.02E-03	7.03E-03	7.01E-03	7.01E-03	7.04E-03	7.01E-03	7.01E-03	7.05E-03	7.02E-03	7.03E-03	7.02E-03	7.01E-03	7.02E-03	7.04E-03	7.02E-03	7.03E-03	7.02E-03	7.03E-03	7.06E-03	7.04E-03	7.02E-03	4%
Scandium (Sc)	7440-20-2	-	-	1.55E-05	2.46E-05	3.46E-05	4.76E-05	1.55E-05	1.30E-05	6.17E-05	8.77E-05	2.76E-05	1.23E-04	3.01E-05	4.26E-05	1.36E-04	6.82E-05	7.62E-05	6.52E-05	3.96E-05	4.81E-05	1.24E-04	5.77E-05	8.62E-05	4.86E-05	7.72E-05	1.76E-04	1.49E-04	4.76E-05	-
Selenium (Se)	7782-49-2	-	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	2.60E-03	-
Tin (Sn)	7440-31-5	0.1	0	1.05E-05	1.60E-05	2.31E-05	3.26E-05	1.05E-05	8.52E-06	4.01E-05	5.67E-05	1.80E-05	8.07E-05	1.91E-05	2.76E-05	8.82E-05	4.26E-05	5.06E-05	4.36E-05	2.61E-05	3.16E-05	8.02E-05	3.76E-05	5.67E-05	3.16E-05	5.11E-05	1.14E-04	9.58E-05	3.26E-05	0%
Strontium (Sr)	7440-24-6	-	1.48E-03	1.81E-03	1.96E-03	2.22E-03	2.52E-03	1.82E-03	1.76E-03	2.69E-03	3.19E-03	2.05E-03	3.95E-03	2.04E-03	2.32E-03	4.13E-03	2.71E-03	3.08E-03	2.85E-03	2.29E-03	2.45E-03	3.93E-03	2.63E-03	3.22E-03	2.44E-03	3.07E-03	4.92E-03	4.33E-03	2.52E-03	-
Tantalum (Ta)	7440-25-7	-	-	1.06E-06	1.62E-06	2.37E-06	3.30E-06	1.07E-06	8.90E-07	4.08E-06	5.77E-06	1.85E-06	8.20E-06	1.95E-06	2.81E-06	8.97E-06	4.32E-06	5.16E-06	4.44E-06	2.65E-06	3.21E-06	8.19E-06	3.82E-06	5.75E-06	3.21E-06	5.18E-06	1.16E-05	9.72E-06	3.30E-06	-
Terbium (Tb) and Compounds (as Tb)	7440-27-9	-	-	6.92E-07	1.06E-06	1.55E-06	2.16E-06	7.00E-07	5.83E-07	2.67E-06	3.78E-06	1.21E-06	5.37E-06	1.28E-06	1.84E-06	5.88E-06	2.83E-06	3.38E-06	2.91E-06	1.73E-06	2.10E-06	5.36E-06	2.50E-06	3.77E-06	2.11E-06	3.39E-06	7.58E-06	6.37E-06	2.16E-06	-
Tellurium (Te)	13494-80-9	-	-	2.28E-07	3.50E-07	5.13E-07	7.13E-07	2.31E-07	1.92E-07	8.82E-07	1.25E-06	4.00E-07	1.77E-06	4.21E-07	6.08E-07	1.94E-06	9.35E-07	1.12E-06	9.59E-07	5.72E-07	6.95E-07	1.77E-06	8.26E-07	1.24E-06	6.95E-07	1.12E-06	2.50E-06	2.10E-06	7.13E-07	-
Titanium (Ti) and Compounds (as Ti)	7440-32-6	-	-	1.23E-03	2.23E-03	2.77E-03	3.84E-03	1.25E-03	1.06E-03	5.56E-03	7.95E-03	2.38E-03	1.10E-02	2.78E-03	3.83E-03	1.24E-02	6.31E-03	6.60E-03	5.72E-03	3.48E-03	4.28E-03	1.10E-02	5.14E-03	7.66E-03	4.38E-03	6.87E-03	1.57E-02	1.35E-02	3.84E-03	-
Thallium (Tl)	7440-28-0	0.25	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.01E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.01E-03	5.00E-03	5.00E-03	5.00E-03	5.01E-03	5.00E-03	5.01E-03	5.00E-03	5.01E-03	5.01E-03	5.01E-03	5.00E-03	2%
Uranium (U)	7440-61-1	6.00E-02	2.60E-04	2.62E-04	2.62E-04	2.64E-04	2.65E-04	2.62E-04	2.61E-04	2.66E-04	2.69E-04	2.63E-04	2.72E-04	2.63E-04	2.64E-04	2.74E-04	2.67E-04	2.68E-04	2.67E-04	2.64E-04	2.65E-04	2.72E-04	2.66E-04	2.69E-04	2.65E-04	2.68E-04	2.77E-04	2.75E-04	2.65E-04	0%
Vanadium (v)	7440-62-2	1	1.00E-02	1.01E-02	1.02E-02	1.03E-02	1.04E-02	1.01E-02	1.01E-02	1.05E-02	1.08E-02	1.02E-02	1.11E-02	1.03E-02	1.04E-02	1.12E-02	1.06E-02	1.07E-02	1.06E-02	1.03E-02	1.04E-02	1.11E-02	1.05E-02	1.08E-02	1.04E-02	1.07E-02	1.15E-02	1.13E-02	1.04E-02	1%
Tungsten (W) and Compounds (as W)	7440-33-7	-	-	2.86E-05	3.86E-05	6.37E-05	8.92E-05	2.91E-05	2.41E-05	1.00E-04	1.43E-04	4.81E-05	2.08E-04	4.51E-05	7.07E-05	2.28E-04	9.28E-05	1.35E-04	1.16E-04	6.72E-05	8.02E-05	1.98E-04	9.58E-05	1.45E-04	7.77E-05	1.32E-04	2.74E-04	2.23E-04	8.92E-05	-
Yttrium (Y) and Compounds (as Y)	96158-02-0	2.8	0	1.70E-05	2.61E-05	3.81E-05	5.31E-05	1.70E-05	1.45E-05	6.62E-05	9.33E-05	3.01E-05	1.33E-04	3.16E-05	4.56E-05	1.45E-04	6.97E-05	8.37E-05	7.17E-05	4.26E-05	5.21E-05	1.32E-04	6.17E-05	9.28E-05	5.21E-05	8.37E-05	1.87E-04	1.57E-04	5.31E-05	0%
Ytterbium (Yb)	7440-64-4	-	-	1.97E-06	3.02E-06	4.42E-06	6.15E-06	1.99E-06	1.66E-06	7.61E-06	1.08E-05	3.45E-06	1.53E-05	3.63E-06	5.25E-06	1.67E-05	8.07E-06	9.63E-06	8.28E-06	4.94E-06	5.99E-06	1.53E-05	7.13E-06	1.07E-05	6.00E-06	9.66E-06	2.16E-05	1.81E-05	6.15E-06	-
Zinc (Zn)	7440-66-6	-	1.40E-02	1.41E-02	1.42E-02	1.43E-02	1.44E-02	1.41E-02	1.41E-02	1.45E-02	1.47E-02	1.42E-02	1.49E-02	1.42E-02	1.43E-02	1.51E-02	1.45E-02	1.46E-02	1.45E-02	1.43E-02	1.44E-02	1.49E-02	1.44E-02	1.47E-02	1.44E-02	1.46E-02	1.52E-02	1.50E-02	1.44E-02	-
Zirconium (Zr)	7440-67-7	-	-	1.07E-04	1.64E-04	2.40E-04	3.34E-04	1.08E-04	9.02E-05	4.13E-04	5.84E-04	1.88E-04	8.31E-04	1.97E-04	2.85E-04	9.08E-04	4.38E-04	5.23E-04	4.49E-04	2.68E-04	3.25E-04	8.29E-04	3.87E-04	5.83E-04	3.25E-04	5.25E-04	1.17E-03	9.85E-04	3.34E-04	-
Silicon Dioxide (SiO_2)	7631-86-9	-	-	7.03E-01	1.08E+00	1.58E+00	2.19E+00	7.11E-01	5.92E-01	2.72E+00	3.85E+00	1.23E+00	5.47E+00	1.30E+00	1.88E+00	5.99E+00	2.90E+00	3.44E+00	2.95E+00	1.77E+00	2.14E+00	5.47E+00	2.55E+00	3.83E+00	2.15E+00	3.45E+00	7.73E+00	6.50E+00	2.19E+00	-
Aluminum Oxide (Al_2O_3)	1344-28-1	-	-	1.68E-01	2.57E-01	3.78E-01	5.25E-01	1.70E-01	1.42E-01	6.49E-01	9.17E-01	2.95E-01	1.30E+00	3.09E-01	4.48E-01	1.43E+00	6.86E-01	8.22E-01	7.06E-01	4.21E-01	5.11E-01	1.30E+00	6.08E-01	9.15E-01	5.11E-01	8.24E-01	1.84E+00	1.54E+00	5.25E-01	-
Iron Oxide (Fe_2O_3)	1309-37-1	-	-	7.40E-02	1.13E-01	1.66E-01	2.31

Table F-8: Maximum Predicted Annual Average CoPC Concentrations at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	CAS	Criteria	Background (µg/m3)																											
Combustion Gases																														
Carbon Monoxide (CO)	630-08-0	-	-	4.11E-02	8.67E-02	9.53E-02	1.27E-01	4.15E-02	3.94E-02	1.90E-01	2.36E-01	1.35E-01	3.18E-01	9.60E-02	1.34E-01	2.93E-01	2.72E-01	4.39E-01	3.61E-01	1.73E-01	2.32E-01	4.68E-01	2.48E-01	2.89E-01	2.29E-01	4.10E-01	5.42E-01	5.63E-01	1.27E-01	-
Sulphur Dioxide (SO2)	7446-09-5	52	20	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.01E+01	2.01E+01	2.00E+01	2.01E+01	2.00E+01	2.00E+01	2.02E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.00E+01	2.01E+01	2.00E+01	2.01E+01	2.00E+01	2.00E+01	2.01E+01	2.01E+01	2.00E+01	39%
Hydrocarbons	<<NMHC>>	-	-	6.02E-03	1.11E-02	1.42E-02	1.97E-02	6.08E-03	5.70E-03	2.59E-02	3.67E-02	1.87E-02	5.02E-02	1.30E-02	1.85E-02	4.87E-02	3.64E-02	6.26E-02	5.29E-02	2.37E-02	3.06E-02	5.84E-02	2.89E-02	3.78E-02	3.07E-02	5.96E-02	7.48E-02	7.90E-02	1.97E-02	-
Nitrogen Dioxide (NO2) (Note 2)	10102-44-0	103	30	3.04E+01	3.08E+01	3.09E+01	3.13E+01	3.04E+01	3.04E+01	3.20E+01	3.28E+01	3.15E+01	3.40E+01	3.10E+01	3.14E+01	3.40E+01	3.24E+01	3.37E+01	3.38E+01	3.16E+01	3.20E+01	3.43E+01	3.22E+01	3.30E+01	3.19E+01	3.38E+01	3.56E+01	3.52E+01	3.13E+01	30%
1,3-butadiene	106-99-0	0.5	0.14	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	1.40E-01	28%
Acenaphthene	83-32-9	-	8.46E-04	8.49E-04	8.52E-04	8.52E-04	8.54E-04	8.49E-04	8.48E-04	8.60E-04	8.66E-04	8.53E-04	8.75E-04	8.52E-04	8.56E-04	8.74E-04	8.59E-04	8.66E-04	8.65E-04	8.56E-04	8.58E-04	8.74E-04	8.61E-04	8.67E-04	8.58E-04	8.68E-04	8.84E-04	8.78E-04	8.54E-04	-
Acenaphthylene	208-96-8	-	1.56E-03	1.57E-03	1.57E-03	1.57E-03	1.58E-03	1.57E-03	1.56E-03	1.59E-03	1.60E-03	1.57E-03	1.62E-03	1.57E-03	1.58E-03	1.62E-03	1.59E-03	1.60E-03	1.60E-03	1.58E-03	1.58E-03	1.62E-03	1.59E-03	1.60E-03	1.58E-03	1.60E-03	1.64E-03	1.62E-03	1.58E-03	-
Acetaldehyde	75-07-0	0.5	-	4.24E-04	9.34E-04	9.31E-04	1.31E-03	4.28E-04	4.02E-04	2.38E-03	3.48E-03	1.16E-03	4.98E-03	1.09E-03	1.71E-03	4.85E-03	2.16E-03	3.18E-03	3.10E-03	1.67E-03	2.02E-03	4.76E-03	2.45E-03	3.54E-03	1.95E-03	3.56E-03	6.48E-03	5.21E-03	1.31E-03	0%
Acrolein	107-02-8	2.00E-02	-	7.60E-05	1.68E-04	1.66E-04	2.34E-04	7.60E-05	7.20E-05	4.29E-04	6.25E-04	2.08E-04	8.94E-04	1.96E-04	3.08E-04	8.71E-04	3.91E-04	5.74E-04	5.60E-04	3.01E-04	3.64E-04	8.59E-04	4.42E-04	6.38E-04	3.53E-04	6.42E-04	1.17E-03	9.41E-04	2.34E-04	1%
Anthracene	120-12-7	-	3.08E-05	3.13E-05	3.18E-05	3.18E-05	3.22E-05	3.13E-05	3.12E-05	3.33E-05	3.44E-05	3.21E-05	3.60E-05	3.20E-05	3.26E-05	3.58E-05	3.32E-05	3.45E-05	3.43E-05	3.26E-05	3.30E-05	3.59E-05	3.34E-05	3.45E-05	3.30E-05	3.48E-05	3.77E-05	3.66E-05	3.22E-05	-
Benzene	71-43-2	-	0.4	4.00E-01	4.01E-01	4.01E-01	4.01E-01	4.00E-01	4.00E-01	4.01E-01	4.02E-01	4.01E-01	4.03E-01	4.01E-01	4.01E-01	4.03E-01	4.01E-01	4.02E-01	4.02E-01	4.01E-01	4.01E-01	4.03E-01	4.01E-01	4.02E-01	4.01E-01	4.02E-01	4.03E-01	4.03E-01	4.01E-01	-
Benzo(a)anthracene	56-55-3	-	-	6.70E-08	1.34E-07	1.53E-07	2.15E-07	6.77E-08	6.36E-08	3.26E-07	4.70E-07	1.98E-07	6.57E-07	1.57E-07	2.34E-07	6.39E-07	3.79E-07	6.17E-07	5.49E-07	2.64E-07	3.32E-07	6.94E-07	3.50E-07	4.81E-07	3.29E-07	6.23E-07	9.15E-07	8.58E-07	2.15E-07	-
Benzo(a)pyrene	50-32-8	9.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	3.00E-04	33%
Benzo(b+k)fluoranthene	205-99-2	-	5.35E-05	5.36E-05	5.36E-05	5.37E-05	5.37E-05	5.36E-05	5.36E-05	5.38E-05	5.40E-05	5.37E-05	5.42E-05	5.37E-05	5.37E-05	5.41E-05	5.40E-05	5.43E-05	5.42E-05	5.38E-05	5.39E-05	5.42E-05	5.39E-05	5.40E-05	5.39E-05	5.42E-05	5.45E-05	5.45E-05	5.37E-05	-
Benzo(g,h,i)perylene	191-24-2	-	-	5.52E-08	1.11E-07	1.27E-07	1.77E-07	5.57E-08	5.25E-08	2.69E-07	3.87E-07	1.66E-07	5.40E-07	1.30E-07	1.93E-07	5.26E-07	3.18E-07	5.19E-07	4.60E-07	2.20E-07	2.78E-07	5.76E-07	2.90E-07	3.96E-07	2.75E-07	5.22E-07	7.57E-07	7.17E-07	1.77E-07	-
Chrysene	218-01-9	-	6.49E-05	6.50E-05	6.51E-05	6.51E-05	6.52E-05	6.50E-05	6.50E-05	6.53E-05	6.55E-05	6.52E-05	6.58E-05	6.51E-05	6.52E-05	6.57E-05	6.55E-05	6.59E-05	6.58E-05	6.53E-05	6.54E-05	6.59E-05	6.54E-05	6.56E-05	6.54E-05	6.59E-05	6.62E-05	6.62E-05	6.52E-05	-
Fluoranthene	206-44-0	-	1.56E-04	1.57E-04	1.58E-04	1.58E-04	1.59E-04	1.57E-04	1.57E-04	1.60E-04	1.62E-04	1.58E-04	1.65E-04	1.58E-04	1.59E-04	1.65E-04	1.60E-04	1.63E-04	1.62E-04	1.59E-04	1.60E-04	1.65E-04	1.61E-04	1.62E-04	1.60E-04	1.63E-04	1.68E-04	1.66E-04	1.59E-04	-
Fluorene	86-73-7	-	2.82E-04	2.86E-04	2.90E-04	2.90E-04	2.93E-04	2.86E-04	2.85E-04	3.02E-04	3.11E-04	2.92E-04	3.23E-04	2.91E-04	2.96E-04	3.22E-04	3.02E-04	3.12E-04	3.10E-04	2.97E-04	3.00E-04	3.23E-04	3.03E-04	3.11E-04	3.00E-04	3.14E-04	3.37E-04	3.28E-04	2.93E-04	-
Formaldehyde	50-00-0	-	-	3.50E-04	7.84E-04	7.68E-04	1.08E-03	3.53E-04	3.34E-04	2.00E-03	2.92E-03	9.69E-04	4.19E-03	9.15E-04	1.44E-03	4.08E-03	1.81E-03	2.66E-03	2.61E-03	1.40E-03	1.69E-03	4.00E-03	2.06E-03	2.98E-03	1.64E-03	2.99E-03	5.45E-03	4.38E-03	1.08E-03	-
Phenanthrene	85-01-8	-	4.24E-04	4.31E-04	4.38E-04	4.39E-04	4.45E-04	4.31E-04	4.30E-04	4.59E-04	4.74E-04	4.43E-04	4.95E-04	4.40E-04	4.49E-04	4.93E-04	4.61E-04	4.82E-04	4.78E-04	4.51E-04	4.57E-04	4.97E-04	4.61E-04	4.76E-04	4.57E-04	4.85E-04	5.21E-04	5.10E-04	4.45E-04	-
Pyrene	129-00-0	13	0	7.65E-07	1.63E-06	1.72E-06	2.41E-06	7.72E-07	7.29E-07	4.05E-06	5.88E-06	2.20E-06	8.33E-06	1.90E-06	2.91E-06	8.11E-06	4.17E-06	6.47E-06	6.01E-06	3.05E-06	3.77E-06	8.37E-06	4.26E-06	6.01E-06	3.69E-06	6.86E-06	1.12E-05	9.73E-06	2.41E-06	0%
Diesel Particulate Matter (PM2.5 from Dieset Combustion)	<<DPM>>	-	1.82E-02	2.16E-02	2.49E-02	2.59E-02	2.90E-02	2.16E-02	2.14E-02	3.47E-02	4.19E-02	2.80E-02	5.15E-02	2.61E-02	3.00E-02	5.06E-02	3.69E-02	4.84E-02	4.52E-02	3.13E-02	3.47E-02	5.30E-02	3.58E-02	4.25E-02	3.44E-02	4.89E-02	6.41E-02	6.06E-02	2.90E-02	-
Elemental Carbon (from diesel exhaust)	7440-44-0	0.3	0	2.20E-03	4.37E-03	5.02E-03	7.02E-03	2.22E-03	2.08E-03	1.07E-02	1.54E-02	6.36E-03	2.17E-02	5.12E-03	7.68E-03	2.11E-02	1.22E-02	1.96E-02	1.76E-02	8.54E-03	1.07E-02	2.26E-02	1.15E-02	1.58E-02	1.06E-02	1.99E-02	2.98E-02	2.76E-02	7.02E-03	2%
Total PAHs (as equivalent B(a)P)	<<BaPeqT>>	2.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	1.40E-03	58%
Reagents																														
Calcium Oxide	1305-78-8	-	-	5.72E-02	9.26E-02	1.27E-01	1.75E-01	5.78E-02	4.88E-02	2.38E-01	3.49E-01	1.00E-01	4.88E-01	1.14E-01	1.69E-01	5.86E-01	2.36E-01	2.75E-01	2.32E-01	1.45E-01	1.73E-01	4.37E-01	2.14E-01	3.37E-01	1.71E-01	2.71E-01	6.07E-01	4.99E-01	1.75E-01	-
Potassium Amyl Xanthate (PAX)	2720-73-2	-	-	5.26E-05	1.54E-04	1.04E-04	1.30E-04	5.31E-05	5.06E-05	4.29E-04	7.25E-04	1.02E-04	9.20E-04	2.15E-04	3.38E-04	1.55E-03	3.45E-04	2.27E-04	1.61E-04	1.70E-04	1.81E-04	4.53E-04	2.94E-04	5.92E-04	1.71E-04	2.00E-04	5.45E-04	3.85E-04	1.54E-04	-
Sodium sulphite	7757-83-7	-	-	3.75E-04	1.10E-03	7.44E-04	9.28E-04	3.79E-04	3.63E-04	3.06E-03	5.18E-03	7.29E-04	6.57E-03	1.53E-03	2.41E-03	1.11E-02	2.47E-03	1.62E-03	1.15E-03	1.22E-03	1.29E-03	3.23E-03	2.10E-03	4.23E-03	1.22E-03	1.43E-03	3.89E-03	2.75E-03	1.10E-03	-
Zinc sulphate	7733-02-0	-	-	1.80E-05	5.26E-05	3.56E-05	4.46E-05	1.80E-05	1.75E-05	1.47E-04	2.49E-04	3.51E-05	3.16E-04	7.37E-05	1.16E-04	5.33E-04	1.19E-04	7.82E-05	5.57E-05	5.87E-05	6.22E-05	1.55E-04	1.01E-04	2.03E-04	5.87E-05	6.87E-05	1.87E-04	1.32E-04	5.26E-05	-
Sodium trithiocarbonate	534-18-9	-	-	2.16E-05	6.32E-05	4.31E-05	5.36E-05	2.21E-05	2.11E-05	1.77E-04	2.99E-04	4.21E-05	3.79E-04	8.82E-05	1.39E-04	6.40E-04	1.42E-04	9.38E-05	6.67E-05	7.02E-05	7.47E-05	1.87E-04	1.21E-04	2.44E-04	7.07E-05	8.22E-05	2.25E-04	1.58E-04	6.32E-05	-
Magnafloc 10	N/A	-	-	7.22E-05	2.12E-04	1.43E-04	1.78E-04	7.27E-05	6.97E-05	5.89E-04	9.96E-04	1.40E-04	1.26E-03	2.95E-04	4.64E-04	2.13E-03	4.75E-04	3.12E-04	2.22E-04	2.34E-04	2.49E-04	6.22E-04	4.04E-04	8.13E-04	2.36E-04	2.74E-04	7.49E-04	5.28E-04	2.12E-04	-

Notes:

1 - Individual model run with plume depletion

2 - Individual model run - with OLM

Table F-9: Maximum Predicted CoPC Concentrations for Other Averaging Periods at Special and Discrete Receptors During Operations - Project + Background

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors	
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Concentration	% Criteria
UTM E (m)				526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797		
UTM N (m)				5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851		
CoPC	**CAS**	**Criteria**	**Background (µg/m3)**																											
8-Hour Average																														
Carbon Monoxide (CO)	630-08-0	34000	400	535.5	568.5	721.0	619.6	536.0	550.1	677.2	625.4	942.5	609.9	732.3	514.5	528.9	578.8	737.3	1321.7	632.2	650.0	637.2	806.6	765.9	859.2	847.7	728.0	1143.4	721.0	2%
15-Minute Average																														
Formaldehyde	50-00-0	37	3	3.3	3.3	3.3	3.4	3.4	3.3	3.8	3.6	3.7	3.4	3.3	3.2	3.4	3.4	3.4	4.1	3.3	3.2	3.8	3.5	3.6	3.3	3.4	3.5	3.5	3.4	9%
4-Minute Average																														
Sulphur Dioxide (SO2)	7446-09-5	1050	150	200.0	176.5	231.7	230.5	200.4	196.0	211.9	237.6	221.9	272.3	224.0	177.5	305.4	215.5	209.6	279.9	172.2	175.5	250.2	202.5	286.4	246.3	207.7	301.3	236.9	231.7	22%
Acrolein	107-02-8	8.3	-	0.11	0.10	0.09	0.11	0.11	0.09	0.26	0.18	0.21	0.12	0.09	0.07	0.11	0.11	0.14	0.33	0.08	0.07	0.24	0.15	0.18	0.09	0.11	0.14	0.15	0.11	1%
Acetaldehyde	75-07-0	3	-	0.59	0.53	0.48	0.60	0.59	0.50	1.40	0.99	1.14	0.64	0.50	0.39	0.60	0.59	0.74	1.80	0.43	0.39	1.33	0.84	1.01	0.50	0.62	0.78	0.83	0.60	20%
Tin (Sn)	7440-31-5	2	0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.04	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.03	0.02	0.01	1%
1,3-butadiene	106-99-0	352	2.0	2.01	2.01	2.01	2.01	2.01	2.01	2.02	2.02	2.02	2.01	2.01	2.01	2.01	2.01	2.01	2.03	2.01	2.01	2.02	2.02	2.02	2.01	2.01	2.01	2.01	2.01	1%

Table F-10: Frequencies of Cumulative Concentration Exceedances at Special and Discrete Receptors During Operations

Receptor ID				CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type				Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Frequency of Exceedance
UTM E (m)				526876.99	543079.29	530947.7	532175.74	526930.53	526820.47	540795.01	540763.38	530613.25	539876.07	543707.81	542376.43	539863.01	537409.94	534333.25	532594.01	531575.69	532275.63	535871.48	537944.07	539424.16	532667.29	532779.44	536204.92	534797.37	
UTM N (m)				5640176.31	5659895.12	5643967.26	5644750.98	5640239.41	5639873.01	5655416.54	5652851.76	5645878.74	5653453.73	5653654.99	5651439.35	5649764.28	5645878.99	5646314.19	5647113.19	5650102.59	5650930.56	5653174.75	5656372.98	5654952.09	5651764.83	5648502.61	5652235.98	5650851.14	
CoPC	**CAS**	**Criteria**																											
Hourly																													
Elemental Carbon (from diesel exhaust)	7440-44-0	1		0.009%	0.002%	0.066%	0.073%	0.009%	0.009%	0.007%	0.018%	0.032%	0.064%	0.002%	0.000%	0.007%	0.005%	0.260%	0.304%	0.009%	0.016%	0.087%	0.011%	0.027%	0.055%	0.135%	0.126%	0.212%	0.073%
Quartz	14808-60-7	23		0.000%	0.000%	0.011%	0.009%	0.000%	0.000%	0.007%	0.021%	0.005%	0.037%	0.007%	0.007%	0.046%	0.007%	0.144%	0.078%	0.005%	0.000%	0.039%	0.011%	0.009%	0.018%	0.039%	0.112%	0.064%	0.011%
Mica	12001-26-2	30		0.000%	0.000%	0.002%	0.002%	0.000%	0.000%	0.007%	0.009%	0.009%	0.016%	0.000%	0.000%	0.025%	0.005%	0.107%	0.098%	0.002%	0.000%	0.034%	0.009%	0.005%	0.007%	0.064%	0.253%	0.105%	0.002%
24-Hour																													
Annual																													
Quartz	14808-60-7	7.00E-02		0%	80%	100%	100%	0%	0%	100%	100%	60%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

