Appendix 6-C

Air Quality and Greenhouse Gas Assessment

NWP COAL CANADA LTD

Crown Mountain Coking Coal Project Air Quality and Greenhouse Gas Assessment

Sparwood, B.C.

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Executive Summary

Dillon Consulting Limited (Dillon) was retained by NWP Coal Canada Ltd (NWP) to prepare an environmental air quality assessment (the Assessment) for the proposed Crown Mountain Coking Coal Project (the Project) located in Sparwood, British Columbia. The Assessment was prepared in support of the Application for an Environmental Assessment Certificate under the B.C. Environmental Assessment Act (2002) and the Environmental Impact Statement under the Canadian Environmental Assessment Act (2012).

This assessment investigated potential air quality and greenhouse gas (GHG) impacts from the Project on nearby Receptor Value Components, including human and wildlife receptors as required by the provincial Application Information Requirements (AIR; 2018). The results presented in this assessment are reflective of the worst-case operating condition for the Project and were compared against the relevant federal and provincial guidelines.

The spatial boundaries for air quality and greenhouse gas impact were defined by the local study area (LSA) and the regional study area (RSA). The LSA is the area in which the Project's potential air quality effects are most likely to occur. The RSA was selected to consider the Project's potential air quality impacts on more regional areas extended from the Project site and includes several other existing operational mines.

The temporal boundaries for the air quality assessment are defined by the operational mine life of the Project and the existing and future cumulative effects to which the Project might contribute. Emissions to air as a result of the Project were quantified for mine commissioning, operation, and decommissioning. The air quality effects from Project construction and decommissioning are anticipated to be localized, intermittent, and limited in duration. Therefore, the effects from these phases of the Project are expected to fall within the bounds of the effects that would occur during the operation phase (i.e., the emissions from these construction and decommissioning phases are anticipated to be less significant than the operation phase). As such, a total of 15 operating years and two pre-operation years, for a total Project timeframe of 17 years, were evaluated to obtain a complete understanding of the air quality effects of the Project. The air quality dispersion modelling assessment was performed for the 11th year of mine operation to capture a conservative worst-case operating scenario for air emissions. The GHG assessment was performed for the 10th year of mine operation to capture a conservative worst-case operating scenario.

The air quality and GHG assessments include three (3) assessment cases: Baseline Scenario, Project Scenario, and Cumulative Effects Scenario. The Baseline Scenario represents existing conditions within the LSA and RSA, including effects of existing activities such as: mining, forestry, and recreational development in the area. The Project Scenario was assessed by evaluating the maximum predicted air quality effects of the Project. The Cumulative Effects Scenario includes impacts from reasonably foreseeable developments and local and regional projects in addition to the impacts from the Project Scenario.

This assessment has been developed to address common air contaminants (CACs) air emissions, including: particulate [TSP, PM_{10}, $PM_{2.5}$], SO_2, NO_2, CO, VOCs, metals, PAHs, and dustfall from Project operations. Baseline and Project greenhouse gases (GHGs) were evaluated for local and regional areas. Specific GHGs included in this assessment are CO_2, CH_4, and N_2O.

Background air quality was characterized through the use of data from local meteorological climate stations. The impact of the air emissions were compared against the British Columbia Ambient Air Quality Objectives (AAQO) and Canadian Ambient Air Quality Standards (CAAQS) currently in effect for the CACs for the Project.

Emission rates were developed for the Project operations using various industry accepted methodologies.

Atmospheric dispersion modelling was conducted using the CALPUFF dispersion model. Local measured meteorological data as well as the BC MOE recommended prognostic WRF dataset were used in the assessment. CALMET was configured to predict meteorological conditions for a 3-year period from January 1st, 2013 to December 31th, 2015. CALMET was configured according to BC MOE recommended settings. Model results are presented for the maximum predicted concentrations at gridded receptors and each selected sensitive receptors in the LSA and RSA such as residences, campgrounds, and recreation sites.

The predicted concentrations of CACs, including background contributions, are below the BC AAQOs at all receptors except for 1-hr NO_2. The predicted concentrations of 1-hr NO_2 at several sensitive receptors located in the close vicinity to the Project footprint, with or without background contributions, exceeded the objective.

Of the 416 sensitive receptors, the maximum predicted particulate concentrations exceeded the BC AAQOs at 53 receptors, when cumulatively considering the Project impacts and background contribution. The average exceedance frequencies of 24-hr PM_{10} and 24-hr $PM_{2.5}$ with the background contributions are 14% and 10% for receptors with exceedances.

The sensitive receptors predicted to experience exceedances of the BC AAQOs are located close to the Project footprint and are within the LSA. The maximum distance from the sensitive receptors with exceedances to the project footprint is about 2km. The predicted maximum concentrations of indicator compounds, including CACs and particulates, are below the corresponding objectives for receptors located within the RSA.

The results of the GHG assessment indicate that the future peak GHG emissions are estimated to be less than 1% of the annual provincial emissions and less than 0.1% compared to the annual federal emissions.

1.0 Introduction

1.1 Purpose and Objectives

Dillon Consulting Limited (Dillon) was retained by NWP Coal Canada Ltd (NWP) to prepare an air quality assessment (the Assessment) for the proposed Crown Mountain Coking Coal Project (the Project) located in Sparwood, British Columbia (B.C.). The Assessment was prepared in support of the Application for an Environmental Assessment Certificate under the *B.C. Environmental Assessment Act* (BCEAA, 2002) and the Environmental Impact Statement (EIS) under the *Canadian Environmental Assessment Act* (2012).

Under the *Canadian Environmental Assessment Act* (2012), the Project is considered a 'Designated Project' under *Regulations Designating Physical Projects* since the mine will have a production capacity of more than 3,000 tonnes per day. Provincially, the Project is considered a Reviewable Project under Part 3 of the *Reviewable Projects Regulations* (B.C. Reg 370/02) of the Act given that the production capacity of the mine will be greater than 250,000 tonnes per year of clean coal and will result in a new land disturbance of greater than 750 hectares (ha). The Application Information Requirements (AIR) issued by the Environmental Assessment Office (EAO) on April 26, 2018, specifies the information that the Proponent must provide in their Application for an Environmental Assessment Certificate (EAC) under section 16(2) of the BCEAA. Additionally, the AIR identified air quality impacts associated with the Project as an "Intermediate Valued Component" (intermediate VC) that is a primary pathway to potential Project effects on "Receptor Valued Components" (receptor VCs).

This assessment investigated potential air quality impacts from the Project on nearby receptor VCs, including human and wildlife receptors as required by the AIR. The results presented in this assessment are reflective of worst-case emissions for the Project and were compared against the relative federal and provincial guidelines/standards.

1.2 General Overview of the Project

The Project is a proposed open pit metallurgical coal mine located in the Elk Valley coal field in the East Kootenay Region of southeastern British Columbia, as shown in Figure 1. There are several existing metallurgical coal mines in the Elk Valley and Crowsnest coal fields surrounding the Project, including Teck Coal Limited's (Teck) Elkview Operations (8 km southwest of the Project) and Line Creek Operations (12 km north of the Project). The Project is located approximately 12 km east of Sparwood, B.C.

The approximate footprint of the Project will be 1,300 ha with 10 tenured coal exploration licenses, which account for approximately 5,630 ha. The anticipated production capacity of the Project is up to 3.7 million run-of-mine tonnes (M ROMt) per annum for 15 years, not including site decommissioning. This equates to a coal production capacity of approximately 10,150 tonnes per day. Exploration activities have indicated that the coal at the Project site is typical of coking coals produced from existing mines in

the Elk Valley. The high quality metallurgical coal would be transported via railway to the Port of Vancouver, where it would be shipped overseas to be used in steelmaking.

The key project components include:

- Surface extraction areas (three connected pits – north pit, east pit, and south pit);
- Waste rock management areas;
- Plant area (includes raw coal stockpile area, a processing plant, and site support facilities);
- Clean coal transportation route (overland conveyor and haul road);
- Rail load-out facility and rail siding (includes various auxiliary facilities such as a guard house; light vehicle wash; and a drug and alcohol testing/orientation building);
- Power supply;
- Natural gas supply;
- Explosives storage;
- Fuel storage;
- Sewage treatment; and
- Water supply.

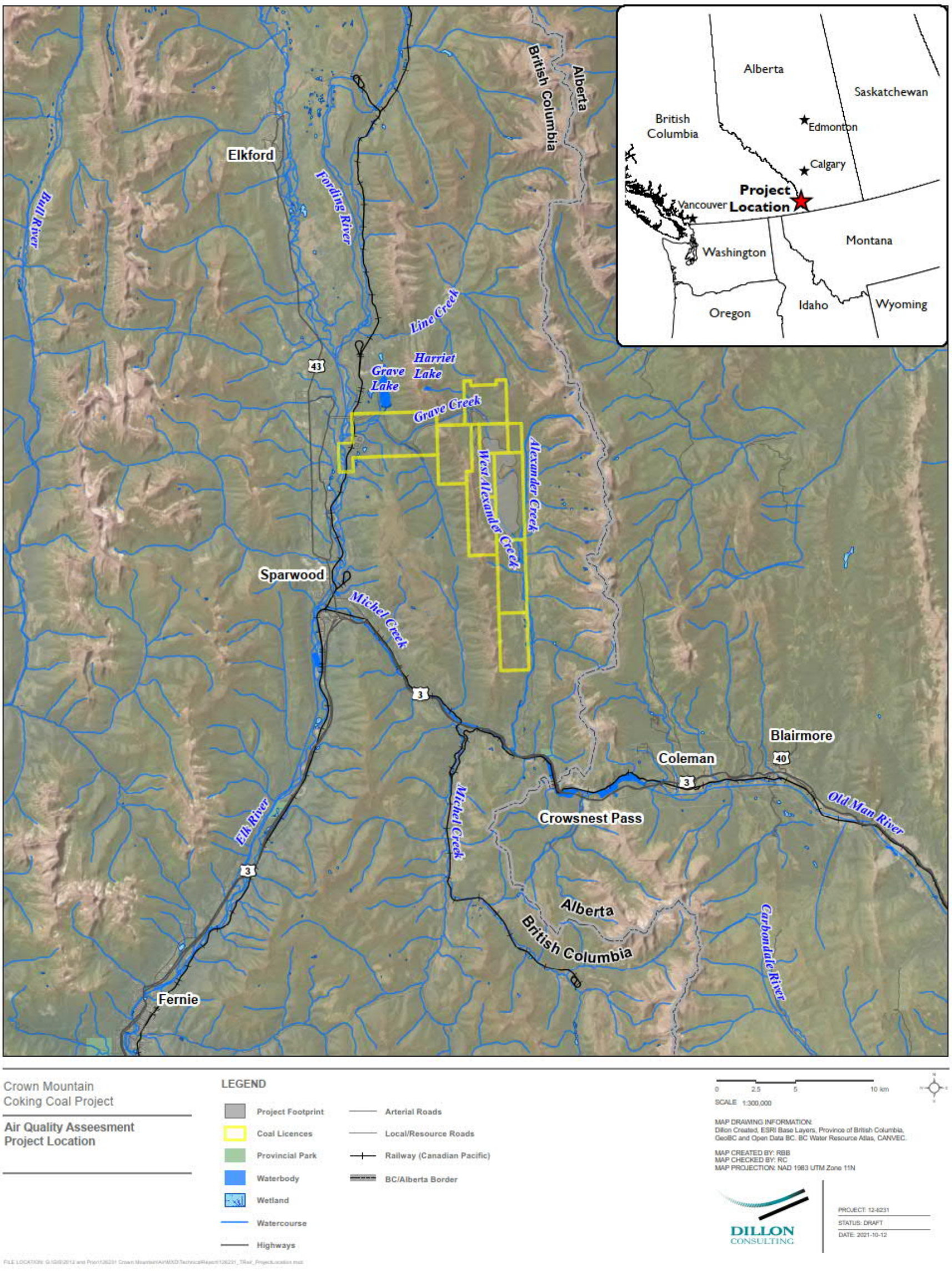


Figure 1: **Project Location**

2.0 Selection of Valued Components

Valued components are components of the natural and human environment that are considered by the proponent, the public, aboriginal groups, scientists, other technical specialists, and government agencies involved in the assessment process to have scientific, ecological, economic, social, cultural, archaeological, historical, or other importance[2]. The intermediate and receptor Valued Components (VCs) that are selected for air quality and climate assessment are shown in the following sections, based on the AIR for the project.

Intermediate VCs are the environmental components of a natural system that are pathways to effects on receptor VCs. For example, air quality is a pathway that carries potential contaminants that could affect land use and access for recreation and tourism.

Receptor VCs are defined in the AIR as components where indicator compound emissions have the potential to impact. For example, changes in indicator compound concentrations can lead to impacts on community health and well-being.

2.1 Selected Valued Components and Measurement Indicators

The VCs for the Project were identified based on an understanding of the community concerns and requirements outlined in the AIR, as well as experience related to other mining projects in the area. Consultation with each group is described in the Impact Assessment.

Coal mining activities include activities such as blasting and explosive detonation, hauling of coal and other materials on unpaved roads, bulldozing of coal and overburden and other activities that have the potential to release compounds to the atmosphere. As per the requirements of the AIR, the indicator compounds included in this assessment are:

- total suspended particulate (TSP),
- particulate matter with aerodynamic diameter less than 10µm (PM_{10}),
- particulate matter with aerodynamic diameter less than 2.5µm ($PM_{2.5}$),
- sulphur dioxide (SO_2),
- nitrogen dioxide (NO_2),
- carbon monoxide (CO),
- volatile organic compounds (VOCs),
- metals and polycyclic aromatic hydrocarbons (PAHs) in dustfall, and
- greenhouse gases (GHGs).

The intermediate VCs, the measurement indicators (indicator compounds), and the receptor VCs for which a significance determination is required are shown in Table 1. For the air quality and climate assessment, air quality is identified as the only intermediate VC. This report evaluates the intermediate VC (Air Quality) against the measurement indicators; the impact of the intermediate VC on the receptor VCs are quantified in their receptor-specific discipline reports.