APPENDIX G Predicted Dustfall Deposition at Special Receptors

Table G-1: Maximum Predicted 24-Hour PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Construction - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Deposition
UTM E (m)		526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	
UTM N (m)		5640176	5659895	5643967	5644751	5640239	5638873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	0.03	0.03	0.06	0.08	0.03	0.03	0.09	0.09	0.05	0.14	0.04	0.10	0.20	0.08	0.11	0.10	0.06	0.08	0.22	0.08	0.11	0.11	0.10	0.42	0.23	0.08
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	1.99E-08	2.52E-08	4.10E-08	5.03E-08	2.00E-08	1.92E-08	5.90E-08	6.90E-08	3.65E-08	9.25E-08	3.23E-08	7.21E-08	1.36E-07	5.25E-08	7.02E-08	6.62E-08	4.69E-08	6.10E-08	1.57E-07	5.94E-08	7.58E-08	7.97E-08	6.86E-08	2.93E-07	1.62E-07	5.03E-08
Aluminum (Al)	7429-90-5	2.23E-03	2.62E-03	4.73E-03	5.85E-03	2.24E-03	2.17E-03	6.63E-03	7.05E-03	4.15E-03	1.03E-02	3.07E-03	7.82E-03	1.47E-02	5.86E-03	8.37E-03	7.29E-03	4.92E-03	6.36E-03	1.64E-02	6.47E-03	8.25E-03	8.10E-03	7.58E-03	3.20E-02	1.76E-02	5.85E-03
Arsenic (As)	7440-38-2	2.53E-07	3.19E-07	5.21E-07	6.40E-07	2.54E-07	2.44E-07	7.50E-07	8.75E-07	4.64E-07	1.17E-06	4.10E-07	9.15E-07	1.72E-06	6.66E-07	8.91E-07	8.40E-07	5.96E-07	7.74E-07	1.99E-06	7.55E-07	9.62E-07	1.01E-06	8.71E-07	3.72E-06	2.05E-06	6.40E-07
Gold (Au)	7440-57-5	3.10E-09	4.22E-09	6.21E-09	7.57E-09	3.12E-09	2.99E-09	9.21E-09	1.18E-08	5.62E-09	1.45E-08	5.85E-09	1.16E-08	2.27E-08	8.86E-09	1.02E-08	1.05E-08	7.82E-09	1.02E-08	2.62E-08	9.57E-09	1.23E-08	1.37E-08	1.16E-08	4.68E-08	2.61E-08	7.57E-09
Boron (B)	7440-42-8	2.99E-06	3.53E-06	6.30E-06	7.79E-06	3.00E-06	2.90E-06	8.86E-06	9.56E-06	5.55E-06	1.38E-05	4.20E-06	1.05E-05	1.96E-05	7.82E-06	1.11E-05	9.78E-06	6.64E-06	8.59E-06	2.22E-05	8.69E-06	1.10E-05	1.10E-05	1.01E-05	4.30E-05	2.36E-05	7.79E-06
Barium (Ba)	7440-39-3	1.09E-05	1.28E-05	2.31E-05	2.85E-05	1.10E-05	1.06E-05	3.24E-05	3.46E-05	2.03E-05	5.05E-05	1.51E-05	3.83E-05	7.17E-05	2.86E-05	4.08E-05	3.57E-05	2.41E-05	3.12E-05	8.04E-05	3.16E-05	4.03E-05	3.98E-05	3.70E-05	1.57E-04	8.60E-05	2.85E-05
Beryllium (Be)	7440-41-7	3.45E-08	4.06E-08	7.31E-08	9.05E-08	3.47E-08	3.36E-08	1.03E-07	1.09E-07	6.43E-08	1.60E-07	4.75E-08	1.21E-07	2.27E-07	9.08E-08	1.30E-07	1.13E-07	7.61E-08	9.84E-08	2.54E-07	1.00E-07	1.28E-07	1.25E-07	1.17E-07	4.95E-07	2.72E-07	9.05E-08
Bismuth (Bi)	7440-69-9	6.19E-08	7.36E-08	1.30E-07	1.61E-07	6.23E-08	6.02E-08	1.84E-07	1.99E-07	1.15E-07	2.87E-07	8.81E-08	2.18E-07	4.07E-07	1.62E-07	2.30E-07	2.03E-07	1.38E-07	1.79E-07	4.61E-07	1.80E-07	2.28E-07	2.29E-07	2.09E-07	8.93E-07	4.90E-07	1.61E-07
Cadmium (Cd)	7440-44-0	2.70E-05	3.20E-05	5.70E-05	7.10E-05	2.70E-05	2.60E-05	8.00E-05	8.70E-05	5.00E-05	1.25E-04	3.80E-05	9.50E-05	1.78E-04	7.10E-05	1.01E-04	8.90E-05	6.00E-05	7.80E-05	2.01E-04	7.90E-05	1.00E-04	1.00E-04	9.10E-05	3.90E-04	2.14E-04	7.10E-05
Calcium (Ca)	7440-70-2	9.33E-04	1.10E-03	1.98E-03	2.44E-03	9.38E-04	9.07E-04	2.77E-03	2.95E-03	1.74E-03	4.32E-03	1.28E-03	3.26E-03	6.12E-03	2.45E-03	3.50E-03	3.05E-03	2.05E-03	2.66E-03	6.85E-03	2.70E-03	3.45E-03	3.38E-03	3.16E-03	1.34E-02	7.34E-03	2.44E-03
Cadmium (Cd)	7440-43-9	4.07E-08	5.41E-08	8.22E-08	1.00E-07	4.09E-08	3.92E-08	1.21E-07	1.50E-07	7.40E-08	1.90E-07	7.32E-08	1.51E-07	2.91E-07	1.13E-07	1.37E-07	1.37E-07	1.00E-07	1.31E-07	3.36E-07	1.24E-07	1.60E-07	1.74E-07	1.48E-07	6.09E-07	3.38E-07	1.00E-07
Cerium (Ce) and Compounds (as Ce)	7440-45-1	2.06E-06	2.41E-06	4.35E-06	5.39E-06	2.07E-06	2.00E-06	6.10E-06	6.49E-06	3.82E-06	9.52E-06	2.83E-06	7.20E-06	1.35E-05	5.40E-06	7.71E-06	6.72E-06	4.53E-06	5.85E-06	1.51E-05	5.95E-06	7.60E-06	7.46E-06	6.98E-06	2.95E-05	1.62E-05	5.39E-06
Cobalt (Co)	7440-48-4	5.25E-07	6.16E-07	1.11E-06	1.37E-06	5.27E-07	5.10E-07	1.56E-06	1.66E-06	9.76E-07	2.43E-06	7.21E-07	1.84E-06	3.44E-06	1.38E-06	1.97E-06	1.71E-06	1.16E-06	1.49E-06	3.85E-06	1.52E-06	1.94E-06	1.90E-06	1.78E-06	7.52E-06	4.13E-06	1.37E-06
Chromium (Cr) and Compounds (as Cr)	7440-47-3	2.62E-06	3.09E-06	5.55E-06	6.86E-06	2.64E-06	2.55E-06	7.79E-06	8.34E-06	4.88E-06	1.22E-05	3.64E-06	9.21E-06	1.72E-05	6.89E-06	9.81E-06	8.58E-06	5.80E-06	7.51E-06	1.94E-05	7.62E-06	9.69E-06	9.58E-06	8.90E-06	3.77E-05	2.07E-05	6.86E-06
Cesium (Cs) and Compounds (as Ce)	7440-46-2	8.73E-08	1.03E-07	1.85E-07	2.29E-07	8.78E-08	8.50E-08	2.59E-07	2.76E-07	1.63E-07	4.04E-07	1.20E-07	3.06E-07	5.74E-07	2.29E-07	3.28E-07	2.85E-07	1.92E-07	2.49E-07	6.42E-07	2.53E-07	3.23E-07	3.17E-07	2.97E-07	1.25E-06	6.87E-07	2.29E-07
Copper (Cu)	7440-50-8	4.43E-06	5.77E-06	9.03E-06	1.15E-05	4.46E-06	4.28E-06	1.32E-05	1.59E-05	8.09E-06	2.07E-05	7.65E-06	1.63E-05	3.11E-05	1.21E-05	1.52E-05	1.49E-05	1.07E-05	1.40E-05	3.59E-05	1.34E-05	1.72E-05	1.84E-05	1.58E-05	6.59E-05	3.65E-05	1.11E-05
Iron (Fe)	7439-89-6	1.01E-03	1.19E-03	2.14E-03	2.64E-03	1.02E-03	9.82E-04	3.00E-03	3.21E-03	1.88E-03	4.68E-03	1.40E-03	3.54E-03	6.64E-03	2.65E-03	3.78E-03	3.30E-03	2.23E-03	2.89E-03	7.45E-03	2.93E-03	3.73E-03	3.68E-03	3.43E-03	1.45E-02	7.96E-03	2.64E-03
Gallium (Ga)	7440-55-3	5.82E-07	6.84E-07	1.23E-06	1.53E-06	5.85E-07	5.67E-07	1.73E-06	1.84E-06	1.08E-06	2.70E-06	8.00E-07	2.04E-06	3.82E-06	1.53E-06	2.18E-06	1.90E-06	1.28E-06	1.66E-06	4.28E-06	1.69E-06	2.15E-06	2.11E-06	1.98E-06	8.35E-06	4.58E-06	1.53E-06
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1.21E-07	1.42E-07	2.55E-07	3.16E-07	1.21E-07	1.17E-07	3.58E-07	3.81E-07	2.24E-07	5.58E-07	1.66E-07	4.22E-07	7.92E-07	3.17E-07	4.52E-07	3.94E-07	2.66E-07	3.43E-07	8.86E-07	3.49E-07	4.45E-07	4.37E-07	4.10E-07	1.73E-06	9.48E-07	3.16E-07
Mercury (Hg)	7439-97-6	7.28E-10	8.55E-10	1.54E-09	1.91E-09	7.32E-10	7.08E-10	2.16E-09	2.30E-09	1.35E-09	3.37E-09	1.00E-09	2.55E-09	4.78E-09	1.91E-09	2.73E-09	2.38E-09	1.60E-09	2.07E-09	5.35E-09	2.11E-09	2.69E-09	2.64E-09	2.47E-09	1.04E-08	5.72E-09	1.91E-09
Indium (In)	7440-74-6	1.46E-10	1.71E-10	3.08E-10	3.81E-10	1.46E-10	1.42E-10	4.32E-10	4.60E-10	2.71E-10	6.74E-10	2.00E-10	5.10E-10	9.56E-10	3.82E-10	5.46E-10	4.76E-10	3.21E-10	4.15E-10	1.07E-09	4.22E-10	5.38E-10	5.28E-10	4.94E-10	2.09E-09	1.15E-09	3.81E-10
Potassium (K)	7440-09-7	4.34E-04	5.11E-04	9.17E-04	1.13E-03	4.36E-04	4.22E-04	1.29E-03	1.38E-03	8.06E-04	2.01E-03	6.04E-04	1.52E-03	2.85E-03	1.14E-03	1.62E-03	1.42E-03	9.61E-04	1.24E-03	3.21E-03	1.26E-03	1.60E-03	1.59E-03	1.47E-03	6.24E-03	3.42E-03	1.13E-03
Lanthanum (La)	7439-91-0	4.68E-07	5.55E-07	9.88E-07	1.22E-06	4.71E-07	4.55E-07	1.39E-06	1.50E-06	8.70E-07	2.17E-06	6.60E-07	1.65E-06	3.08E-06	1.23E-06	1.74E-06	1.53E-06	1.04E-06	1.35E-06	3.48E-06	1.36E-06	1.73E-06	1.72E-06	1.58E-06	6.74E-06	3.70E-06	1.22E-06
Lithium (Li)	7439-93-2	7.46E-07	8.76E-07	1.58E-06	1.95E-06	7.49E-07	7.25E-07	2.21E-06	2.36E-06	1.39E-06	3.45E-06	1.03E-06	2.61E-06	4.90E-06	1.96E-06	2.80E-06	2.44E-06	1.64E-06	2.12E-06	5.48E-06	2.16E-06	2.75E-06	2.70E-06	2.53E-06	1.07E-05	5.87E-06	1.95E-06
Lutetium (Lu)	7439-94-3	6.81E-09	8.00E-09	1.44E-08	1.78E-08	6.85E-09	6.63E-09	2.02E-08	2.15E-08	1.27E-08	3.15E-08	9.36E-09	2.39E-08	4.47E-08	1.79E-08	2.56E-08	2.23E-08	1.50E-08	1.94E-08	5.00E-08	1.97E-08	2.52E-08	2.47E-08	2.31E-08	9.77E-08	5.36E-08	1.78E-08
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	4.04E-04	4.75E-04	8.57E-04	1.06E-03	4.07E-04	3.93E-04	1.20E-03	1.28E-03	7.52E-04	1.87E-03	5.55E-04	1.42E-03	2.66E-03	1.06E-03	1.52E-03	1.32E-03	8.91E-04	1.15E-03	2.97E-03	1.17E-03	1.50E-03	1.47E-03	1.37E-03	5.80E-03	3.18E-03	1.06E-03
Manganese (Mn) and Compounds (as Mn)	7439-96-5	5.14E-07	1.39E-06	1.20E-06	1.67E-06	5.22E-07	3.74E-07	2.93E-06	5.88E-06	1.70E-06	8.31E-06	2.52E-06	5.08E-06	1.45E-05	3.13E-06	3.25E-06	2.66E-06	3.38E-06	5.76E-06	1.06E-05	3.58E-06	5.90E-06	9.29E-06	5.26E-06	2.67E-05	1.60E-05	1.67E-06
Molybdenum (Mo)	7439-98-7	1.88E-07	2.21E-07	3.98E-07	4.92E-07	1.89E-07	1.83E-07	5.57E-07	5.93E-07	3.49E-07	8.69E-07	2.58E-07	6.57E-07	1.23E-06	4.93E-07	7.04E-07	6.13E-07	4.14E-07	5.35E-07	1.38E-06	5.44E-07	6.94E-07	6.81E-07	6.38E-07	2.69E-06	1.48E-06	4.92E-07
Sodium (Na)	7440-23-5	8.64E-04	1.02E-03	1.83E-03	2.26E-03	8.69E-04	8.41E-04	2.57E-03	2.73E-03	1.61E-03	4.00E-03	1.19E-03	3.03E-03	5.68E-03	2.27E-03	3.24E-03	2.82E-03	1.90E-03	2.46E-03	6.35E-03	2.50E-03	3.19E-03	3.14E-03	2.94E-03	1.24E-02	6.80E-03	2.26E-03
Niobium (Nb)	7440-03-1	1.70E-07	2.00E-07	3.60E-07	4.46E-07	1.71E-07	1.65E-07	5.05E-07	5.37E-07	3.16E-07	7.87E-07	2.34E-07	5.96E-07	1.12E-06	4.47E-07	6.38E-07	5.56E-07	3.75E-07	4.84E-07	1.25E-06	4.93E-07	6.28E-07	6.17E-07	5.78E-07	2.44E-06	1.34E-06	4.46E-07
Nickel (Ni)	7440-02-0	5.79E-08	1.56E-07	1.35E-07	1.88E-07	5.87E-08	4.19E-08	3.29E-07	6.57E-07	1.90E-07	9.30E-07	2.80E-07	5.59E-07	1.62E-06	3.49E-07	3.65E-07	2.98E-07	3.77E-07	6.45E-07	1.18E-06	4.02E-07	6.62E-07	1.04E-06	5.90E-07	2.99E-06	1.79E-06	1.88E-07
Phosphorus (P)	7723-14-0	1.82E-05	2.14E-05	3.86E-05	4.77E-05	1.83E-05	1.77E-05	5.40E-05	5.75E-05	3.38E-05	8.43E-05	2.49E-05	6.36E-05	1.19E-04	4.78E-05	6.82E-05	5.94E-05	4.01E-05	5.18E-05	1.34E-04	5.27E-05	6.73E-05	6.59E-05	6.17E-05	2.61E-04	1.43E-04	4.77E-05
Lead (Pb)	7439-92-1	5.87E-07	6.91E-07	1.24E-06	1.54E-06	5.91E-07	5.71E-07	1.74E-06	1.87E-06	1.09E-06	2.72E-06	8.16E-07	2.06E-06	3.86E-06	1.54E-06	2.20E-06	1.92E-06	1.30E-06	1.68E-06	4.33E-06	1.70E-06	2.17E-06	2.14E-06	1.99E-06	8.44E-06	4.63E-06	1.54E-06
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	2.19E-06	2.57E-06	4.63E-06	5.73E-06	2.20E-06	2.13E-06	6.49E-06	6.91E-06	4.07E-06	1.01E-05	3.01E-06	7.66E-06	1.44E-05	5.75E-06	8.21E-06	7.15E-06	4.82E-06	6.23E-06	1.61E-05	6.34E-06	8.09E-06	7.94E-06	7.43E-06	3.14E-05	1.72E-05	5.73E-06
Sulphur (S)	7704-34-9	5.70E-05	2.04E-04	1.19E-04	1.47E-04	5.72E-05	5.52E-05	1.75E-04	1.79E-04	1.48E-04	2.65E-04	8.04E-05	2.08E-04	3.78E-04	1.48E-04	2.08E-04	1.86E-04	1.70E-04	3.77E-04	1.68E-04	2.14E-04	2.19E-04	1.91E-04	8.32E-04	4.58E-04	1.47E-04
Antimony (Sb)	7440-36-0	1.50E-07	1.80E-07	3.15E-07	3.89E-07	1.51E-07	1.46E-07	4.45E-07	4.87E-07	2.78E-07	6.95E-07	2.17E-07	5.31E-07	9.88E-07	3.91E-07	5.53E-07	4.93E-07	3.37E-07	4.36E-07	1.12E-06	4.38E-07	5.54E-07	5.60E-07	5.05E-07	2.17E-06	1.19E-06	3.89E-07
Scandium (Sc)	7440-20-2	3.23E-07	3.79E-07	6.84E-07	8.46E-07	3.24E-07	3.14E-07	9.58E-07	1.02E-06	6.00E-07	1.49E-06	4.44E-07	1.13E-06	2.12E-06	8.48E-07	1.21E-06	1.05E-06	7.11E-07	9.19E-07	2.37E-06	9.35E-07	1.19E-06	1.17E-06	1.10E-06	4.63E-06	2.54E-06	8.46E-07
Selenium (Se)	7782-49-2	1.02E-08	1.20E-08	2.16E-08	2.67E-08	1.02E-08	9.91E-09	3.02E-08	3.22E-08	1.90E-08	4.72E-08	1.40E-08	3.57E-08	6.69E-08	2.68E-08	3.82E-08	3.33E-08	2.24E-08	2.90E-08	7.48E-08	2.95E-08	3.76E-08	3.70E-08	3.46E-08	1.46E-07	8.02E-08	2.67E-08
Tin (Sn)	7440-31-5	2.49E-07	2.93E-07	5.28E-07	6.53E-07	2.51E-07	2.42E-07	7.40E-07	7.88E-07	4.64E-07	1.15E-06	3.43E-07	8.73E-07	1.64E-06	6.55E-07	9.35E-07	8.14E-07	5.49E-07	7.10E-07	1.83E-06	7.22E-07	9.21E-07	9.05E-07	8.47E-07	3.58E-06	1.96E-06	6.53E-07
Strontium (Sr)	7440-24-6	9.70E-06	1.12E-05	2.05E-05	2.54E-05	9.75E-06	9.42E-06	2.88E-05	3.06E-05	1.80E-05	4.49E-05	1.33E-05	3.39E-05	6.36E-05	2.55E-05	3.64E-05	3.17E-05	2.14E-05	2.76E-05	7.12E-05	2.81E-05	3.58E-05	3.51E-05	3.29E-05	1.39E-04	7.62E-05	2.54E-05
Tantalum (Ta)	7440-25-7	2.93E-08	3.44E-08	6.21E-08	7.68E-08	2.95E-08	2.85E-08	8.70E-08	9.26E-08	5.45E-08	1.36E-07	4.03E-08	1.03E-07	1.93E-07	7.70E-08	1.10E-07	9.58E-08	6.46E-08	8.35E-08	2.15E-07	8.49E-08	1.08E-07	1.06E-07	9.96E-08	4.21E-07	2.31E-07	7.68E-08
Terbium (Tb) and Compounds (as Tb)	7440-27-9	1.55E-08	1.82E-08	3.28E-08	4.06E-08	1.56E-08	1.51E-08	4.60E-08	4.89E-08	2.88E-08	7.17E-08	2.13E-08	5.43E-08	1.02E-07	4.07E-08	5.81E-08	5.06E-08	3.41E-08	4.41E-08	1.14E-07	4.49E-08	5.72E-08	5.62E-08	5.26E-08	2.22E-07	1.22E-07	4.06E-08
Tellurium (Te)	13494-80-9	5.09E-09	5.98E-09	1.08E-08	1.33E-08	5.12E-09	4.95E-09	1.51E-08	1.61E-08	9.48E-09	2.36E-08	7.00E-09	1.78E-08	3.34E-08	1.34E-08	1.91E-08	1.66E-08	1.12E-08	1.45E-08	3.74E-08	1.48E-08	1.88E-08	1.85E-08	1.73E-08	7.30E-08	4.01E-08	1.33E-08
Titanium (Ti) and Compounds (as Ti)	7440-32-6	3.65E-06	9.78E-06	8.53E-06	1.18E-05	3.70E-06	2.64E-06	2.07E-05	4.13E-05	1.19E-05	5.85E-05	1.76E-05	3.51E-05	1.02E-04	2.20E-05	2.30E-05	1.87E-05	2.37E-05	4.06E-05	7.42E-05	2.53E-05	4.17E-05	6.52E-05	3.71E-05	1.88E-04	1.13E-04	1.18E-05
Thallium (Tl)	7440-28-0	2.63E-08	3.29E-08	5.58E-08	6.90E-08	2.65E-08	2.58E-08	7.82E-08	8.32E-08	4.90E-08	1.22E-07	3.62E-08	9.28E-08	1.73E-07	6.92E-08	9.88E-08	8.61E-08	5.80E-08	7.50E-08	1.94E-07	6.38E-08	9.73E-08	9.56E-08	8.95E-08	3.78E-07	2.07E-07	6.90E-08
Uranium (U)	7440-61-1	3.90E-08	4.59E-08	8.27E-08	1.02E-07	3.92E-08	3.80E-08	1.16E-07	1.23E-07	7.26E-08	1.81E-07	5.37E-08	1.37E-07	2.56E-07	1.03E-07	1.46E-07	1.28E-07	8.60E-08	1.11E-07	2.87E-07	1.13E-07	1.44E-07	1.42E-07	1.33E-07	5.60E-07	3.07E-07	1.02E-07
Vanadium (v)	7440-62-2	2.86E-06	3.36E-06	6.06E-06	7.50E-06	2.88E-06	2.79E-06	8.50E-06	9.05E-06	5.33E-06	1.33E-05	3.93E-06	1.00E-05	1.88E-05	7.52E-06	1.07E-05	9.35E-06	6.31E-06	8.15E-06	2.10E-05	8.29E-06	1.06E-05	1.04E-05	9.72E-06	4.11E-05	2.25E-05	7.50E-06
Tungsten (W) and Compounds (as W)	7440-33-7	1.44E-06	1.69E-06	3.04E-06	3.77E-06	1.45E-06	1.40E-06	4.27E-06	4.54E-06	2.67E-06	6.66E-06	1.97E-06	5.03E-06	9.44E-06	3.78E-06	5.39E-06	4.70E-06	3.17E-06	4.09E-06	1.06E-05	4.16E-06	5.31E-06	5.21E-06	4.88E-06	2.06E-05	1.13E-05	3.77E-06
Yttrium (Y) and Compounds (as Y)	7440-65-5	3.78E-07	4.45E-07	8.02E-07	9.92E-07	3.80E-07	3.68E-07	1.12E-06	1.20E-06	7.04E-07	1.75E-06	5.21E-07	1.33E-06	2.49E-06	9.95E-07	1.42E-06	1.24E-06	8.34E-07	1.08E-06	2.78E-06	1.10E-06	1.40E-06	1.37E-06	1.29E-06	5.43E-06	2.98E-06	9.92E-07
Ytterbium (Yb)	7440-64-4	4.36E-08	5.12E-08	9.23E-08	1.14E-07	4.38E-08	4.24E-08	1.29E-07	1.38E-07	8.11E-08	2.02E-07	6.00E-08	1.53E-07	2.86E-07	1.15E-07	1.64E-07	1.42E-07	9.61E-08	1.24E-07	3.20E-07	1.26E-07	1.61E-07	1.58E-07	1.48E-07	6.25E-07	3.43E-07	1.14E-07
Zinc (Zn)	7440-66-6	3.64E-06	4.40E-06	7.62E-06	9.40E-06	3.66E-06	3.53E-06	1.08E-05	1.20E-05	6.73E-06	1.69E-05	5.38E-06	1.29E-05	2.40E-05	9.45E-06	1.33E-05	1.20E-05	8.25E-06	1.07E-05	2.75E-05	1.07E-05	1.35E-05	1.38E-05	1.22E-05	5.27E-05	2.90E-05	9.40E-06
Zirconium (Zr)	7440-67-7	2.81E-06	3.30E-06	5.95E-06	7.35E-06	2.82E-06	2.73E-06	8.33E-06	8.87E-06	5.22E-06	1.30E-05	3.86E-06	9.83E-06	1.84E-05	7.38E-06	1.05E-05	9.17E-06	6.18E-06	8.00E-06	2.06E-05	8.13E-06	1.04E-05	1.02E-05	9.54E-06	4.03E-05	2.21E-05	7.35E-06
Silicon Dioxide (SiO2)	7631-86-9	1.90E-02	2.24E-02	4.03E-02	4.99E-02	1.91E-02	1.85E-02	5.65E-02	6.01E-02	3.54E-02	8.81E-02	2.62E-02	6.67E-02	1.25E-01	5.00E-02	7.14E-02	6.22E-02	4.19E-02	5.42E-02	1.40E-01	5.51E-02	7.03E-02	6.91E-02	6.47E-02	2.73E-01	1.50E-01	4.99E-02
Aluminum Oxide (Al2O3)	1344-28-1	4.40E-03	5.17E-03	9.32E-03	1.15E-02	4.42E-03	4.28E-03	1.31E-02	1.39E-02	8.18E-03	2.04E-02	6.05E-03	1.54E-02	2.89E-02	1.16E-02	1.65E-02	1.44E-02	9.69E-03	1.25E-02	3.23E-02	1.27E-02	1.63E-02	1.60E-02	1.49E-02	6.31E-02	3.46E-02	1.15E-02
Iron Oxide (Fe2O3)	1309-37-1	1.46E-03	1.71E-03	3.09E-03	3.82E-03	1.46E-03	1.42E-03	4.32E-03	4.61E-03	2.71E-03	6.75E-03	2.01E-03	5.10E-03	9.57E-03	3.83E-03	5.46E-03	4.76E-03	3.21E-03	4.15E-03	1.07E-02	4.22E-03	5.38E-03	5.29E-03	4.95E-03	2.09E-02	1.15E-02	3.82E-03
Magnesium Oxide (MgO)	1309-48-4	6.14E-04	7.21E-04	1.30E-03	1.61E-03	6.17E-04	5.97E-04	1.82E-03	1.94E-03	1.14E-03	2.84E-03	8.44E-04	2.15E-03	4.03E-03	1.61E-03	2.30E-03	2.01E-03	1.35E-03	1.75E-03	4.51E-03	1.78E-03	2.27E-03	2.23E-03	2.09E-03	8.81E-03	4.83E-03	1.61E-03
Calcium Oxide (CaO)	1305-78-8	1.05E-03	1.23E-03	2.22E-03	2.75E-03	1.06E-03	1.02E-03	3.12E-03	3.32E-03	1.95E-03	4.86E-03	1.44E-03	3.68E-03	6.90E-03	2.76E-03	3.94E-03	3.43E-03	2.31E-03	2.99E-03	7.72E-03	3.04E-03	3.88E-03	3.81E-03	3.57E-03	1.51E-02	8.26E-03	2.75E-03
Sodium Oxide (Na2O)	1313-59-3	1.00E-03	1.18E-03	2.12E-03	2.62E-03	1.01E-03	9.73E-04	2.97E-03	3.16E-03	1.86E-03	4.63E-03	1.38E-03	3.51E-03	6.57E-03	2.63E-03	3.75E-03	3.27E-03	2.21E-03	2.85E-03	7.35E-03	2.90E-03	3.70E-03	3.63E-03	3.40E-03	1.44E-02	7.87E-03	2.62E-03
Potassium Oxide (K2O)	12136-45-7	7.09E-04	8.33E-04	1.50E-03	1.86E-03	7.13E-04	6.90E-04	2.11E-03	2.24E-03	1.32E-03