Table 1: Intermediate Valued Component Measurement Indicators

Intermediate Valued Component	Measurement Indicators	Receptor Valued Components for which the Intermediate Valued Component is a Primary Pathway to Potential Project Effects

Air Quality	• Common air contaminants:
	  o Fine particulates (PM_{10} and $PM_{2.5}$)
	  o TSP
	  o SO_2
	  o NO_2
	  o CO
	  o VOCs
	• Metals and PAHs in dustfall
	• Meteorology (e.g., wind speed and direction)
	• Greenhouse Gases
	  o CO_2
	  o CH_4
	  o N_2O
		• Climate
		• Listed and sensitive plant communities and species
		• Limber pine
		• Whitebark pine
		• Culturally significant plants and ecosystems
		• Community health and well-being
		• Land use and access

Based on the above, air quality is considered an intermediate VC which affects the following disciplines:

- Climate
- Vegetation
- Socio-economics and Community health
- Land use and tenure
- Visual aesthetics
- Human and terrestrial wildlife health risk assessments

The air quality effects assessment compares changes in indicator compounds to relevant air quality criteria (which are protective of the environment and health). As such, compounds without air quality criteria have been addressed as follows:

- Metals and PAHs in dustfall
- VOCs
- Greenhouse Gases

3.0 Residual Effects Assessment Methods

This section summarizes the overall process and methodologies used to identify and assess the potential effects of the proposed Project on the identified intermediate VCs and receptor VCs.

3.1 Pathway Analysis

A pathway analysis approach was used to evaluate the potential effects to air quality and the interaction with receptor VCs. The pathway method is based on the source-pathway-receptor model recommended in CEAA-2012, which is used to identify the source of an environmental change, how the source may affect VCs, and how the source may reach the receptor [1,2]. The potential interactions between Project activities and the selected receptor VCs (refer to Table 1) are determined based on the following criteria:

- Review of Project components and physical works and activities at each stage;
- Consideration of potential effects on air quality identified in the AIR from EAO;
- The temporal and spatial boundaries of the air quality assessment; and,
- Scientific knowledge and experience with similar mining projects in the past

The primary pathway refers to pathways which can cause measurable environmental changes relative to environmental baseline. The secondary pathway refers to pathways which can result in minor environmental changes relative to the baseline, and therefore are expected to have negligible residual effects with the implementation of mitigation measures. Mitigation measures were proposed to limit and/or alleviate the residual effects from identified primary and secondary pathways.

The air quality changes are anticipated to have measurable, potential effects on receptor VCs including human health, vegetation and wildlife. The residual effects of air quality on those receptors, after incorporation of mitigation measures, are assessed in their respective discipline-specific assessments.

Mitigation measures were developed based on a review of Project physical activities, best practices in environmental management and reporting, and relevant environmental policies and guidelines. The mitigation measures were incorporated in the pathway analysis to identify primary pathways with residual environmental effects which require further quantitative or qualitative effects analysis. The interactions of Project components and physical activities with potential environmental effects as well as proposed mitigation measures are discussed in Section 3.2 and summarized in Figure 2.

[1] (CEAA, 2020). Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012. Retrieved from: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-ceaa2012.html#toc008

[2] (MECC, 2018). Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012. Retrieved from: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-ceaa2012.html#fig005

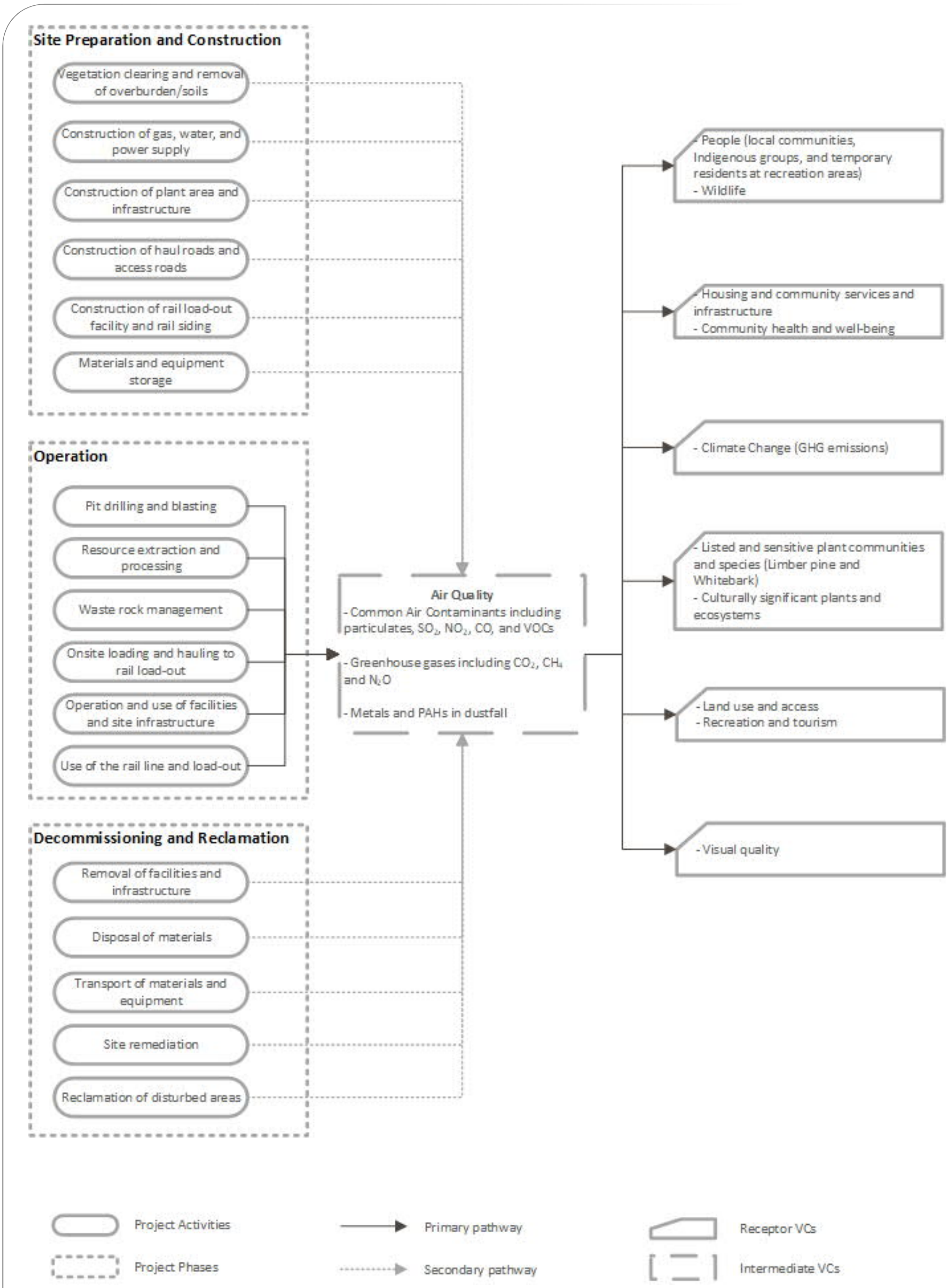


Figure 2: Pathway Analysis Diagram

3.2 Summary of Project Interactions and Mitigation Measures

To support the identification of potential effects on the intermediate VCs and receptor VCs that may result from all phases of the Project, a potential effects matrix was developed. The matrix, shown in Figure 2, identifies the potential interactions between various physical works and activities of the Project and intermediate and receptor VCs, as well as mitigation measures to reduce the potential environmental effects. For the air quality and greenhouse gas assessment, air quality is identified as the only intermediate VC and has potential effects on several receptor VCs.

The mitigation measures for the Project include the adoption of dust management measures proposed in the Project's Feasibility Study Report as well as general Best Management Practices (BMP) for mine projects. The mitigation measures for air quality and relevant receptor VCs are summarized in Table 2[3]

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[3] NWP Coal Canada Ltd, 2020. Feasibility Study Report – Crown Mountain Coking Coal Project

Table 2: Potential Pathways for Effects on Air Quality and Climate Change

Project Components and Physical Activities	Potential Environmental Effects on Intermediate and Receptor VCs		Proposed Mitigation Measures
	Air Quality and Climate	Other Receptor VCs	
Site Preparation and Construction • Vegetation clearing and removal of overburden/soils • Construction of natural gas, water, and transmission line/power supply • Construction of plant area, ancillary structures, and site infrastructure • Construction of haul roads and access roads • Construction of rail load-out facility and rail siding • Materials and equipment storage	• Construction activities associated with material handling such as overburden/soil removal, loading/unloading excavated material, compacting, grading, and stockpiling, cause fugitive dust emissions which changes particulate concentrations in the air and dustfall accumulation. • Use of fossil-fuel combustion construction equipment and vehicles results in CACs and GHG emissions and dustfall deposition.	• Impacts to air quality caused by Project construction activities have potential effects on ecosystem and sensitive plant species such as limber pine, whitebark pine, and other culturally significant plants. • CACs and GHG emissions have potential effects on nearby community health and well-being • Site construction activities have potential impact on land use and access	• Implement dust control measures (e.g., water spray) to identified problem areas with the significant potential for generating fugitive dust (e.g., stockpile) through visual inspections, especially during dry and windy conditions • Maintain construction vehicles and equipment per manufacturer recommendations and operate within regulatory requirements • Limit long-term idling, where possible • Limit material handling activities (e.g., material loading) during high wind events
Operation • Pit development (drilling and blasting of pit areas) • Resource extraction, processing, and storage • Waste rock management (placement and development) • Onsite loading and hauling to rail load-out • Operation and use of facilities and site infrastructure (including transmission line, water supply, transportation of workers/staff/materials/equipment) • Use of the rail line and load-out	• Operation activities associated with material handling such as drilling, blasting, excavation, and loading/unloading materials, and transporting materials on unpaved roads results in fugitive dust emissions. • Operation of nonroad equipment and vehicles emits CACs and GHGs to the atmosphere due to combustion of fossil fuel. • Fugitive dust and CAC emissions from Project operations result in changes of ambient air quality concentrations and dustfall deposition rates.	• Project operation activities associated with material handling (e.g., drilling, blasting and excavation) change air quality and impact climate which potentially affect the ecosystem and sensitive plant species such as limber pine, whitebark pine, and other culturally significant plants. • Fugitive dust and CACs emissions from Project operation activities (e.g., resource extraction, processing, and transportation) have potential effects on nearby community health and well-being. • Project operation activities such as drilling and resource extraction have potential effects on land use and access	• Control road dust via watering, or through the application of a chemical dust suppressant (e.g., calcium chloride) • Install covers on all exposed conveyor belts to minimise potential dust generation • Install two fabric stockpile covers for the product coal stockpiles near the train load-out to manage product moisture and minimise dust emissions • Install a canopy on the top of ROM dump hopper to minimise dust emissions • Reduce vehicle speeds on unpaved roads where possible to reduce trailing dust clouds • Apply a dustbinder chemical solution to the rail cars after filling to effectively seal the top layer of coal and mitigate dust during the mine to port journey • Install a dust extraction system on the train loadout bin • Install a local dust hood over the raw coal screen and enclose and skirt all conveyor transfer points to mitigate local dust emissions • If feasible, consider paving the roads, particularly in the vicinity of communities/populated areas • Limit traffic to the delineated haul roads that have been maintained regularly to minimized disturbance of unmaintained areas of the site • Evaluate the use of larger capacity trucks to limit the total number of truck trips per day • Cover aggregate loads during transport to prevent spillage and air entrainment • Inject water to suppress dust during hole drilling • Limit long-term idling, where possible • Limit the size and slope angle of stockpiles to keep them manageable for working with loaders and for dust control • Monitor the stockpile load in and out daily using an inspection sheet and apply water and tackifying agent to exposed surface as needed • Inspect and maintain combustion equipment on a regular basis • Minimize loading and stockpiling activities during high wind events

Project Components and Physical Activities	Potential Environmental Effects on Intermediate and Receptor VCs		Proposed Mitigation Measures
	Air Quality and Climate	Other Receptor VCs	
Decommissioning and Reclamation • Removal of facilities and infrastructure • Disposal of materials • Transport of materials and equipment • Site remediation • Reclamation of disturbed areas	• Reclamation activities such as disposal and transport of materials causes fugitive dust emissions which change ambient air concentrations and dustfall deposition. • Use of vehicle and equipment for decommissioning and reclamation activities results in releases of CACs and GHG emissions.	• Site reclamation and remediation activities have potential effects on ecosystem and the sensitive plant species. • Site reclamation activities associated with material handling causes fugitive dust emissions and have potential effects on nearby community health and well-being • Project reclamation and remediation activities have potential effects on land use and access.	• Limit vehicle speed on unpaved roads during material and equipment transport • Limit demolition activities during high wind events • Optimize hauling route and limit hauling distance and trips as much as possible • Cover aggregate loads during transport to prevent spillage and air entrainment • Develop a site-specific air monitoring plan for site closure to minimize releases of fugitive dust, CACs, and GHGs

4.0 Assessment Boundaries and Regulatory Requirements

The air quality and greenhouse gas assessment includes three assessment cases: Baseline Scenario, Project Scenario, and Cumulative Effects Scenario.

The Baseline Scenario represents existing conditions within the Local Study Area and Regional Study Area, including the effects of existing activities such as: mining, forestry, and recreational development in the area. A list of existing activities and emission sources is provided in Section 6.0. Ambient air quality data collected from measurement stations in the area was used to characterize air quality conditions for the Baseline Scenario. The assessment of baseline air quality is provided in Section 5.0.

The Project Scenario was defined by identifying the operating year with the maximum air emissions generating activities over the lifetime of the Project. Ambient conditions from the Baseline Scenario were included in the Project Scenario assessment to account for existing air quality.

The Cumulative Effects Scenario included impacts from reasonably foreseeable developments and local and regional projects in addition to the impacts from the Project Scenario.

4.1 Assessment Boundaries

Assessment boundaries were used to define the spatial, temporal, administrative, and technical limits of the Project with respect to air quality and greenhouse gas emissions. The spatial and temporal boundaries were developed to include applicable relevant Project phases, components, and activities, including: construction, operation, decommissioning, and post-closure. Past, present, and reasonably foreseeable projects and activities are captured in the assessment. The following subsections describes each of the boundaries used in the air quality and greenhouse gas assessment.

4.1.1 Spatial Boundaries

The Project area is a greenfield site in the Kootenays, and is a combination of the Montane Spruce and Engelmann Spruce (Subalpine Fir) biogeoclimatic zones, and within the Montane Cordilliera ecozone[4]. There are several existing metallurgical coal mines in the Elk Valley and Crowsnest coal fields, including the Teck Elkview Operations approximately 8 km southwest of the Project and Line Creek Operations, approximately 12 km north of the Project. Therefore, air quality in the Project area may be impacted by the emissions from the existing nearby mines.

[4] http://www.canadianbiodiversity.mcgill.ca/english/ecozones/montanecordillera/montanecordillera.htm

The Project area is mainly used for recreational purposes. Recreational fishers and campers were observed in the area at the time of undertaking the ambient noise monitoring program in 2017.