Table G-2: Maximum Predicted Monthly PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Construction - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Deposition
UTM E (m)		526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	
UTM N (m)		5640176	5659895	5643967	5644751	5640239	5638873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	0.23	0.33	0.53	0.70	0.23	0.19	0.81	0.99	0.31	1.40	0.39	0.73	2.16	0.68	0.89	0.59	0.50	0.60	1.78	0.73	1.27	0.64	0.61	3.57	1.63	0.70
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	1.66E-07	2.20E-07	3.33E-07	4.42E-07	1.48E-07	1.21E-07	5.40E-07	6.96E-07	1.98E-07	9.40E-07	2.65E-07	5.15E-07	1.47E-06	4.52E-07	5.61E-07	3.80E-07	3.30E-07	4.08E-07	1.23E-06	4.88E-07	8.44E-07	4.45E-07	3.95E-07	2.41E-06	1.09E-06	4.42E-07
Aluminum (Al)	7429-90-5	1.75E-02	2.50E-02	4.02E-02	5.37E-02	1.77E-02	1.44E-02	6.10E-02	7.41E-02	2.34E-02	1.05E-01	2.93E-02	5.55E-02	1.60E-01	5.15E-02	6.75E-02	4.50E-02	3.82E-02	4.58E-02	1.35E-01	5.51E-02	9.63E-02	4.84E-02	4.66E-02	2.71E-01	1.23E-01	5.37E-02
Arsenic (As)	7440-38-2	1.86E-06	2.80E-06	4.24E-06	5.62E-06	1.88E-06	1.54E-06	6.85E-06	8.84E-06	2.52E-06	1.19E-05	3.37E-06	6.54E-06	1.86E-05	5.74E-06	7.13E-06	4.82E-06	4.19E-06	5.18E-06	1.57E-05	6.20E-06	1.07E-05	5.64E-06	5.01E-06	3.06E-05	1.38E-05	5.62E-06
Gold (Au)	7440-57-5	2.13E-08	3.40E-08	4.81E-08	6.32E-08	2.15E-08	1.77E-08	8.35E-08	1.14E-07	2.94E-08	1.47E-07	4.21E-08	8.36E-08	2.35E-07	6.95E-08	8.11E-08	5.57E-08	5.18E-08	6.61E-08	1.97E-07	7.57E-08	1.29E-07	7.15E-08	5.82E-08	3.75E-07	1.71E-07	6.32E-08
Boron (B)	7440-42-8	2.30E-05	3.30E-05	5.30E-05	7.10E-05	2.30E-05	1.90E-05	8.20E-05	1.00E-04	3.10E-05	1.41E-04	3.90E-05	7.50E-05	2.15E-04	6.90E-05	9.00E-05	6.00E-05	5.10E-05	6.10E-05	1.82E-04	7.40E-05	1.29E-04	6.50E-05	6.20E-05	3.63E-04	1.65E-04	7.10E-05
Barium (Ba)	7440-39-3	8.50E-05	1.22E-04	1.96E-04	2.61E-04	8.60E-05	7.00E-05	2.98E-04	3.63E-04	1.14E-04	5.15E-04	1.43E-04	2.72E-04	7.85E-04	2.51E-04	3.29E-04	2.20E-04	1.87E-04	2.24E-04	6.63E-04	2.69E-04	4.70E-04	2.37E-04	2.27E-04	1.33E-03	6.03E-04	2.61E-04
Beryllium (Be)	7440-41-7	2.70E-07	3.86E-07	6.21E-07	8.30E-07	2.73E-07	2.22E-07	9.44E-07	1.15E-06	3.61E-07	1.63E-06	4.53E-07	8.59E-07	2.48E-06	7.97E-07	1.04E-06	6.97E-07	5.92E-07	7.09E-07	2.10E-06	8.53E-07	1.49E-06	7.49E-07	7.22E-07	4.20E-06	1.91E-06	8.30E-07
Bismuth (Bi)	7440-69-9	4.79E-07	6.92E-07	1.10E-06	1.47E-06	4.84E-07	3.94E-07	1.69E-06	2.08E-06	6.42E-07	2.92E-06	8.16E-07	1.55E-06	4.47E-06	1.42E-06	1.85E-06	1.24E-06	1.05E-06	1.26E-06	3.77E-06	1.53E-06	2.66E-06	1.35E-06	1.28E-06	7.52E-06	3.42E-06	1.47E-06
Carbon (C)	7440-44-0	2.10E-04	3.02E-04	4.82E-04	6.43E-04	2.12E-04	1.73E-04	7.39E-04	9.06E-04	2.81E-04	1.28E-03	3.56E-04	6.78E-04	1.95E-03	6.23E-04	8.09E-04	5.41E-04	4.61E-04	5.53E-04	1.65E-03	6.68E-04	1.16E-03	5.89E-04	5.61E-04	3.29E-03	1.49E-03	6.43E-04
Calcium (Ca)	7440-70-2	7.31E-03	1.04E-02	1.68E-02	2.24E-02	7.38E-03	6.00E-03	2.55E-02	3.08E-02	9.76E-03	4.39E-02	1.22E-02	2.31E-02	6.68E-02	2.15E-02	2.82E-02	1.88E-02	1.60E-02	1.91E-02	5.66E-02	2.30E-02	4.02E-02	2.02E-02	1.95E-02	1.13E-01	5.16E-02	2.24E-02
Cadmium (Cd)	7440-43-9	2.86E-07	4.48E-07	6.47E-07	8.53E-07	2.88E-07	2.37E-07	1.10E-06	1.48E-06	3.92E-07	1.93E-06	5.49E-07	1.08E-06	3.06E-06	9.16E-07	1.09E-06	7.46E-07	6.77E-07	8.56E-07	2.57E-06	9.95E-07	1.71E-06	9.29E-07	7.78E-07	4.92E-06	2.22E-06	8.53E-07
Cerium (Ce) and Compounds as Ce)	7440-45-1	1.61E-05	2.30E-05	3.70E-05	4.95E-05	1.63E-05	1.32E-05	5.62E-05	6.82E-05	2.15E-05	9.70E-05	2.70E-05	5.12E-05	1.48E-04	4.74E-05	6.22E-05	4.15E-05	3.52E-05	4.22E-05	1.25E-04	5.08E-05	8.87E-05	4.45E-05	4.29E-05	2.50E-04	1.14E-04	4.95E-05
Cobalt (Co)	7440-48-4	4.11E-06	5.87E-06	9.44E-06	1.26E-05	4.15E-06	3.38E-06	1.43E-05	1.74E-05	5.49E-06	2.47E-05	6.89E-06	1.30E-05	3.77E-05	1.21E-05	1.59E-05	1.06E-05	8.98E-06	1.08E-05	3.18E-05	1.29E-05	2.26E-05	1.14E-05	1.10E-05	6.37E-05	2.90E-05	1.26E-05
Chromium (Cr) and Compounds (as Cr)	7440-47-3	2.05E-05	2.94E-05	4.71E-05	6.29E-05	2.07E-05	1.68E-05	7.17E-05	8.74E-05	2.74E-05	1.24E-04	3.45E-05	6.55E-05	1.89E-04	6.05E-05	7.91E-05	5.28E-05	4.49E-05	5.38E-05	1.59E-04	6.48E-05	1.13E-04	5.70E-05	5.47E-05	3.19E-04	1.45E-04	6.29E-05
Cesium (Cs) and Compounds (as Ce)	7440-46-2	6.84E-07	9.77E-07	1.57E-06	2.10E-06	6.91E-07	5.62E-07	2.39E-06	2.90E-06	9.14E-07	4.12E-06	1.15E-06	2.17E-06	6.28E-06	2.01E-06	2.64E-06	1.76E-06	1.50E-06	1.79E-06	5.30E-06	2.16E-06	3.77E-06	1.89E-06	1.82E-06	1.06E-05	4.83E-06	2.10E-06
Copper (Cu)	7440-50-8	3.20E-05	4.90E-05	7.20E-05	1.00E-04	3.23E-05	2.70E-05	1.20E-04	1.58E-04	4.30E-05	2.10E-04	6.00E-05	1.17E-04	3.31E-04	1.00E-04	1.21E-04	8.30E-05	7.30E-05	9.20E-05	2.78E-04	1.09E-04	1.87E-04	1.00E-04	8.60E-05	5.37E-04	2.42E-04	9.50E-05
Iron (Fe)	7439-89-6	7.89E-03	1.13E-02	1.81E-02	2.42E-02	7.97E-03	6.48E-03	2.76E-02	3.36E-02	1.05E-02	4.77E-02	1.33E-02	2.52E-02	7.27E-02	2.33E-02	3.04E-02	2.03E-02	1.73E-02	2.07E-02	6.13E-02	2.49E-02	4.36E-02	2.19E-02	2.11E-02	1.23E-01	5.59E-02	2.42E-02
Gallium (Ga)	7440-55-3	4.56E-06	6.52E-06	1.05E-05	1.40E-05	4.61E-06	3.75E-06	1.59E-05	1.93E-05	6.09E-06	2.75E-05	7.65E-06	1.45E-05	4.18E-05	1.34E-05	1.76E-05	1.18E-05	9.98E-06	1.19E-05	3.53E-05	1.44E-05	2.51E-05	1.26E-05	1.22E-05	7.07E-05	3.22E-05	1.40E-05
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	9.44E-07	1.35E-06	2.17E-06	2.90E-06	9.54E-07	7.76E-07	3.29E-06	4.00E-06	1.26E-06	5.69E-06	1.58E-06	3.00E-06	8.66E-06	2.78E-06	3.64E-06	2.43E-06	2.06E-06	2.47E-06	7.31E-06	2.98E-06	5.20E-06	2.61E-06	2.52E-06	1.46E-05	6.67E-06	2.90E-06
Mercury (Hg)	7439-97-6	5.70E-09	8.14E-09	1.31E-08	1.75E-08	5.76E-09	4.68E-09	1.99E-08	2.42E-08	7.62E-09	3.43E-08	9.56E-09	1.81E-08	5.23E-08	1.68E-08	2.20E-08	1.47E-08	1.25E-08	1.49E-08	4.42E-08	1.80E-08	3.14E-08	1.58E-08	1.52E-08	8.84E-08	4.03E-08	1.75E-08
Indium (In)	7440-74-6	1.14E-09	1.63E-09	2.62E-09	3.50E-09	1.15E-09	9.37E-10	3.98E-09	4.83E-09	1.52E-09	6.87E-09	1.91E-09	3.62E-09	1.05E-08	3.36E-09	4.40E-09	2.94E-09	2.49E-09	2.96E-09	8.83E-09	3.59E-09	6.28E-09	3.16E-09	3.04E-09	1.77E-08	8.05E-09	3.50E-09
Potassium (K)	7440-09-7	3.38E-03	4.85E-03	7.77E-03	1.04E-02	3.42E-03	2.78E-03	1.19E-02	1.45E-02	4.53E-03	2.05E-02	5.70E-03	1.08E-02	3.12E-02	1.00E-02	1.31E-02	8.72E-03	7.42E-03	8.89E-03	2.64E-02	1.07E-02	1.87E-02	9.42E-03	9.03E-03	5.27E-02	2.40E-02	1.04E-02
Lanthanum (La)	7439-91-0	3.64E-06	5.24E-06	8.34E-06	1.11E-05	3.67E-06	2.99E-06	1.28E-05	1.57E-05	4.87E-06	2.21E-05	6.16E-06	1.17E-05	3.38E-05	1.08E-05	1.40E-05	9.38E-06	7.99E-06	9.58E-06	2.85E-05	1.16E-05	2.02E-05	1.02E-05	9.72E-06	5.69E-05	2.59E-05	1.11E-05
Lithium (Li)	7439-93-2	5.84E-06	8.34E-06	1.34E-05	1.79E-05	5.90E-06	4.80E-06	2.04E-05	2.47E-05	7.80E-06	3.52E-05	9.79E-06	1.86E-05	5.36E-05	1.72E-05	2.25E-05	1.50E-05	1.28E-05	1.53E-05	4.52E-05	1.84E-05	3.22E-05	1.62E-05	1.56E-05	9.06E-05	4.12E-05	1.79E-05
Lutetium (Lu)	7439-94-3	5.34E-08	7.62E-08	1.23E-07	1.64E-07	5.39E-08	4.38E-08	1.86E-07	2.26E-07	7.13E-08	3.21E-07	8.94E-08	1.70E-07	4.90E-07	1.57E-07	2.06E-07	1.37E-07	1.17E-07	1.40E-07	4.13E-07	1.68E-07	2.94E-07	1.48E-07	1.42E-07	8.27E-07	3.77E-07	1.64E-07
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	3.17E-03	4.52E-03	7.28E-03	9.73E-03	3.20E-03	2.60E-03	1.10E-02	1.34E-02	4.23E-03	1.91E-02	5.31E-03	1.00E-02	2.90E-02	9.33E-03	1.22E-02	8.16E-03	6.93E-03	8.30E-03	2.45E-02	9.98E-03	1.74E-02	8.76E-03	8.45E-03	4.91E-02	2.24E-02	9.73E-03
Manganese (Mn) and Compounds (as Mn)	7439-96-5	5.72E-06	8.01E-06	1.35E-05	1.88E-05	5.78E-06	3.85E-06	1.99E-05	3.86E-05	5.25E-06	5.17E-05	1.41E-05	3.37E-05	1.16E-04	1.82E-05	1.35E-05	9.46E-06	1.28E-05	1.66E-05	6.52E-05	2.09E-05	3.03E-05	2.31E-05	1.60E-05	1.42E-04	4.83E-05	1.88E-05
Molybdenum (Mo)	7439-98-7	1.47E-06	2.10E-06	3.38E-06	4.52E-06	1.49E-06	1.21E-06	5.13E-06	6.23E-06	1.97E-06	8.86E-06	2.46E-06	4.67E-06	1.35E-05	4.33E-06	5.68E-06	3.79E-06	3.22E-06	3.85E-06	1.14E-05	4.64E-06	8.10E-06	4.07E-06	3.92E-06	2.28E-05	1.04E-05	4.52E-06
Sodium (Na)	7440-23-5	6.77E-03	9.67E-03	1.56E-02	2.08E-02	6.84E-03	5.56E-03	2.36E-02	2.87E-02	9.04E-03	4.08E-02	1.13E-02	2.15E-02	6.21E-02	1.99E-02	2.61E-02	1.74E-02	1.48E-02	1.77E-02	5.24E-02	2.13E-02	3.73E-02	1.87E-02	1.81E-02	1.05E-01	4.78E-02	2.08E-02
Niobium (Nb)	7440-03-1	1.33E-06	1.90E-06	3.06E-06	4.09E-06	1.35E-06	1.14E-06	4.65E-06	5.65E-06	1.78E-06	8.03E-06	2.23E-06	4.23E-06	1.22E-05	3.92E-06	5.14E-06	3.43E-06	2.91E-06	3.49E-06	1.03E-05	4.20E-06	7.34E-06	3.69E-06	3.55E-06	2.07E-05	9.41E-06	4.09E-06
Nickel (Ni)	7440-02-0	6.44E-07	8.95E-07	1.52E-06	2.12E-06	6.51E-07	4.33E-07	2.23E-06	4.30E-06	5.88E-07	5.79E-06	1.56E-06	3.72E-06	1.29E-05	2.05E-06	1.52E-06	1.06E-06	1.43E-06	1.85E-06	7.29E-06	2.34E-06	3.39E-06	2.58E-06	1.80E-06	1.60E-05	5.40E-06	2.12E-06
Phosphorus (P)	7723-14-0	1.43E-04	2.04E-04	3.28E-04	4.38E-04	1.44E-04	1.17E-04	4.97E-04	6.02E-04	1.90E-04	8.58E-04	2.39E-04	4.52E-04	1.30E-03	4.20E-04	5.50E-04	3.67E-04	3.12E-04	3.73E-04	1.10E-03	4.49E-04	7.85E-04	3.94E-04	3.80E-04	2.21E-03	1.01E-03	4.38E-04
Lead (Pb)	7439-92-1	4.58E-06	6.57E-06	1.05E-05	1.41E-05	4.63E-06	3.77E-06	1.61E-05	1.96E-05	6.13E-06	2.77E-05	7.72E-06	1.47E-05	4.23E-05	1.35E-05	1.77E-05	1.18E-05	1.00E-05	1.20E-05	3.57E-05	1.45E-05	2.53E-05	1.28E-05	1.22E-05	7.14E-05	3.25E-05	1.41E-05
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	1.71E-05	2.45E-05	3.94E-05	5.26E-05	1.73E-05	1.41E-05	5.98E-05	7.26E-05	2.29E-05	1.03E-04	2.87E-05	5.45E-05	1.57E-04	5.05E-05	6.62E-05	4.42E-05	3.75E-05	4.49E-05	1.33E-04	5.40E-05	9.44E-05	4.74E-05	4.57E-05	2.66E-04	1.21E-04	5.26E-05
Sulphur (S)	7704-34-9	4.33E-04	6.58E-04	9.91E-04	1.29E-03	4.37E-04	3.56E-04	1.46E-03	1.95E-03	5.82E-04	2.64E-03	7.57E-04	1.46E-03	4.17E-03	1.31E-03	1.77E-03	1.12E-03	9.63E-04	1.16E-03	3.51E-03	1.41E-03	2.46E-03	1.26E-03	1.16E-03	6.94E-03	3.15E-03	1.32E-03
Antimony (Sb)	7440-36-0	1.16E-06	1.67E-06	2.65E-06	3.53E-06	1.17E-06	9.50E-07	4.09E-06	5.06E-06	1.55E-06	7.08E-06	1.98E-06	3.78E-06	1.09E-05	3.45E-06	4.45E-06	2.98E-06	2.55E-06	3.06E-06	9.16E-06	3.70E-06	6.44E-06	3.28E-06	3.09E-06	1.82E-05	8.27E-06	3.53E-06
Scandium (Sc)	7440-20-2	2.53E-06	3.61E-06	5.81E-06	7.77E-06	2.56E-06	2.08E-06	8.82E-06	1.07E-05	3.38E-06	1.52E-05	4.24E-06	8.03E-06	2.32E-05	7.44E-06	9.76E-06	6.51E-06	5.53E-06	6.62E-06	1.96E-05	7.97E-06	1.39E-05	6.99E-06	6.74E-06	3.92E-05	1.79E-05	7.77E-06
Selenium (Se)	7782-49-2	7.99E-08	1.14E-07	1.83E-07	2.45E-07	8.06E-08	6.56E-08	2.78E-07	3.38E-07	1.07E-07	4.81E-07	1.34E-07	2.54E-07	7.32E-07	2.35E-07	3.08E-07	2.06E-07	1.75E-07	2.09E-07	6.18E-07	2.52E-07	4.40E-07	2.21E-07	2.13E-07	1.24E-06	5.64E-07	2.45E-07
Tin (Sn)	7440-31-5	1.95E-06	2.79E-06	4.49E-06	6.00E-06	1.97E-06	1.60E-06	6.81E-06	8.28E-06	2.61E-06	1.18E-05	3.27E-06	6.20E-06	1.79E-05	5.75E-06	7.53E-06	5.03E-06	4.27E-06	5.11E-06	1.51E-05	6.16E-06	1.08E-05	5.40E-06	5.21E-06	3.03E-05	1.38E-05	6.00E-06
Strontium (Sr)	7440-24-6	7.60E-05	1.08E-04	1.74E-04	2.32E-04	7.64E-05	6.20E-05	2.65E-04	3.20E-04	1.01E-04	4.56E-04	1.27E-04	2.40E-04	6.93E-04	2.24E-04	2.93E-04	1.96E-04	1.66E-04	1.99E-04	5.88E-04	2.39E-04	4.17E-04	2.10E-04	2.02E-04	1.18E-03	5.36E-04	2.32E-04
Tantalum (Ta)	7440-25-7	2.30E-07	3.28E-07	5.28E-07	7.06E-07	2.32E-07	1.89E-07	8.01E-07	9.73E-07	3.07E-07	1.38E-06	3.85E-07	7.30E-07	2.11E-06	6.76E-07	8.86E-07	5.91E-07	5.02E-07	6.01E-07	1.78E-06	7.24E-07	1.27E-06	6.35E-07	6.12E-07	3.56E-06	1.62E-06	7.06E-07
Terbium (Tb) and Compounds (as Tb)	7440-27-9	1.21E-07	1.73E-07	2.79E-07	3.73E-07	1.23E-07	9.97E-08	4.23E-07	5.14E-07	1.62E-07	7.31E-07	2.03E-07	3.86E-07	1.11E-06	3.57E-07	4.68E-07	3.13E-07	2.65E-07	3.18E-07	9.40E-07	3.83E-07	6.68E-07	3.36E-07	3.24E-07	1.88E-06	8.57E-07	3.73E-07
Tellurium (Te)	13494-80-9	3.99E-08	5.70E-08	9.17E-08	1.23E-07	4.03E-08	3.28E-08	1.39E-07	1.69E-07	5.33E-08	2.40E-07	6.69E-08	1.27E-07	3.66E-07	1.17E-07	1.54E-07	1.03E-07	8.72E-08	1.04E-07	3.09E-07	1.26E-07	2.20E-07	1.10E-07	1.06E-07	6.19E-07	2.82E-07	1.23E-07
Titanium (Ti) and Compounds (as Ti)	7440-32-6	4.10E-05	5.60E-05	9.60E-05	1.33E-04	4.10E-05	2.70E-05	1.40E-04	2.70E-04	3.70E-05	3.64E-04	9.80E-05	2.34E-04	8.09E-04	1.29E-04	9.60E-05	6.70E-05	9.00E-05	1.16E-04	4.59E-04	1.47E-04	2.13E-04	1.62E-04	1.13E-04	1.01E-03	3.40E-04	1.33E-04
Thallium (Tl)	7440-28-0	2.07E-07	2.95E-07	4.79E-07	6.34E-07	2.09E-07	1.70E-07	7.20E-07	8.74E-07	2.76E-07	1.32E-06	3.46E-07	6.58E-07	1.89E-06	6.08E-07	7.98E-07	5.32E-07	4.51E-07	5.40E-07	1.60E-06	6.50E-07	1.14E-06	5.71E-07	5.50E-07	3.20E-06	1.46E-06	6.34E-07
Uranium (U)	7440-61-1	3.05E-07	4.37E-07	7.02E-07	9.38E-07	3.08E-07	2.51E-07	1.07E-06	1.30E-06	4.08E-07	1.84E-06	5.13E-07	9.72E-07	2.81E-06	9.01E-07	1.18E-06	7.88E-07	6.69E-07	8.01E-07	2.37E-06	9.64E-07	1.68E-06	8.46E-07	8.15E-07	4.74E-06	2.16E-06	9.38E-07
Vanadium (v)	7440-62-2	2.20E-05	3.20E-05	5.20E-05	6.90E-05	2.30E-05	1.80E-05	7.80E-05	9.50E-05	3.00E-05	1.35E-04	3.80E-05	7.10E-05	2.05E-04	6.60E-05	8.70E-05	5.80E-05	4.90E-05	5.90E-05	1.74E-04	7.10E-05	1.24E-04	6.20E-05	6.00E-05	3.48E-04	1.58E-04	6.90E-05
Tungsten (W) and Compounds (as W)	7440-33-7	1.13E-05	1.61E-05	2.59E-05	3.46E-05	1.14E-05	9.25E-06	3.93E-05	4.77E-05	1.50E-05	6.78E-05	1.89E-05	3.57E-05	1.03E-04	3.32E-05	4.35E-05	2.90E-05	2.46E-05	2.95E-05	8.72E-05	3.55E-05	6.20E-05	3.11E-05	3.00E-05	1.75E-04	7.95E-05	3.46E-05
Yttrium (Y) and Compounds (as Y)	7440-65-5	2.96E-06	4.24E-06	6.81E-06	9.10E-06	2.99E-06	2.43E-06	1.03E-05	1.26E-05	3.96E-06	1.79E-05	4.97E-06	9.42E-06	2.72E-05	8.73E-06	1.14E-05	7.64E-06	6.48E-06	7.77E-06	2.30E-05	9.35E-06	1.63E-05	8.20E-06	7.91E-06	4.60E-05	2.09E-05	9.10E-06
Ytterbium (Yb)	7440-64-4	3.41E-07	4.88E-07	7.84E-07	1.04E-06	3.44E-07	2.81E-07	1.19E-06	1.45E-06	4.56E-07	2.04E-06	5.72E-07	1.08E-06	3.13E-06	1.01E-06	1.32E-06	8.80E-07	7.47E-07	8.95E-07	2.65E-06	1.08E-06	1.88E-06	9.45E-07	9.11E-07	5.30E-06	2.41E-06	1.05E-06
Zinc (Zn)	7440-66-6	2.80E-05	4.10E-05	6.40E-05	8.50E-05	2.80E-05	2.30E-05	9.90E-05	1.23E-04	3.70E-05	1.72E-04	4.80E-05	9.20E-05	2.64E-04	8.30E-05	1.07E-04	7.20E-05	6.20E-05	7.40E-05	2.23E-04	9.00E-05	1.56E-04	8.00E-05	7.40E-05	4.41E-04	2.00E-04	8.50E-05
Zirconium (Zr)	7440-67-7	2.20E-05	3.10E-05	5.10E-05	6.80E-05	2.20E-05	1.80E-05	7.70E-05	9.30E-05	2.90E-05	1.32E-04	3.70E-05	7.00E-05	2.02E-04	6.50E-05	8.50E-05	5.70E-05	4.80E-05	5.80E-05	1.70E-04	6.90E-05	1.21E-04	6.10E-05	5.90E-05	3.41E-04	1.55E-04	6.80E-05
Silicon Dioxide (SiO2)	7631-86-9	1.49E-01	2.13E-01	3.42E-01	4.58E-01	1.51E-01	1.22E-01	5.20E-01	6.32E-01	1.99E-01	8.98E-01	2.50E-01	4.74E-01	1.37E+00	4.39E-01	5.75E-01	3.84E-01	3.26E-01	3.90E-01	1.15E+00	4.70E-01	8.21E-01	4.12E-01	3.98E-01	2.31E+00	1.05E+00	4.58E-01
Aluminum Oxide (Al2O3)	1344-28-1	3.45E-02	4.92E-02	7.92E-02	1.06E-01	3.48E-02	2.83E-02	1.20E-01	1.46E-01	4.60E-02	2.08E-01	5.77E-02	1.09E-01	3.16E-01	1.01E-01	1.33E-01	8.87E-02	7.53E-02	9.02E-02	2.67E-01	1.09E-01	1.90E-01	9.53E-02	9.19E-02	5.34E-01	2.43E-01	1.06E-01
Iron Oxide (Fe2O3)	1309-37-1	1.14E-02	1.63E-02	2.62E-02	3.50E-02	1.15E-02	9.37E-03	3.98E-02	4.84E-02	1.52E-02	6.88E-02	1.91E-02	3.63E-02	1.05E-01	3.36E-02	4.40E-02	2.94E-02	2.50E-02	2.99E-02	8.84E-02	3.60E-02	6.29E-02	3.16E-02	3.04E-02	1.77E-01	8.06E-02	3.50E-02
Magnetite (Fe3O4)	1309-48-4	4.81E-03	6.87E-03	1.10E-02	1.48E-02	4.86E-03	3.95E-03	1.68E-02	2.04E-02	6.42E-03	2.90E-02	8.06E-03	1.53E-02	4.41E-02	1.42E-02	1.86E-02	1.24E-02	1.05E-02	1.26E-02	3.72E-02	1.52E-02	2.65E-02	1.33E-02	1.28E-02	7.46E-02	3.40E-02	1.48E-02
Calcium Oxide (CaO)	1305-78-8	8.23E-03	1.17E-02	1.89E-02	2.53E-02	8.31E-03	6.76E-03	2.87E-02	3.48E-02	1.10E-02	4.95E-02	1.38E-02	2.61E-02	7.54E-02	2.42E-02	3.17E-02	2.12E-02	1.80E-02	2.15E-02	6.37E-02	2.59E-02	4.53E-02	2.28E-02	2.19E-02	1.28E-01	5.81E-02	2.53E-02
Sodium Oxide (Na2O)	1313-59-3	7.83E-03	1.12E-02	1.80E-02	2.40E-02	7.91E-03	6.43E-03	2.73E-02	3.32E-02	1.05E-02	4.72E-02	1.31E-02	2.49E-02	7.19E-02	2.31E-02	3.02E-02	2.02E-02	1.71E-02	2.05E-02	6.07E-02	2.47E-02	4.32E-02	2.17E-02	2.09E-02	1.21E-01	5.53E-02	2.40E-02
Potassium Oxide (K2O)	12136-45-7	5.56E-03	7.94E-03	1.28E-02	1.71E-02	5.61E-03	4.57E-03	1.94E-02	2.35E-02	7.43E-03