The spatial boundaries for air quality are defined by the local study area (LSA) and the regional study area (RSA). The LSA is the area in which the Project's potential air quality effects are most likely to occur. The boundaries of the LSA and the RSA are shown in Figure 3.

The LSA is approximately 25 km by 40 km and includes the municipalities of Sparwood and Elkford in British Columbia and the Municipality of Crowsnest Pass and the Municipal District of Ranchland 66 in Alberta. The LSA was selected based on the following:

- Inclusive of local communities that may be impacted by emissions generated from the Project activities;
- Inclusive of towns within approximately 20 km of the centre of the Project;
- Allows for an evaluation of potential impacts of air quality at the identified sensitive receptors; and
- Inclusive of operating mines near the Project area.

The RSA was selected to consider the Project's potential air quality impacts on more regional areas extended from the Project site and includes several other existing operational mines.

The RSA limits were selected based on the following:

- Communities within the Elk Valley that may be regionally affected by changes in air quality as a result of cumulative effects;
- Operating and proposed mines within the Elk Valley that may be considered as part of the cumulative effects assessment; and
- The federal border with the United States, which is a jurisdictional limit.

4.1.2 Temporal Boundaries

The temporal boundaries for the air quality assessment were defined based on the operational mine life of the Project and in consideration the existing and future cumulative effects to which the Project might contribute. Emissions to air as a result of the Project were quantified for mine commissioning (construction), operation, and decommissioning.

The air quality effects from Project construction and decommissioning are anticipated to be localized, intermittent, and limited in duration. Therefore, the most significant effects from these phases of the Project are expected to fall within the bounds of the effects that would occur during the operation phase (i.e., the emissions from these construction and decommissioning phases are anticipated to be less significant than the operation phase).

As such, a total of 15 operating years, 2 pre-operation (construction) years, and a post-operation decommissioning phase were evaluated to characterize air quality emissions from the Project.

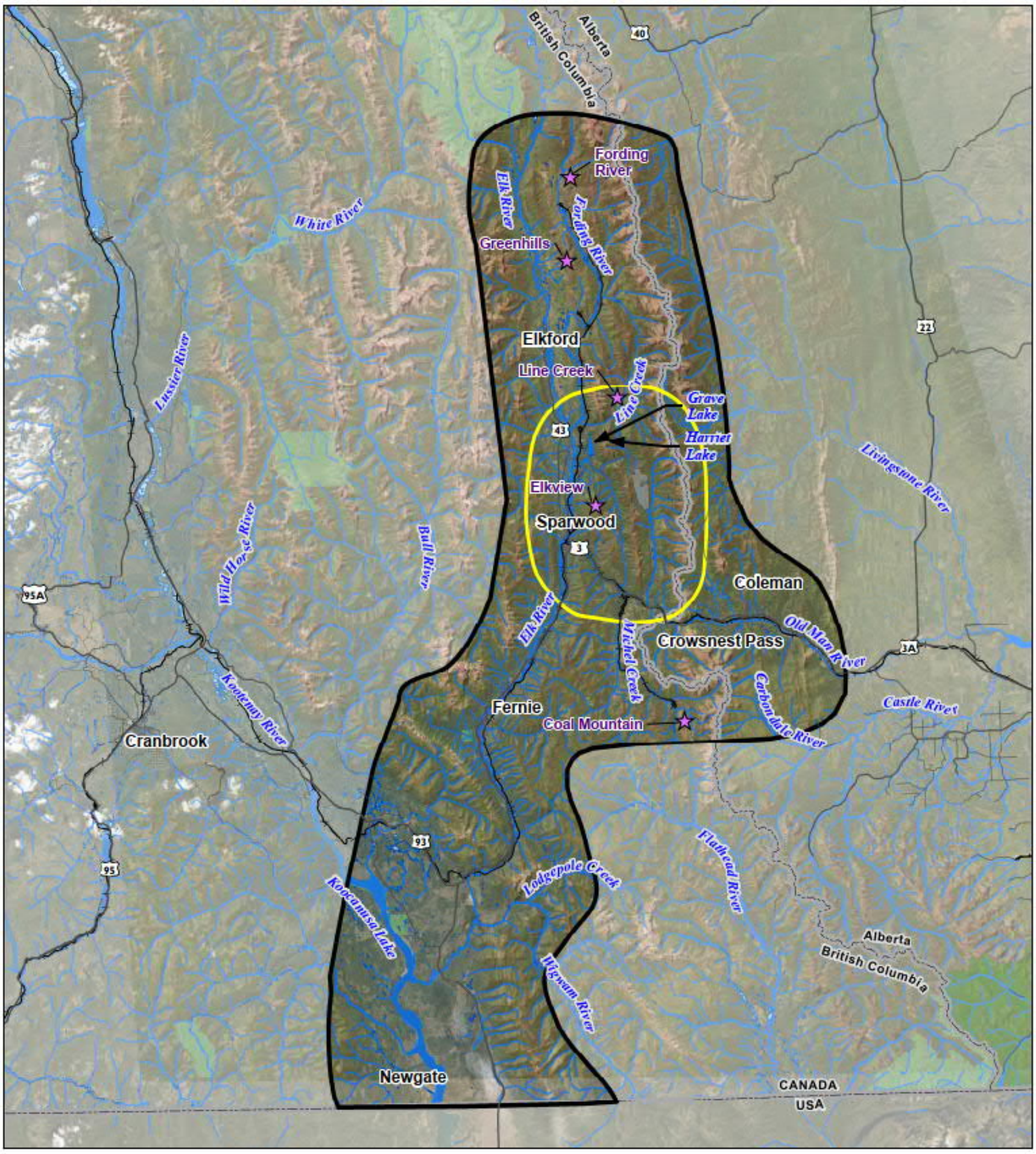


Figure 3: Air Quality and Greenhouse Gas LSA and RSA

A review of air quality emissions over the entire Project timeframe determined that Year 11 of mine operation would represent the most conservative operating scenario with respect to Project air quality impact. This operational year represents a worst-case scenario for air quality with the most air quality related Project activities (e.g. combustion, fugitive road dust generation) and operations in closest proximity to local receptors.

A review of GHG emissions over the entire Project timeframe determined that Year 10 of mine operation would capture the most conservative operating scenario with respect to Project GHG impact. This operational year represents a worst-case scenario for GHG with the most GHG-related Project activities (e.g. combustion equipment).

Emissions for each operating year as well as commissioning and decommissioning are described in Section 7.2.1.2- Air Quality Emission Summary.

4.1.3 Administrative Boundaries

Administrative boundaries represent limitations imposed on the assessment due to political, economic, and social constraints (EAO, 2013). Administrative boundaries are not considered to constrain the identification of potential effects and the assessment of air quality. As such, they are not applicable for the purposes of this Air Quality Assessment.

4.1.4 Technical Boundaries

Technical boundaries represent constraints imposed on the assessment due to limitations in the ability to predict the effects of the Project (EAO, 2013). Air dispersion modelling is a tool that is used for determining air quality impacts for the Project. The modelling is based on accepted best practices, such as those outlined in the BC MOE Air Dispersion Modelling Guideline.

For the purposes of this assessment, notable levels of conservatism are built into the assessment methodology to minimize the risk of under-prediction, and present a reasonable worst-case scenario. For example, the air quality dispersion modelling was based on Year 11 of mine operation which represents the worst-case year in terms of Project activity, coal extraction, and coal processing over the lifecycle of the Project.

4.2 Regulatory Requirements

Relevant regulatory requirements for air quality and greenhouse gases are summarized in the following sections.

4.2.1 Air Quality Criteria

Air quality in Canada is generally managed by Federal and Provincial governments. A list of the applicable legislation and guidelines for the Project are listed below.

The Federal and Provincial legislation that apply to the assessment of air quality for the Project include:

- Canadian Environmental Protection Act (1999) - Federal
- Environmental Management Act (2003) – Provincial

The Federal and Provincial guidelines, air quality standards, and air quality objectives that were considered in this Project assessment include:

- National Ambient Air Quality Objectives (NAAQOs) (1974) – Federal
- Canadian Ambient Air Quality Standards (CAAQSs) – Federal
- Incorporating Climate Change Considerations in Environmental Assessment - Federal
- BC Ministry of Environment (2015b) Air Quality Dispersion Modelling Guideline *(BC AQDMG)*[5] - Provincial
- Province of British Columbia (2020) British Columbia Ambient Air Quality Objectives (BC AAQO)[6] – Provincial
- Air Monitoring Site Selection and Exposure Criteria (2013) – Provincial
- Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators (2016) – Provincial
- Pollution Control Objectives (1979) – Provincial

A table of applicable Air Quality Objectives based on the documents listed above is included in Table 3. A description is provided for each of the indicator compounds included in Table 3, in the following sub-sections.

4.2.1.1 Particulate Matter

Particulate Matter (PM) is a mixture of solid and liquid particles found in air from sources such as dust, dirt and smoke. PM is often defined in terms of size fractions. Total suspended particulate (TSP) includes all size fractions of particles which typically remain suspended in the air for some time. Inhalable particles with diameters less than 10 µm are called PM_{10}. Fine inhalable particles with diameters less than 2.5 µm in diameter are called $PM_{2.5}$. PM_{10} and $PM_{2.5}$ are subsets within TSP.

Particles less than 10 µm are of most concern for human health, because they can irritate the lungs and can enter the bloodstream, causing both acute and chronic health challenges[7]. Air quality objectives for PM are generally based on PM_{10} and $PM_{2.5}$ levels due to greater health concerns associated with these inhalable particles.

[5] British Columbia Ministry of Environment. (2015). British Columbia Air Quality Dispersion Modelling Guideline. Retrieved from https://www.bcogc.ca/node/13339/download
[6] British Columbia Ministry of Environment. (2020). Ambient Air Quality Objectives. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf.
[7] United States Environmental Protection Agency. (2020, April 13). *Health and Environmental Effects of Particulate Matter (PM)*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm

Expected sources of PM from the Project include coal dust, overburden dust, unpaved roads, and construction activities.

4.2.1.2 Sulphur Oxides

Sulphur oxides (SO_x), generally in the form of sulphur dioxide (SO_2), are produced from the combustion of fossil fuels containing sulphur. SO_2 can affect both human health and the environment, causing harm to the human respiratory system and damaging trees and plants[8].

Expected sources of SO_2 from the Project include blasting as well as industrial equipment that uses fossil fuels such as boilers and generators.

4.2.1.3 Nitrogen Dioxide

Nitrogen dioxide (NO_2) is used as the indicator for the larger groups of nitrogen oxides (NO_X) which include nitrogen oxide (NO) and NO_2. The group is highly reactive with other atmospheric compounds. It is produced primarily from the burning of fossil fuels. NO_2 can damage the human respiratory system and aggravate respiratory diseases. In the environment, NO_2 can react with water, oxygen and other chemicals in the air to form acid rain[9].

Expected sources of NO_2 from the Project include mobile equipment such as trucks and bulldozers, as well as fuel combustion equipment such as generators and boilers.

4.2.1.4 Carbon Monoxide

Carbon Monoxide (CO) is produced due to incomplete combustion of fossil fuels. CO is a commonly occurring contaminant that is derived from activities such as fuel use in vehicles, fuel burning appliances and heating systems.

The latest version of B.C. Ambient Air Quality Objectives (Provincial Air Quality Objective Information Sheet; updated Feb, 28, 2020) removed CO from the contaminant list. The air quality objective for CO is taken from a former version of B.C. Ambient Air Quality Objectives publication (updated Oct, 21, 2014) and is provided for reference only.

Expected sources of CO from the Project include mobile equipment such as trucks and bulldozers, as well as industrial equipment such as generators and comfort heating.

[8] United States Environmental Protection Agency. (2019, April 2). *Sulfur Dioxide (SO2) Pollution*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/so2-pollution/sulfur-dioxide-basics

[9] United States Environmental Protection Agency. (2016, September 8). *Nitrogen Dioxide (NO2) Pollution*. Retrieved from United States Environmental Protection Agency: https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2

4.2.1.5 Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are a large group of chemicals present in air. Examples include toluene, benzene and formaldehyde. Sources include vehicle emissions, building materials, and wood combustion. Short-term exposure can cause breathing problems and irritation of eyes, nose and throat[10].

The main source of VOCs from the Project will be the use of fuel in the locomotive engine.

4.2.1.6 Metals and Polycyclic Aromatic Hydrocarbons in Dustfall

Dustfall is the measure of the amount of PM that is deposited on the ground or other surfaces in a given amount of time, and over a defined area. Metals and PAHs may be present in the dustfall, deposited from coal and overburden dust from Project activities such as blasting, mobile equipment use and loading and unloading of coal.

4.2.1.7 Air Quality Criteria

British Columbia Ambient Air Quality Objectives (AAQO) and Canadian Ambient Air Quality Standards (CAAQS) currently in effect for the indicator compounds for the Project are shown in Table 3. The AAQO was used to evaluate baseline air quality conditions in the LSA. Additionally, the 2025 CAAQS for NO_2 and SO_2 have been included in the AAQO.

Table 3: Applicable Ambient Air Quality Objectives

Contaminant	Averaging Period	Air Quality Concentration [µg/m^3]	Source
NO_2	1 hr	188	Interim Provincial AQO [1]
	1 hr	113	2020 CAAQS [2]
	1 hr	79	2025 CAAQS[3]
	Annual	60	Interim Provincial AQO [1]
	Annual	32	2020 CAAQS [2]
	Annual	23	2025 CAAQS[3]
$PM_{2.5}$	24 hr	25	Provincial AQO [4]
	24 hr	27	2020 CAAQS [2]
	Annual	8	Provincial AQO [4]
	Annual	8.8	2020 CAAQS [2]
PM_{10}	24 hr	50	Provincial AQO [4]

[10] Government of Canada. (2021, January 15). *Volatile organic compounds*. Retrieved from Government of Canada: https://www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/volatile-organic-compounds.html

Contaminant	Averaging Period	Air Quality Concentration [µg/m^3]	Source
SO_2	1 hr	196	Interim Provincial AQO [1]
	1 hr	183	2020 CAAQS [2]
	1 hr	170	2025 CAAQS[3]
	Annual	13	2020 CAAQS [2]
	Annual	10	2025 CAAQS[3]
TSP	24 hr	120	NAAQO [5]
	Annual	60	NAAQO [5]
CO	1 hr	14,300	PCO [6]
	8 hr	5,500	PCO [6]

Notes:
Bold – represents most stringent values and those that will be used in assessment

1. Interim Provincial Air Quality Objectives - NO_2 objectives are currently under review
2. Canadian Council of Ministers of the Environment: 2020 Canadian Ambient Air Quality Standards
3. Canadian Council of Ministers of the Environment: 2025 Canadian Ambient Air Quality Standards
4. Provincial Air Quality Objectives
5. Canadian Council of Ministers of the Environment: Canadian National Ambient Air Quality Objectives
6. Pollution Control Objectives for food-processing, agriculturally orientated, and other misc. industries

4.3 Greenhouse Gases

Project operations have the potential to emit greenhouse gases (GHGs), specifically, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). GHG emissions can be generated from Project activities such as use of mobile equipment and natural gas combustion. The Canadian Environmental Assessment Agency (CEAA) was consulted for the consideration of GHGs in the environmental assessment for the Project.

There are currently no specific regulations that govern GHG emissions from the Project, however, there are relevant reporting thresholds and carbon reduction targets set by the federal and provincial governments. At a federal level, Environment and Climate Change Canada's (ECCC) Greenhouse Gas Reporting Program collects information on GHG emissions from facilities across Canada. It is a mandatory program for facilities that emit 10,000 tonnes or more of GHGs in carbon dioxide equivalent units (CO_2e) per year. At a provincial level, facilities emitting over 10,000 tonnes of CO_2e per year must report to the B.C. Ministry of Environment and Climate Change Strategy (ENV) under the *Greenhouse Gas Emission Reporting Regulation*.

The Canadian Environmental Assessment Agency (CEAA) has guidance for incorporating the impact of the Project on climate change in environmental assessments, that recommends a comparison of Project specific GHG emissions with sectoral, provincial, and national [11].

[11] The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment. (November 2003). *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*. Catalogue No. EN106-50/2003E-PDF. ISBN 0-662-35454-0.

5.0 Existing Conditions Characterization

An air quality baseline assessment program was completed in 2020 to assess the existing air quality at Crown Mountain; full details of the program are documented in Dillon Consulting Limited's *Air Quality Baseline Report*[12]. The Air Quality Baseline Report (Appendix A) details the methodology and findings from the air quality baseline program that was conducted to meet provincial and federal requirements outlined in the AIR and the Environmental Impact Statement (EIS) Guidelines for the Project.

Four baseline analyses were completed:

1. Meteorological and climatic baseline;
2. Common air contaminants baseline;
3. GHG emissions baseline; and
4. Dustfall baseline.

A summary of each scope is presented in the following subsections.

5.1 Meteorological and Climatic Baseline Conditions

The AIR requires that baseline climatic conditions both at a site-specific and regional level be characterized. Local meteorological and regional climatic data were collected from the local air monitoring stations as well as ECCC meteorological stations in Sparwood.

The Project site is located 8 km east of Elk Valley Highway at Sparwood municipality. The Elk Valley Highway runs north to south with terrain elevation ranging from approximately 1,100 to 1,300 meters above sea level (masl). There are two communities along this highway, Sparwood and Elkford, as shown in Figure 1. The terrain elevation at the Project site is approximately 1,500 masl and the terrain elevation on the north and south side of the Project site reach greater than 2,300 masl.

5.1.1 Meteorological Baseline

To characterize the local meteorological conditions around the Project site, data from multiple meteorological stations with either hourly or daily observations was analyzed, as follows:

- Sparwood CS (hourly)
- Cranbrook Airport (hourly)
- Crowsnest (hourly)
- Fording River Cominco (daily)
- Sparwood CS (daily)
- Fernie (daily)

[12] Dillon Consulting Limited, May 2020. Air Quality Baseline Report- Crown Mountain Coking Coal Project.

Based on the preliminary assessment of hourly wind data, it was concluded that stations selected to represent the meteorological conditions around the Project should be located within the Elk Valley due to the strong influence of the local topography on the local meteorological conditions. Thus, the meteorological data collected from the three stations within the Elk Valley (Sparwood CS, Fernie, and Fording River Cominco) are considered to be representative of regional baseline meteorological conditions. The approximate location of climatic and air quality stations are illustrated in Figure 4

Among the air monitoring stations, the Sparwood CS Station was considered to be the best representative of the site-specific meteorological baseline due to its proximity to the Project site and availability of data. The wind data measured at the Sparwood CS station were analyzed using a windrose for the 5-year period from 2014 to 2018. Figure 5 shows the prevailing winds measured at Sparwood CS station. The predominant wind directions measured at this station were the northerly and southerly directions. The most frequent winds were from the south. Figure 6 shows a frequency distribution for wind speed at the Sparwood CS station, which indicates more than 75% of wind speeds during the period were below 4 m/s with 5% calm conditions (i.e., wind speeds below 0.5 m/s).

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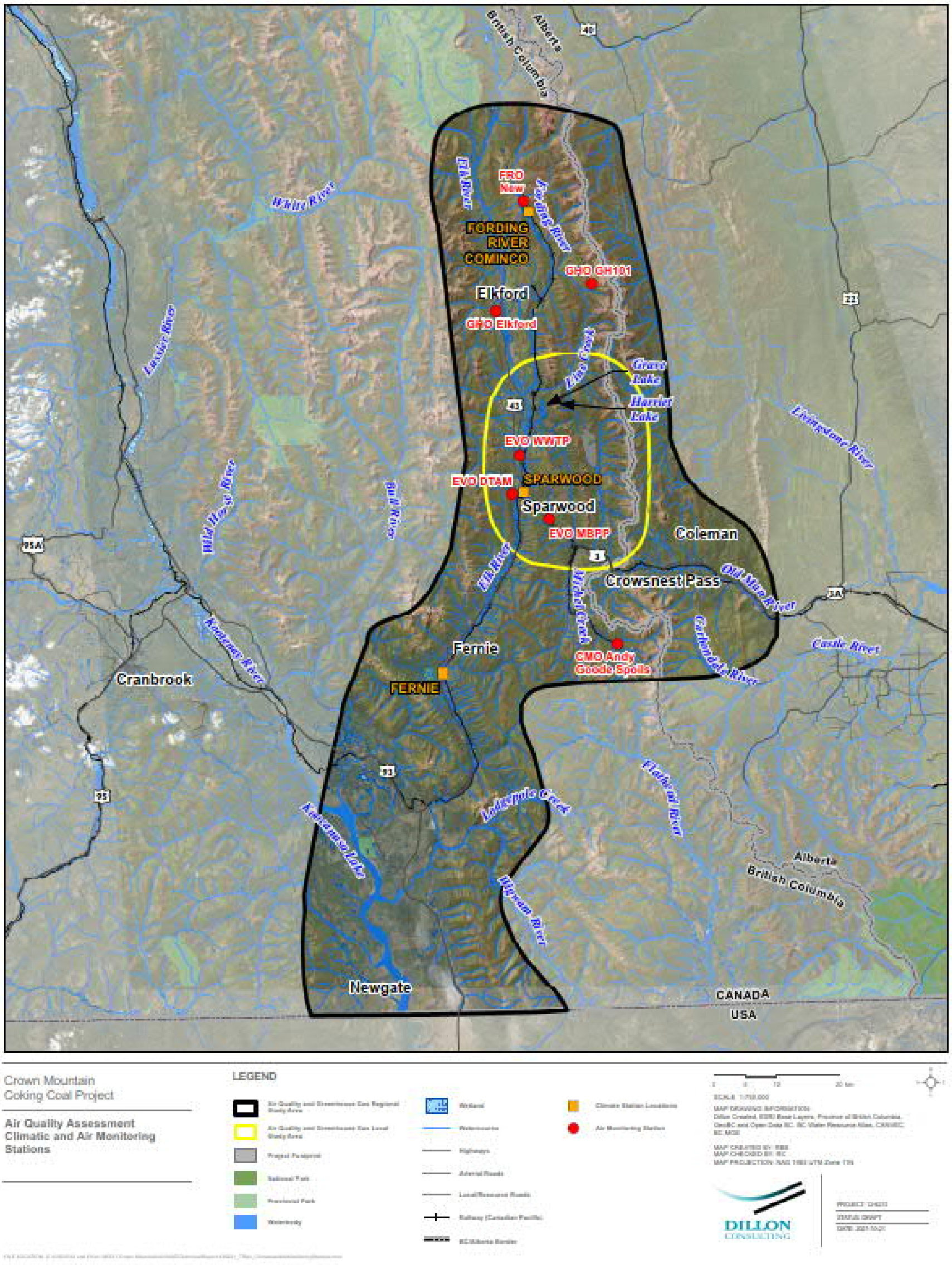


Figure 4: Climatic and Air Monitoring Stations

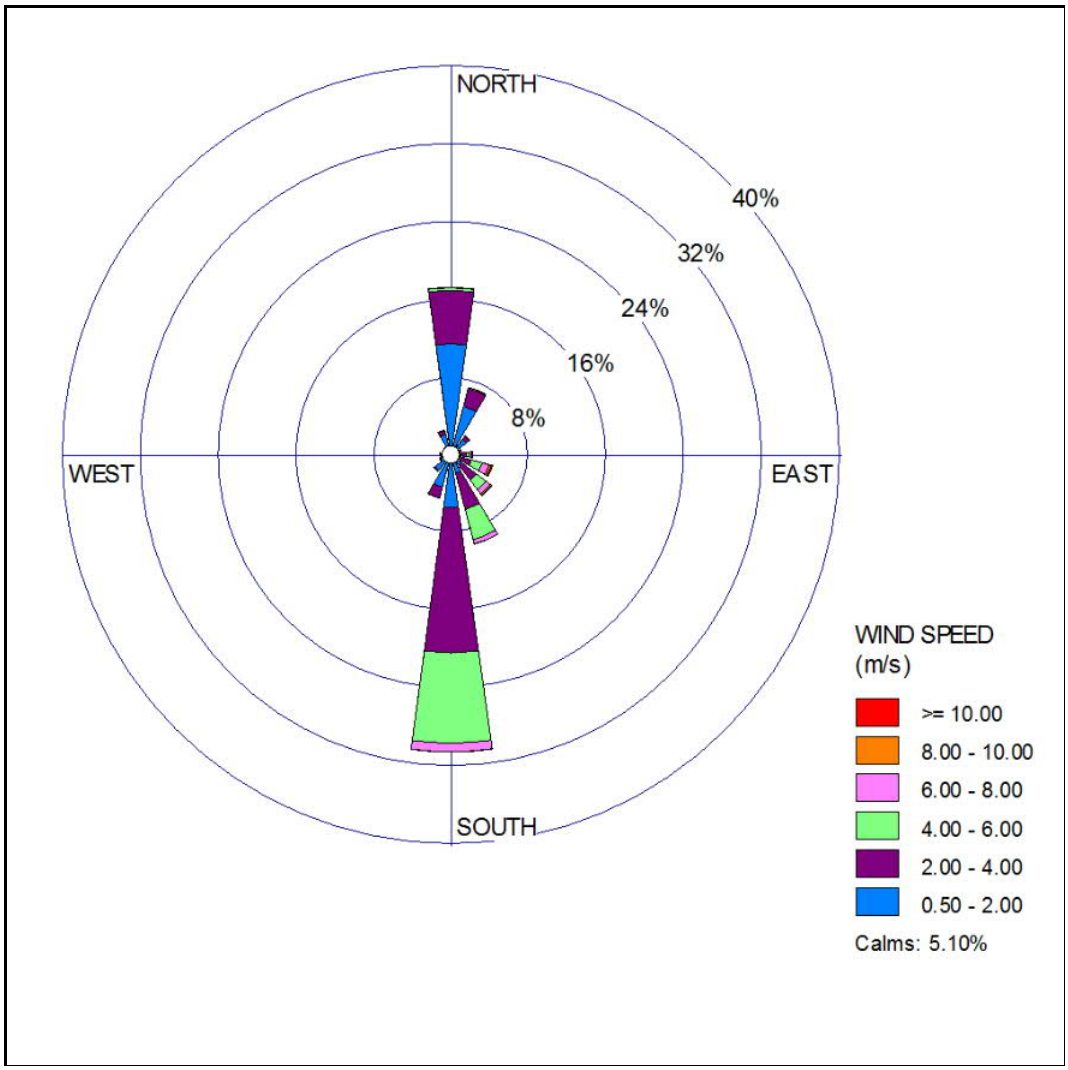


Figure 5: Windrose at Sparwood CS (2014-2018; Blowing From)

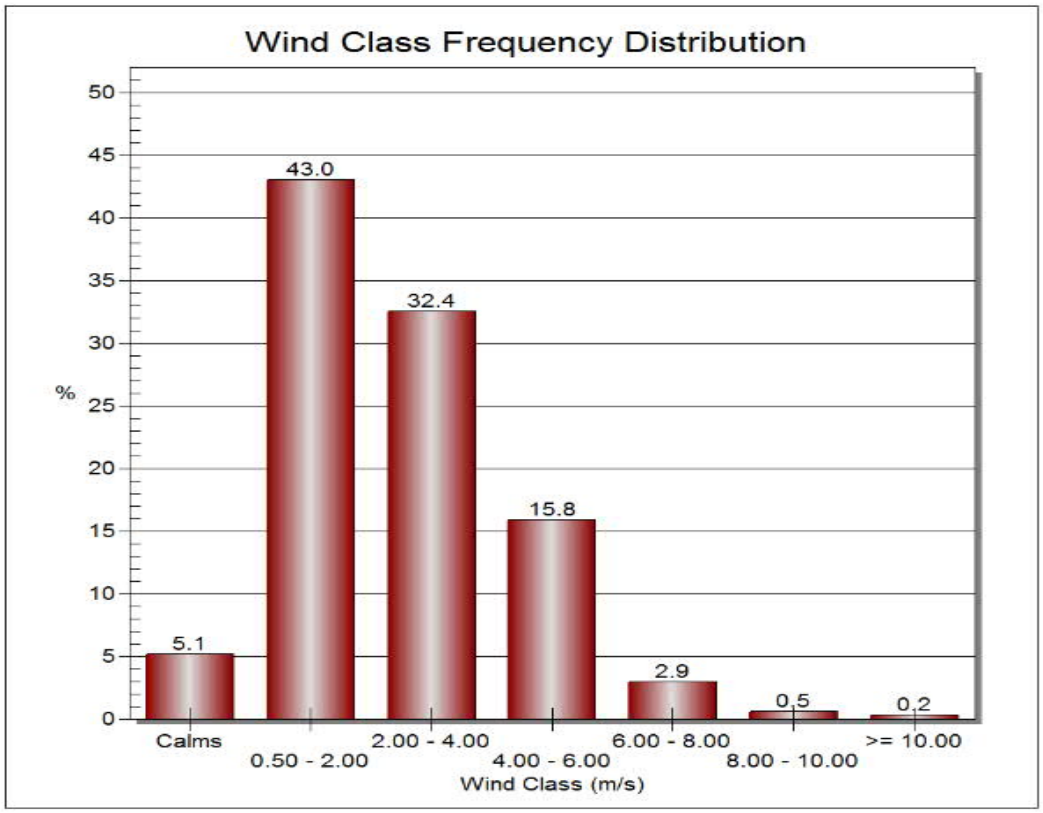


Figure 6: Wind Class Frequency Distribution at Sparwood CS station (2014-2018)

5.1.2 Climatic Baseline

To characterize climatic conditions at the Project site, the last 30 years of climate normals data (from 1981 to 2010) were obtained from the Government of Canada's Climate Normals Online Database for the Sparwood station (Climate ID: 1157630)[13]. Climate normals are compiled by ECCC every decade and represent average meteorological conditions. Key meteorological parameters between 1981 and 2010 year including temperature and precipitation are summarized in Table 4.