Table G-3: Maximum Predicted Annual PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Construction - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Deposition
UTM E (m)		526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	
UTM N (m)		5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	1.6	1.7	3.8	5.3	1.7	1.2	4.3	6.4	1.8	8.7	2.4	4.7	16.0	5.0	5.3	3.5	3.1	3.7	11.0	4.6	6.5	3.7	3.9	17.9	10.3	5.3
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	1.03E-06	1.10E-06	2.39E-06	3.30E-06	1.04E-06	7.72E-07	2.83E-06	4.37E-06	1.16E-06	5.74E-06	1.64E-06	3.24E-06	1.09E-05	3.20E-06	3.35E-06	2.22E-06	2.02E-06	2.45E-06	7.45E-06	3.07E-06	4.32E-06	2.42E-06	2.52E-06	1.20E-05	6.76E-06	3.30E-06
Aluminum (Al)	7429-90-5	1.25E-01	1.25E-01	2.91E-01	4.02E-01	1.26E-01	9.34E-02	3.23E-01	4.79E-01	1.38E-01	6.51E-01	1.80E-01	3.51E-01	1.18E+00	3.78E-01	4.06E-01	2.67E-01	2.34E-01	2.81E-01	8.38E-01	3.47E-01	4.93E-01	2.78E-01	2.98E-01	1.36E+00	7.79E-01	4.02E-01
Arsenic (As)	7440-38-2	1.30E-05	1.40E-05	3.04E-05	4.20E-05	1.32E-05	9.81E-06	3.60E-05	5.55E-05	1.47E-05	7.29E-05	2.09E-05	4.11E-05	1.39E-04	4.07E-05	4.26E-05	2.83E-05	2.57E-05	3.11E-05	9.46E-05	3.90E-05	5.49E-05	3.08E-05	3.20E-05	1.52E-04	8.59E-05	4.20E-05
Gold (Au)	7440-57-5	1.47E-07	1.69E-07	3.41E-07	4.69E-07	1.49E-07	1.11E-07	4.35E-07	6.98E-07	1.69E-07	8.86E-07	2.62E-07	5.22E-07	1.77E-06	4.74E-07	4.79E-07	3.22E-07	3.06E-07	3.72E-07	1.16E-06	4.75E-07	6.63E-07	3.68E-07	3.70E-07	1.85E-06	1.03E-06	4.69E-07
Boron (B)	7440-42-8	1.65E-04	1.67E-04	3.86E-04	5.32E-04	1.67E-04	1.24E-04	4.31E-04	6.43E-04	1.84E-04	8.70E-04	2.42E-04	4.72E-04	1.59E-03	5.02E-04	5.38E-04	3.54E-04	3.12E-04	3.75E-04	1.12E-03	4.64E-04	6.59E-04	3.71E-04	3.96E-04	1.82E-03	1.04E-03	5.32E-04
Barium (Ba)	7440-39-3	6.07E-04	6.12E-04	1.42E-03	1.96E-03	6.15E-04	4.55E-04	1.58E-03	2.34E-03	6.74E-04	3.18E-03	8.82E-04	1.72E-03	5.79E-03	1.84E-03	1.98E-03	1.30E-03	1.14E-03	1.37E-03	4.10E-03	1.70E-03	2.41E-03	1.36E-03	1.45E-03	6.63E-03	3.80E-03	1.96E-03
Beryllium (Be)	7440-41-7	1.93E-06	1.94E-06	4.50E-06	6.22E-06	1.95E-06	1.44E-06	4.99E-06	7.41E-06	2.14E-06	1.01E-05	2.79E-06	5.43E-06	1.83E-05	5.85E-06	6.28E-06	4.13E-06	3.62E-06	4.35E-06	1.30E-05	5.37E-06	7.64E-06	4.31E-06	4.61E-06	2.10E-05	1.21E-05	6.22E-06
Bismuth (Bi)	7440-69-9	3.41E-06	3.47E-06	7.96E-06	1.10E-05	3.45E-06	2.56E-06	8.92E-06	1.34E-05	3.80E-06	1.80E-05	5.03E-06	9.81E-06	3.31E-05	1.04E-05	1.11E-05	7.31E-06	6.45E-06	7.77E-06	2.32E-05	9.61E-06	1.36E-05	7.69E-06	8.19E-06	3.76E-05	2.15E-05	1.10E-05
Carbon (C)	7440-44-0	1.49E-03	1.52E-03	3.49E-03	4.81E-03	1.51E-03	1.12E-03	3.90E-03	5.83E-03	1.66E-03	7.88E-03	2.19E-03	4.28E-03	1.44E-02	4.55E-03	4.87E-03	3.20E-03	2.82E-03	3.40E-03	1.02E-02	4.20E-03	5.97E-03	3.36E-03	3.58E-03	1.64E-02	9.41E-03	4.81E-03
Calcium (Ca)	7440-70-2	5.21E-02	5.24E-02	1.22E-01	1.68E-01	5.28E-02	3.90E-02	1.35E-01	2.00E-01	5.78E-02	2.72E-01	7.52E-02	1.46E-01	4.92E-01	1.58E-01	1.70E-01	1.11E-01	9.76E-02	1.17E-01	3.50E-01	1.45E-01	2.06E-01	1.16E-01	1.25E-01	5.67E-01	3.25E-01	1.68E-01
Cadmium (Cd)	7440-43-9	1.98E-06	2.23E-06	4.60E-06	6.34E-06	2.00E-06	1.48E-06	5.74E-06	9.09E-06	2.27E-06	1.17E-05	3.41E-06	6.77E-06	2.29E-05	6.33E-06	6.47E-06	4.33E-06	4.06E-06	4.92E-06	1.52E-05	6.24E-06	8.74E-06	4.87E-06	4.95E-06	2.43E-05	1.36E-05	6.34E-06
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1.15E-04	1.16E-04	2.68E-04	3.70E-04	1.16E-04	8.60E-05	2.97E-04	4.41E-04	1.27E-04	6.00E-04	1.66E-04	3.23E-04	1.09E-03	3.48E-04	3.74E-04	2.46E-04	2.15E-04	2.59E-04	7.72E-04	3.20E-04	4.55E-04	2.56E-04	2.75E-04	1.25E-03	7.17E-04	3.70E-04
Cobalt (Co)	7440-48-4	2.90E-05	2.90E-05	6.80E-05	9.50E-05	3.00E-05	2.20E-05	7.60E-05	1.13E-04	3.30E-05	1.53E-04	4.20E-05	8.20E-05	2.78E-04	8.90E-05	9.50E-05	6.30E-05	5.50E-05	6.60E-05	1.97E-04	8.20E-05	1.16E-04	6.50E-05	7.00E-05	3.19E-04	1.83E-04	9.50E-05
Chromium (Cr) and Compounds (as Cr)	7440-47-3	1.46E-04	1.47E-04	3.41E-04	4.71E-04	1.48E-04	1.09E-04	3.79E-04	5.64E-04	1.62E-04	7.65E-04	2.12E-04	4.14E-04	1.39E-03	4.43E-04	4.76E-04	3.13E-04	2.74E-04	3.30E-04	9.86E-04	4.08E-04	5.80E-04	3.27E-04	3.50E-04	1.60E-03	9.15E-04	4.71E-04
Cesium (Cs) and Compounds (as Ce)	7440-46-2	4.87E-06	4.91E-06	1.14E-05	1.57E-05	4.94E-06	3.66E-06	1.26E-05	1.87E-05	5.41E-06	2.55E-05	7.06E-06	1.37E-05	4.63E-05	1.48E-05	1.59E-05	1.04E-05	9.15E-06	1.10E-05	3.28E-05	1.36E-05	1.93E-05	1.09E-05	1.17E-05	5.31E-05	3.05E-05	1.57E-05
Copper (Cu)	7440-50-8	2.21E-04	2.44E-04	5.15E-04	7.10E-04	2.24E-04	1.65E-04	6.27E-04	9.83E-04	2.52E-04	1.27E-03	3.66E-04	7.31E-04	2.47E-03	7.00E-04	7.23E-04	4.82E-04	4.40E-04	5.40E-04	1.66E-03	6.81E-04	9.57E-04	5.34E-04	5.48E-04	2.66E-03	1.49E-03	7.10E-04
Iron (Fe)	7439-89-6	5.62E-02	5.67E-02	1.31E-01	1.81E-01	5.70E-02	4.21E-02	1.46E-01	2.17E-01	6.24E-02	2.94E-01	8.17E-02	1.59E-01	5.36E-01	1.71E-01	1.83E-01	1.20E-01	1.06E-01	1.27E-01	3.79E-01	1.57E-01	2.23E-01	1.26E-01	1.35E-01	6.14E-01	3.52E-01	1.81E-01
Gallium (Ga)	7440-55-3	3.30E-05	3.30E-05	7.60E-05	1.05E-04	3.30E-05	2.40E-05	8.40E-05	1.25E-04	3.60E-05	1.70E-04	4.70E-05	9.20E-05	3.09E-04	9.90E-05	1.06E-04	7.00E-05	6.10E-05	7.30E-05	2.19E-04	9.10E-05	1.29E-04	7.30E-05	7.80E-05	3.54E-04	2.03E-04	1.05E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	6.73E-06	6.77E-06	1.57E-05	2.17E-05	6.82E-06	5.05E-06	1.74E-05	2.59E-05	7.45E-06	3.52E-05	9.74E-06	1.90E-05	6.39E-05	2.04E-05	2.19E-05	1.44E-05	1.26E-05	1.52E-05	4.53E-05	1.87E-05	2.66E-05	1.50E-05	1.61E-05	7.33E-05	4.21E-05	2.17E-05
Mercury (Hg)	7439-97-6	4.06E-08	4.09E-08	9.50E-08	1.31E-07	4.12E-08	3.05E-08	1.05E-07	1.56E-07	4.51E-08	2.12E-07	5.88E-08	1.14E-07	3.86E-07	1.23E-07	1.32E-07	8.70E-08	7.62E-08	9.17E-08	2.73E-07	1.13E-07	1.61E-07	9.07E-08	9.72E-08	4.43E-07	2.54E-07	1.31E-07
Indium (In)	7440-74-6	8.12E-09	8.18E-09	1.90E-08	2.62E-08	8.24E-09	6.09E-09	2.10E-08	3.13E-08	9.02E-09	4.25E-08	1.18E-08	2.29E-08	7.72E-08	2.46E-08	2.65E-08	1.74E-08	1.52E-08	1.83E-08	5.47E-08	2.26E-08	3.22E-08	1.81E-08	1.94E-08	8.86E-08	5.08E-08	2.62E-08
Potassium (K)	7440-09-7	2.41E-02	2.44E-02	5.63E-02	7.77E-02	2.44E-02	1.81E-02	6.26E-02	9.33E-02	2.68E-02	1.26E-01	3.51E-02	6.84E-02	2.31E-01	7.32E-02	7.85E-02	5.16E-02	4.53E-02	5.46E-02	1.63E-01	6.74E-02	9.58E-02	5.40E-02	5.77E-02	2.64E-01	1.51E-01	7.77E-02
Lanthanum (La)	7439-91-0	2.58E-05	2.63E-05	6.04E-05	8.34E-05	2.62E-05	1.94E-05	6.76E-05	1.01E-04	2.88E-05	1.36E-04	3.80E-05	7.41E-05	2.50E-04	7.88E-05	8.43E-05	5.55E-05	4.89E-05	5.88E-05	1.76E-04	7.27E-05	1.03E-04	5.82E-05	6.21E-05	2.85E-04	1.63E-04	8.34E-05
Lithium (Li)	7439-93-2	4.20E-05	4.20E-05	9.70E-05	1.34E-04	4.20E-05	3.10E-05	1.08E-04	1.60E-04	4.60E-05	2.17E-04	6.00E-05	1.17E-04	3.95E-04	1.26E-04	1.36E-04	8.90E-05	7.80E-05	9.40E-05	2.80E-04	1.16E-04	1.65E-04	9.30E-05	1.00E-04	4.54E-04	2.60E-04	1.34E-04
Lutetium (Lu)	7439-94-3	3.80E-07	3.83E-07	8.89E-07	1.23E-06	3.86E-07	2.85E-07	9.94E-07	1.46E-06	4.22E-07	1.99E-06	5.50E-07	1.07E-06	3.61E-06	1.15E-06	1.24E-06	8.14E-07	7.13E-07	8.58E-07	2.56E-06	1.06E-06	1.51E-06	8.49E-07	9.10E-07	4.14E-06	2.38E-06	1.23E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	2.26E-02	2.27E-02	5.28E-02	7.29E-02	2.29E-02	1.69E-02	5.84E-02	8.66E-02	2.51E-02	1.18E-01	3.26E-02	6.35E-02	2.14E-01	6.85E-02	7.36E-02	4.83E-02	4.23E-02	5.09E-02	1.52E-01	6.28E-02	8.94E-02	5.04E-02	5.40E-02	2.46E-01	1.41E-01	7.29E-02
Manganese (Mn) and Compounds (as Mn)	7439-96-5	3.80E-05	3.50E-05	8.90E-05	1.25E-04	3.80E-05	2.70E-05	9.70E-05	1.85E-04	3.50E-05	2.21E-04	6.60E-05	1.50E-04	5.67E-04	1.14E-04	1.00E-04	6.90E-05	6.90E-05	8.80E-05	3.16E-04	1.10E-04	1.51E-04	9.20E-05	8.00E-05	5.66E-04	2.59E-04	1.25E-04
Molybdenum (Mo)	7439-98-7	1.05E-05	1.05E-05	2.45E-05	3.39E-05	1.06E-05	7.87E-06	2.71E-05	4.03E-05	1.16E-05	5.47E-05	1.52E-05	2.95E-05	9.95E-05	3.18E-05	3.42E-05	2.25E-05	1.97E-05	2.37E-05	7.05E-05	2.92E-05	4.15E-05	2.34E-05	2.51E-05	1.14E-04	6.55E-05	3.39E-05
Sodium (Na)	7440-23-5	4.82E-02	4.86E-02	1.13E-01	1.56E-01	4.89E-02	3.62E-02	1.25E-01	1.85E-01	5.35E-02	2.52E-01	6.98E-02	1.36E-01	4.58E-01	1.46E-01	1.57E-01	1.03E-01	9.05E-02	1.09E-01	3.24E-01	1.34E-01	1.91E-01	1.08E-01	1.15E-01	5.26E-01	3.02E-01	1.56E-01
Niobium (Nb)	7440-03-1	9.48E-06	9.56E-06	2.22E-05	3.06E-05	9.62E-06	7.12E-06	2.46E-05	3.65E-05	1.05E-05	4.96E-05	1.37E-05	2.68E-05	9.02E-05	2.88E-05	3.09E-05	2.02E-05	1.78E-05	2.14E-05	6.39E-05	2.64E-05	3.76E-05	2.12E-05	2.27E-05	1.03E-04	5.94E-05	3.06E-05
Nickel (Ni)	7440-02-0	4.25E-06	3.92E-06	1.01E-05	1.41E-05	4.32E-06	3.01E-06	1.08E-05	2.06E-05	3.93E-06	2.47E-05	7.40E-06	1.66E-05	6.30E-05	1.28E-05	1.13E-05	7.76E-06	7.77E-06	9.89E-06	3.54E-05	1.23E-05	1.69E-05	1.03E-05	9.04E-06	6.34E-05	2.91E-05	1.41E-05
Phosphorus (P)	7723-14-0	1.02E-03	1.02E-03	2.38E-03	3.28E-03	1.03E-03	7.62E-04	2.63E-03	3.90E-03	1.13E-03	5.30E-03	1.47E-03	2.86E-03	9.61E-03	3.08E-03	3.31E-03	2.18E-03	1.91E-03	2.29E-03	6.83E-03	2.83E-03	4.02E-03	2.27E-03	2.43E-03	1.11E-02	6.35E-03	3.28E-03
Lead (Pb)	7439-92-1	3.30E-05	3.30E-05	7.60E-05	1.05E-04	3.30E-05	2.40E-05	8.50E-05	1.26E-04	3.60E-05	1.71E-04	4.80E-05	9.30E-05	3.12E-04	9.90E-05	1.06E-04	7.00E-05	6.10E-05	7.40E-05	2.21E-04	9.10E-05	1.30E-04	7.30E-05	7.80E-05	3.57E-04	2.05E-04	1.05E-04
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	1.22E-04	1.23E-04	2.86E-04	3.94E-04	1.24E-04	9.20E-05	3.16E-04	4.70E-04	1.36E-04	6.38E-04	1.77E-04	3.44E-04	1.16E-03	3.70E-04	3.98E-04	2.62E-04	2.29E-04	2.76E-04	8.22E-04	3.40E-04	4.84E-04	2.73E-04	2.92E-04	1.33E-03	7.64E-04	3.94E-04
Sulphur (S)	7704-34-9	3.06E-03	3.19E-03	7.14E-03	9.86E-03	3.09E-03	2.30E-03	7.90E-03	1.24E-02	3.40E-03	1.66E-02	4.68E-03	9.36E-03	3.09E-02	9.42E-03	9.98E-03	6.58E-03	5.75E-03	7.16E-03	2.14E-02	8.85E-03	1.25E-02	7.04E-03	7.45E-03	3.46E-02	1.97E-02	9.86E-03
Antimony (Sb)	7440-36-0	8.19E-06	8.39E-06	1.91E-05	2.64E-05	8.31E-06	6.15E-06	2.16E-05	3.24E-05	9.14E-06	4.36E-05	1.22E-05	2.38E-05	8.04E-05	2.50E-05	2.67E-05	1.76E-05	1.56E-05	1.88E-05	5.63E-05	2.33E-05	3.30E-05	1.86E-05	1.97E-05	9.10E-05	5.20E-05	2.64E-05
Scandium (Sc)	7440-20-2	1.80E-05	1.81E-05	4.22E-05	5.82E-05	1.83E-05	1.35E-05	4.66E-05	6.93E-05	2.00E-05	9.41E-05	2.61E-05	5.08E-05	1.71E-04	5.46E-05	5.87E-05	3.86E-05	3.38E-05	4.07E-05	1.21E-04	5.02E-05	7.13E-05	4.02E-05	4.31E-05	1.96E-04	1.13E-04	5.82E-05
Selenium (Se)	7782-49-2	5.69E-07	5.73E-07	1.33E-06	1.84E-06	5.77E-07	4.27E-07	1.47E-06	2.19E-06	6.32E-07	2.97E-06	8.23E-07	1.60E-06	5.40E-06	1.72E-06	1.85E-06	1.22E-06	1.07E-06	1.28E-06	3.83E-06	1.58E-06	2.25E-06	1.27E-06	1.36E-06	6.20E-06	3.56E-06	1.84E-06
Tin (Sn)	7440-31-5	1.39E-05	1.40E-05	3.25E-05	4.49E-05	1.41E-05	1.04E-05	3.60E-05	5.35E-05	1.54E-05	7.27E-05	2.01E-05	3.92E-05	1.32E-04	4.22E-05	4.53E-05	2.98E-05	2.61E-05	3.14E-05	9.36E-05	3.88E-05	5.51E-05	3.11E-05	3.33E-05	1.52E-04	8.70E-05	4.49E-05
Strontium (Sr)	7440-24-6	5.41E-04	5.44E-04	1.27E-03	1.75E-03	5.50E-04	4.02E-04	1.40E-03	2.07E-03	5.41E-04	2.82E-03	7.81E-04	1.52E-03	5.11E-03	1.64E-03	1.76E-03	1.16E-03	1.01E-03	1.21E-03	3.64E-03	1.51E-03	2.14E-03	1.21E-03	1.29E-03	5.90E-03	3.38E-03	1.75E-03
Tantalum (Ta)	7440-25-7	1.64E-06	1.65E-06	3.83E-06	5.29E-06	1.66E-06	1.23E-06	4.24E-06	6.29E-06	1.82E-06	8.55E-06	2.37E-06	4.61E-06	1.55E-05	4.96E-06	5.33E-06	3.50E-06	3.07E-06	3.69E-06	1.10E-05	4.56E-06	6.48E-06	3.65E-06	3.91E-06	1.78E-05	1.02E-05	5.29E-06
Terbium (Tb) and Compounds (as Tb)	7440-27-9	8.65E-07	8.70E-07	2.02E-06	2.79E-06	8.77E-07	6.49E-07	2.24E-06	3.32E-06	9.60E-07	4.52E-06	1.25E-06	2.44E-06	8.21E-06	2.62E-06	2.82E-06	1.85E-06	1.62E-06	1.95E-06	5.82E-06	2.41E-06	3.42E-06	1.93E-06	2.07E-06	9.43E-06	5.41E-06	2.79E-06
Tellurium (Te)	13494-80-9	2.84E-07	2.86E-07	6.65E-07	9.18E-07	2.88E-07	2.13E-07	7.36E-07	1.09E-06	3.16E-07	1.49E-06	4.12E-07	8.01E-07	2.70E-06	8.62E-07	9.27E-07	6.09E-07	5.33E-07	6.42E-07	1.91E-06	7.92E-07	1.13E-06	6.35E-07	6.80E-07	3.10E-06	1.78E-06	9.18E-07
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.68E-04	2.46E-04	6.34E-04	8.85E-04	2.72E-04	1.90E-04	6.81E-04	1.29E-03	2.47E-04	1.55E-03	4.65E-04	1.05E-03	3.96E-03	8.07E-04	7.11E-04	4.89E-04	4.89E-04	6.22E-04	2.23E-03	7.76E-04	1.06E-03	6.49E-04	5.69E-04	3.99E-03	1.83E-03	8.81E-04
Thallium (Tl)	7440-28-0	1.47E-06	1.48E-06	3.46E-06	4.75E-06	1.49E-06	1.10E-06	3.81E-06	5.65E-06	1.63E-06	7.68E-06	2.13E-06	4.14E-06	1.40E-05	4.46E-06	4.80E-06	3.15E-06	2.77E-06	3.32E-06	9.89E-06	4.09E-06	5.82E-06	3.29E-06	3.52E-06	1.60E-05	9.19E-06	4.75E-06
Uranium (U)	7440-61-1	2.18E-06	2.19E-06	5.09E-06	7.02E-06	2.21E-06	1.63E-06	5.64E-06	8.38E-06	2.42E-06	1.14E-05	3.15E-06	6.14E-06	2.07E-05	6.61E-06	7.10E-06	4.67E-06	4.09E-06	4.92E-06	1.47E-05	6.07E-06	8.63E-06	4.87E-06	5.21E-06	2.38E-05	1.36E-05	7.02E-06
Vanadium (v)	7440-62-2	1.60E-04	1.61E-04	3.74E-04	5.16E-04	1.62E-04	1.20E-04	4.14E-04	6.14E-04	1.77E-04	8.34E-04	2.31E-04	4.50E-04	1.52E-03	4.85E-04	5.21E-04	3.42E-04	3.00E-04	3.61E-04	1.08E-03	4.45E-04	6.33E-04	3.57E-04	3.82E-04	1.74E-03	9.99E-04	5.16E-04
Tungsten (W) and Compounds (as W)	7440-33-7	8.00E-05	8.10E-05	1.88E-04	2.59E-04	8.10E-05	6.00E-05	2.08E-04	3.08E-04	8.90E-05	4.19E-04	1.16E-04	2.26E-04	7.61E-04	2.43E-04	2.62E-04	1.72E-04	1.51E-04	1.81E-04	5.40E-04	2.23E-04	3.18E-04	1.79E-04	1.92E-04	8.75E-04	5.02E-04	2.59E-04
Ytrium (Y) and Compounds (as Y)	7440-65-5	2.11E-05	2.13E-05	4.93E-05	6.81E-05	2.14E-05	1.58E-05	5.47E-05	8.13E-05	2.35E-05	1.10E-04	3.06E-05	5.96E-05	2.01E-04	6.41E-05	6.88E-05	4.52E-05	3.96E-05	4.77E-05	1.42E-04	5.89E-05	8.37E-05	4.72E-05	5.06E-05	2.30E-04	1.32E-04	6.81E-05
Ytterbium (Yb)	7440-64-4	2.45E-06	2.45E-06	5.69E-06	7.85E-06	2.47E-06	1.82E-06	6.30E-06	9.36E-06	2.70E-06	1.27E-05	3.52E-06	6.86E-06	2.31E-05	7.38E-06	7.93E-06	5.21E-06	4.57E-06	5.49E-06	1.64E-05	6.78E-06	9.64E-06	5.44E-06	5.82E-06	2.65E-05	1.52E-05	7.85E-06
Zinc (Zn)	7440-66-6	1.97E-04	2.03E-04	4.59E-04	6.34E-04	1.99E-04	1.48E-04	5.23E-04	7.88E-04	2.20E-04	1.06E-03	2.97E-04	5.80E-04	1.96E-03	6.03E-04	6.42E-04	4.23E-04	3.77E-04	4.54E-04	1.37E-03	5.64E-04	7.99E-04	4.49E-04	4.75E-04	2.20E-03	1.26E-03	6.34E-04
Zirconium (Zr)	7440-67-7	1.57E-04	1.58E-04	3.66E-04	5.06E-04	1.59E-04	1.18E-04	4.06E-04	6.03E-04	1.74E-04	8.19E-04	2.27E-04	4.42E-04	1.49E-03	4.75E-04	5.11E-04	3.36E-04	2.94E-04	3.54E-04	1.05E-03	4.36E-04	6.21E-04	3.50E-04	3.75E-04	1.71E-03	9.80E-04	5.06E-04
Silicon Dioxide (SiO2)	7631-86-9	1.06E+00	1.07E+00	2.48E+00	3.43E+00	1.08E+00	7.97E-01	2.75E+00	4.08E+00	1.18E+00	5.55E+00	1.54E+00	2.99E+00	1.01E+01	3.22E+00	3.46E+00	2.27E+00	1.99E+00	2.40E+00	7.15E+00	2.96E+00	4.21E+00	2.37E+00	2.54E+00	1.16E+01	6.64E+00	3.43E+00
Aluminum Oxide (Al2O3)	1344-28-1	2.45E-01	2.47E-01	5.74E-01	7.92E-01	2.49E-01	1.84E-01	6.36E-01	9.44E-01	2.73E-01	1.28E+00	3.55E-01	6.92E-01	2.33E+00	7.44E-01	8.00E-01	5.26E-01	4.61E-01	5.54E-01	1.65E+00	6.84E-01	9.72E-01	5.48E-01	5.87E-01	2.68E+00	1.53E+00	7.92E-01
Iron Oxide (Fe2O3)	1309-37-1	8.13E-02	8.19E-02	1.90E-01	2.62E-01	8.24E-02	6.10E-02	2.11E-01	3.13E-01	9.02E-02	4.25E-01	1.18E-01	2.29E-01	7.73E-01	2.46E-01	2.65E-01	1.74E-01	1.53E-01	1.84E-01	5.47E-01	2.26E-01	3.22E-01	1.82E-01	1.94E-01	8.86E-01	5.08E-01	2.62E-01
Magnesium Oxide (MgO)	1309-48-4	3.43E-02	3.45E-02	8.01E-02	1.11E-01	3.47E-02	2.57E-02	8.87E-02	1.32E-01	3.80E-02	1.79E-01	4.96E-02	9.66E-02	3.26E-01	1.04E-01	1.12E-01	7.34E-02	6.43E-02	7.73E-02	2.31E-01	9.54E-02	1.36E-01	7.65E-02	8.20E-02	3.74E-01	2.14E-01	1.11E-01
Calcium Oxide (CaO)	1305-78-8	5.86E-02	5.90E-02	1.37E-01	1.89E-01	5.94E-02	4.40E-02	1.52E-01	2.25E-01	6.51E-02	3.06E-01	8.48E-02	1.65E-01	5.56E-01	1.78E-01	1.91E-01	1.26E-01	1.10E-01	1.32E-01	3.94E-01	1.63E-01	2.32E-01	1.31E-01	1.40E-01	6.39E-01	3.66E-01	1.89E-01
Sodium Oxide (Na2O)	1313-59-3	5.58E-02	5.62E-02	1.30E-01	1.80E-01	5.66E-02	4.18E-02	1.45E-01	2.15E-01	6.19E-02	2.92E-01	8.08E-02	1.57E-01	5.31E-01	1.69E-01	1.82E-01	1.19E-01	1.05E-01	1.26E-01	3.76E-01	1.55E-01	2.21E-01	1.25E-01	1.34E-01	6.09E-01	3.49E-01	1.80E-01
Potassium Oxide (K2O)	12136-45-7	3.96E-02	3.99E-02	9.26E-02	1.28E-01	4.02E-02	2.97E-02	1.03E-01	1.52E-01	4.40E-02

Table G-4: Maximum Predicted 24-Hour PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Operations - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Deposition
UTM E (m)		526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	
UTM N (m)		5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	0.05	0.13	0.13	0.15	0.05	0.05	0.29	0.36	0.31	0.45	0.20	0.30	0.70	0.81	0.25	0.64	0.52	0.50	0.47	0.19	0.35	0.41	0.53	0.65	0.93	0.15
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	3.05E-08	6.59E-08	6.58E-08	7.79E-08	3.07E-08	2.96E-08	1.44E-07	2.01E-07	1.57E-07	2.39E-07	1.09E-07	1.63E-07	3.02E-07	3.30E-07	1.57E-07	3.04E-07	2.22E-07	2.09E-07	2.34E-07	9.69E-08	1.77E-07	1.70E-07	2.64E-07	3.31E-07	3.76E-07	7.79E-08
Aluminum (Al)	7429-90-5	4.07E-03	9.67E-03	9.93E-03	1.12E-02	4.13E-03	3.74E-03	2.22E-02	2.82E-02	2.43E-02	3.47E-02	1.57E-02	2.30E-02	5.43E-02	6.34E-02	1.95E-02	4.96E-02	4.01E-02	3.92E-02	3.63E-02	1.44E-02	2.74E-02	3.18E-02	4.13E-02	5.04E-02	7.25E-02	1.12E-02
Arsenic (As)	7440-38-2	9.62E-07	1.54E-06	1.93E-06	2.16E-06	9.68E-07	9.35E-07	3.20E-06	4.93E-06	3.43E-06	5.86E-06	2.61E-06	4.41E-06	1.10E-05	5.00E-06	4.33E-06	6.93E-06	3.82E-06	3.31E-06	5.35E-06	2.49E-06	3.89E-06	3.63E-06	6.17E-06	1.03E-05	6.20E-06	2.16E-06
Gold (Au)	7440-57-5	5.40E-09	6.31E-09	1.07E-08	1.19E-08	5.44E-09	5.26E-09	1.37E-08	2.31E-08	1.24E-08	2.78E-08	1.18E-08	2.27E-08	6.64E-08	1.61E-08	2.17E-08	2.77E-08	1.25E-08	1.47E-08	3.07E-08	1.37E-08	1.93E-08	1.89E-08	2.80E-08	5.74E-08	3.48E-08	1.19E-08
Boron (B)	7440-42-8	5.87E-06	1.38E-05	1.43E-05	1.58E-05	5.96E-06	5.36E-06	3.19E-05	4.04E-05	3.49E-05	4.94E-05	2.27E-05	3.33E-05	7.90E-05	9.26E-05	2.77E-05	7.15E-05	5.82E-05	5.70E-05	5.23E-05	2.06E-05	3.93E-05	4.63E-05	5.90E-05	7.30E-05	1.06E-04	1.58E-05
Barium (Ba)	7440-39-3	2.30E-05	5.40E-05	5.60E-05	6.10E-05	2.30E-05	2.10E-05	1.24E-04	1.56E-04	1.36E-04	1.91E-04	8.90E-05	1.31E-04	3.15E-04	3.70E-04	1.07E-04	2.80E-04	2.31E-04	2.27E-04	2.06E-04	8.00E-05	1.53E-04	1.84E-04	2.30E-04	2.91E-04	4.23E-04	6.10E-05
Beryllium (Be)	7440-41-7	4.88E-08	1.19E-07	1.17E-07	1.44E-07	4.91E-08	4.71E-08	2.69E-07	3.46E-07	2.94E-07	4.33E-07	1.88E-07	2.69E-07	6.06E-07	6.95E-07	2.74E-07	5.86E-07	4.54E-07	4.37E-07	4.57E-07	1.77E-07	3.31E-07	3.57E-07	5.03E-07	6.18E-07	8.00E-07	1.44E-07
Bismuth (Bi)	7440-69-9	9.44E-08	1.25E-07	1.98E-07	2.17E-07	9.50E-08	9.13E-08	2.89E-07	3.79E-07	2.82E-07	5.45E-07	1.79E-07	3.47E-07	6.91E-07	3.55E-07	4.30E-07	6.05E-07	3.00E-07	2.67E-07	5.13E-07	2.11E-07	3.21E-07	3.01E-07	5.87E-07	1.03E-06	6.11E-07	2.17E-07
Carbon (C)	7440-44-0	7.30E-05	1.73E-04	1.78E-04	1.99E-04	7.40E-05	6.70E-05	3.97E-04	5.04E-04	4.35E-04	6.19E-04	2.82E-04	4.12E-04	9.74E-04	1.14E-03	3.47E-04	8.88E-04	7.19E-04	7.03E-04	6.49E-04	2.57E-04	4.89E-04	5.71E-04	7.36E-04	8.99E-04	1.30E-03	1.99E-04
Calcium (Ca)	7440-70-2	1.44E-03	3.52E-03	3.49E-03	4.20E-03	1.46E-03	1.35E-03	7.98E-03	1.02E-02	8.75E-03	1.27E-02	5.57E-03	8.03E-03	1.85E-02	2.14E-02	7.83E-03	1.76E-02	1.38E-02	1.34E-02	1.34E-02	5.24E-03	9.85E-03	1.09E-02	1.50E-02	1.80E-02	2.46E-02	4.20E-03
Cadmium (Cd)	7440-43-9	7.13E-08	8.50E-08	1.43E-07	1.58E-07	7.17E-08	6.93E-08	1.87E-07	3.05E-07	1.77E-07	3.58E-07	1.56E-07	2.97E-07	8.31E-07	2.04E-07	2.94E-07	3.89E-07	1.70E-07	1.91E-07	3.98E-07	1.77E-07	2.46E-07	2.49E-07	3.85E-07	7.61E-07	4.60E-07	1.58E-07
Cerium (Ce) and Compounds (as Ce)	7440-45-1	3.82E-06	9.09E-06	9.30E-06	1.06E-05	3.87E-06	3.51E-06	2.09E-05	2.65E-05	2.28E-05	3.26E-05	1.48E-05	2.15E-05	5.07E-05	5.91E-05	1.85E-05	4.65E-05	3.75E-05	3.66E-05	3.40E-05	1.35E-05	2.57E-05	2.97E-05	3.87E-05	4.72E-05	6.77E-05	1.06E-05
Cobalt (Co)	7440-48-4	1.10E-06	2.63E-06	2.67E-06	3.01E-06	1.12E-06	1.01E-06	6.01E-06	7.73E-06	6.58E-06	9.43E-06	4.32E-06	6.29E-06	1.45E-05	1.69E-05	5.31E-06	1.34E-05	1.07E-05	1.04E-05	9.68E-06	3.90E-06	7.40E-06	8.48E-06	1.11E-05	1.35E-05	1.93E-05	3.01E-06
Chromium (Cr) and Compounds (as Cr)	7440-47-3	1.11E-05	2.45E-05	2.75E-05	2.93E-05	1.13E-05	9.79E-06	5.83E-05	7.16E-05	6.40E-05	8.51E-05	4.24E-05	6.41E-05	1.63E-04	1.96E-04	5.11E-05	1.36E-04	1.18E-04	1.18E-04	1.03E-04	3.67E-05	7.16E-05	9.51E-05	1.06E-04	1.52E-04	2.23E-04	2.93E-05
Cesium (Cs) and Compounds (as Ce)	7440-46-2	1.79E-07	4.27E-07	4.36E-07	4.95E-07	1.82E-07	1.65E-07	9.79E-07	1.24E-06	1.07E-06	1.53E-06	6.92E-07	1.01E-06	2.38E-06	2.77E-06	8.68E-07	2.18E-06	1.76E-06	1.72E-06	1.60E-06	6.35E-07	1.21E-06	1.40E-06	1.82E-06	2.22E-06	3.18E-06	4.95E-07
Copper (Cu)	7440-50-8	7.46E-06	1.19E-05	1.51E-05	1.69E-05	7.51E-06	7.24E-06	2.51E-05	3.74E-05	2.68E-05	4.60E-05	1.96E-05	3.26E-05	7.85E-05	4.02E-05	3.41E-05	5.42E-05	3.05E-05	2.67E-05	4.16E-05	1.89E-05	3.04E-05	2.70E-05	4.85E-05	8.03E-05	4.82E-05	1.69E-05
Iron (Fe)	7439-89-6	2.46E-03	5.78E-03	5.99E-03	6.58E-03	2.49E-03	2.24E-03	1.33E-02	1.69E-02	1.46E-02	2.06E-02	9.50E-03	1.39E-02	3.31E-02	3.80E-02	1.16E-02	2.99E-02	2.44E-02	2.39E-02	2.19E-02	8.60E-03	1.64E-02	1.94E-02	2.46E-02	3.06E-02	4.44E-02	6.58E-03
Gallium (Ga)	7440-55-3	1.09E-06	2.60E-06	2.67E-06	3.01E-06	1.11E-06	1.00E-06	5.98E-06	7.58E-06	6.54E-06	9.33E-06	4.23E-06	6.18E-06	1.46E-05	1.70E-05	5.23E-06	1.33E-05	1.08E-05	1.05E-05	9.75E-06	3.87E-06	7.36E-06	8.56E-06	1.11E-05	1.35E-05	1.95E-05	3.01E-06
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	2.24E-07	5.34E-07	5.46E-07	6.20E-07	2.28E-07	2.06E-07	1.22E-06	1.56E-06	1.34E-06	1.92E-06	8.66E-07	1.26E-06	2.98E-06	3.47E-06	1.09E-06	2.73E-06	2.20E-06	2.15E-06	2.00E-06	7.94E-07	1.51E-06	1.75E-06	2.28E-06	2.77E-06	3.97E-06	6.20E-07
Mercury (Hg)	7439-97-6	1.31E-09	3.13E-09	3.20E-09	3.63E-09	1.33E-09	1.21E-09	7.18E-09	9.11E-09	7.86E-09	1.12E-08	5.08E-09	7.40E-09	1.74E-08	2.03E-08	6.36E-09	1.60E-08	1.29E-08	1.26E-08	1.17E-08	4.66E-09	8.84E-09	1.02E-08	1.33E-08	1.63E-08	2.33E-08	3.63E-09
Indium (In)	7440-74-6	9.05E-10	2.16E-09	2.21E-09	2.50E-09	9.19E-10	8.32E-10	4.95E-09	6.28E-09	5.42E-09	7.74E-09	3.50E-09	5.10E-09	1.20E-08	1.40E-08	4.39E-09	1.10E-08	8.88E-09	8.67E-09	8.07E-09	3.21E-09	6.09E-09	7.05E-09	9.19E-09	1.12E-08	1.60E-08	2.50E-09
Potassium (K)	7440-09-7	8.50E-04	1.99E-03	2.08E-03	2.27E-03	8.63E-04	7.74E-04	4.61E-03	5.83E-03	5.05E-03	7.11E-03	3.29E-03	4.83E-03	1.15E-02	1.35E-02	3.99E-03	1.04E-02	8.47E-03	8.31E-03	7.58E-03	2.97E-03	5.67E-03	6.74E-03	8.51E-03	1.07E-02	1.54E-02	2.27E-03
Lanthanum (La)	7439-91-0	1.68E-06	3.82E-06	4.13E-06	4.43E-06	1.71E-06	1.50E-06	8.95E-06	1.12E-05	9.81E-06	1.34E-05	6.48E-06	9.65E-06	2.38E-05	2.82E-05	7.59E-06	2.05E-05	1.73E-05	1.72E-05	1.52E-05	5.70E-06	1.10E-05	1.39E-05	1.64E-05	2.21E-05	3.21E-05	4.43E-06
Lithium (Li)	7439-93-2	1.35E-06	3.22E-06	3.30E-06	3.74E-06	1.37E-06	1.24E-06	7.40E-06	9.39E-06	8.10E-06	1.16E-05	5.23E-06	7.63E-06	1.80E-05	2.10E-05	6.56E-06	1.65E-05	1.33E-05	1.30E-05	1.21E-05	4.80E-06	9.11E-06	1.05E-05	1.37E-05	1.67E-05	2.40E-05	3.74E-06
Lutetium (Lu)	7439-94-3	1.40E-08	3.33E-08	3.40E-08	3.86E-08	1.42E-08	1.28E-08	7.64E-08	9.70E-08	8.36E-08	1.20E-07	5.40E-08	7.87E-08	1.86E-07	6.77E-08	1.70E-07	1.37E-07	1.34E-07	1.25E-07	4.95E-08	9.40E-08	1.09E-07	1.42E-07	1.73E-07	2.48E-07	3.86E-08
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	7.69E-04	1.84E-03	1.88E-03	2.14E-03	7.81E-04	7.08E-04	4.21E-03	5.33E-03	4.61E-03	6.58E-03	2.97E-03	4.33E-03	1.02E-02	1.19E-02	3.75E-03	9.39E-03	7.56E-03	7.38E-03	6.89E-03	2.73E-03	5.19E-03	6.00E-03	7.84E-03	9.55E-03	1.37E-02	2.14E-03
Manganese (Mn) and Compounds (as Mn)	7439-96-5	1.13E-05	2.62E-05	2.75E-05	2.95E-05	1.15E-05	1.02E-05	6.12E-05	7.79E-05	6.75E-05	9.48E-05	4.42E-05	6.52E-05	1.57E-04	1.86E-04	5.18E-05	1.41E-04	1.15E-04	1.13E-04	1.01E-04	3.87E-05	7.46E-05	9.16E-05	1.14E-04	1.45E-04	2.11E-04	2.95E-05
Molybdenum (Mo)	7439-98-7	2.38E-07	4.25E-07	5.01E-07	5.78E-07	2.40E-07	2.30E-07	9.25E-07	1.25E-06	1.01E-06	1.67E-06	6.44E-07	1.01E-06	1.80E-06	1.92E-06	1.19E-06	2.00E-06	1.35E-06	1.25E-06	1.68E-06	6.44E-07	1.14E-06	1.04E-06	1.87E-06	2.62E-06	2.24E-06	5.78E-07
Sodium (Na)	7440-23-5	1.57E-03	3.72E-03	3.82E-03	4.29E-03	1.59E-03	1.44E-03	8.55E-03	1.08E-02	9.36E-03	1.33E-02	6.05E-03	8.84E-03	2.09E-02	2.45E-02	7.47E-03	1.91E-02	1.54E-02	1.51E-02	1.40E-02	5.53E-03	1.05E-02	1.23E-02	1.59E-02	1.94E-02	2.80E-02	4.29E-03
Niobium (Nb)	7440-03-1	3.03E-07	7.21E-07	7.37E-07	8.37E-07	3.07E-07	2.78E-07	1.65E-06	2.10E-06	1.81E-06	2.59E-06	1.17E-06	1.71E-06	4.02E-06	4.59E-06	1.47E-06	3.69E-06	2.97E-06	2.90E-06	2.70E-06	1.07E-06	2.04E-06	2.36E-06	3.07E-06	3.74E-06	5.36E-06	8.37E-07
Nickel (Ni)	7440-02-0	1.49E-06	3.37E-06	3.66E-06	3.91E-06	1.52E-06	1.32E-06	7.96E-06	1.00E-05	8.77E-06	1.20E-05	5.81E-06	8.67E-06	2.14E-05	2.55E-05	6.82E-06	1.85E-05	1.55E-05	1.55E-05	1.36E-05	5.00E-06	9.71E-06	1.25E-05	1.47E-05	1.99E-05	2.90E-05	3.91E-06
Phosphorus (P)	7723-14-0	2.60E-05	6.50E-05	6.40E-05	7.80E-05	2.70E-05	2.50E-05	1.47E-04	1.88E-04	1.61E-04	2.35E-04	1.03E-04	1.48E-04	3.39E-04	3.91E-04	1.45E-04	3.23E-04	2.53E-04	2.45E-04	2.48E-04	9.60E-05	1.81E-04	2.00E-04	2.76E-04	3.31E-04	4.49E-04	7.80E-05
Lead (Pb)	7439-92-1	6.13E-07	1.52E-06	1.48E-06	1.80E-06	6.22E-07	5.91E-07	3.43E-06	4.46E-06	3.72E-06	5.55E-06	2.42E-06	3.47E-06	7.68E-06	8.82E-06	3.42E-06	7.41E-06	5.75E-06	5.53E-06	5.71E-06	2.24E-06	4.22E-06	4.51E-06	6.32E-06	7.67E-06	1.01E-05	1.80E-06
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	4.00E-06	9.54E-06	9.75E-06	1.11E-05	4.06E-06	3.68E-06	2.19E-05	2.78E-05	2.40E-05	3.42E-05	1.55E-05	2.26E-05	5.32E-05	6.20E-05	1.94E-05	4.88E-05	3.93E-05	3.84E-05	3.57E-05	1.42E-05	2.69E-05	3.12E-05	4.06E-05	4.95E-05	7.10E-05	1.11E-05
Sulphur (S)	7704-34-9	2.36E-04	5.78E-04	5.78E-04	6.31E-04	2.38E-04	2.16E-04	1.26E-03	1.63E-03	1.39E-03	1.91E-03	9.16E-04	1.37E-03	3.30E-03	3.92E-03	1.07E-03	2.87E-03	2.38E-03	2.38E-03	2.11E-03	8.00E-04	1.54E-03	1.90E-03	2.29E-03	3.07E-03	4.46E-03	6.30E-04
Antimony (Sb)	7440-36-0	2.29E-07	3.00E-07	4.78E-07	5.25E-07	2.31E-07	2.22E-07	6.91E-07	9.24E-07	6.71E-07	1.30E-06	4.39E-07	8.51E-07	1.77E-06	8.03E-07	1.03E-06	1.44E-06	6.93E-07	6.28E-07	1.22E-06	5.15E-07	7.64E-07	7.36E-07	1.39E-06	2.50E-06	1.48E-06	5.25E-07
Scandium (Sc)	7440-20-2	9.08E-07	2.10E-06	2.22E-06	2.39E-06	9.22E-07	8.20E-07	4.88E-06	6.14E-06	5.35E-06	7.45E-06	3.50E-06	5.17E-06	1.25E-05	1.48E-05	4.20E-06	1.11E-05	9.16E-06	9.03E-06	8.12E-06	3.13E-06	6.01E-06	7.32E-06	8.99E-06	1.16E-05	1.68E-05	2.39E-06
Selenium (Se)	7782-49-2	1.84E-08	4.38E-08	4.48E-08	5.08E-08	1.87E-08	1.69E-08	1.01E-07	1.28E-07	1.10E-07	1.57E-07	7.11E-08	1.04E-07	2.44E-07	2.85E-07	8.91E-08	2.24E-07	1.80E-07	1.76E-07	1.64E-07	6.52E-08	1.24E-07	1.43E-07	1.87E-07	2.28E-07	3.26E-07	5.08E-08
Tin (Sn)	7440-31-5	4.86E-07	1.16E-06	1.18E-06	1.34E-06	4.93E-07	4.47E-07	2.66E-06	3.37E-06	2.91E-06	4.16E-06	1.88E-06	2.74E-06	6.45E-06	7.53E-06	2.35E-06	5.92E-06	4.77E-06	4.66E-06	4.33E-06	1.72E-06	3.27E-06	3.79E-06	4.93E-06	6.01E-06	8.62E-06	1.34E-06
Strontium (Sr)	7440-24-6	1.25E-05	2.71E-05	2.88E-05	3.22E-05	1.26E-05	1.10E-05	6.78E-05	8.36E-05	7.08E-05	1.03E-04	4.84E-05	6.13E-05	1.35E-04	1.54E-04	6.81E-05	1.34E-04	1.02E-04	9.71E-05	1.08E-04	4.16E-05	7.65E-05	7.96E-05	1.19E-04	1.51E-04	1.77E-04	3.42E-05
Tantalum (Ta)	7440-25-7	4.94E-08	1.18E-07	1.20E-07	1.37E-07	5.02E-08	4.55E-08	2.70E-07	3.43E-07	2.96E-07	4.23E-07	1.91E-07	2.79E-07	6.57E-07	7.66E-07	2.40E-07	6.02E-07	4.85E-07	4.74E-07	4.41E-07	1.75E-07	3.33E-07	3.85E-07	5.02E-07	6.12E-07	8.77E-07	1.37E-07
Terbium (Tb) and Compounds (as Tb)	7440-27-9	3.24E-08	7.72E-08	7.89E-08	8.96E-08	3.29E-08	2.98E-08	1.77E-07	2.25E-07	1.94E-07	2.77E-07	1.25E-07	1.83E-07	4.30E-07	5.02E-07	1.57E-07	3.95E-07	3.18E-07	3.10E-07	2.89E-07	1.15E-07	2.18E-07	2.52E-07	3.29E-07	4.01E-07	5.74E-07	8.96E-08
Tellurium (Te)	13494-80-9	1.07E-08	2.55E-08	2.61E-08	2.96E-08	1.09E-08	9.83E-09	5.85E-08	7.42E-08	6.40E-08	9.15E-08	4.13E-08	6.03E-08	1.42E-07	1.66E-07	5.18E-08	1.30E-07	1.05E-07	1.02E-07	9.54E-08	3.79E-08	7.20E-08	8.33E-08	1.09E-07	1.32E-07	1.90E-07	2.96E-08
Titanium (Ti) and Compounds (as Ti)	7440-32-6	9.40E-05	2.14E-04	2.29E-04	2.45E-04	9.50E-05	8.40E-05	5.03E-04	6.38E-04	5.54E-04	7.69E-04	3.67E-04	5.45E-04	1.32E-03	1.57E-03	4.25E-04	1.16E-03	9.61E-04	9.52E-04	8.41E-04	3.17E-04	6.13E-04	7.69E-04	9.30E-04	1.22E-03	1.78E-03	2.45E-04
Thallium (Tl)	7440-28-0	5.33E-08	1.27E-07	1.30E-07	1.47E-07	5.41E-08	4.98E-08	2.91E-07	3.70E-07	3.19E-07	4.56E-07	2.02E-07	3.00E-07	7.07E-07	8.25E-07	2.58E-07	6.49E-07	5.10E-07	4.75E-07	4.75E-07	1.88E-07	3.59E-07	4.15E-07	5.41E-07	6.59E-07	9.44E-07	1.47E-07
Uranium (U)	7440-61-1	7.45E-08	1.78E-07	1.82E-07	2.06E-07	7.57E-08	6.86E-08	4.08E-07	5.17E-07	4.46E-07	6.38E-07	2.88E-07	4.20E-07	9.90E-07	1.15E-06	3.61E-07	9.08E-07	7.32E-07	7.14E-07	6.65E-07	2.64E-07	5.02E-07	5.81E-07	7.57E-07	9.23E-07	1.32E-06	2.06E-07
Vanadium (v)	7440-62-2	7.56E-06	1.76E-05	1.85E-05	1.99E-05	7.67E-06	6.85E-06	4.08E-05	5.16E-05	4.47E-05	6.28E-05	2.93E-05	4.31E-05	1.03E-04	1.21E-04	3.53E-05	9.20E-05	7.56E-05	7.43E-05	6.74E-05	2.63E-05	5.02E-05	6.02E-05	7.53E-05	9.52E-05	1.38E-04	1.99E-05
Tungsten (W) and Compounds (as W)	7440-33-7	1.13E-06	1.36E-06	2.38E-06	2.61E-06	1.13E-06	1.09E-06	3.19E-06	4.36E-06	2.93E-06	6.12E-06	1.90E-06	3.92E-06	7.54E-06	2.90E-06	5.04E-06	6.55E-06	2.94E-06	2.84E-06	5.96E-06	2.49E-06	3.35E-06	3.39E-06	6.55E-06	1.24E-05	7.30E-06	2.61E-06
Yttrium (Y) and Compounds (as Y)	7440-65-5	8.00E-07	1.91E-06	1.95E-06	2.21E-06	8.12E-07	7.35E-07	4.37E-06	5.55E-06	4.79E-06	6.84E-06	3.09E-06	4.51E-06	1.06E-05	1.24E-05	3.87E-06	9.74E-06	7.85E-06	7.66E-06	7.13E-06	2.84E-06	5.38E-06	6.23E-06	8.12E-06	9.90E-06	1.42E-05	2.21E-06
Ytterbium (Yb)	7440-64-4	9.23E-08	2.20E-07	2.25E-07	2.55E-07	9.37E-08	8.48E-08	5.04E-07	6.40E-07	5.52E-07	7.89E-07	3.57E-07	5.20E-07	1.23E-06	1.43E-06	4.47E-07	1.12E-06	9.06E-07	8.84E-07	8.23E-07	3.27E-07	6.21E-07	7.19E-07	9.37E-07	1.14E-06	1.64E-06	2.55E-07
Zinc (Zn)	7440-66-6	4.71E-06	9.82E-06	1.04E-05	1.21E-05	4.74E-06	4.55E-06	2.17E-05	2.90E-05	2.37E-05	3.66E-05	1.55E-05	2.28E-05	4.48E-05	5.04E-05	2.46E-05	4.60E-05	3.40E-05	3.21E-05	3.73E-05	1.47E-05	2.67E-05	2.63E-05	4.15E-05	5.27E-05	5.80E-05	1.21E-05
Zirconium (Zr)	7440-67-7	5.01E-06	1.19E-05	1.22E-05	1.39E-05	5.09E-06	4.61E-06	2.74E-05	3.48E-05	3.00E-05	4.29E-05	1.94E-05	2.82E-05	6.65E-05	7.76E-05	2.34E-05	6.10E-05	4.92E-05	4.80E-05	4.47E-05	1.78E-05	3.37E-05	3.90E-05	5.09E-05	6.20E-05	8.88E-05	1.39E-05
Silicon Dioxide (SiO2)	7631-86-9	3.36E-02	7.98E-02	8.19E-02	9.23E-02	3.41E-02	3.08E-02	1.83E-01	2.33E-01	2.01E-01	2.86E-01	1.30E-01	1.90E-01	4.48E-01	5.23E-01	1.61E-01	4.09E-01	3.31E-01	3.23E-01	2.99E-01	1.19E-01	2.26E-01	2.63E-01	3.40E-01	4.15E-01	5.99E-01	9.23E-02
Aluminum Oxide (Al2O3)	1344-28-1	7.79E-03	1.86E-02	1.90E-02	2.16E-02	7.91E-03	7.17E-03	4.26E-02	5.42E-02	4.67E-02	6.68E-02	3.01E-02	4.39E-02	1.03E-01	1.20E-01	3.80E-02	9.49E-02	7.64E-02	7.45E-02	6.97E-02	2.77E-02	5.25E-02	6.06E-02	7.92E-02	9.65E-02	1.38E-01	2.16E-02
Iron Oxide (Fe2O3)	1309-37-1	3.42E-03	8.16E-03	8.32E-03	9.49E-03	3.47E-03	3.15E-03	1.87E-02	2.38E-02	2.05E-02	2.93E-02	1.32E-02	1.92E-02	4.53E-02	5.27E-02	1.67E-02	4.16E-02	3.35E-02	3.27E-02	3.06E-02	1.21E-02	2.30E-02	2.66E-02	3.48E-02	4.23E-02	6.04E-02	9.49E-03
Magnesium Oxide (MgO)	1309-48-4	1.30E-03	3.14E-03	3.17E-03	3.69E-03	1.32E-03	1.21E-03	7.16E-03	9.13E-03	7.84E-03	1.13E-02	5.04E-03	7.31E-03	1.70E-02	1.98E-02	6.65E-03	1.59E-02	1.26E-02	1.23E-02	1.18E-02	4.67E-03	8.82E-03	1.00E-02	1.33E-02	1.62E-02	2.27E-02	3.69E-03
Calcium Oxide (CaO)	1305-78-8	2.64E-03	5.50E-03	5.46E-03	6.31E-03	2.67E-03	2.29E-03	1.28E-02	1.70E-02	1.31E-02	2.17E-02	8.88E-03	1.25E-02	2.66E-02	3.05E-02	1.20E-02	2.58E-02	2.00E-02	1.91E-02	2.02E-02	8.07E-03	1.56E-02	1.55E-02	2.15E-02	2.83E-02	3.46E-02	6.31E-03
Sodium Oxide (Na2O)	1313-59-3	2.01E-03	4.72E-03	4.91E-03	5.38E-03	2.04E-03	1.83E-03	1.09E-02	1.38E-02	1.19E-02	1.68E-02	7.75E-03	1.14E-02	2.72E-02	3.19E-02	9.46E-03	2.45E-02	2.00E-02	1.96E-02	1.80E-02	7.03E-03	1.34E-02	1.59E-02	2.02E-02	2.52E-02	3.65E-02	5.38E-03
Potassium Oxide (K2O)	12136-45-7	1.05E-03	2.50E-03	2.56E-03	2.89E-03	1.07E-03	9.65E-04	5.74E-03	7.28E-03	6.28E-03	8.96