Table 4: Climate Normals at the Sparwood Station

1981 to 2010 Canadian Climate Normals Station Data – Sparwood Climate ID: 1157630													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature (°C)													
Daily Average	-6.5	-4.5	0.2	4.8	9.1	12.7	15.8	15.5	10.5	4.8	-2	-7.3	4.4
Daily Maximum	-2.2	0.5	5.4	10.9	15.9	19.6	23.8	24.2	18.2	10.7	1.7	-3.4	10.4
Daily Minimum	-10.7	-9.6	-5.1	-1.3	2.3	5.8	7.7	6.7	2.9	-1.1	-5.6	-11.3	-1.6
Extreme Maximum	11.9	13.8	20.6	25.6	31.3	32.5	34.9	36.5	34.2	27.2	16.9	10.5	-
Precipitation													
Rainfall (mm)	17.3	12.4	17.0	27.9	52.0	67.7	46.8	34.8	43.4	39.6	39.1	13.2	411.0
Snowfall (cm)	50.4	37.0	31.7	17.4	8.6	1.8	0.0	0.1	4.2	11.3	47.3	54.2	264.0
Precipitation (mm)	53.9	40.9	44.2	41.4	60.4	69.3	46.8	34.9	47.4	48.8	72.1	53.4	613.3

To identify the trend of climatic conditions at the Project area, the available temperature data from 2014-2018 for the Sparwood station were analyzed and compared with the temperature data collected from the decades between 1981 and 2010. Figure 7 shows the maximum, average, and minimum temperate for the 2014-2018 period are all above the corresponding temperate summaries for the period from 1981 to 2010, which indicates the Project area is warmer from 2014-2018. The wind monitoring data for the Sparwood station from 2014-2018 were not sufficient to make a meaningful comparison. More specifically, only the wind speed of daily max gust is measured at the Sparwood station and a significant portion of max gust is recorded as below 31km/hr.

[13] Retrieved from: https://climat.weather.gc.ca/climate_normals/index_e.html

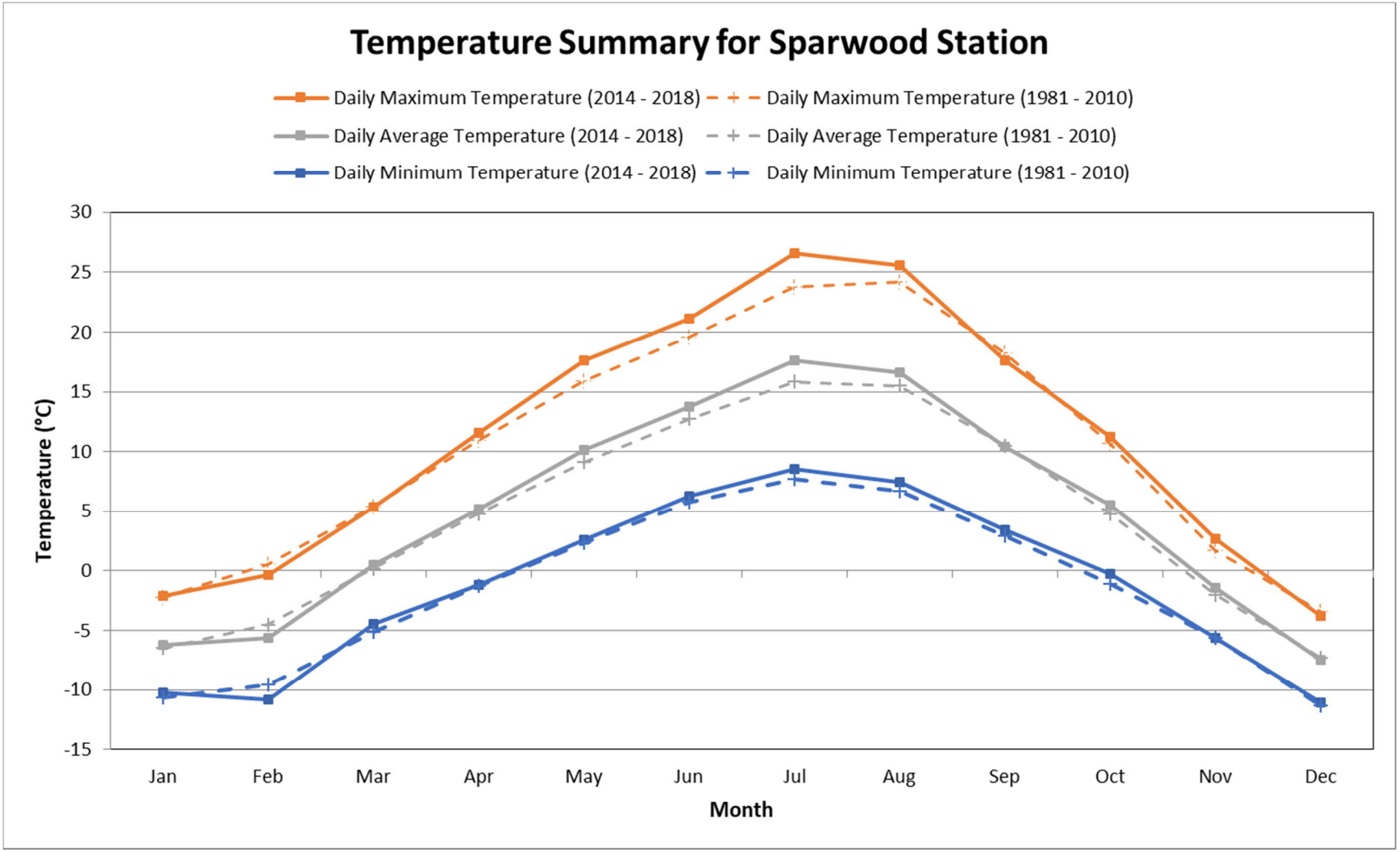


Figure 7: Temperature Summary for Sparwood Station

5.2 Common Air Contaminants

The evaluation of baseline conditions for common air contaminants involved an analysis of background levels of the following:

- Nitrogen Dioxide (NO_2);
- TSP;
- PM_{10};
- $PM_{2.5}$;
- Carbon Monoxide (CO); and
- Sulphur Dioxide (SO_2).

The selection of these contaminants was based on requirements of the AIR along with data availability from local air monitoring stations. Volatile Organic Compounds (VOCs) were not included in the baseline assessment due to the lack of available monitoring data.

Existing monitoring data for the contaminants were obtained for 5 years from BC's Ministry of Environment and Climate Change Strategy (ENV) from different Teck Coal Limited monitoring stations presented in Table 5. These stations collect data at nearby municipalities (Fernie, Sparwood, Elkford), and existing mining operations.

Table 5: Air Quality Monitoring Stations

Station Name	Study Area	Closest Proximity	Station ID	UTM Coordinates (m)
CMO Andy Goode Spoils (AGS)	Regional	Coal Mountain Operations – Teck Coal Limited	E297251	667586, 5488250
EVO DTAM	Local	Elkview Operations – Teck Coal Limited	E262137	650720, 5512289
EVO MBPP	Local	Elkview Operations – Teck Coal Limited	E206193	656547, 5508176
EVO WWTP	Local	Elkview Operations – Teck Coal Limited	0250184	651925, 5518371
FRO New	Regional	Fording River Operations – Teck Coal Limited	E297832	652552, 5559060
GHO GH101	Regional	Greenhills Operations – Teck Coal Limited	E206190	663474, 5545817
GHO Elkford	Regional	Municipality of Elkford Greenhills Operations – Teck Coal Limited	E290310	648058, 5541544

ENV has stated that it will not endorse the quality of the data and that it will be the proponent's obligation to do so. As such, Dillon reviewed the data based on, but not limited to, the following:

- Review that the station locations adhere to ENV's siting criteria as detailed in the BC Ministry of Environment *Air Monitoring Site Selection and Exposure Criteria*;
- Verify station compliance with guidance documents provided by ENV;
- Review the data for completeness; and

- Perform qualitative and quantitative evaluations of the data to identify any gaps or outliers within the dataset.

An initial data gap analysis was conducted following the BC MOE Air Dispersion Modelling Guideline (Modelling Guideline). The data sets for each station were deemed sufficient and three years of data was available compared to the one year period recommended in the Modelling Guideline. Following the initial data gap assessment, an analysis of the stations was completed to determine the most appropriate for use in the LSA. Further details on station selection and data gap analysis is provided in the Baseline Report. Four criteria were considered including, contaminant data availability, data quality, geographic location, local influence of station results. Based on the criteria listed above, the two following stations were selected to represent the local baseline air quality:

1. EVO Downtown Sparwood Centennial Square (EVO DTAM)
2. Whispering Winds Trailer Park (WWTP)

Measured concentrations of particulates and gasses at the above stations between 2014 and 2016 were analyzed for baseline concentrations of CACs. As TSP monitoring data is not available at the above LSA stations (EVO DTAM and WWTP), TSP concentrations measured at the CMO Andy Goode Spoil (AGS) station (ID E297251) in the RSA was used as background. Note the AGS station is located at a reclaimed refuse spoil northwest of the active mining area and therefore the use of TSP measurements as background is considered to be conservative.

Table 6 summarizes the monitoring data at the selected stations that were used for determining baseline concentrations as well as the time-averaged concentrations of monitored contaminants at each station.

Table 6: Air Monitoring Station Data Summary

Contaminant	Station	Data Period	Averaging Period	Baseline Air Concentration ($\mu g/m^3$)
NO_2	EVO DTAM	Jan 2014 – Dec 2016	1 hr	29.4 [1]
			Annual	7.4 [6]
SO_2	EVO DTAM	Jan 2014 – Dec 2016	1 hr	2.4 [2]
			Annual	0.8 [6]
CO	EVO DTAM	Jan 2014 – Dec 2016	1 hr	647.6 [3]
			8 hr	786.9 [4]
TSP	CMO AGS	Jan 2014 – Dec 2016	24 hr	59.9 [5]
			Annual	15.2 [6]
PM_{10}	EVO DTAM	Jan 2014 – Dec 2016	24 hr	29.8 [5]
	WWTP	Jan 2014 – Dec 2016	24 hr	27.6 [5]

Contaminant	Station	Data Period	Averaging Period	Baseline Air Concentration (µg/m^3)
$PM_{2.5}$	EVO DTAM	Jan 2014 – Dec 2016	24 hr	22.4 [5]
			Annual	5.6 [6]
	WWTP	Jan 2014 – Dec 2016	24 hr	17.0 [5]
			Annual	4.8 [6]

Notes:
1. NO_2 value is based on 98th percentile of daily maximum 1-hour value
2. SO_2 value is based on 99th percentile of daily maximum 1-hour value
3. CO 1-hr value is based on 98th percentile of 1-hour values
4. CO 8-hr value is based on 98th percentile of rolling 8-hr average
5. $PM_{2.5}$,PM_{10}, and TSP are based on the 98th percentile of 24-hour averages
6. Annual averages use the annual mean of 1 hour values over the entire data set

The *BC AQDMG* specifies that when multiple monitoring sites are being used to represent local baseline air quality, the arithmetic average of these stations is calculated to represent what the baseline air quality value should be for each contaminant. Table 7 provides a summary of this data along with each contaminant's percent contribution to *BC AAQO*.

Table 7: Percent Contribution to BC AAQO

Contaminant	Averaging Period	Baseline Air Concentration (µg/m3)	Air Quality Objective (µg/m3)	Criteria	Percent Contribution to Objective
NO_2	1 hr	29.4 [1]	113	2020 CAAQS	26.0%
	Annual	7.4 [6]	32	2020 CAAQS	23.0%
SO_2	1 hr	2.4 [2]	183	2020 CAAQS	1.3%
	Annual	0.8 [6]	13	2020 CAAQS	6.1%
CO	1 hr	647.6 [3]	14,300	PCO*	4.5%
	8 hr	786.9 [4]	5,500	PCO*	14.3%
PM_{10}	24 hr	28.7 [5]	50	Provincial AQO	57.3%
$PM_{2.5}$	24 hr	19.7 [5]	25	Provincial AQO	78.8%
	Annual	5.2 [6]	8	Provincial AQO	64.8%
TSP	24 hr	59.9 [5]	120	NAAQO	49.9%
	Annual	15.2 [6]	60	NAAQO	25.3%

Notes:
1. NO_2 value is based on 98th percentile of daily maximum 1-hour value
2. SO_2 value is based on 99th percentile of daily maximum 1-hour value
3. CO 1-hr value is based on 98th percentile of 1-hour values
4. CO 8-hr value is based on 98th percentile of rolling 8-hr average
5. $PM_{2.5}$, PM_{10}, and TSP are based on the 98th percentile of 24-hour averages
6. Annual averages use the annual mean of 1 hour values over the entire data set

* PCO: Pollution Control Objectives for food-processing, agriculturally orientated, and other misc. industries

5.3 Greenhouse Gases

Baseline GHG emissions were estimated for local and regional areas. GHG emission calculations followed provincial and federal guidelines, namely:

- Federal: Environment and Climate Change Canada (2021) National Inventory Report 1990-2019: Greenhouse Gas Sources and Sinks in Canada (ECCC NIR); and
- Provincial: best industry practices such as those prescribed under the *Greenhouse Gas Industrial Reporting and Control Act.*

Total GHG emissions from BC and sector specific emissions, particularly emissions from the mining sector, were considered in the evaluation. The best available estimate of BC's reported GHG emissions is provided in the ECCC NIR. GHG emissions from all of Canada are also documented below for context. Results are documented in megatonnes tonnes of CO_2 equivalents (Mt CO_2e).

A review of the 2019 GHG emissions summary from the ECCC NIR shows that:

- GHG emissions from all of Canada equate to an annual average of 730 Mt CO_2e ;
- GHG emissions from the mining sector across Canada had an annual average of 7.8 Mt CO_2e ;
- GHG emissions from BC had an annual average of 65.7 Mt CO_2e;
- GHG emissions from the mining sector in BC had an annual average of 1.5 Mt CO_2e.
- GHG fugitive emissions from coal mines had an annual average of 1.0 Mt CO_2e.