Table G-5: Maximum Predicted Monthly PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Operations - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	
UTM E (m)		526877	543079	530948	532176	526931	526820	540795	540763	530613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	Max Deposition
UTM N (m)		5640176	5658895	5643967	5644751	5640239	5638873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654952	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	0.32	0.70	0.75	1.02	0.33	0.27	1.69	2.88	0.74	3.20	1.15	1.71	5.18	2.94	1.38	1.58	2.00	1.95	3.29	1.44	2.23	2.04	2.91	5.51	5.29	1.02
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	2.07E-07	4.46E-07	4.69E-07	6.34E-07	2.09E-07	1.75E-07	1.09E-06	1.92E-06	4.38E-07	2.14E-06	7.19E-07	1.12E-06	3.33E-06	1.36E-06	8.76E-07	9.50E-07	1.05E-06	1.05E-06	1.93E-06	9.19E-07	1.47E-06	1.06E-06	1.68E-06	3.42E-06	2.58E-06	6.34E-07
Aluminum (Al)	7429-90-5	2.46E-02	5.41E-02	5.74E-02	7.73E-02	2.49E-02	2.04E-02	1.30E-01	2.21E-01	5.68E-02	2.46E-01	8.88E-02	1.31E-01	4.00E-01	2.28E-01	1.05E-01	1.21E-01	1.54E-01	1.50E-01	2.53E-01	1.10E-01	1.70E-01	1.57E-01	2.23E-01	4.21E-01	4.08E-01	7.73E-02
Arsenic (As)	7440-38-2	5.94E-06	1.27E-05	1.32E-05	1.78E-05	6.00E-06	5.11E-06	3.18E-05	5.58E-05	1.17E-05	6.41E-05	1.98E-05	3.22E-05	1.14E-04	2.87E-05	2.53E-05	2.58E-05	2.43E-05	2.53E-05	5.50E-05	2.61E-05	4.27E-05	2.47E-05	4.38E-05	9.53E-05	5.74E-05	1.78E-05
Gold (Au)	7440-57-5	3.14E-08	6.48E-08	6.85E-08	9.33E-08	3.17E-08	2.73E-08	1.65E-07	2.85E-07	5.60E-08	3.41E-07	9.53E-08	1.69E-07	6.68E-07	1.17E-07	1.34E-07	1.30E-07	1.05E-07	1.11E-07	2.82E-07	1.34E-07	2.23E-07	1.19E-07	2.11E-07	4.87E-07	2.77E-07	9.33E-08
Boron (B)	7440-42-8	3.30E-05	7.70E-05	7.80E-05	1.04E-04	3.40E-05	2.80E-05	1.85E-04	3.11E-04	7.90E-05	3.46E-04	1.27E-04	1.86E-04	5.74E-04	3.29E-04	1.42E-04	1.65E-04	2.20E-04	2.13E-04	3.55E-04	1.52E-04	2.35E-04	2.23E-04	3.10E-04	5.75E-04	5.79E-04	1.04E-04
Barium (Ba)	7440-39-3	1.21E-04	2.95E-04	2.84E-04	3.80E-04	1.23E-04	1.00E-04	7.07E-04	1.17E-03	2.96E-04	1.31E-03	4.84E-04	7.03E-04	2.21E-03	1.30E-03	5.32E-04	6.09E-04	8.48E-04	8.19E-04	1.35E-03	5.68E-04	8.68E-04	8.63E-04	1.17E-03	2.12E-03	2.24E-03	3.80E-04
Beryllium (Be)	7440-41-7	3.71E-07	7.40E-07	8.55E-07	1.16E-06	3.75E-07	3.09E-07	1.77E-06	2.97E-06	7.71E-07	3.41E-06	1.14E-06	1.73E-06	4.97E-06	2.66E-06	1.56E-06	1.74E-06	1.94E-06	1.91E-06	3.33E-06	1.55E-06	2.42E-06	1.97E-06	3.03E-06	6.09E-06	5.11E-06	1.16E-06
Bismuth (Bi)	7440-69-9	6.59E-07	1.15E-06	1.49E-06	2.06E-06	6.66E-07	5.54E-07	2.84E-06	4.34E-06	1.11E-06	5.71E-06	1.44E-06	2.64E-06	8.39E-06	2.50E-06	2.72E-06	2.85E-06	2.16E-06	2.27E-06	5.29E-06	2.46E-06	3.97E-06	2.27E-06	4.31E-06	1.00E-05	5.63E-06	2.06E-06
Carbon (C)	7440-44-0	4.31E-04	9.64E-04	1.01E-03	1.35E-03	4.36E-04	3.58E-04	2.32E-03	3.93E-03	1.01E-03	4.37E-03	1.59E-03	2.34E-03	7.15E-03	4.08E-03	1.84E-03	2.12E-03	2.75E-03	2.68E-03	4.49E-03	1.95E-03	3.00E-03	2.80E-03	3.94E-03	7.39E-03	7.27E-03	1.35E-03
Calcium (Ca)	7440-70-2	1.04E-02	2.10E-02	2.40E-02	3.26E-02	1.05E-02	8.62E-03	5.02E-02	8.48E-02	2.22E-02	9.57E-02	3.29E-02	4.95E-02	1.45E-01	8.01E-02	4.40E-02	4.94E-02	5.70E-02	5.61E-02	9.68E-02	4.41E-02	6.85E-02	5.79E-02	8.72E-02	1.72E-01	1.51E-01	3.26E-02
Cadmium (Cd)	7440-43-9	4.26E-07	8.64E-07	9.35E-07	1.28E-06	4.30E-07	3.68E-07	2.20E-06	3.74E-06	7.61E-07	4.59E-06	1.26E-06	2.21E-06	8.43E-06	1.65E-06	1.80E-06	1.78E-06	1.41E-06	1.53E-06	3.79E-06	1.79E-06	2.97E-06	1.61E-06	2.86E-06	6.61E-06	3.78E-06	1.28E-06
Cerium (Ce) and compounds (as Ce)	7440-45-1	2.40E-05	5.10E-05	5.50E-05	7.40E-05	2.40E-05	2.00E-05	1.23E-04	2.09E-04	5.40E-05	2.32E-04	8.40E-05	1.24E-04	3.76E-04	2.14E-04	1.00E-04	1.15E-04	1.45E-04	1.42E-04	2.39E-04	1.05E-04	1.62E-04	1.48E-04	2.11E-04	4.00E-04	3.84E-04	7.40E-05
Cobalt (Co)	7440-48-4	6.67E-06	1.48E-05	1.55E-05	2.08E-05	6.74E-06	5.55E-06	3.57E-05	6.19E-05	1.55E-05	6.77E-05	2.48E-05	3.68E-05	1.11E-04	6.13E-05	2.84E-05	3.25E-05	4.18E-05	4.08E-05	6.84E-05	3.03E-05	4.69E-05	4.25E-05	6.04E-05	1.14E-04	1.09E-04	2.08E-05
Chromium (Cr) and Compounds (as Cr)	7440-47-3	3.40E-05	1.27E-04	8.10E-05	1.05E-04	3.40E-05	2.70E-05	3.00E-04	4.55E-04	1.13E-04	5.19E-04	2.08E-04	2.86E-04	9.97E-04	6.39E-04	1.90E-04	2.40E-04	3.75E-04	3.54E-04	5.47E-04	1.95E-04	2.94E-04	3.82E-04	4.43E-04	8.37E-04	9.97E-04	1.27E-04
Cesium (Cs) and Compounds (as Ce)	7440-46-2	1.10E-06	2.39E-06	2.57E-06	3.47E-06	1.12E-06	9.16E-07	5.76E-06	9.81E-06	2.52E-06	1.09E-05	3.93E-06	5.81E-06	1.77E-05	1.00E-05	4.70E-06	5.39E-06	6.82E-06	6.65E-06	1.12E-05	4.91E-06	7.58E-06	6.94E-06	9.90E-06	1.88E-05	1.80E-05	3.47E-06
Copper (Cu)	7440-50-8	4.80E-05	9.80E-05	1.06E-04	1.48E-04	4.85E-05	4.10E-05	2.44E-04	4.19E-04	9.10E-05	4.91E-04	1.84E-04	2.63E-04	8.36E-04	2.27E-04	2.01E-04	2.08E-04	1.91E-04	1.98E-04	4.29E-04	2.03E-04	3.30E-04	1.92E-04	3.45E-04	7.57E-04	4.52E-04	1.44E-04
Iron (Fe)	7439-89-6	1.37E-02	3.20E-02	3.20E-02	4.30E-02	1.39E-02	1.14E-02	7.70E-02	1.29E-01	3.29E-02	1.44E-01	5.28E-02	7.74E-02	2.39E-01	1.38E-01	5.89E-02	6.81E-02	9.16E-02	8.88E-02	1.48E-01	6.31E-02	9.71E-02	9.31E-02	1.29E-01	2.38E-01	2.42E-01	4.30E-02
Gallium (Ga)	7440-55-3	6.61E-06	1.46E-05	1.54E-05	2.07E-05	6.69E-06	5.48E-06	3.50E-05	5.95E-05	1.53E-05	6.61E-05	2.39E-05	3.53E-05	1.08E-04	6.13E-05	2.81E-05	3.23E-05	4.15E-05	4.04E-05	6.80E-05	2.96E-05	4.57E-05	4.22E-05	5.98E-05	1.13E-04	1.10E-04	2.07E-05
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	1.38E-06	2.99E-06	3.21E-06	4.34E-06	1.40E-06	1.15E-06	7.21E-06	1.23E-05	3.16E-06	1.37E-05	4.92E-06	7.27E-06	2.21E-05	1.25E-05	5.87E-06	6.74E-06	8.54E-06	8.32E-06	1.40E-05	6.14E-06	9.48E-06	8.68E-06	1.24E-05	2.35E-05	2.26E-05	4.34E-06
Mercury (Hg)	7439-97-6	8.10E-09	1.75E-08	1.88E-08	2.54E-08	8.19E-09	6.71E-09	4.22E-08	7.19E-08	1.85E-08	8.00E-08	2.88E-08	4.26E-08	1.29E-07	7.35E-08	3.44E-08	3.95E-08	5.00E-08	4.88E-08	8.23E-08	3.60E-08	5.58E-08	5.09E-08	7.26E-08	1.38E-07	1.32E-07	2.54E-08
Indium (In)	7440-74-6	5.58E-09	1.21E-08	1.30E-08	1.75E-08	5.65E-09	4.63E-09	2.91E-08	4.96E-08	1.28E-08	5.51E-08	1.99E-08	2.94E-08	8.92E-08	5.07E-08	2.37E-08	2.72E-08	3.45E-08	3.36E-08	5.67E-08	2.48E-08	3.83E-08	3.51E-08	5.00E-08	9.49E-08	9.11E-08	1.75E-08
Potassium (K)	7440-09-7	4.65E-03	1.10E-02	1.09E-02	1.46E-02	4.71E-03	3.85E-03	2.65E-02	4.43E-02	1.13E-02	4.93E-02	1.82E-02	2.66E-02	8.25E-02	4.78E-02	2.01E-02	2.32E-02	3.16E-02	3.06E-02	5.07E-02	2.15E-02	3.31E-02	3.21E-02	4.41E-02	8.09E-02	8.33E-02	1.46E-02
Lanthanum (La)	7439-91-0	6.96E-06	2.04E-05	1.65E-05	2.17E-05	7.05E-06	5.74E-06	4.87E-05	7.81E-05	1.95E-05	8.76E-05	3.37E-05	4.79E-05	1.57E-04	9.55E-05	3.38E-05	3.93E-05	5.94E-05	5.67E-05	9.07E-05	3.57E-05	5.40E-05	6.04E-05	7.63E-05	1.38E-04	1.57E-04	2.17E-05
Lithium (Li)	7439-93-2	8.34E-06	1.81E-05	1.94E-05	2.62E-05	8.44E-06	6.92E-06	4.36E-05	7.41E-05	1.91E-05	8.24E-05	2.97E-05	4.39E-05	1.33E-04	7.57E-05	3.55E-05	4.07E-05	5.16E-05	5.03E-05	8.48E-05	3.71E-05	5.73E-05	5.24E-05	7.48E-05	1.42E-04	1.36E-04	2.62E-05
Lutetium (Lu)	7439-94-3	8.61E-08	1.87E-07	2.00E-07	2.70E-07	8.71E-08	7.14E-08	4.50E-07	7.65E-07	1.97E-07	8.51E-07	3.06E-07	4.53E-07	1.38E-06	7.82E-07	3.66E-07	4.20E-07	5.32E-07	5.19E-07	8.75E-07	3.83E-07	5.91E-07	5.41E-07	7.72E-07	1.47E-06	1.41E-06	2.70E-07
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	4.78E-03	1.03E-02	1.11E-02	1.50E-02	4.83E-03	3.96E-03	2.48E-02	4.20E-02	1.09E-02	4.69E-02	1.68E-02	2.49E-02	7.56E-02	4.31E-02	2.03E-02	2.33E-02	2.94E-02	2.86E-02	4.84E-02	2.12E-02	3.26E-02	2.99E-02	4.28E-02	8.11E-02	7.77E-02	1.50E-02
Manganese (Mn) and Compounds (as Mn)	7439-96-5	5.00E-05	1.42E-04	1.17E-04	1.55E-04	5.00E-05	4.10E-05	3.41E-04	5.65E-04	1.38E-04	6.34E-04	2.36E-04	3.42E-04	1.07E-03	6.40E-04	2.49E-04	2.82E-04	4.08E-04	3.91E-04	6.35E-04	2.58E-04	3.94E-04	4.12E-04	5.58E-04	9.63E-04	1.07E-03	1.55E-04
Molybdenum (Mo)	7439-98-7	1.72E-06	3.19E-06	3.91E-06	5.38E-06	1.74E-06	1.44E-06	7.78E-06	1.24E-05	3.19E-06	1.53E-05	4.43E-06	7.29E-06	2.13E-05	8.96E-06	7.15E-06	7.72E-06	7.09E-06	7.20E-06	1.44E-05	6.77E-06	1.08E-05	7.19E-06	1.25E-05	2.71E-05	1.84E-05	5.38E-06
Sodium (Na)	7440-23-5	9.38E-03	2.08E-02	2.18E-02	2.94E-02	9.49E-03	7.77E-03	5.00E-02	8.46E-02	2.17E-02	9.42E-02	3.41E-02	5.03E-02	1.54E-01	8.78E-02	3.99E-02	4.60E-02	5.93E-02	5.77E-02	9.70E-02	4.21E-02	6.49E-02	6.03E-02	8.52E-02	1.60E-01	1.57E-01	2.94E-02
Niobium (Nb)	7440-03-1	1.87E-06	4.04E-06	4.34E-06	5.86E-06	1.89E-06	1.55E-06	9.74E-06	1.66E-05	4.29E-06	1.84E-05	6.64E-06	9.82E-06	2.98E-05	1.69E-05	7.93E-06	9.10E-06	1.15E-05	1.12E-05	1.98E-05	8.29E-06	1.46E-05	1.17E-05	1.67E-05	3.17E-05	3.05E-05	5.86E-06
Nickel (Ni)	7440-02-0	5.18E-06	1.78E-05	1.24E-05	1.61E-05	5.25E-06	4.29E-06	4.26E-05	6.77E-05	1.64E-05	7.65E-05	2.96E-05	4.19E-05	1.38E-04	8.52E-05	2.87E-05	3.45E-05	5.18E-05	4.92E-05	7.75E-05	2.94E-05	4.43E-05	5.25E-05	6.58E-05	1.18E-04	1.36E-04	1.78E-05
Phosphorus (P)	7723-14-0	1.93E-04	3.91E-04	4.47E-04	6.08E-04	1.96E-04	1.61E-04	9.34E-04	1.58E-03	4.11E-04	1.79E-03	6.10E-04	9.20E-04	2.69E-03	1.47E-03	8.17E-04	9.18E-04	1.05E-03	1.04E-03	1.79E-03	8.19E-04	1.28E-03	1.07E-03	1.62E-03	3.20E-03	2.78E-03	6.08E-04
Lead (Pb)	7439-92-1	4.58E-06	9.42E-06	1.05E-05	1.43E-05	4.63E-06	3.82E-06	2.26E-05	3.85E-05	9.70E-06	4.36E-05	1.47E-05	2.23E-05	6.46E-05	3.38E-05	1.92E-05	2.15E-05	2.45E-05	2.42E-05	4.18E-05	1.96E-05	3.08E-05	2.49E-05	3.77E-05	7.57E-05	6.38E-05	1.43E-05
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	2.50E-05	5.30E-05	5.70E-05	7.70E-05	2.50E-05	2.00E-05	1.29E-04	2.19E-04	5.60E-05	2.44E-04	8.80E-05	1.30E-04	3.94E-04	2.24E-04	1.05E-04	1.20E-04	1.52E-04	1.49E-04	2.51E-04	1.10E-04	1.69E-04	1.55E-04	2.21E-04	4.20E-04	4.03E-04	7.70E-05
Sulphur (S)	7704-34-9	9.78E-04	2.89E-03	2.31E-03	3.26E-03	1.03E-03	9.70E-04	6.91E-03	1.13E-02	2.85E-03	1.24E-02	4.85E-03	6.92E-03	1.52E-02	8.33E-03	7.97E-03	1.27E-02	1.33E-02	1.29E-02	1.47E-02	8.47E-03	1.07E-02	1.02E-02	1.22E-02	2.79E-02	2.18E-02	3.04E-03
Antimony (Sb)	7440-36-0	1.58E-06	2.78E-06	3.55E-06	4.91E-06	1.59E-06	1.33E-06	6.89E-06	1.07E-05	2.66E-06	1.39E-05	3.53E-06	6.46E-06	2.10E-05	5.90E-06	6.50E-06	6.80E-06	5.15E-06	5.44E-06	1.28E-05	5.95E-06	9.61E-06	5.46E-06	1.03E-05	2.41E-05	1.35E-05	4.91E-06
Scandium (Sc)	7440-20-2	4.47E-06	1.15E-05	1.05E-05	1.40E-05	4.53E-06	3.70E-06	2.74E-05	4.52E-05	1.14E-05	5.04E-05	1.89E-05	2.73E-05	8.67E-05	5.12E-05	2.02E-05	2.28E-05	3.30E-05	3.18E-05	5.20E-05	2.14E-05	3.28E-05	3.36E-05	4.47E-05	7.95E-05	8.72E-05	1.40E-05
Selenium (Se)	7782-49-2	1.13E-07	2.46E-07	2.64E-07	3.56E-07	1.15E-07	9.40E-08	5.92E-07	1.01E-06	2.59E-07	1.12E-06	4.03E-07	5.97E-07	1.81E-06	1.03E-06	4.82E-07	5.53E-07	7.00E-07	6.83E-07	1.15E-06	5.04E-07	7.78E-07	7.12E-07	1.02E-06	1.93E-06	1.85E-06	3.56E-07
Tin (Sn)	7440-31-5	3.00E-06	6.49E-06	6.97E-06	9.40E-06	3.03E-06	2.48E-06	1.56E-05	2.66E-05	6.85E-06	2.96E-05	1.07E-05	1.58E-05	4.79E-05	2.72E-05	1.27E-05	1.46E-05	1.85E-05	1.80E-05	3.04E-05	1.33E-05	2.06E-05	1.88E-05	2.69E-05	5.10E-05	4.89E-05	9.40E-06
Strontium (Sr)	7440-24-6	9.40E-05	1.81E-04	1.96E-04	2.51E-04	8.09E-05	6.63E-05	4.17E-03	7.10E-03	1.83E-03	7.90E-03	2.84E-03	4.21E-03	1.28E-02	7.26E-03	3.40E-03	3.90E-03	4.94E-03	4.81E-03	8.12E-03	3.55E-03	5.49E-03	5.02E-03	7.17E-03	1.36E-02	1.31E-02	2.51E-03
Tantalum (Ta)	7440-25-7	3.05E-07	6.61E-07	7.09E-07	9.57E-07	3.08E-07	2.53E-07	1.59E-06	2.71E-06	6.97E-07	3.01E-06	1.08E-06	1.60E-06	4.87E-06	2.77E-06	1.30E-06	1.49E-06	1.88E-06	1.84E-06	3.10E-06	1.36E-06	2.09E-06	1.92E-06	2.73E-06	5.19E-06	4.98E-06	9.57E-07
Terbium (Tb) and Compounds (as Tb)	7440-27-9	2.00E-07	4.33E-07	4.65E-07	6.27E-07	2.02E-07	1.66E-07	1.04E-06	1.77E-06	4.56E-07	1.97E-06	7.11E-07	1.05E-06	3.19E-06	1.81E-06	8.49E-07	9.74E-07	1.23E-06	1.20E-06	2.03E-06	8.88E-07	1.37E-06	1.25E-06	1.79E-06	3.40E-06	3.26E-06	6.27E-07
Tellurium (Te)	13494-80-9	6.59E-08	1.43E-07	1.53E-07	2.07E-07	6.67E-08	5.47E-08	3.44E-07	5.86E-07	1.51E-07	6.51E-07	2.35E-07	3.47E-07	1.05E-06	5.98E-07	2.80E-07	3.22E-07	4.07E-07	3.97E-07	6.70E-07	2.93E-07	4.53E-07	4.14E-07	5.91E-07	1.12E-06	1.08E-06	2.07E-07
Titanium (Ti) and Compounds (as Ti)	7440-32-6	3.64E-04	1.15E-03	8.62E-04	1.13E-03	3.69E-04	3.03E-04	2.75E-03	4.50E-03	1.08E-03	5.03E-03	1.92E-03	2.76E-03	8.81E-03	5.31E-03	1.92E-03	2.24E-03	3.31E-03	3.16E-03	5.04E-03	1.99E-03	3.02E-03	3.35E-03	4.35E-03	7.65E-03	8.68E-03	1.15E-03
Thallium (Tl)	7440-28-0	3.28E-07	7.12E-07	7.64E-07	1.03E-06	3.32E-07	2.72E-07	1.71E-06	2.92E-06	7.48E-07	3.24E-06	1.17E-06	1.73E-06	5.25E-06	2.98E-06	1.43E-06	1.60E-06	2.03E-06	1.98E-06	3.34E-06	1.46E-06	2.42E-06	2.06E-06	2.94E-06	5.59E-06	5.36E-06	1.03E-06
Uranium (U)	7440-61-1	4.60E-07	9.96E-07	1.07E-06	1.44E-06	4.65E-07	3.81E-07	2.40E-06	4.08E-06	1.05E-06	4.54E-06	1.64E-06	2.42E-06	7.35E-06	4.17E-06	1.95E-06	2.24E-06	2.84E-06	2.77E-06	4.67E-06	2.04E-06	3.16E-06	2.89E-06	4.12E-06	7.82E-06	7.51E-06	1.44E-06
Vanadium (v)	7440-62-2	4.00E-05	9.70E-05	9.30E-05	1.24E-04	4.00E-05	3.30E-05	2.33E-04	3.89E-04	9.80E-05	4.32E-04	1.61E-04	2.34E-04	7.31E-04	4.25E-04	1.75E-04	1.99E-04	2.78E-04	2.69E-04	4.44E-04	1.87E-04	2.86E-04	2.83E-04	3.84E-04	6.97E-04	7.34E-04	1.24E-04
Tungsten (W) and Compounds (as W)	7440-33-7	7.96E-06	1.32E-05	1.80E-05	2.50E-05	8.04E-06	6.69E-06	3.26E-05	4.81E-05	1.32E-05	6.59E-05	1.56E-05	2.97E-05	9.43E-05	2.62E-05	3.27E-05	3.41E-05	2.35E-05	2.63E-05	6.17E-05	2.86E-05	4.61E-05	2.66E-05	4.97E-05	1.19E-04	6.53E-05	2.50E-05
Yttrium (Y) and Compounds (as Y)	7440-65-5	4.93E-06	1.07E-05	1.15E-05	1.55E-05	4.99E-06	4.09E-06	2.57E-05	4.38E-05	1.13E-05	4.87E-05	1.75E-05	2.60E-05	7.88E-05	4.48E-05	2.10E-05	2.40E-05	3.05E-05	2.97E-05	5.01E-05	2.19E-05	3.38E-05	3.10E-05	4.42E-05	8.39E-05	8.05E-05	1.55E-05
Ytterbium (Yb)	7440-64-4	5.69E-07	1.23E-06	1.33E-06	1.79E-06	5.76E-07	4.72E-07	2.97E-06	5.05E-06	1.30E-06	5.62E-06	2.02E-06	2.99E-06	9.09E-06	5.16E-06	2.42E-06	2.77E-06	3.51E-06	3.43E-06	5.78E-06	2.53E-06	3.90E-06	3.57E-06	5.10E-06	9.68E-06	9.29E-06	1.79E-06
Zinc (Zn)	7440-66-6	3.40E-05	6.70E-05	7.80E-05	1.06E-04	3.40E-05	2.90E-05	1.63E-04	2.71E-04	6.80E-05	3.18E-04	1.00E-04	1.56E-04	4.44E-04	2.09E-04	1.43E-04	1.56E-04	1.60E-04	1.61E-04	2.98E-04	1.41E-04	2.23E-04	1.62E-04	2.64E-04	5.50E-04	4.13E-04	1.06E-04
Zirconium (Zr)	7440-67-7	3.10E-05	6.70E-05	7.20E-05	9.70E-05	3.10E-05	2.60E-05	1.61E-04	2.74E-04	7.10E-05	3.05E-04	1.10E-04	1.63E-04	4.94E-04	2.80E-04	1.31E-04	1.51E-04	1.91E-04	1.86E-04	3.14E-04	1.37E-04	2.12E-04	1.94E-04	2.77E-04	5.25E-04	5.04E-04	9.70E-05
Silicon Dioxide (SiO2)	7631-86-9	2.03E-01	4.46E-01	4.73E-01	6.37E-01	2.05E-01	1.68E-01	1.07E+00	1.82E+00	4.68E-01	2.03E+00	7.33E-01	1.08E+00	3.30E+00	1.88E+00	8.64E-01	9.94E-01	1.27E+00	1.24E+00	2.09E+00	9.08E-01	1.40E+00	1.30E+00	1.84E+00	3.47E+00	3.37E+00	6.37E-01
Aluminum Oxide (Al2O3)	1344-28-1	4.85E-02	1.04E-01	1.13E-01	1.52E-01	4.91E-02	4.03E-02	2.52E-01	4.29E-01	1.10E-01	4.77E-01	1.71E-01	2.54E-01	7.69E-01	4.36E-01	2.06E-01	2.36E-01	2.98E-01	2.90E-01	4.90E-01	2.15E-01	3.32E-01	3.03E-01	4.33E-01	8.24E-01	7.86E-01	1.52E-01
Iron Oxide (Fe2O3)	1309-37-1	2.13E-02	4.58E-02	4.96E-02	6.70E-02	2.16E-02	1.77E-02	1.10E-01	1.88E-01	4.85E-02	2.09E-01	7.52E-02	1.11E-01	3.38E-01	1.91E-01	9.07E-02	1.04E-01	1.31E-01	1.27E-01	2.15E-01	9.45E-02	1.46E-01	1.33E-01	1.90E-01	3.62E-01	3.45E-01	6.70E-02
Magnesium Oxide (MgO)	1309-48-4	8.64E-03	1.81E-02	2.00E-02	2.71E-02	8.74E-03	7.17E-03	4.29E-02	7.39E-02	1.91E-02	8.20E-02	2.92E-02	4.35E-02	1.30E-01	7.26E-02	3.66E-02	4.16E-02	5.04E-02	4.94E-02	8.42E-02	3.76E-02	5.82E-02	5.13E-02	7.50E-02	1.45E-01	1.33E-01	2.71E-02
Calcium Oxide (CaO)	1305-78-8	1.67E-02	3.66E-02	3.81E-02	5.16E-02	1.69E-02	1.42E-02	8.95E-02	1.53E-01	3.55E-02	1.75E-01	5.71E-02	8.47E-02	2.60E-01	1.20E-01	7.03E-02	7.57E-02	8.86E-02	8.83E-02	1.52E-01	7.38E-02	1.20E-01	9.06E-02	1.32E-01	2.79E-01	2.23E-01	5.16E-02
Sodium Oxide (Na2O)	1313-59-3	1.11E-02	2.61E-02	2.60E-02	3.50E-02	1.13E-02	9.23E-03	6.26E-02	1.05E-01	2.68E-02	1.17E-01	4.28E-02	6.26E-02	1.95E-01	1.13E-01	4.79E-02	5.54E-02	7.48E-02	7.25E-02	1.21E-01	5.12E-02	7.87E-02	7.61E-02	1.05E-01	1.93E-01	1.98E-01	3.50E-02
Potassium Oxide (K2O)	12136-45-7	6.37E-03	1.40E-02	1.48E-02	2.00E-02	6.45E-03	5.28E-03	3.37E-02	5.71E-02	1.47E-02