Through the course of the Project, it is expected that both GHG sources and sinks within the Project area will change.

5.4 Dustfall

A baseline monitoring program included measurement of dustfall within and surrounding the Project area. A field sampling program was carried out from October 2018 to October 2019 with samples collected from nine (9) dust monitoring locations through seven (7) sampling events. Sampling was conducted in accordance with ASTM Method D1739-98. Details on the dust monitoring locations, sample dates, etc. can be found in Dillon's *Air Quality Baseline Report* provided in Appendix A.

Total dustfall results are summarized on a monthly basis in Table 8 below. Further observations are provided in *Dillon's Air Quality Baseline Report*.

Table 8: Total Dustfall Monitoring Results

Station ID	Units	November 2018	June 2019	July 2019	August 2019	September 2019	October 2019
DM-2	mg/dm^2.day	1.66	0.91	0.8	NA	1.13	1.82
DM-3	mg/dm2.day	1.64	0.78	0.76	0.36	0.79	1.12
DM-6	mg/dm^2.day	0.63	0.55	0.61	0.11	0.52	0.72
DM-7	mg/dm^2.day	0.66	0.84	0.7	0.77	0.94	0.52
DM-8	mg/dm^2.day	0.4	0.86	0.91	0.2	0.92	0.73
DM-9	mg/dm^2.day	0.39	0.51	0.32	0.1	0.39	0.34
DM-10	mg/dm^2.day	NA	1.12	0.1	0.1	0.41	0.51
DM-11	mg/dm^2.day	0.41	0.38	0.45	0.33	0.16	0.96
DM-12	mg/dm^2.day	1.11	NA	0.83	0.28	0.62	0.93

Notes:
NA - No sample available for analysis
Month represents month of dustfall sample canister collection.

Average and maximum values of total dustfall at each station are presented in Table 9 below. Following BC AQDMG, the arithmetic average of maximum dustfall concentrations measured at all monitoring stations are calculated to represent dustfall baseline level for the LSA and RSA. AIthough BC AQDMG recommends at least of one (1) year of monitoring data to be representative of the area, using the arithmetic average of maximum dustfall concentrations at all monitoring stations within the study area gives a conservative estimate of baseline.

Table 9: Average and Maximum Dustfall Results

Station ID	Average [mg/dm^2.day]	Maximum [mg/dm^2.day](1)
DM-2	1.26	1.82
DM-3	0.91	1.64
DM-6	0.52	0.72
DM-7	0.74	0.94
DM-8	0.67	0.92
DM-9	0.34	0.51
DM-10	0.45	1.12
DM-11	0.45	0.96
DM-12	0.75	1.11
Average of maximum measured dustfall [mg/dm^2.day]		1.08

Metal results are presented in Table 10, which provides average and maximum values for each station through the duration of the 6 month dustfall monitoring program. The arithmetic average of the maximum metal concentration at all measurement stations were estimated to represent metals composition in dustfall and in suspended particulates for the RSA and LSA.

Polycyclic Aromatic Hydrocarbons (PAHs) concentrations were not analysed for the collected dustfall, as discussion with the laboratory indicated that analysis for PAHs in dustfall cannot be completed. Long term sampling of PAHs in dustfall would not be a representative method to quantify PAHs due to their volatility. Field notes, photo logs and laboratory certificates of analysis are appended to Dillon's *Air Quality Baseline Report*. Metals and PAHs in dustfall are evaluated but are not included in the residual air quality effects assessment due to the lack of federal and provincial air quality objectives. However, the results of metal and PAHs in dustfall as well as VOCs are used for other disciplines of the environmental assessments such as human and terrestrial wildlife health assessment.

Table 10: Dustfall Metal Results

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																		Average of Max Values
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
Aluminum (Al)	5.4E-3	1.1E-2	2.2E-3	3.1E-3	2.0E-3	3.5E-3	3.5E-3	5.7E-3	2.8E-3	4.5E-3	1.5E-3	2.2E-3	1.9E-3	4.1E-3	2.4E-3	4.0E-3	2.3E-3	2.8E-3	4.5E-3
Antimony (Sb)	2.9E-6	4.8E-6	2.2E-6	3.9E-6	3.5E-6	8.4E-6	3.1E-6	6.6E-6	3.2E-6	7.2E-6	1.6E-6	3.2E-6	2.4E-6	5.0E-6	2.0E-6	5.4E-6	4.8E-6	6.8E-6	5.7E-6
Arsenic (As)	2.1E-5	7.7E-5	1.6E-5	7.3E-5	1.6E-5	7.8E-5	1.8E-5	8.0E-5	1.7E-5	7.6E-5	8.5E-6	3.9E-5	1.8E-5	7.3E-5	1.5E-5	7.2E-5	3.9E-6	5.0E-6	6.4E-5
Barium (Ba)	5.2E-4	8.0E-4	2.1E-4	3.0E-4	1.9E-4	3.1E-4	3.2E-4	4.0E-4	1.1E-3	2.3E-3	1.1E-4	1.7E-4	1.4E-4	4.2E-4	1.3E-4	2.6E-4	2.2E-4	3.3E-4	5.9E-4
Beryllium (Be)	9.9E-6	2.2E-5	8.4E-6	1.9E-5	1.1E-5	2.7E-5	1.5E-5	3.3E-5	1.5E-5	3.6E-5	7.8E-6	1.6E-5	1.2E-5	2.5E-5	9.9E-6	2.7E-5	1.1E-5	2.4E-5	2.5E-5
Bismuth (Bi)	1.3E-5	2.2E-5	2.1E-5	5.8E-5	1.6E-5	3.3E-5	1.5E-5	3.3E-5	1.7E-5	3.6E-5	1.1E-5	1.6E-5	1.7E-5	3.7E-5	1.1E-5	3.0E-5	1.7E-5	2.5E-5	3.2E-5
Boron (B)	2.0E-4	4.3E-4	1.8E-4	3.9E-4	2.3E-4	5.4E-4	2.9E-4	6.6E-4	3.1E-4	7.2E-4	1.6E-4	3.2E-4	2.4E-4	5.0E-4	2.0E-4	5.4E-4	2.2E-4	4.7E-4	5.1E-4
Cadmium (Cd)	2.2E-6	3.2E-6	3.5E-6	1.3E-5	1.2E-6	2.7E-6	1.6E-6	3.3E-6	2.3E-6	6.3E-6	1.0E-6	1.6E-6	2.9E-6	4.8E-6	1.4E-6	4.1E-6	5.1E-6	1.5E-5	6.0E-6
Calcium (Ca)	2.7E-2	4.3E-2	2.6E-2	3.0E-2	1.0E-2	1.8E-2	1.4E-2	2.4E-2	1.5E-2	2.2E-2	9.1E-3	1.5E-2	1.3E-2	2.1E-2	1.2E-2	2.4E-2	1.4E-2	1.8E-2	2.4E-2
Chromium (Cr)	1.5E-5	2.2E-5	8.9E-6	1.9E-5	1.3E-5	3.5E-5	1.5E-5	3.3E-5	1.6E-5	3.6E-5	7.8E-6	1.6E-5	1.7E-5	3.7E-5	1.2E-5	2.7E-5	1.3E-5	2.4E-5	2.8E-5
Cobalt (Co)	8.1E-6	1.2E-5	4.1E-6	6.9E-6	3.4E-6	5.4E-6	5.4E-6	6.6E-6	5.2E-6	7.2E-6	2.1E-6	3.2E-6	3.5E-6	7.1E-6	2.8E-6	5.4E-6	3.7E-6	4.7E-6	6.5E-6
Copper (Cu)	2.7E-4	6.4E-4	3.9E-4	7.6E-4	1.8E-4	3.4E-4	3.4E-4	9.7E-4	2.9E-4	9.2E-4	4.0E-4	1.1E-3	3.1E-4	9.0E-4	2.4E-4	8.7E-4	4.1E-4	1.2E-3	8.6E-4
Iron (Fe)	7.5E-3	1.0E-2	4.2E-3	5.4E-3	2.9E-3	5.3E-3	6.0E-3	9.7E-3	3.9E-3	6.3E-3	2.2E-3	2.9E-3	2.9E-3	6.9E-3	3.2E-3	6.1E-3	4.5E-3	6.0E-3	6.5E-3
Lead (Pb)	1.5E-5	2.4E-5	1.2E-5	1.8E-5	2.7E-4	1.6E-3	1.3E-5	1.9E-5	1.1E-5	1.8E-5	7.4E-6	1.0E-5	9.8E-6	1.9E-5	8.5E-6	1.3E-5	1.2E-5	1.8E-5	1.9E-4
Lithium (Li)	9.9E-5	2.2E-4	8.4E-5	1.9E-4	1.1E-4	2.7E-4	1.5E-4	3.3E-4	1.5E-4	3.6E-4	7.8E-5	1.6E-4	1.2E-4	2.5E-4	9.9E-5	2.7E-4	1.1E-4	2.4E-4	2.5E-4
Magnesium (Mg)	7.4E-3	8.8E-3	8.0E-3	1.0E-2	2.5E-3	3.4E-3	3.6E-3	4.9E-3	4.0E-3	5.7E-3	2.3E-3	2.8E-3	4.0E-3	6.8E-3	2.7E-3	4.5E-3	4.2E-3	6.1E-3	5.9E-3
Manganese (Mn)	2.9E-4	4.4E-4	2.2E-4	2.7E-4	1.1E-4	1.8E-4	2.1E-4	3.3E-4	1.8E-4	2.3E-4	1.1E-4	1.6E-4	1.5E-4	2.5E-4	1.5E-4	3.5E-4	1.4E-4	1.6E-4	2.6E-4
Molybdenum (Mo)	3.5E-6	6.5E-6	2.5E-6	5.8E-6	1.3E-6	2.7E-6	2.7E-6	6.6E-6	2.1E-6	3.6E-6	1.0E-6	1.6E-6	2.2E-6	4.5E-6	2.0E-6	5.4E-6	3.2E-6	4.7E-6	4.6E-6
Nickel (Ni)	3.6E-5	5.4E-5	2.0E-5	3.1E-5	1.7E-5	3.2E-5	2.3E-5	3.3E-5	2.5E-5	3.6E-5	1.0E-5	1.6E-5	1.7E-5	3.5E-5	1.3E-5	2.7E-5	1.6E-5	2.4E-5	3.2E-5

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																		Average of Max Values
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12		
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	
Phosphorus (P)	3.3E-3	5.6E-3	1.5E-2	3.5E-2	2.3E-3	5.1E-3	4.7E-3	1.5E-2	4.4E-3	1.5E-2	3.7E-3	6.6E-3	7.3E-3	1.6E-2	4.0E-3	9.1E-3	9.6E-3	1.5E-2	1.4E-2
Potassium (K)	8.4E-3	1.4E-2	2.2E-2	4.8E-2	4.8E-3	9.0E-3	8.8E-3	2.6E-2	8.2E-3	2.3E-2	7.7E-3	1.0E-2	1.7E-2	3.2E-2	7.2E-3	1.2E-2	1.5E-2	2.9E-2	2.3E-2
Selenium (Se)	2.0E-5	4.3E-5	1.7E-5	3.9E-5	2.3E-5	5.4E-5	2.9E-5	6.6E-5	3.1E-5	7.2E-5	1.6E-5	3.2E-5	2.4E-5	5.0E-5	2.0E-5	5.4E-5	2.2E-5	4.7E-5	5.1E-5
Silicon (Si)	8.1E-3	1.7E-2	3.4E-3	5.3E-3	2.9E-3	4.4E-3	5.1E-3	9.2E-3	3.8E-3	5.3E-3	2.3E-3	3.7E-3	2.9E-3	6.0E-3	4.0E-3	8.3E-3	3.1E-3	4.2E-3	7.1E-3
Silver (Ag)	5.2E-7	8.1E-7	5.2E-7	1.7E-6	2.6E-7	5.4E-7	3.4E-7	6.6E-7	3.8E-7	7.2E-7	2.3E-7	3.2E-7	3.4E-7	5.8E-7	2.2E-7	5.4E-7	3.8E-7	6.0E-7	7.2E-7
Sodium (Na)	2.3E-3	5.9E-3	4.5E-3	1.2E-2	2.0E-3	5.8E-3	3.1E-3	6.1E-3	2.8E-3	6.3E-3	2.4E-3	3.3E-3	3.9E-3	6.7E-3	2.3E-3	9.0E-3	3.8E-3	6.1E-3	6.8E-3
Strontium (Sr)	9.7E-5	2.7E-4	5.2E-5	8.9E-5	3.8E-5	1.2E-4	6.2E-5	1.8E-4	6.2E-5	1.4E-4	3.1E-5	9.4E-5	4.3E-5	1.2E-4	3.8E-5	1.2E-4	6.0E-5	1.1E-4	1.4E-4
Thallium (Tl)	2.0E-6	4.3E-6	1.7E-6	3.9E-6	2.3E-6	5.4E-6	2.9E-6	6.6E-6	3.1E-6	7.2E-6	1.6E-6	3.2E-6	2.4E-6	5.0E-6	2.0E-6	5.4E-6	2.2E-6	4.7E-6	5.1E-6
Tin (Sn)	2.0E-6	4.3E-6	2.1E-6	6.2E-6	2.3E-6	5.4E-6	2.9E-6	6.6E-6	3.1E-6	7.2E-6	1.6E-6	3.2E-6	2.4E-6	5.0E-6	2.0E-6	5.4E-6	4.0E-6	1.3E-5	6.3E-6
Titanium (Ti)	2.0E-4	4.3E-4	1.7E-4	3.9E-4	2.3E-4	5.4E-4	2.9E-4	6.6E-4	3.1E-4	7.2E-4	1.6E-4	3.2E-4	2.4E-4	5.0E-4	2.0E-4	5.4E-4	2.2E-4	4.7E-4	5.1E-4
Uranium (U)	8.5E-7	1.2E-6	5.6E-7	9.1E-7	3.7E-7	6.2E-7	6.5E-7	1.1E-6	5.7E-7	7.5E-7	2.4E-7	3.2E-7	4.1E-7	9.8E-7	3.3E-7	7.1E-7	4.3E-7	6.8E-7	8.0E-7
Vanadium (V)	3.3E-5	6.5E-5	2.0E-5	3.9E-5	2.3E-5	5.4E-5	3.0E-5	6.6E-5	3.1E-5	7.2E-5	1.6E-5	3.2E-5	2.4E-5	5.0E-5	2.2E-5	5.4E-5	2.3E-5	4.7E-5	5.3E-5
Zinc (Zn)	1.7E-3	7.3E-3	6.2E-4	1.3E-3	8.6E-4	2.6E-3	9.8E-4	2.9E-3	9.3E-4	2.8E-3	6.0E-4	1.7E-3	8.0E-4	2.2E-3	5.8E-4	1.8E-3	8.9E-4	2.0E-3	2.7E-3

5.5 Past, Present and Foreseeable Developments

Existing projects and/or activities in the LSA and RSA were used as part of the Baseline Scenario as well as in combination with the Project Scenario to assess cumulative effects. The proposed and/or planned activities shown in Table 11 provide a summary of past, present, and reasonably foreseeable projects and activities that overlap either spatially or temporally (or both) with the Project. The list of projects and activities was developed from information obtained from the following sources:

- Alberta Major Projects Inventory;
- BC Major Projects Inventory (BC Ministry of Jobs, Tourism, and Skills Training, 2015);
- Mining Association of British Columbia;
- Exploration and Mining in Kootenay-Boundary Region, British Columbia (Katay, 2014);
- Map of Operating Mines and Selected Major Exploration Projects in BC from Exploration and Mining in British Columbia (2014);
- MINFILE reports for operating mines;
- BC EAO Project Information Centre (e-PIC);
- Canadian Environmental Assessment Registry;
- Alberta Environment and Parks, Environmental Assessment/EIAs; and
- Input from the Elk Valley CEMF (cumulative effects management framework) committee.

Table 11: Past, Present and Reasonably Foreseeable Future Projects and Physical Activities

Project or Physical Activities	Project / Activity Type	Proponent Description
Past		
Natural resource extraction	Mining	Past mining operations including Balmer, J-Area (Sparwood Operations), Natal Ridge, Michel Creek, Sparwood Ridge, and Hosmer Wheeler
Existing		
Elkview Operations	Mining	Operation of an open pit coal mine by Teck Coal Limited with an estimated mine life of 31 years (from 2015).
Line Creek Operations	Mining	Operation of an open pit coal mine by Teck Coal Limited with an estimated mine life of 22 years (from 2015).
Fording River Operations	Mining	Operation of an open pit coal mine by Teck Coal Limited with an estimated mine life of 73 years (from 2015).
Greenhills Operations	Mining	Operation of an open pit coal mine by Teck Coal Limited with an estimated mine life of 14 years (from 2014).
Coal Mountain Operations	Mining	Operation of an open pit coal mine by Teck Coal Limited with an estimated mine life of 3 years (from 2015) which a projected second phase of the project is in the permitting stages.

Project or Physical Activities	Project / Activity Type	Proponent Description
Mount Brussilof Mine (Bay Mag Mine)	Mining	Operation of an industrial open pit mine by Baymag Inc.
Elkhorn Quarry West (Windermere Mining Operation)	Mining	Operation of an open pit gypsum mine by CertainTeed Gypsum Canada Inc. with an estimated mine life of 7 to 12 years (from 2014).
Forestry	Forestry	Where information is readily available, various active forestry activities on both Crown and private lands, including logging and roads. Current active companies include Canfor Corporation, Tembec Inc., and CanWel.
Sparwood Rifle Range	Recreation	Existing rifle range at Michel Creek along Highway 3.
Kootenay West Mine Project	Mining	Industrial mineral open pit mine by CertainTeed Gypsum Canada Inc. with an estimated mine life of 38 years (Permitting stage).
Grassy Mountain Coal Project	Mining	Mine and coal processing plant operated by Benga Mining Limited.
Proposed or Planned		
Baldy Ridge Extension Project	Mining	Proposed extension to the open pit coal mine at Elkview Operations operated by Teck Coal Limited. Estimated production capacity of 130 million metric tonnes.
Coal Mountain Phase 2 Project	Mining	Proposed open pit mine by Teck Coal Limited with a production capacity estimated at 2.25 million metric tonnes and a mine life of 34 years.
Michel Creek Coal	Mining	Proposed open pit mine by North Coal, currently in the pre-application phase of the EA process.
Bingay Main Coal	Mining	Proposed surface and underground coal mine by Centermount Coal Ltd with an estimated production capacity of 2 million metric tonnes.

The air contaminants contributions from foreseeable developments are evaluated and discussed in Section 7.3.2- Contribution from Reasonably Foreseeable Projects.

6.0 Emission Quantification and Modeling Approach

A quantitative assessment of emission rates was performed to identify the worst-case operating scenario based on total annual emissions. The assessment of the worst-case scenario includes the 15 years of mine operation, the 2 years of commissioning, and the post-closure decommissioning phase. This assessment identified Year 11 as the worst-case operating year which was further evaluated through dispersion modelling.

Dispersion modelling was completed to align with the British Columbia Ministry of the Environment & Climate Change Strategy's (BC MOE) *British Columbia Air Quality Dispersion Modelling Guideline* (BC AQDMG). The dispersion modelling was conducted based on feedback and recommendations from BC MOE.

The CALMET/CALPUFF dispersion modelling system was used to predict the expected concentrations of CACs and dustfall due to the Project. CALPUFF model version 7.2.1, level 150618, CALMET model version 6.5.0, level 150223, and CALPOST model version 7.1.0, Level 141010 were used for modelling. Modelling configuration parameters were selected to align with the BC AQDMG. The selection of non-default modelling parameters were made in consultation with BC MOE.

6.1 Emission Sources

Emissions from Project mining activities were estimated for inclusion in the dispersion modelling. This section describes the development of the emission rates. The emissions inventory includes the following emissions sources

- Locomotive Engine;
- Emergency Generators;
- Blasting and Explosive Detonation;
- Blast Hole Drilling;
- Conveyor Belt System;
- Rail Loading;
- Stockpile and Screening Drop;
- Truck Loading;
- Bulldozing – Coal;
- Bulldozing – Overburden;
- Grading;
- Stockpile Wind Erosion;
- Rail Car Spray Bar;
- Coal Cleaning Plant Steam Boiler;
- Feeder Breaker;
- Natural Gas-Fired Comfort Heating;
- Unpaved Roads; and
- Mobile Equipment.

The locations of emission sources are presented in Figure 8 to Figure 12. The following subsections describe the development of emissions rates related to the Project. Detailed emission rates are provided in Appendix B.