Table G-6: Maximum Predicted Annual PM and Metals in PM Depositions (g/m2) at Special and Discrete Receptors During Operations - Project Alone

Receptor ID		CC1	CC2	CC3	CC4	CC5	P4	FH1	FH2	FH3	WB1	WB2	WB3	WB4	WB5	WB6	WB7	WB8	WB9	WB10	WB11	WB12	T1	T2	T3	T4	Special Receptors
Receptor Type		Special	Special	Special	Special	Special	Special	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Max Deposition
UTM E (m)		526877	543079	539948	532176	526931	526820	540795	540763	539613	539876	543708	542376	539863	537410	534333	532594	531576	532276	535871	537944	539424	532667	532779	536205	534797	
UTM N (m)		5640176	5659895	5643967	5644751	5640239	5639873	5655417	5652852	5645879	5653454	5653655	5651439	5649764	5645879	5646314	5647113	5650103	5650931	5653175	5656373	5654962	5651765	5648503	5652236	5650851	
CoPC	CAS																										
Particulates																											
TSP	<<PM>>	2.2	3.3	5.0	7.0	2.2	1.7	8.4	13.9	3.8	17.7	5.3	9.8	35.0	15.3	10.0	9.3	7.5	9.5	21.7	8.6	11.8	9.9	14.2	34.7	29.8	7.0
Metals and Metallic Compounds																											
Silver (Ag)	7440-22-4	1.34E-06	2.17E-06	3.07E-06	4.31E-06	1.36E-06	1.07E-06	5.63E-06	1.00E-05	2.29E-06	1.23E-05	3.57E-06	6.98E-06	2.78E-05	8.35E-06	6.30E-06	5.54E-06	4.58E-06	5.66E-06	1.33E-05	5.64E-06	7.98E-06	5.75E-06	8.50E-06	2.08E-05	1.65E-05	4.31E-06
Aluminum (Al)	7429-90-5	1.64E-01	2.54E-01	3.80E-01	5.36E-01	1.66E-01	1.29E-01	6.40E-01	1.06E+00	2.87E-01	1.35E+00	4.03E-01	7.50E-01	2.67E+00	1.18E+00	7.63E-01	7.09E-01	5.74E-01	7.29E-01	1.66E+00	6.55E-01	8.97E-01	7.60E-01	1.08E+00	2.65E+00	2.29E+00	5.36E-01
Arsenic (As)	7440-38-2	3.80E-05	6.30E-05	8.60E-05	1.20E-04	3.80E-05	3.00E-05	1.66E-04	3.09E-04	6.30E-05	3.73E-04	1.06E-04	2.13E-04	9.05E-04	2.05E-04	1.79E-04	1.50E-04	1.26E-04	1.52E-04	3.64E-04	1.64E-04	2.37E-04	1.51E-04	2.31E-04	5.63E-04	4.11E-04	1.20E-04
Gold (Au)	7440-57-5	1.98E-07	3.23E-07	4.45E-07	6.25E-07	2.00E-07	1.59E-07	8.74E-07	1.67E-06	3.13E-07	2.00E-06	5.52E-07	1.14E-06	5.03E-06	8.90E-07	9.34E-07	7.44E-07	6.25E-07	7.38E-07	1.81E-06	8.54E-07	1.26E-06	7.12E-07	1.15E-06	2.78E-06	1.86E-06	6.25E-07
Boron (B)	7440-42-8	2.20E-04	3.52E-04	5.11E-04	7.19E-04	2.23E-04	1.73E-04	8.85E-04	1.47E-03	3.95E-04	1.85E-03	5.61E-04	1.04E-03	3.74E-03	1.66E-03	1.03E-03	9.72E-04	7.94E-04	1.01E-03	2.30E-03	9.05E-04	1.24E-03	1.06E-03	1.49E-03	3.66E-03	3.19E-03	7.19E-04
Barium (Ba)	7440-39-3	8.00E-04	1.31E-03	1.86E-03	2.62E-03	8.11E-04	6.31E-04	3.27E-03	5.39E-03	1.47E-03	6.80E-03	2.09E-03	3.86E-03	1.37E-02	6.36E-03	3.77E-03	3.61E-03	2.96E-03	3.80E-03	8.58E-03	3.35E-03	4.55E-03	4.00E-03	5.52E-03	1.37E-02	1.21E-02	2.62E-03
Beryllium (Be)	7440-41-7	2.48E-06	3.58E-06	5.74E-06	8.12E-06	2.51E-06	1.94E-06	9.13E-06	1.53E-05	4.07E-06	1.96E-05	5.62E-06	1.06E-05	3.80E-05	1.52E-05	1.14E-05	1.01E-05	8.05E-06	1.01E-05	2.32E-05	9.34E-06	1.30E-05	1.03E-05	1.54E-05	3.72E-05	3.07E-05	8.12E-06
Bismuth (Bi)	7440-69-9	4.42E-06	5.70E-06	1.02E-05	1.45E-05	4.48E-06	3.45E-06	1.50E-05	2.62E-05	6.42E-06	3.37E-05	8.88E-06	1.76E-05	6.57E-05	1.87E-05	1.99E-05	1.62E-05	1.25E-05	1.50E-05	3.57E-05	1.52E-05	2.19E-05	1.47E-05	2.45E-05	5.75E-05	4.19E-05	1.45E-05
Carbon (C)	7440-44-0	2.86E-03	4.49E-03	6.64E-03	9.36E-03	2.90E-03	2.25E-03	1.13E-02	1.88E-02	5.06E-03	2.38E-02	7.14E-03	1.33E-02	4.75E-02	2.09E-02	1.34E-02	1.25E-02	1.01E-02	1.29E-02	2.93E-02	1.16E-02	1.58E-02	1.35E-02	1.90E-02	4.68E-02	4.05E-02	9.36E-03
Calcium (Ca)	7440-70-2	6.94E-02	1.01E-01	1.61E-01	2.28E-01	7.03E-02	5.43E-02	2.57E-01	4.29E-01	1.16E-01	5.49E-01	1.59E-01	2.99E-01	1.06E+00	4.43E-01	3.20E-01	2.88E-01	2.29E-01	2.88E-01	6.62E-01	2.64E-01	3.64E-01	2.97E-01	4.38E-01	1.06E+00	8.87E-01	2.28E-01
Cadmium (Cd)	7440-43-9	2.71E-06	4.30E-06	6.12E-06	8.65E-06	2.74E-06	2.17E-06	1.16E-05	2.19E-05	4.26E-06	2.64E-05	7.27E-06	1.49E-05	6.45E-05	1.23E-05	1.27E-05	1.02E-05	8.48E-06	1.01E-05	2.45E-05	1.14E-05	1.67E-05	9.74E-06	1.57E-05	3.79E-05	2.58E-05	8.60E-06
Cerium (Ce) and Compounds (as Ce)	7440-45-1	1.56E-04	2.41E-04	3.63E-04	5.12E-04	1.58E-04	1.23E-04	6.08E-04	1.01E-03	2.73E-04	1.28E-03	3.82E-04	7.13E-04	2.54E-03	1.11E-03	7.27E-04	6.74E-04	5.45E-04	6.91E-04	1.58E-03	6.23E-04	8.54E-04	7.20E-04	1.03E-03	2.52E-03	2.17E-03	5.12E-04
Cobalt (Co)	7440-48-4	4.40E-05	7.00E-05	1.02E-04	1.43E-04	4.40E-05	3.50E-05	1.77E-04	2.98E-04	7.80E-05	3.75E-04	1.12E-04	2.11E-04	7.73E-04	3.19E-04	2.06E-04	1.91E-04	1.56E-04	1.98E-04	4.53E-04	1.81E-04	2.49E-04	2.06E-04	2.92E-04	7.20E-04	6.17E-04	1.43E-04
Chromium (Cr) and Compounds (as Cr)	7440-47-3	2.15E-04	4.52E-04	5.04E-04	7.00E-04	2.18E-04	1.72E-04	1.09E-03	1.74E-03	4.99E-04	2.14E-03	7.43E-04	1.32E-03	4.65E-03	2.68E-03	1.07E-03	1.19E-03	1.04E-03	1.38E-03	3.03E-03	1.12E-03	1.46E-03	1.52E-03	1.84E-03	4.76E-03	4.71E-03	7.00E-04
Cesium (Cs) and Compounds (as Ce)	7440-46-2	7.33E-06	1.13E-05	1.70E-05	2.40E-05	7.43E-06	5.76E-06	2.86E-05	4.74E-05	1.28E-05	6.02E-05	1.79E-05	3.35E-05	1.19E-04	5.21E-05	3.41E-05	3.16E-05	2.56E-05	3.25E-05	7.39E-05	2.92E-05	4.01E-05	3.38E-05	4.82E-05	1.18E-04	1.02E-04	2.40E-05
Cooper (Cu)	7440-50-8	3.06E-04	4.83E-04	6.98E-04	9.96E-04	3.10E-04	2.46E-04	1.24E-03	2.08E-03	4.96E-04	2.86E-03	8.02E-04	1.61E-03	6.66E-03	1.61E-03	1.43E-03	1.20E-03	9.88E-04	1.20E-03	2.86E-03	1.27E-03	1.83E-03	1.19E-03	1.84E-03	4.46E-03	3.28E-03	9.81E-04
Iron (Fe)	7439-89-6	9.07E-02	1.46E-01	2.11E-01	2.97E-01	9.19E-02	7.15E-02	3.66E-01	6.07E-01	1.64E-01	7.67E-01	2.33E-01	4.32E-01	1.55E+00	6.92E-01	4.26E-01	4.02E-01	3.29E-01	4.20E-01	9.52E-01	3.75E-01	5.11E-01	4.40E-01	6.15E-01	1.52E+00	1.33E+00	2.97E-01
Gallium (Ga)	7440-55-3	4.40E-05	6.80E-05	1.02E-04	1.44E-04	4.40E-05	3.40E-05	1.72E-04	2.85E-04	7.70E-05	3.62E-04	1.08E-04	2.02E-04	7.20E-04	3.16E-04	2.04E-04	1.90E-04	1.54E-04	1.96E-04	4.46E-04	1.76E-04	2.41E-04	2.04E-04	2.90E-04	7.12E-04	6.15E-04	1.44E-04
Hafnium (Hf) and Compounds (as Hf)	7440-58-6	9.18E-06	1.42E-05	2.13E-05	3.01E-05	9.30E-06	7.21E-06	3.57E-05	5.93E-05	1.60E-05	7.53E-05	2.24E-05	4.19E-05	1.49E-04	6.51E-05	4.27E-05	3.96E-05	3.20E-05	4.06E-05	9.25E-05	3.66E-05	5.01E-05	4.23E-05	6.04E-05	1.48E-04	1.27E-04	3.01E-05
Mercury (Hg)	7439-97-6	5.38E-08	8.30E-08	1.25E-07	1.76E-07	5.45E-08	4.23E-08	2.09E-07	3.47E-07	9.39E-08	4.41E-07	1.32E-07	2.45E-07	8.74E-07	3.82E-07	2.50E-07	2.32E-07	1.88E-07	2.38E-07	5.42E-07	2.14E-07	2.94E-07	2.48E-07	3.54E-07	8.67E-07	7.48E-07	1.76E-07
Indium (In)	7440-74-6	3.71E-08	5.72E-08	8.61E-08	1.21E-07	3.76E-08	2.91E-08	1.44E-07	2.39E-07	6.47E-08	3.04E-07	9.06E-08	1.68E-07	6.02E-07	2.63E-07	1.73E-07	1.60E-07	1.29E-07	1.64E-07	3.74E-07	1.48E-07	2.02E-07	1.71E-07	2.44E-07	5.97E-07	5.14E-07	1.21E-07
Potassium (K)	7440-09-7	3.07E-02	4.98E-02	7.13E-02	1.00E-01	3.11E-02	2.42E-02	1.25E-01	2.07E-01	5.58E-02	2.61E-01	7.95E-02	1.47E-01	5.28E-01	2.38E-01	1.44E-01	1.37E-01	1.12E-01	1.43E-01	3.25E-01	1.28E-01	1.74E-01	1.51E-01	2.10E-01	5.18E-01	4.55E-01	1.00E-01
Lanthanum (La)	7439-91-0	4.50E-05	8.30E-05	1.06E-04	1.48E-04	4.60E-05	3.60E-05	2.04E-04	3.33E-04	9.20E-05	4.15E-04	1.34E-04	2.44E-04	8.75E-04	4.35E-04	2.19E-04	2.22E-04	1.87E-04	2.43E-04	5.44E-04	2.09E-04	2.79E-04	2.61E-04	3.41E-04	8.59E-04	7.98E-04	1.48E-04
Lithium (Li)	7439-93-2	5.50E-05	8.60E-05	1.29E-04	1.82E-04	5.60E-05	4.40E-05	2.16E-04	3.58E-04	9.70E-05	4.55E-04	1.36E-04	2.53E-04	9.00E-04	3.93E-04	2.58E-04	2.39E-04	1.93E-04	2.45E-04	5.59E-04	2.21E-04	3.03E-04	2.55E-04	3.65E-04	8.93E-04	7.68E-04	1.82E-04
Lutetium (Lu)	7439-94-3	5.72E-07	8.83E-07	1.33E-06	1.87E-06	5.80E-07	4.49E-07	2.23E-06	3.70E-06	9.99E-07	4.70E-06	1.40E-06	2.61E-06	9.30E-06	4.06E-06	2.66E-06	2.47E-06	2.00E-06	2.53E-06	5.77E-06	2.28E-06	3.13E-06	2.64E-06	3.76E-06	9.22E-06	7.93E-06	1.87E-06
Magnesium (Mg) and Compounds (as Mg)	7439-95-4	3.17E-02	4.87E-02	7.37E-02	1.04E-01	3.22E-02	2.49E-02	1.23E-01	2.03E-01	5.53E-02	2.59E-01	1.70E-02	1.43E-01	5.08E-01	2.24E-01	1.48E-01	1.37E-01	1.10E-01	1.40E-01	3.19E-01	1.26E-01	1.72E-01	1.46E-01	2.09E-01	5.10E-01	4.38E-01	1.04E-01
Manganese (Mn) and Compounds (as Mn)	7439-96-5	3.19E-04	5.96E-04	7.38E-04	1.04E-03	3.23E-04	2.56E-04	1.49E-03	2.48E-03	6.57E-04	3.10E-03	9.67E-04	1.79E-03	6.39E-03	3.03E-03	1.66E-03	1.63E-03	1.36E-03	1.75E-03	3.90E-03	1.52E-03	2.06E-03	1.86E-03	2.58E-03	6.21E-03	5.62E-03	1.04E-03
Molybdenum (Mo)	7439-98-7	1.15E-05	1.57E-05	2.66E-05	3.77E-05	1.17E-05	8.99E-06	4.06E-05	6.99E-05	1.77E-05	8.94E-05	2.45E-05	4.75E-05	1.75E-04	5.82E-05	5.23E-05	4.43E-05	3.46E-05	4.25E-05	9.95E-05	4.14E-05	5.85E-05	4.25E-05	6.72E-05	1.60E-04	1.24E-04	3.77E-05
Sodium (Na)	7440-23-5	6.22E-02	9.70E-02	1.44E-01	2.04E-01	6.30E-02	4.89E-02	2.44E-01	4.05E-01	1.10E-01	5.14E-01	1.54E-01	2.87E-01	1.02E+00	4.51E-01	2.90E-01	2.71E-01	2.19E-01	2.79E-01	6.34E-01	2.50E-01	3.42E-01	2.91E-01	4.13E-01	1.01E+00	8.76E-01	2.04E-01
Niobium (Nb)	7440-03-1	1.24E-05	1.91E-05	2.88E-05	4.06E-05	1.26E-05	9.73E-06	4.82E-05	8.00E-05	2.16E-05	1.02E-04	2.70E-05	5.65E-05	2.01E-04	8.79E-05	5.77E-05	5.35E-05	4.32E-05	5.48E-05	1.25E-04	4.94E-05	6.77E-05	5.71E-05	8.15E-05	2.00E-04	1.72E-04	4.06E-05
Nickel (Ni)	7440-02-0	3.30E-05	6.80E-05	7.60E-05	1.06E-04	3.30E-05	2.70E-05	1.68E-04	2.76E-04	7.40E-05	3.41E-04	1.12E-04	2.04E-04	7.30E-04	3.76E-04	1.74E-04	1.82E-04	1.55E-04	2.04E-04	4.49E-04	1.72E-04	2.28E-04	2.20E-04	2.88E-04	7.10E-04	6.74E-04	1.06E-04
Phosphorus (P)	7723-14-0	1.29E-03	1.89E-03	3.00E-03	4.24E-03	1.31E-03	1.01E-03	4.79E-03	8.00E-03	2.15E-03	1.02E-02	2.96E-03	5.58E-03	1.98E-02	8.19E-03	5.96E-03	5.35E-03	4.26E-03	5.35E-03	1.23E-02	4.91E-03	6.79E-03	5.50E-03	8.14E-03	1.97E-02	1.64E-02	4.24E-03
Lead (Pb)	7439-92-1	3.00E-05	4.60E-05	7.00E-05	9.90E-05	3.10E-05	2.40E-05	1.16E-04	1.97E-04	5.10E-05	2.50E-04	7.20E-05	1.37E-04	5.04E-04	1.92E-04	1.40E-04	1.25E-04	1.01E-04	1.26E-04	2.91E-04	1.18E-04	1.65E-04	1.29E-04	1.91E-04	4.65E-04	3.83E-04	9.90E-05
Rubidium (Rb) and Compounds (as Rb)	7440-17-7	1.64E-04	2.53E-04	3.81E-04	5.37E-04	1.66E-04	1.29E-04	6.38E-04	1.06E-03	2.86E-04	1.35E-03	4.01E-04	7.48E-04	2.66E-03	1.18E-03	7.63E-04	7.07E-04	5.72E-04	7.25E-04	1.65E-03	6.53E-04	8.95E-04	7.55E-04	1.08E-03	2.64E-03	2.27E-03	5.37E-04
Sulphur (S)	7704-34-9	6.32E-03	1.18E-02	1.47E-02	2.05E-02	6.40E-03	4.80E-03	2.36E-02	4.85E-02	1.29E-02	1.93E-02	3.98E-02	3.07E-02	1.30E-01	3.55E-02	1.30E-01	1.64E-02	2.64E-02	3.43E-02	7.68E-02	3.11E-02	3.68E-02	4.78E-02	1.21E-01	1.12E-01	2.05E-02	
Antimony (Sb)	7440-36-0	1.05E-05	1.38E-05	2.42E-05	3.44E-05	1.07E-05	8.24E-06	3.65E-05	6.43E-05	1.54E-05	8.20E-05	2.17E-05	4.31E-05	1.64E-04	4.48E-05	4.76E-05	3.86E-05	2.99E-05	3.60E-05	8.58E-05	3.69E-05	5.31E-05	3.52E-05	5.86E-05	1.38E-04	9.97E-05	3.44E-05
Scandium (Sc)	7440-20-2	2.90E-05	5.00E-05	6.80E-05	9.60E-05	3.00E-05	2.30E-05	1.24E-04	2.04E-04	5.50E-05	2.56E-04	8.00E-05	1.47E-04	5.25E-04	2.46E-04	1.39E-04	1.35E-04	1.12E-04	1.44E-04	3.25E-04	1.27E-04	1.71E-04	1.53E-04	2.07E-04	5.16E-04	4.63E-04	9.60E-05
Selenium (Se)	7782-49-2	7.53E-07	1.16E-06	1.75E-06	2.47E-06	7.63E-07	5.92E-07	2.93E-06	4.86E-06	1.31E-06	6.18E-06	1.84E-06	3.44E-06	1.22E-05	5.34E-06	3.51E-06	3.25E-06	2.63E-06	3.33E-06	7.59E-06	3.00E-06	4.11E-06	3.47E-06	4.95E-06	1.21E-05	1.04E-05	2.47E-06
Tin (Sn)	7440-31-5	1.99E-05	3.07E-05	4.62E-05	6.52E-05	2.02E-05	1.56E-05	7.75E-05	1.29E-04	3.47E-05	1.63E-04	4.87E-05	9.08E-05	3.23E-04	1.41E-04	9.26E-05	8.59E-05	6.94E-05	8.81E-05	2.01E-04	7.93E-05	1.09E-04	9.17E-05	1.31E-04	3.21E-04	2.76E-04	6.52E-05
Strontium (Sr)	7440-24-6	6.32E-04	1.27E-03	1.98E-03	2.68E-03	6.41E-04	4.93E-04	2.24E-03	3.76E-03	1.07E-03	4.68E-03	1.38E-03	2.59E-03	9.10E-03	3.62E-03	2.59E-03	2.53E-03	1.96E-03	2.47E-03	5.72E-03	2.30E-03	3.20E-03	2.51E-03	3.84E-03	9.21E-03	7.48E-03	2.06E-03
Tantalum (Ta)	7440-25-7	2.02E-06	3.13E-06	4.70E-06	6.63E-06	2.05E-06	1.59E-06	7.88E-06	1.31E-05	3.53E-06	1.66E-05	4.95E-06	9.24E-06	3.29E-05	1.44E-05	9.43E-06	8.74E-06	7.06E-06	8.96E-06	2.04E-05	8.07E-06	1.11E-05	9.33E-06	1.33E-05	3.26E-05	2.81E-05	6.63E-06
Terbium (Tb) and Compounds (as Tb)	7440-27-9	1.33E-06	2.05E-06	3.08E-06	4.35E-06	1.34E-06	1.04E-06	5.16E-06	8.57E-06	2.32E-06	1.09E-05	3.24E-06	6.05E-06	2.16E-05	9.42E-06	6.18E-06	5.72E-06	4.63E-06	5.87E-06	1.34E-05	5.29E-06	7.25E-06	6.11E-06	8.73E-06	2.14E-05	1.84E-05	4.35E-06
Tellurium (Te)	13494-80-9	4.38E-07	6.76E-07	1.02E-06	1.43E-06	4.44E-07	3.44E-07	1.70E-06	2.83E-06	7.64E-07	3.59E-06	1.07E-06	2.00E-06	7.11E-06	3.11E-06	2.04E-06	1.89E-06	1.53E-06	1.94E-06	4.41E-06	1.75E-06	2.39E-06	2.02E-06	2.88E-06	7.06E-06	6.07E-06	1.43E-06
Titanium (Ti) and Compounds (as Ti)	7440-32-6	2.31E-03	4.61E-03	5.36E-03	7.52E-03	2.34E-03	1.87E-03	1.14E-02	1.91E-02	5.03E-03	2.36E-02	7.56E-03	1.39E-02	5.03E-02	2.43E-02	1.22E-02	1.23E-02	1.04E-02	1.36E-02	3.01E-02	1.17E-02	1.57E-02	1.45E-02	1.95E-02	4.77E-02	4.41E-02	7.52E-03
Thallium (Tl)	7440-28-0	2.18E-06	3.37E-06	4.96E-06	7.14E-06	2.21E-06	1.71E-06	8.49E-06	1.41E-05	3.81E-06	1.79E-05	5.33E-06	9.95E-06	3.49E-05	1.54E-05	9.95E-06	9.41E-06	7.61E-06	9.65E-06	2.20E-05	8.54E-06	1.19E-05	1.00E-05	1.43E-05	3.51E-05	3.02E-05	7.14E-06
Uranium (U)	7440-61-1	3.05E-06	4.71E-06	7.09E-06	1.00E-05	3.09E-06	2.40E-06	1.19E-05	1.97E-05	5.33E-06	2.51E-05	7.46E-06	1.39E-05	4.96E-05	2.17E-05	1.42E-05	1.32E-05	1.07E-05	1.35E-05	3.08E-05	1.22E-05	1.67E-05	1.41E-05	2.01E-05	4.92E-05	4.23E-05	1.00E-05
Vanadium (v)	7440-62-2	2.61E-04	4.32E-04	6.07E-04	8.54E-04	2.65E-04	2.06E-04	1.08E-03	1.79E-03	4.83E-04	2.25E-03	6.92E-04	1.28E-03	4.61E-03	2.09E-03	1.23E-03	1.18E-03	9.74E-04	1.25E-03	2.82E-03	1.11E-03	1.50E-03	1.31E-03	1.81E-03	4.48E-03	3.97E-03	8.54E-04
Tungsten (W) and Compounds (as W)	7440-33-7	5.40E-05	6.60E-05	1.24E-04	1.77E-04	5.50E-05	4.20E-05	1.74E-04	3.01E-04	7.60E-05	3.91E-04	1.01E-04	1.99E-04	7.26E-04	2.09E-04	2.41E-04	1.92E-04	1.46E-04	1.74E-04	4.16E-04	1.77E-04	2.54E-04	1.69E-04	2.90E-04	6.75E-04	4.84E-04	1.77E-04
Yttrium (Y) and Compounds (as Y)	7440-65-5	3.30E-05	5.10E-05	7.60E-05	1.07E-04	3.30E-05	2.60E-05	1.27E-04	2.12E-04	5.70E-05	2.69E-04	8.00E-05	1.49E-04	5.32E-04	2.32E-04	1.52E-04	1.41E-04	1.14E-04	1.45E-04	3.30E-04	1.31E-04	1.79E-04	1.51E-04	2.15E-04	5.28E-04	4.54E-04	1.07E-04
Ytterbium (Yb)	7440-64-4	3.78E-06	5.65E-06	8.51E-06	1.20E-05	3.83E-06	2.97E-06	1.47E-05	2.44E-05	6.60E-06	3.12E-05	9.26E-06	1.72E-05	6.14E-05	2.68E-05	1.76E-05	1.63E-05	1.32E-05	1.67E-05	3.81E-05	1.51E-05	2.06E-05	1.74E-05	2.49E-05	6.09E-05	5.22E-05	1.24E-05
Zinc (Zn)	7440-66-6	2.26E-04	3.27E-04	5.22E-04	7.38E-04	2.29E-04	1.78E-04	8.45E-04	1.45E-03	3.64E-04	1.84E-03	5.19E-04	1.00E-03	3.73E-03	1.28E-03	1.04E-03	9.03E-04	7.20E-04	8.90E-04	2.07E-03	8.58E-04	1.21E-03	9.01E-04	1.38E-03	3.31E-03	2.63E-03	7.38E-04
Zirconium (Zr)	7440-67-7	2.05E-04	3.17E-04	4.76E-04	6.72E-04	2.08E-04	1.61E-04	7.99E-04	1.33E-03	3.58E-04	1.68E-03	5.02E-04	9.36E-04	3.33E-03	1.46E-03	9.55E-04	8.85E-04	7.16E-04	9.08E-04	2.07E-03	8.18E-04	1.12E-03	9.45E-04	1.35E-03	3.31E-03	2.84E-03	6.72E-04
Silicon Dioxide (SiO2)	7631-86-9	1.35E+00	2.09E+00	3.13E+00	4.41E+00	1.37E+00	1.06E+00	5.28E+00	8.75E+00	2.37E+00	1.11E+01	3.32E+00	6.19E+00	2.20E+01	9.70E+00	6.28E+00	5.84E+00	4.74E+00	6.01E+00	1.37E+01	5.40E+00	7.40E+00	6.27E+00	8.91E+00	2.19E+01	1.89E+01	4.41E+00
Aluminum Oxide (Al2O3)	1344-28-1	3.22E-01	4.96E-01	7.48E-01	1.06E+00	3.27E-01	2.53E-01	1.25E+00	2.08E+00	5.61E-01	2.64E+00	7.86E-01	1.47E+00	5.22E+00	2.27E+00	1.50E+00	1.39E+00	1.12E+00	1.42E+00	3.24E+00	1.28E+00	1.76E+00	1.48E+00	2.12E+00	5.18E+00	4.44E+00	1.06E+00
Iron Oxide (Fe2O3)	1309-37-1	1.42E-01	2.18E-01	3.29E-01	4.65E-01	1.44E-01	1.11E-01	5.50E-01	9.13E-01	2.47E-01	1.16E+00	3.45E-01	6.44E-01	2.29E+00	9.98E-01	6.60E-01	6.10E-01	4.93E-01	6.24E-01	1.42E+00	5.63E-01	7.72E-01	6.49E-01	9.30E-01	2.28E+00	1.95E+00	4.65E-01
Magnesium Oxide (MgO)	1309-48-4	5.75E-02	8.66E-02	1.33E-01	1.88E-01	5.83E-02	4.51E-02	2.19E-01	3.65E-01	9.82E-02	4.65E-01	1.37E-01	2.56E-01	9.12E-01	3.88E-01	2.66E-01	2.43E-01	1.96E-01	2.47E-01	5.65E-01	2.25E-01	3.09E-01	2.56E-01	3.71E-01	9.04E-01	7.67E-01	1.88E-01
Calcium Oxide (CaO)	1305-78-8	1.09E-01	1.78E-01	2.50E-01	3.50E-01	1.11E-01	8.74E-02	4.61E-01	7.90E-01	1.88E-01	9.92E-01	2.86E-01	5.41E-01	2.18E+00	7.03E-01	5.00E-01	4.47E-01	3.72E-01	4.62E-01	1.08E+00	4.56E-01	6.51E-01	4.72E-01	6.73E-01	1.70E+00	1.37E+00	3.50E-01
Sodium Oxide (Na2O)	1313-59-3	7.37E-02	1.18E-01	1.71E-01	2.41E-01	7.47E-02	5.81E-02	2.96E-01	4.90E-01	1.33E-01	6.19E-01	1.88E-01	3.49E-01	1.24E+00	5.64E-01	3.46E-01	3.28E-01	2.67E-01	3.42E-01	7.74E-01	3.04E-01	4.13E-01	3.58E-01	5.00E-01	1.23E+00	1.08E+00	2.41E-01
Potassium Oxide (K2O)	12136-45-7	4.23E-02	6.57E-02	9.81E-02	1.38E-01	4.29E-02	3.32E-02	1.65E-01	2.74E-01	7.40E-02	3.48E

APPENDIX H Predicted Acid Deposition at Special Receptors

Table H-1: Maximum Predicted Annual PAI, N and S Depositions for Construction

Deposition Receptor		PAI	S	N
UTM Easting (m)	UTM Northing (m)	(keq H+/ha/year)	(kg/ha/year)	(kg/ha/year)
		Calculation	Calculation	Calculation
526877	5640176	2.56E-03	1.00E-04	3.58E-02
543079	5659895	7.08E-03	3.00E-04	9.89E-02
530948	5643967	5.68E-03	2.00E-04	7.93E-02
532176	5644751	7.45E-03	3.00E-04	1.04E-01
526931	5640239	2.59E-03	1.00E-04	3.62E-02
526820	5639873	2.43E-03	1.00E-04	3.40E-02
540795	5655417	1.61E-02	6.50E-04	2.25E-01
540763	5652852	2.22E-02	8.00E-04	3.10E-01
530613	5645879	7.69E-03	3.00E-04	1.07E-01
539876	5653454	3.13E-02	1.25E-03	4.37E-01
543708	5653655	9.02E-03	3.50E-04	1.26E-01
542376	5651439	1.51E-02	6.00E-04	2.11E-01
539863	5649764	4.30E-02	1.45E-03	6.00E-01
537410	5645879	1.68E-02	6.50E-04	2.34E-01
534333	5646314	1.36E-02	4.50E-04	1.90E-01
532594	5647113	1.34E-02	5.00E-04	1.87E-01
531576	5650103	1.37E-02	6.50E-04	1.92E-01
532276	5650931	1.46E-02	6.50E-04	2.04E-01
535871	5653175	3.72E-02	1.85E-03	5.20E-01
537944	5656373	2.21E-02	1.10E-03	3.08E-01
539424	5654952	2.46E-02	1.00E-03	3.44E-01
532667	5651765	1.37E-02	5.50E-04	1.91E-01
532779	5648503	1.66E-02	6.50E-04	2.32E-01
536205	5652236	5.23E-02	2.50E-03	7.29E-01
534797	5650851	3.69E-02	1.80E-03	5.15E-01

Table H-2: Maximum Predicted Annual PAI, N and S Depositions for Operations

Deposition Receptor		PAI	S	N
UTM Easting (m)	UTM Northing (m)	(keq $H+$/ha/year)	(kg/ha/year)	(kg/ha/year)
		Calculation	Calculation	Calculation
526877	5640176	3.16E-03	1.80E-03	4.27E-02
543079	5659895	6.77E-03	5.00E-03	9.04E-02
530948	5643967	7.87E-03	3.95E-03	1.07E-01
532176	5644751	1.09E-02	5.05E-03	1.49E-01
526931	5640239	3.20E-03	1.85E-03	4.32E-02
526820	5639873	3.00E-03	1.75E-03	4.05E-02
540795	5655417	1.53E-02	1.28E-02	2.02E-01
540763	5652852	2.24E-02	2.12E-02	2.95E-01
530613	5645879	1.23E-02	4.85E-03	1.69E-01
539876	5653454	2.93E-02	2.54E-02	3.88E-01
543708	5653655	8.83E-03	7.55E-03	1.17E-01
542376	5651439	1.35E-02	1.32E-02	1.77E-01
539863	5649764	3.33E-02	4.76E-02	4.24E-01
537410	5645879	1.87E-02	1.24E-02	2.51E-01
534333	5646314	3.09E-02	9.40E-03	4.24E-01
532594	5647113	2.98E-02	8.30E-03	4.10E-01
531576	5650103	1.73E-02	7.75E-03	2.36E-01
532276	5650931	2.09E-02	8.55E-03	2.84E-01
535871	5653175	3.59E-02	1.87E-02	4.87E-01
537944	5656373	1.89E-02	1.26E-02	2.54E-01
539424	5654952	2.24E-02	1.90E-02	2.98E-01
532667	5651765	2.01E-02	8.80E-03	2.73E-01
532779	5648503	3.43E-02	1.04E-02	4.72E-01
536205	5652236	5.37E-02	2.47E-02	7.30E-01
534797	5650851	5.11E-02	1.83E-02	7.00E-01

APPENDIX I Concentration Contour Plots - Construction

Project Components

Modelled Mine Boundary

Modelling

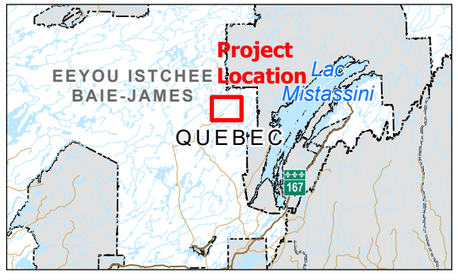
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-1

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

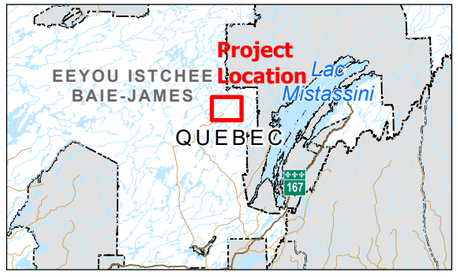
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-2

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

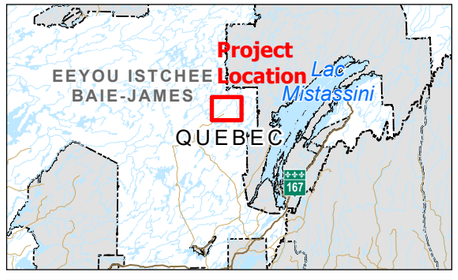
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

1-3

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM2.5 Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

Concentration Contours (µg/m³)

0 1 2 Kilometers

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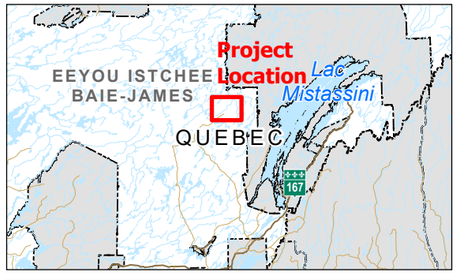
Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-4

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM2.5 Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

Concentration Contours (µg/m³)

0 1 2 Kilometers

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Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
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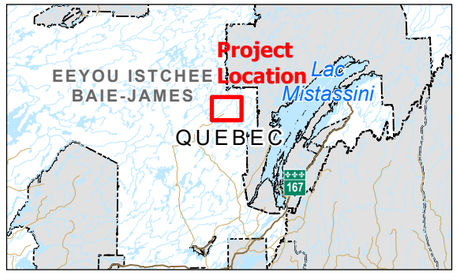
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-5

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM2.5 CAAQS Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

Concentration Contours (µg/m³)

0 1 2 Kilometers

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Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
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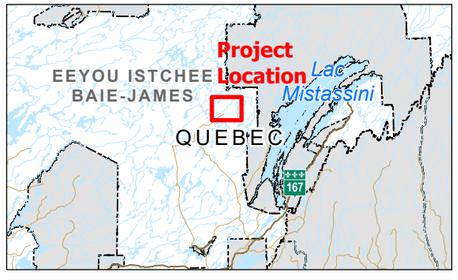
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

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Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

1-6

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM2.5 CAAQS Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

Concentration Contours (µg/m³)

0 1 2 Kilometers

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Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
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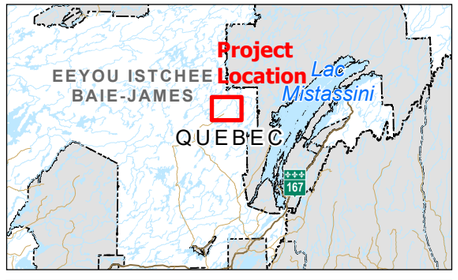

Project Location
Mistissini
Québec

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Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-7

Title

Concentration Contour Plot of Maximum 1-Hour Average NO2 Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

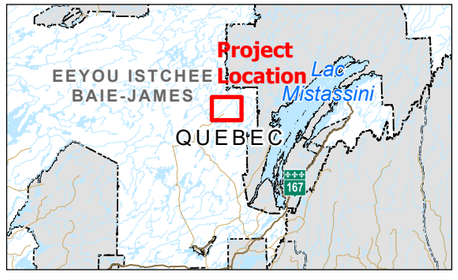
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-8

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average NO2 Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

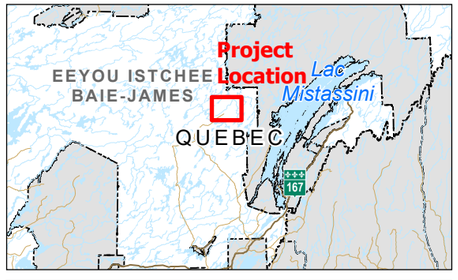
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

1-9

Title

Concentration Contour Plot of Maximum Predicted Annual Average NO2 Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

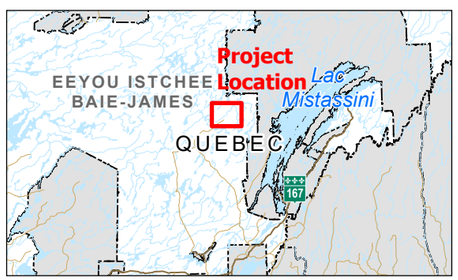
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-10

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average NO2 CAAQS Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

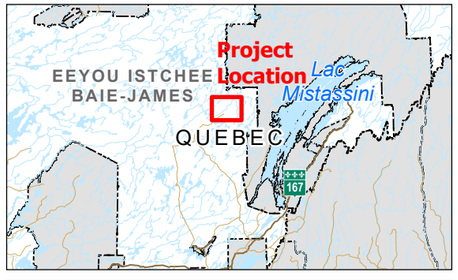
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-11

Title

Concentration Contour Plot of Maximum Predicted Annual Average NO2 CAAQS Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

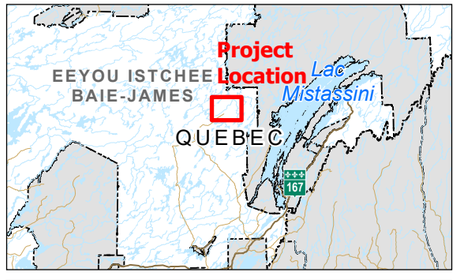
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-12

Title

Concentration Contour Plot of Maximum 1-Hour Average SO2 Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

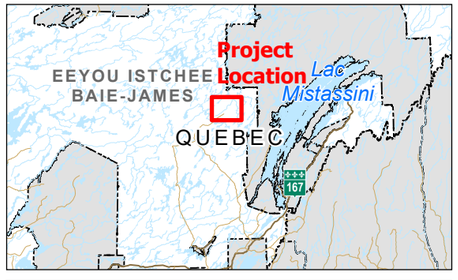
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-13

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average SO2 Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

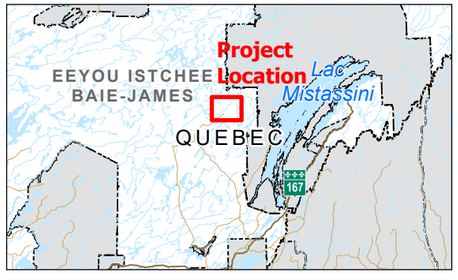
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-14

Title

Concentration Contour Plot of Maximum Predicted Annual Average SO2 Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
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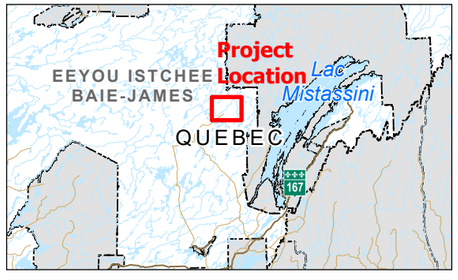

Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-15

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average SO2 CAAQS Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

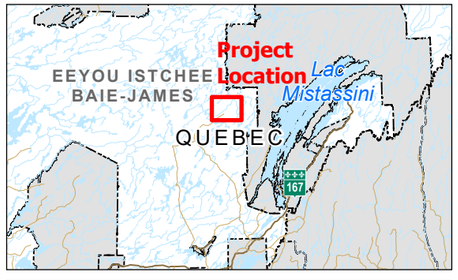
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-16

Title

Concentration Contour Plot of Maximum Predicted Annual Average SO2 CAAQS Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

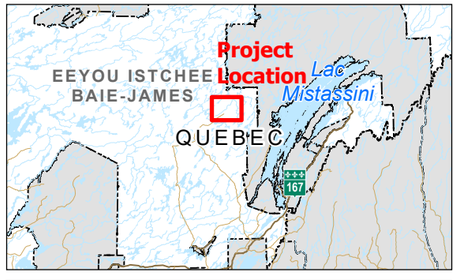
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-17

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average Quartz Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

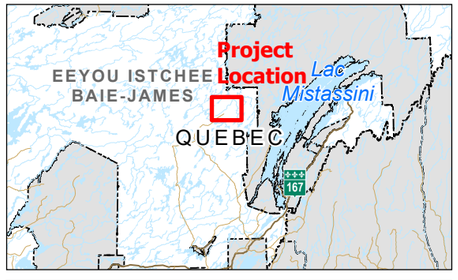
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-18

Title

Concentration Contour Plot of Maximum Predicted Annual average Quartz Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

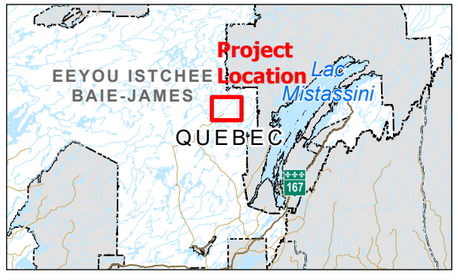
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-19

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average Elemental Carbon Concentrations - Construction

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Project Components

Modelled Mine Boundary

Modelling

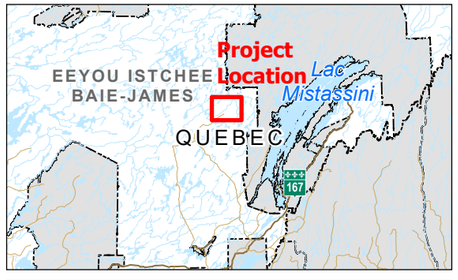
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-20

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average DPM Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

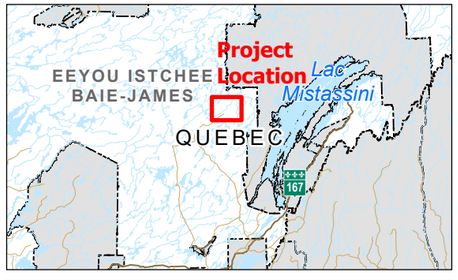
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-21

Title

Concentration Contour Plot of Maxiumum Predicted 24-Hour Average Total B(a)P Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

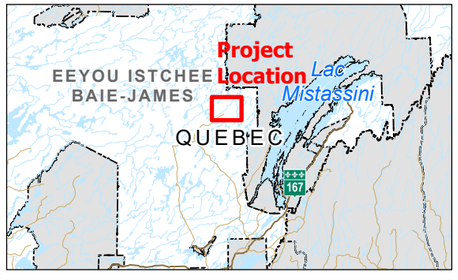
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-22

Title

Concentration Contour Plot of Maximum Predicted Annual Average Total B(a)P Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

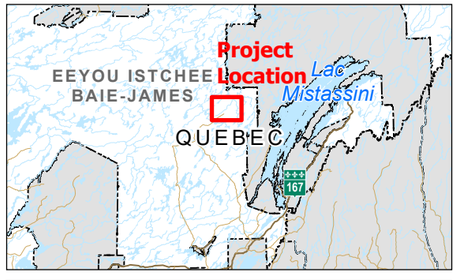
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-23

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average Benzene Concentrations - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

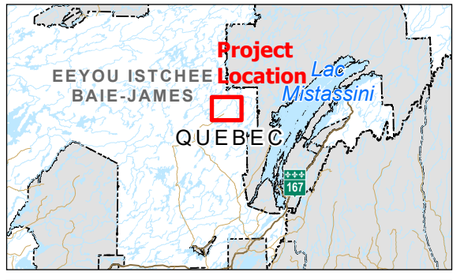
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Modelling : Stantec, 2025
4. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

I-24

Title

Concentration Contour Plot of Maximum Predicted Annual Average Benzene Concentrations - Construction

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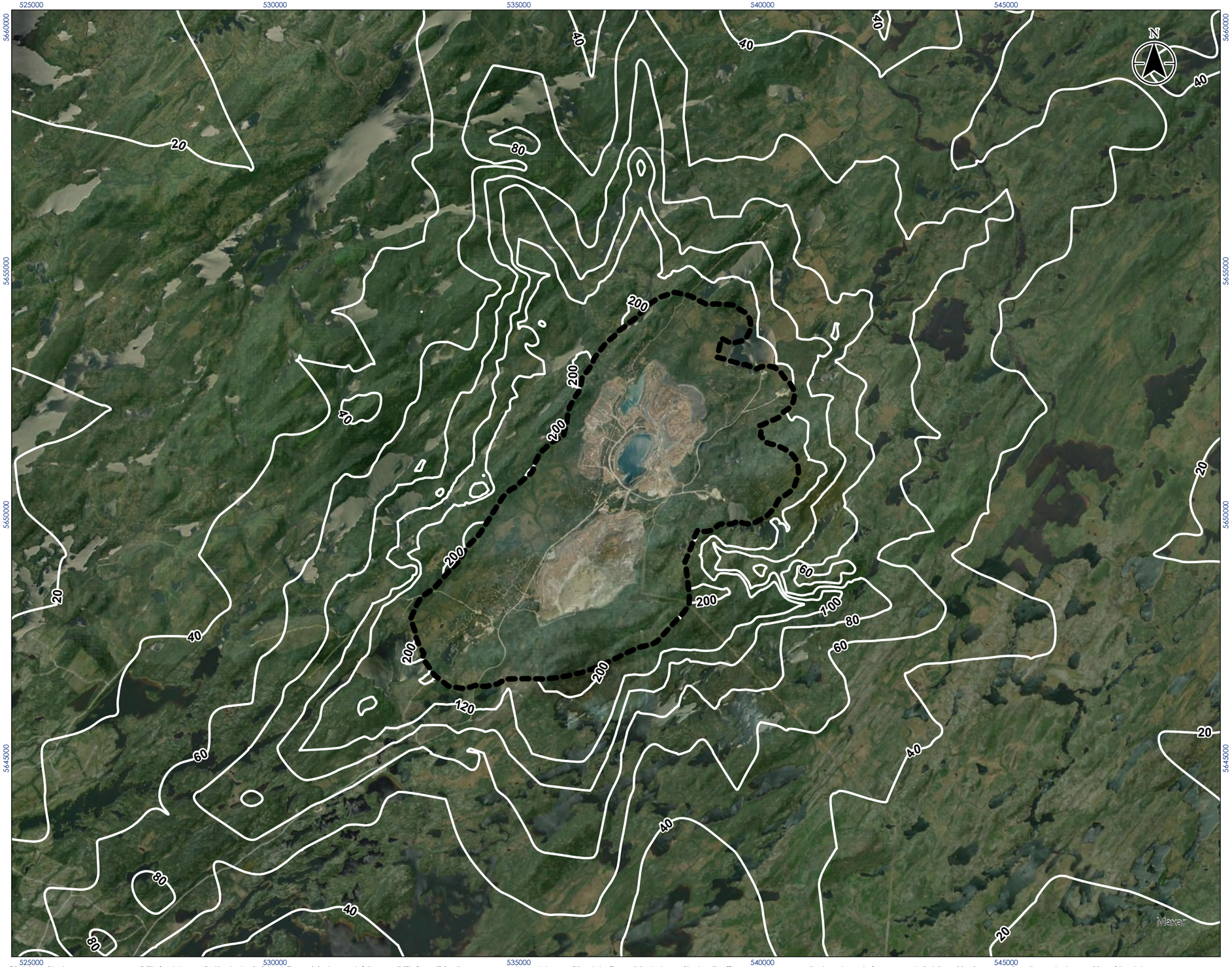
APPENDIX J Concentration Contour Plots – Operations



Stantec

Project Components

Modelled Mine Boundary

Modelling

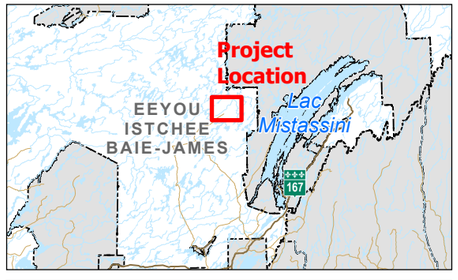
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-1

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

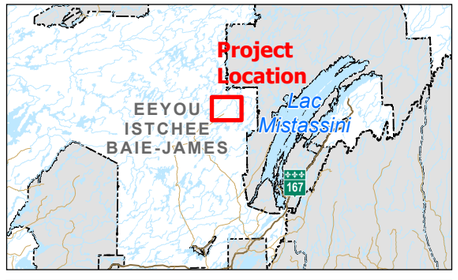
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-2

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM Concentrations - Operations

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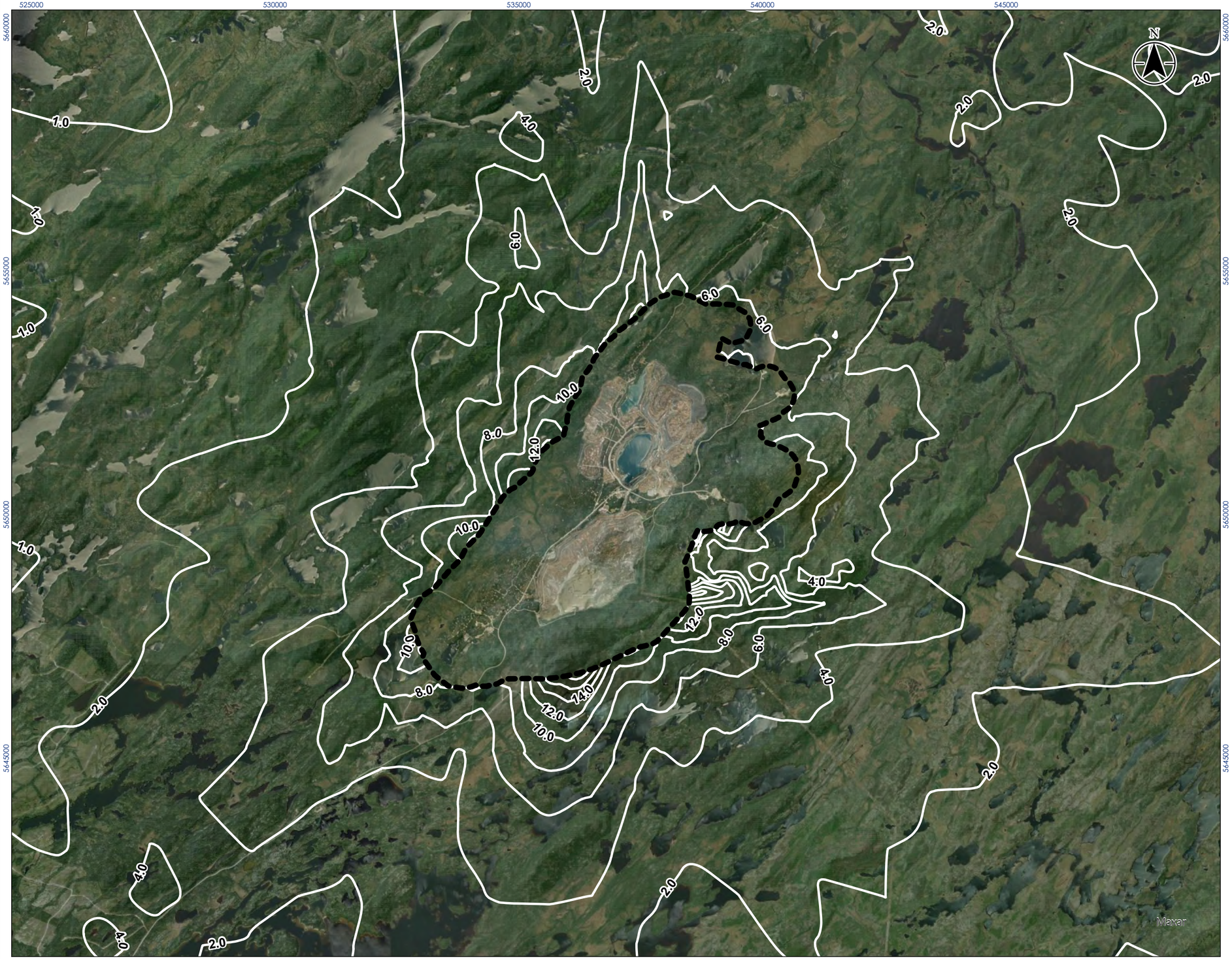


Stantec

Project Components

Modelled Mine Boundary

Modelling

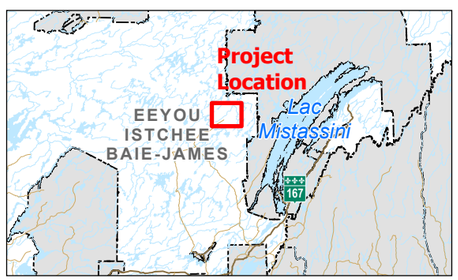
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-3

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM2.5 Concentrations - Operations

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Project Components

Modelled Mine Boundary

Modelling

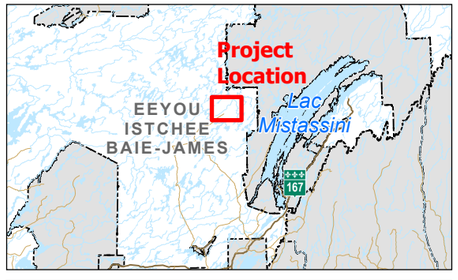
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-4

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM2.5 Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

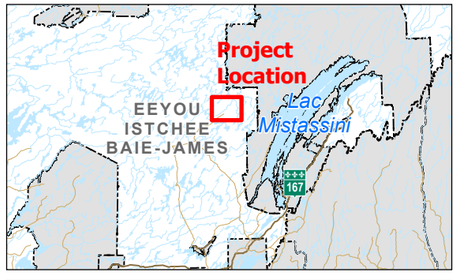
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-5

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average PM2.5 CAAQS Concentrations - Operations

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Project Components

Modelled Mine Boundary

Modelling

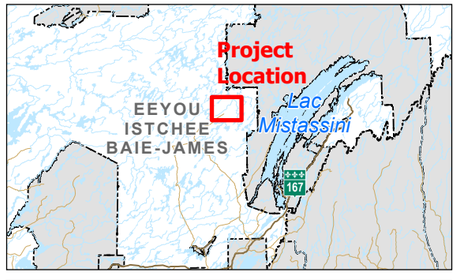
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-6

Title

Concentration Contour Plot of Maximum Predicted Annual Average PM2.5 CAAQS Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

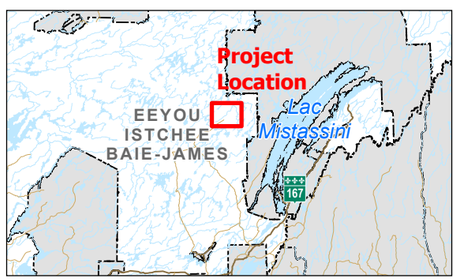
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-7

Title

Concentration Contour Plot of Maximum 1-Hour Average NO2 Concentrations - Operations

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Project Components

Modelled Mine Boundary

Modelling

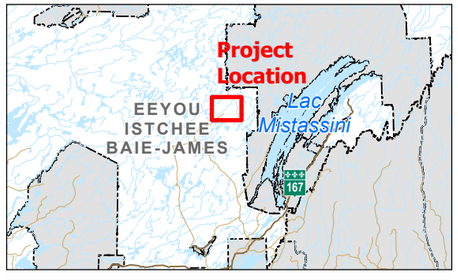
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-8

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average NO2 Concentrations - Operations

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Stantec

Project Components

Modelled Mine Boundary

Modelling

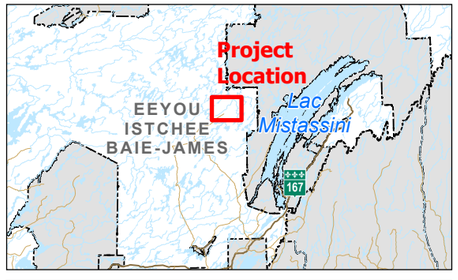
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-9

Title

Concentration Contour Plot of Maximum Predicted Annual Average NO2 Concentrations - Operations

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Stantec

Project Components

Modelled Mine Boundary

Modelling

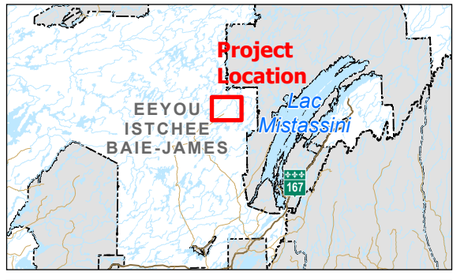
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-10

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average NO2 CAAQS Concentrations - Operations

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Stantec

Project Components

Modelled Mine Boundary

Modelling

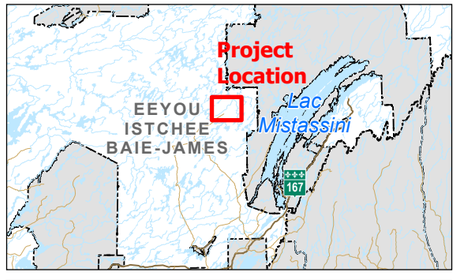
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-11

Title

Concentration Contour Plot of Maximum Predicted Annual Average NO2 CAAQS Concentrations - Operations

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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Stantec

Project Components

Modelled Mine Boundary

Modelling

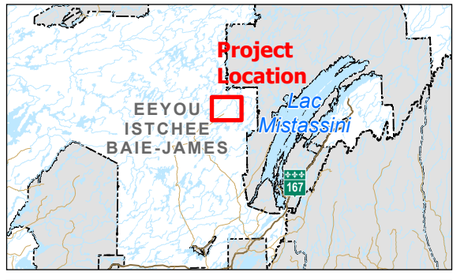
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-12

Title

Concentration Contour Plot of Maximum 1-Hour Average SO2 Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

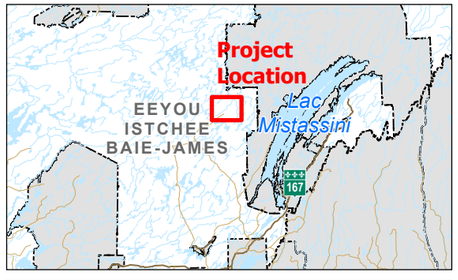
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-13

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average SO2 Concentrations - Operations

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Project Components

Modelled Mine Boundary

Modelling

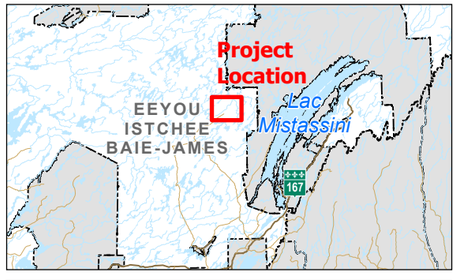
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-14

Title

Concentration Contour Plot of Maximum Predicted Annual Average SO2 Concentrations - Operations

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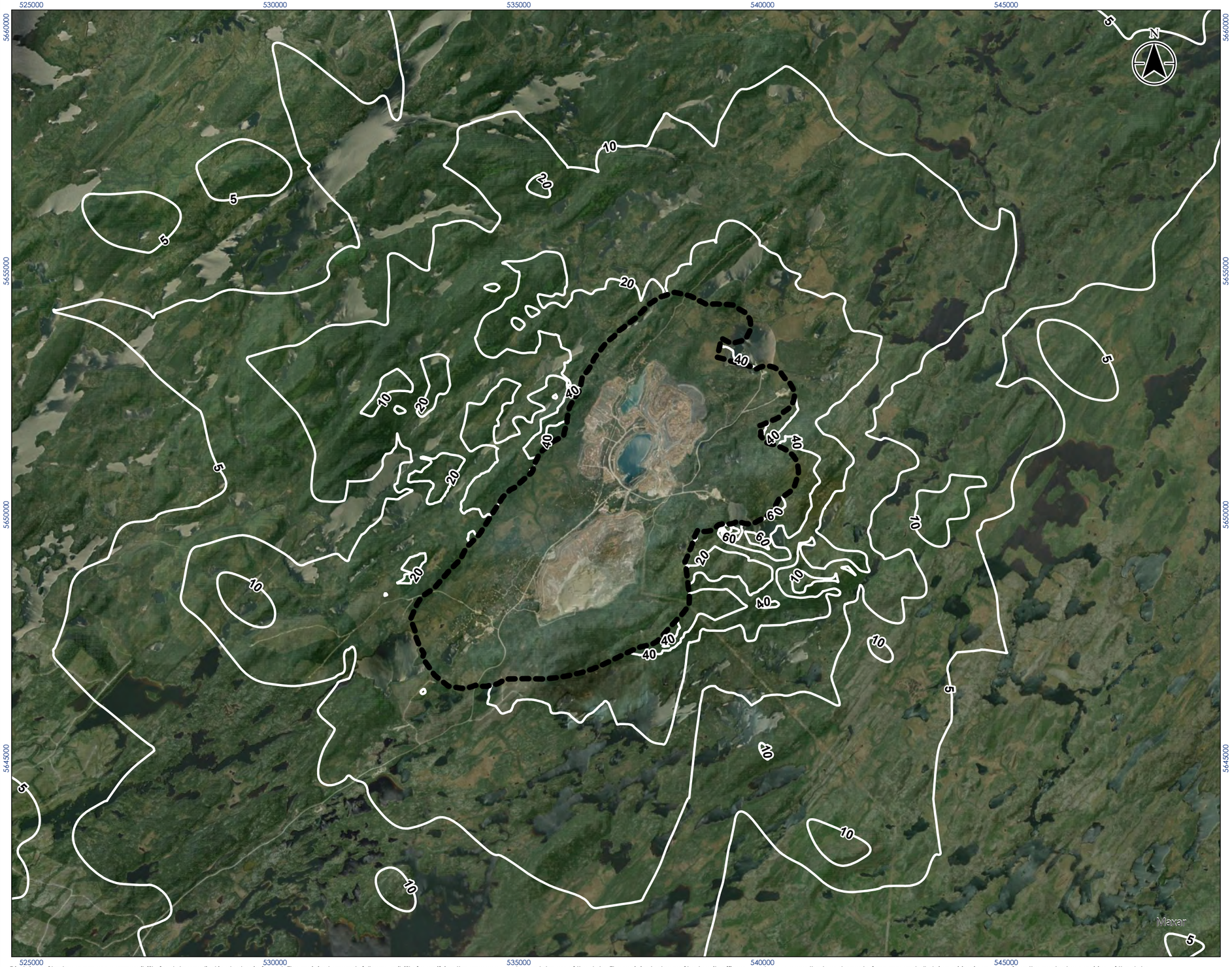


Stantec

Project Components

Modelled Mine Boundary

Modelling

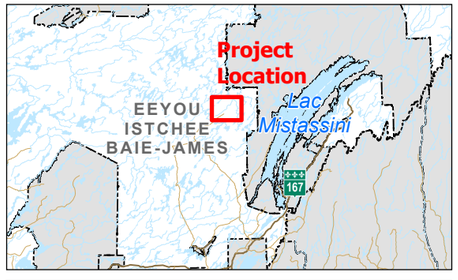
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-15

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average SO2 CAAQS Concentrations - Operations

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Project Components

Modelled Mine Boundary

Modelling

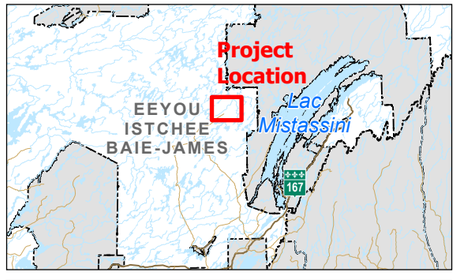
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-16

Title

Concentration Contour Plot of Maximum Predicted Annual Average SO2 CAAQS Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

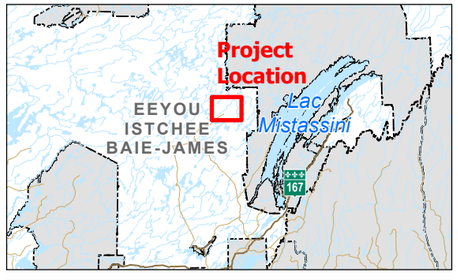
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-17

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average Quartz Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

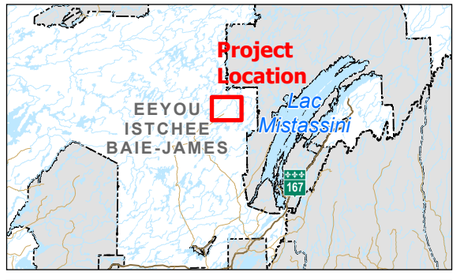
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-18

Title

Concentration Contour Plot of Maximum Predicted Annual average Quartz Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

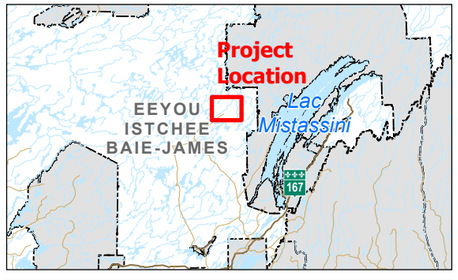
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-19

Title

Concentration Contour Plot of Maximum Predicted 1-Hour Average Elemental Carbon Concentrations - Operations

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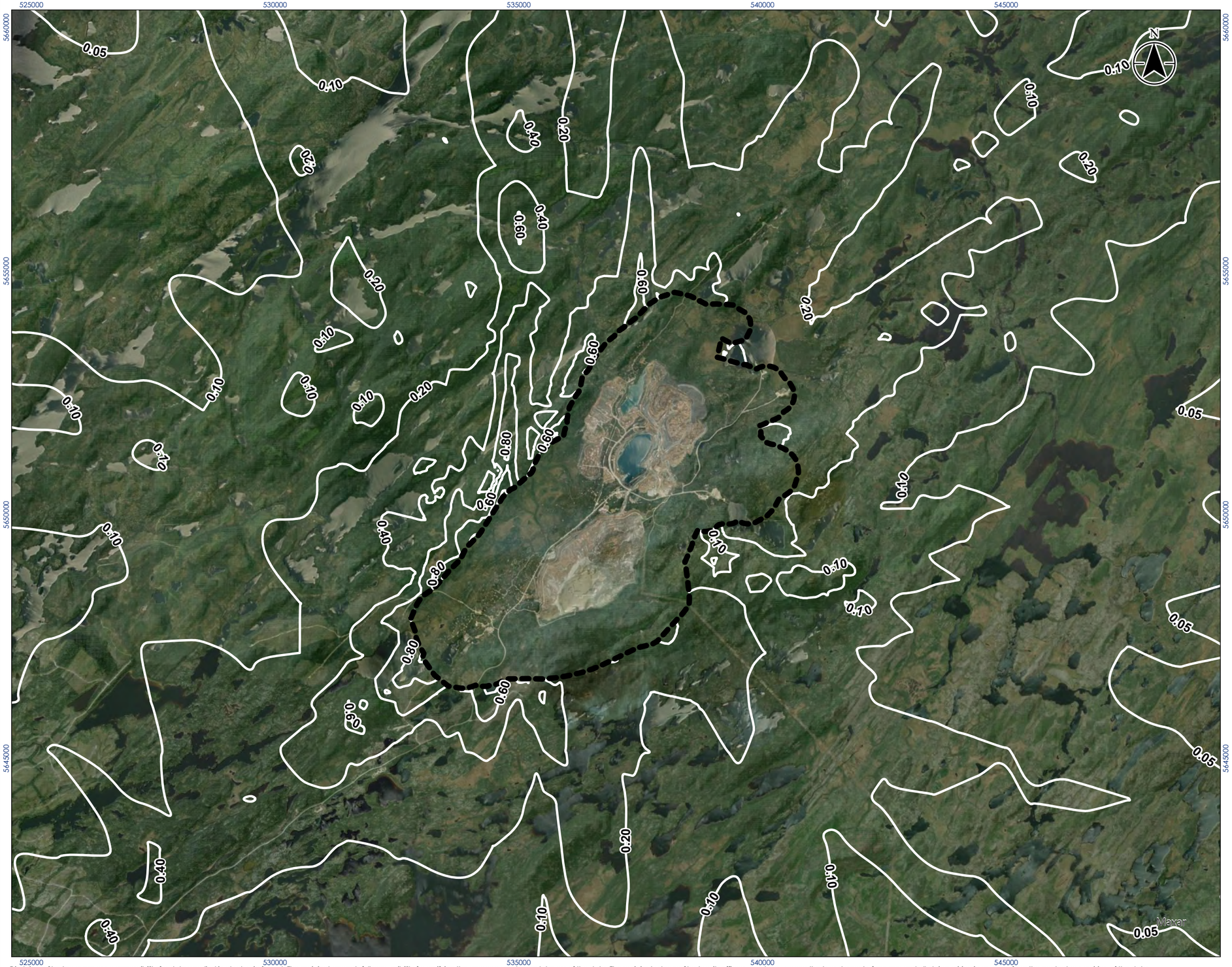


Project Components

Modelled Mine Boundary

Modelling

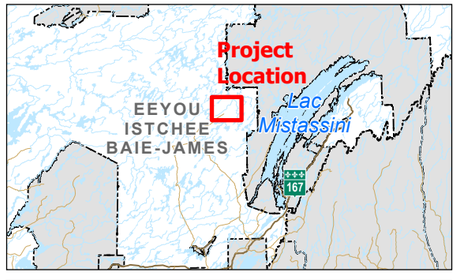
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-20

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average DPM Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

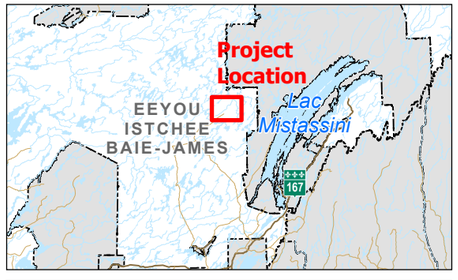
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-21

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average Total B(a)P Concentrations - Operations

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Project Components

Modelled Mine Boundary

Modelling

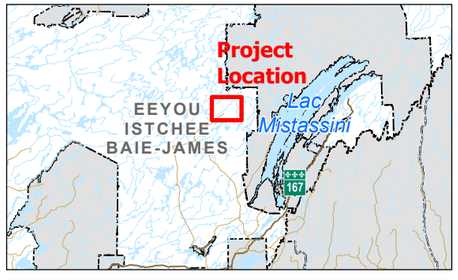
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-22

Title

Concentration Contour Plot of Maximum Predicted Annual Average Total B(a)P Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

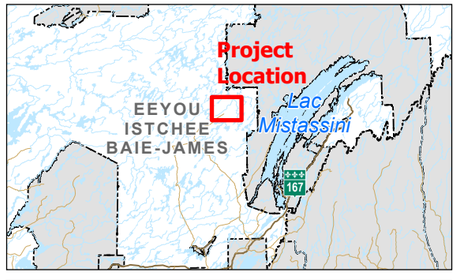
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-23

Title

Concentration Contour Plot of Maximum Predicted 24-Hour Average Benzene Concentrations - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

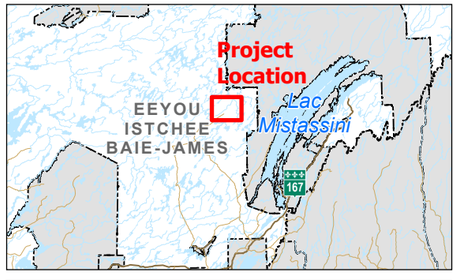
Concentration Contours (µg/m³)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/23
Technical Review by M. Stachejczuk on 2025/06/23
Independent Review by G. Crooks on 2025/06/23

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

J-24

Title

Concentration Contour Plot of Maximum Predicted Annual Average Benzene Concentrations - Operations

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APPENDIX K Deposition Contour Plots - Construction

Stantec

Project Components

Modelled Mine Boundary

Modelling

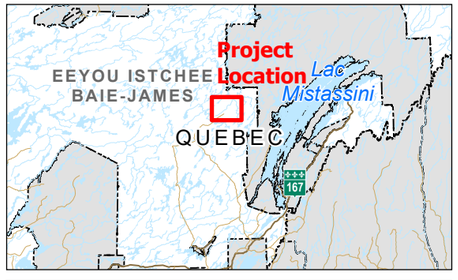
Deposition Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-1

Title

Contour Plot of Maximum Predicted 24-Hour Total PM Deposition - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

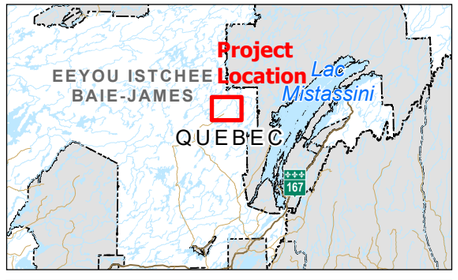
Deposition Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-2

Title

Contour Plot of Maximum Predicted Monthly Total PM Deposition - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

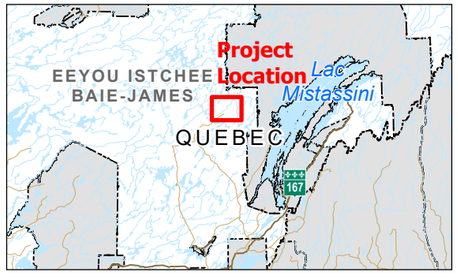
Deposition Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-3

Title

Contour Plot of Maximum Predicted Annual Total PM Deposition - Construction

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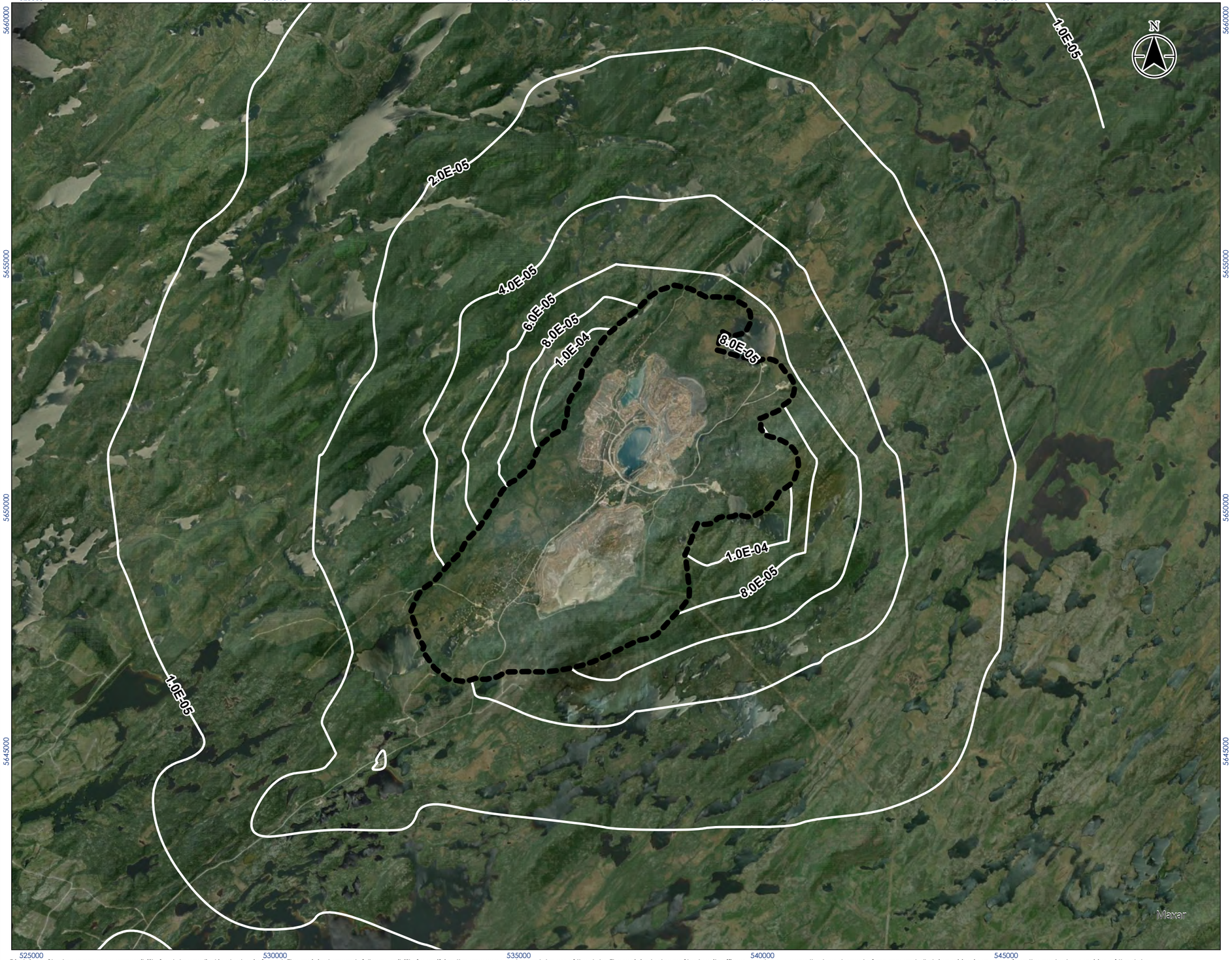


Stantec

Project Components

Modelled Mine Boundary

Modelling

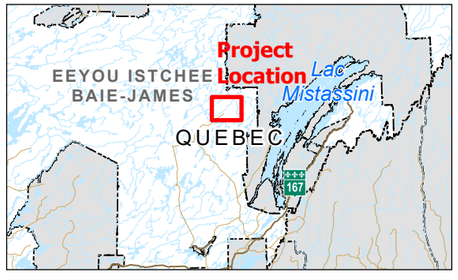
Deposition Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-4

Title

Contour Plot of Maximum Predicted Annual Total Arsenic Deposition - Construction

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Project Components

Modelled Mine Boundary

Modelling

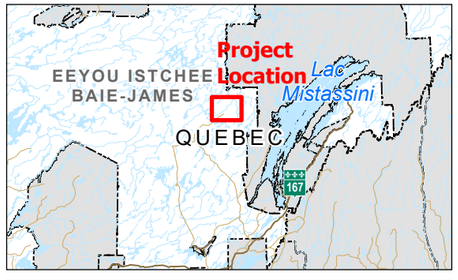
Deposition Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-5

Title

Contour Plot of Maximum Predicted Annual Total Chlorite Deposition - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

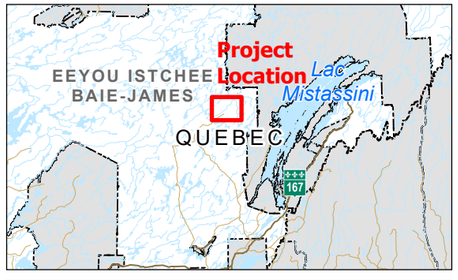
Deposition Contours (kg/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-6

Title

Contour Plot of Maximum Predicted Annual Total Nitrogen Deposition - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

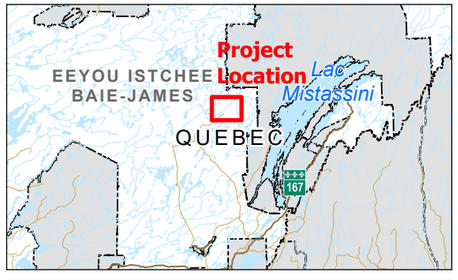
Deposition Contours (kg/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-7

Title

Contour Plot of Maximum Predicted Annual Total Sulphur Deposition - Construction

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Stantec

Project Components

Modelled Mine Boundary

Modelling

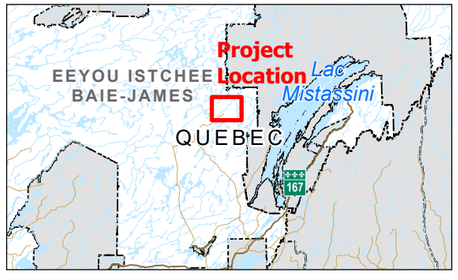
Deposition Contours (keq H+/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

K-8

Title

Contour Plot of Maximum Predicted Annual Potential Acid Input Deposition - Construction

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APPENDIX L Deposition Contour Plots - Operations

Stantec

Project Components

Modelled Mine Boundary

Modelling

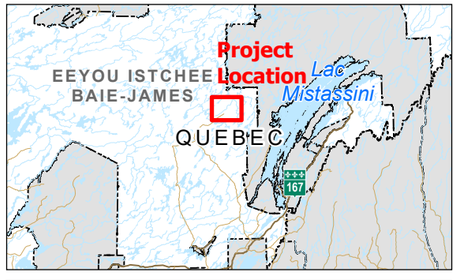
Concentration Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-1

Title

Contour Plot of Maximum Predicted 24-Hour Total PM Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

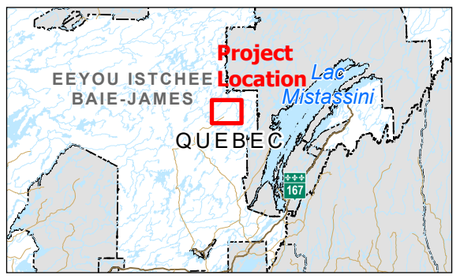
Concentration Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-2

Title

Contour Plot of Maximum Predicted Monthly Total PM Deposition - Operations

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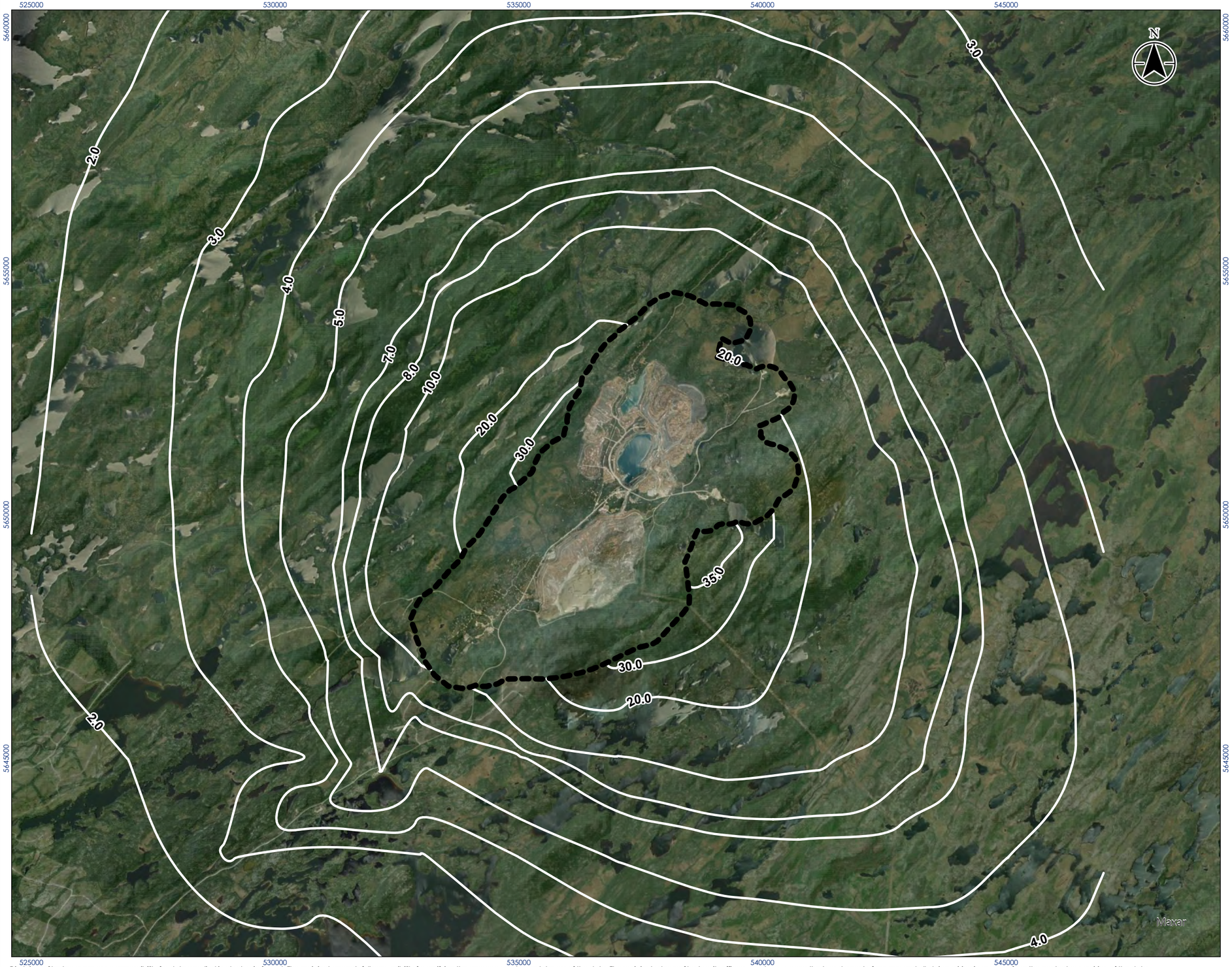


Stantec

Project Components

Modelled Mine Boundary

Modelling

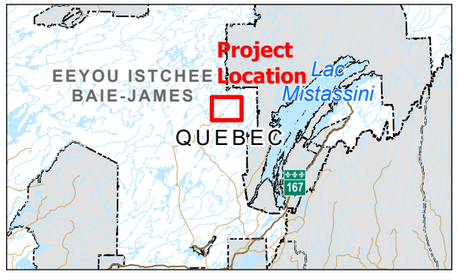
Concentration Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-3

Title

Contour Plot of Maximum Predicted Annual Total PM Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

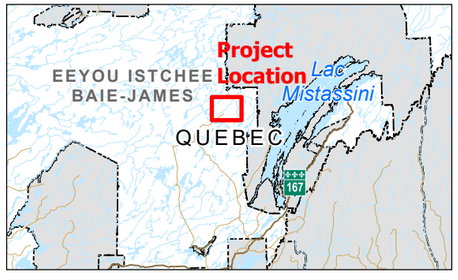
Concentration Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-4

Title

Contour Plot of Maximum Predicted Annual Total Arsenic Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

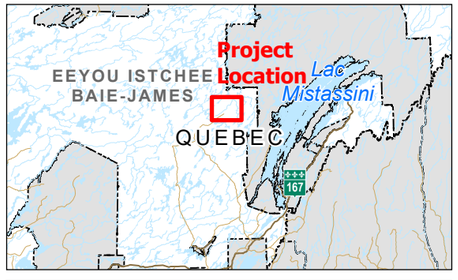
Concentration Contours (g/m²)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location

Mistissini
Québec

167040485-C0007-REV0

Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-5

Title

Contour Plot of Maximum Predicted Annual Total Chlorite Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

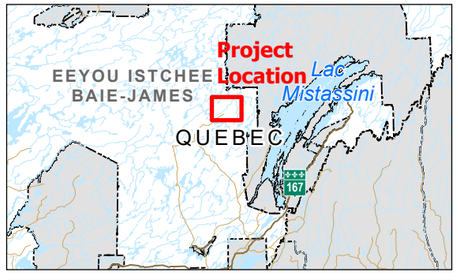
Deposition Contours (kg/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-6

Title

Contour Plot of Maximum Predicted Annual Total Nitrogen Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

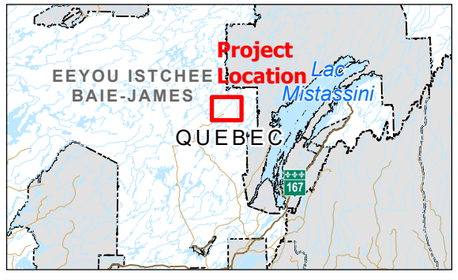
Deposition Contours (kg/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-7

Title

Contour Plot of Maximum Predicted Annual Total Sulphur Deposition - Operations

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Stantec

Project Components

Modelled Mine Boundary

Modelling

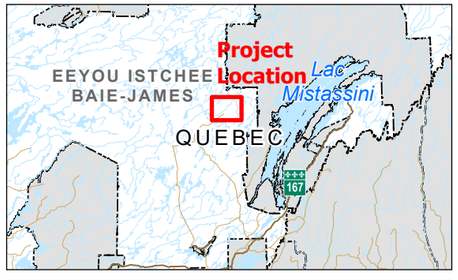
Deposition Contours (keq H+/ha/year)

0 1 2 Kilometers

1:80 000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD83(CSRS)v2 UTM Zone 18N
2. Project Componants, Modeling : Troilus Gold Corp., 2024
3. Imagery : Esri World Imagery, 2023.



Project Location
Mistissini
Québec

167040485-C0007-REV0
Prepared by P. Ravo on 2025/06/20
Technical Review by M. Stachejczuk on 2025/06/20
Independent Review by G. Crooks on 2025/06/20

Client/Project

Troilus Gold Corp
Troilus Mining Project

Figure No.

L-8

Title

Contour Plot of Maximum Predicted Annual Potential Acid Input Deposition - Operations

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