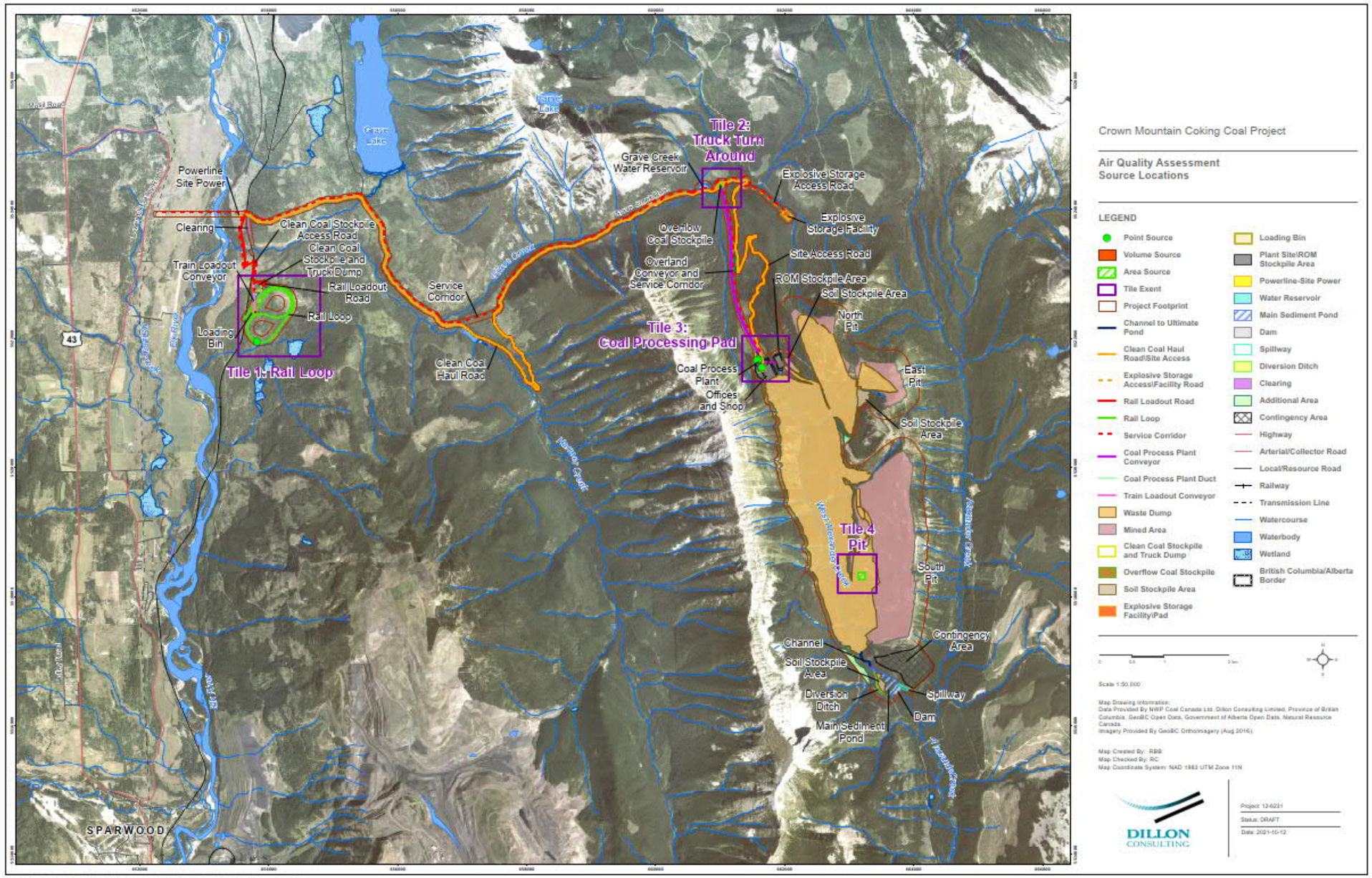


Figure 8: Air Quality Assessment Source Locations

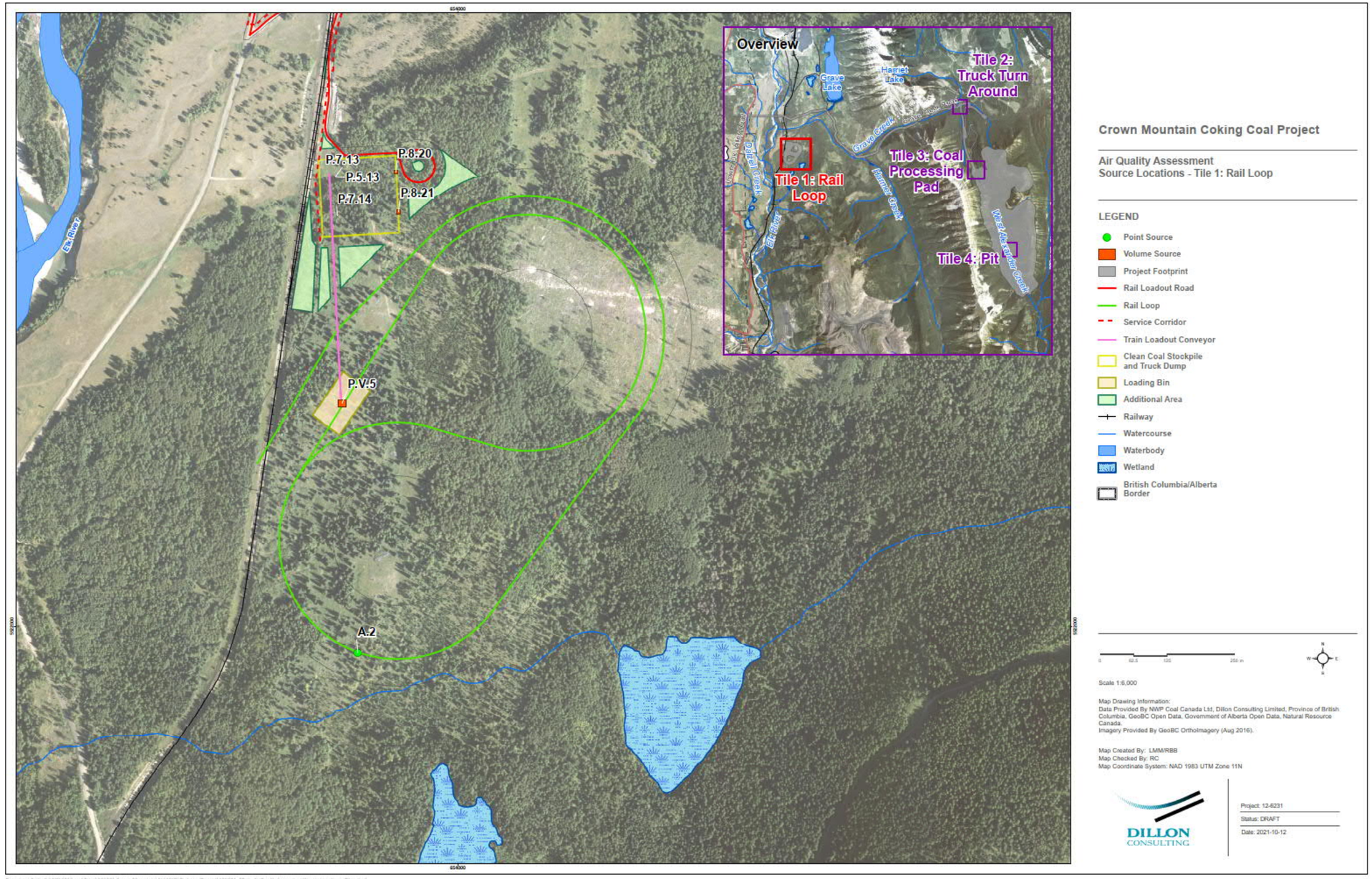


Figure 9: Air Quality Assessment Source Locations- Tile 1 Rail Loop

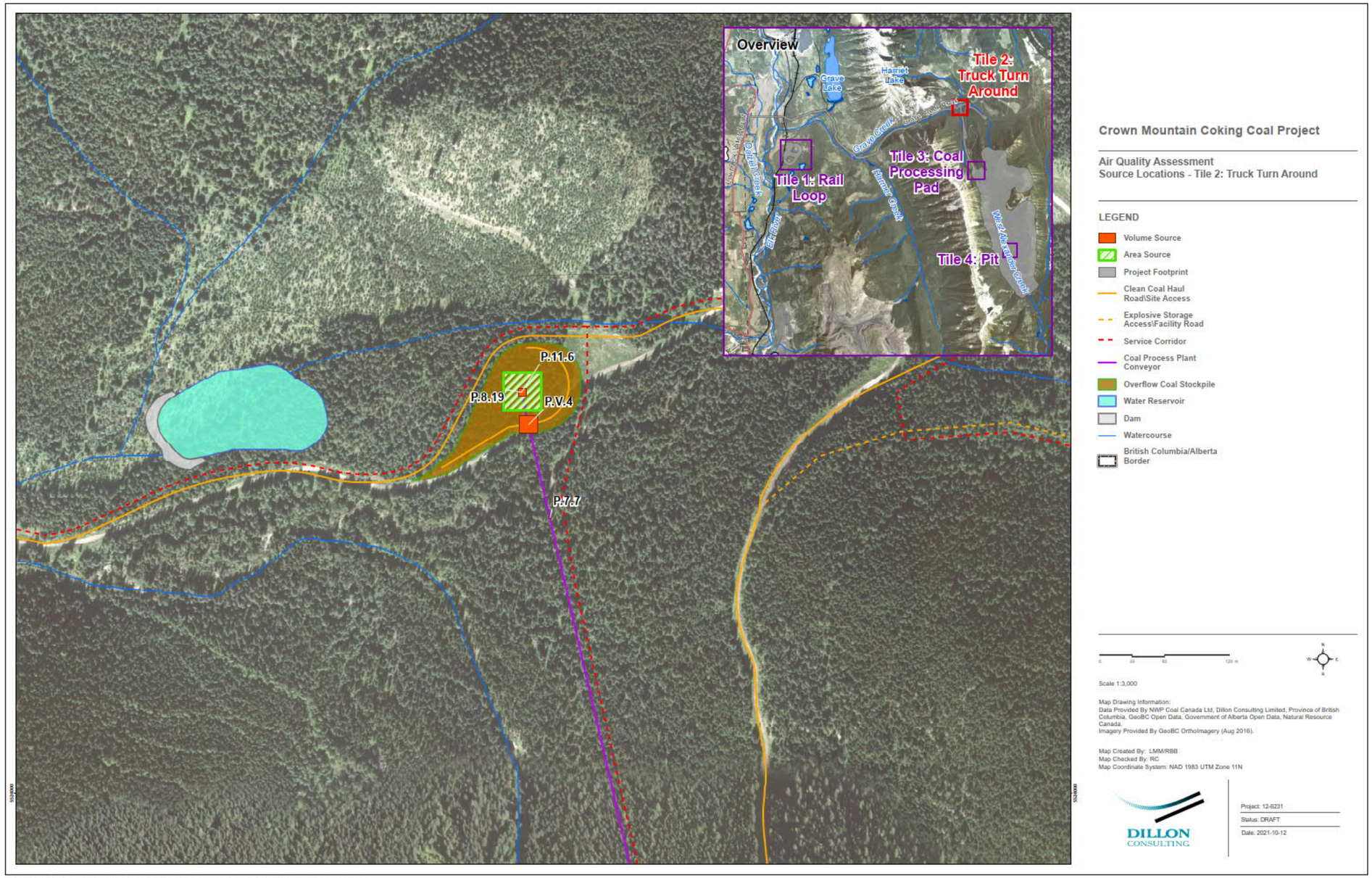


Figure 10: Air Quality Assessment Source Locations- Tile 2 Truck Turn Around

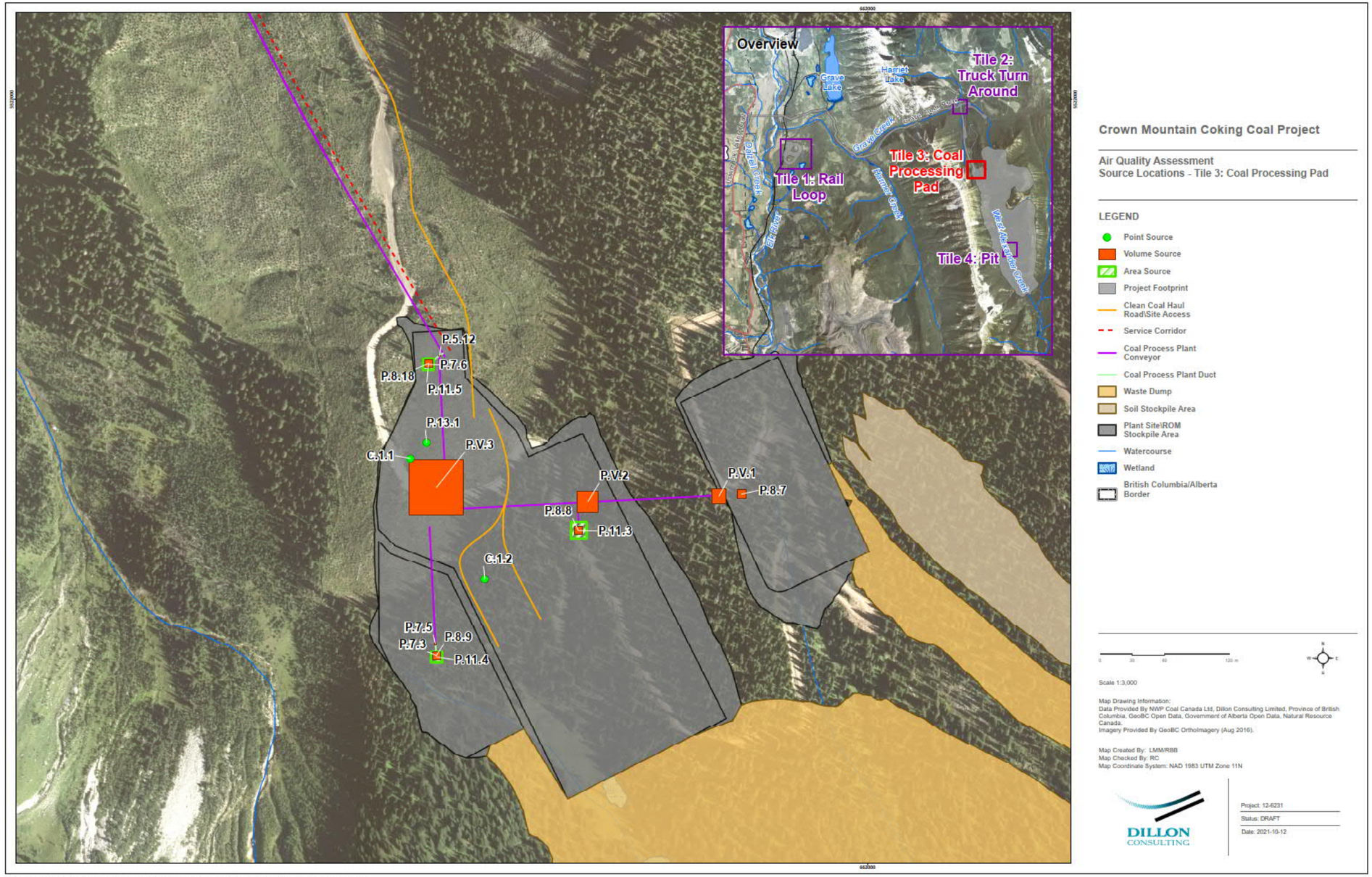


Figure 11: Air Quality Assessment Source Locations- Tile 3 Coal Processing Pad

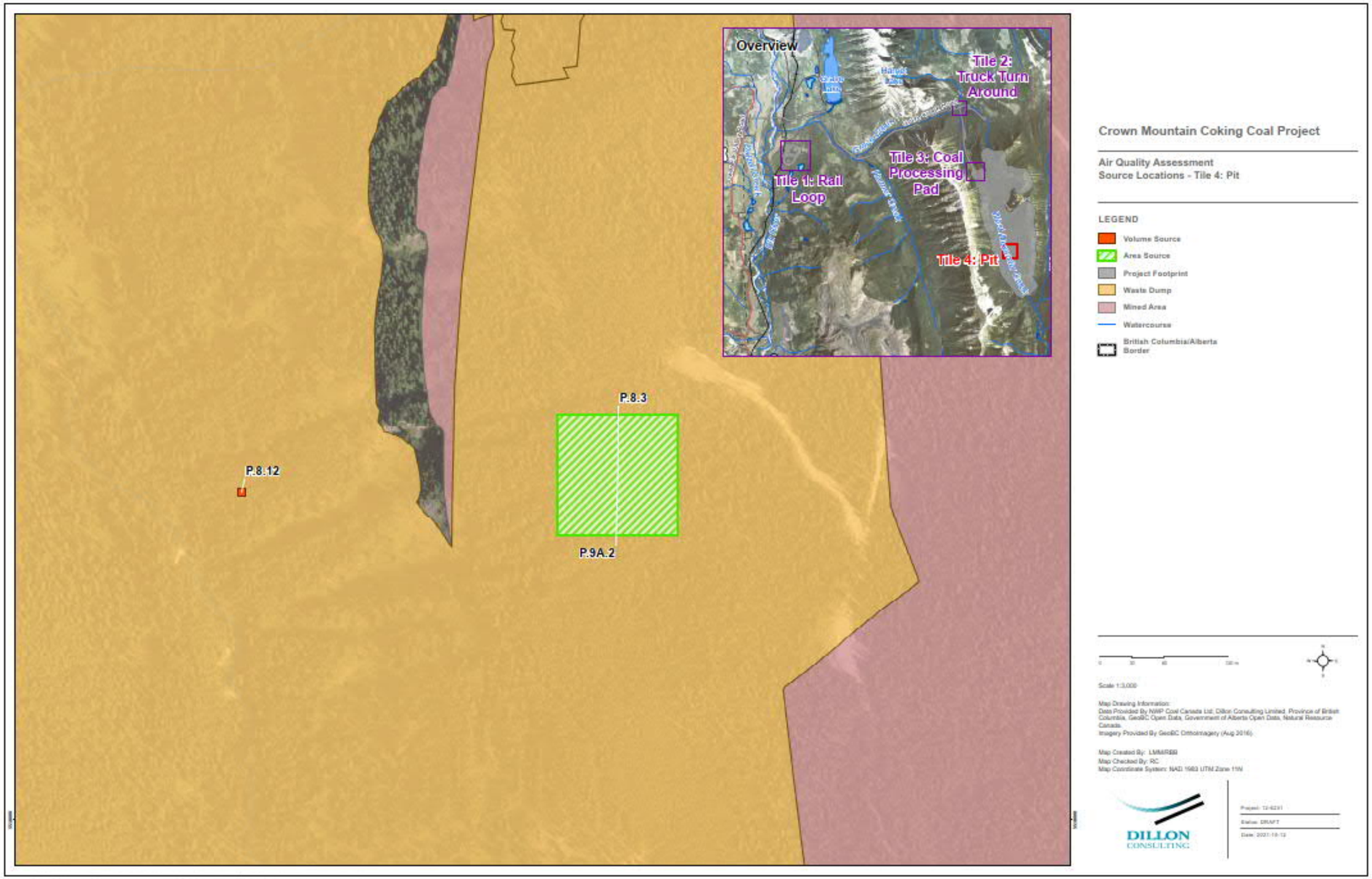


Figure 12: Air Quality Assessment Source Locations- Tile 4 Typical Pit

6.1.1 Locomotive Engine

Diesel locomotive engines will be used to transport coal product offsite. The typical train consists of four 4,400 hp six-axle locomotive engines. Rail emissions are regulated by the Railway Safety Act, which provides maximum allowable emission factors for NO_x, CO, TSP, and VOCs (obtained from Table 1: Line-haul locomotive emission standards)[14]. Emission factors for $PM_{2.5}$, PM_{10}, and SO_2 were obtained from US EPA Emission Factors for Locomotives[15]. The emission rate estimates for the locomotive engines are provided in detail in Table B.1 of Appendix B.

6.1.2 Emergency Generators

Two diesel emergency generators will be used for the Project; one for the plant and one for the office and shops. Each generator is expected to operate approximately 88 hours per year.

Emissions associated with emergency generators were calculated using emission factors from Table 3.3-1 of the US EPA's AP-42 Chapter 3.3 Gasoline and Diesel Industrial Engines[16]. In accordance with the US EPA AP-42, the expected contaminants from diesel generator emissions that were assessed are: NO_x, CO, TSP, PM_{10}, $PM_{2.5}$, SO_2 and VOCs. Note that the emission factor for total organic compounds (TOC) was used as a surrogate for VOCs. The emergency generators were conservatively assumed to operate continuously (i.e., 24 hours a day). The emission rate estimates for the emergency generators are provided in detail in Table B.2 of Appendix B.

6.1.3 Blasting and Explosive Detonation

All extraction pits will include blasting and explosive detonation during every year of their respective operation.

Emissions factors for CO, NO_x, CH_4 and SO_2 from the detonation of ammonium nitrate with fuel oil were obtained from the US EPA's AP-42 Chapter 13.3 Explosives Detonation[17]. An emission factor for CO_2 was obtained from the Energy and GHG Emissions Management Reference Guide[18]. A summary of the emission factors used, explosive usage, and maximum number of blasts per year is presented in Table B.3 of Appendix B. The explosive detonation emissions were calculated by multiplying the emission factor by the number of blasts per year and the quantity of explosive per blast.

[14] RAILWAY SAFETY ACT, SOR/2017-121, June 9, 2017
[15] Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
[16] United States Environmental Protection Agency. (October 1996). *AP-42 Chapter 3.3 Gasoline and Diesel Industrial Engines.* Retrieved from: https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf
[17] United States Environmental Protection Agency. (February 1980). *AP-42 Chapter 13.3 Explosives Detonation.* Retrieved from: https://www.epa.gov/sites/default/files/2020-10/documents/13.3_explosives_detonation.pdf
[18] The Mining Association of Canada, Energy and GHG Emissions Management Reference Guide (June 2014) accessed from: https://mining.ca/documents/energy-and-ghg-emissions-management-reference-guide/

Emissions associated with on-site blasting activities were calculated based on the US EPA's AP-42 Chapter 11.9 Western Surface Coal Mining[19]. Particulate matter emissions are expected from blasting activities; emission factors are calculated based on the blast surface area. Blasting area for each pit varies each year, with a maximum blasting area of approximately 8,333 m^2. The equations to calculate emission factors for TSP, PM_{10} and $PM_{2.5}$, obtained from Table 11.9-2 of the US EPA's AP-42, are shown below.

$$E_{TSP} = 0.00022(A)^{1.5}$$

$$E_{PM10} = 0.52 * E_{TSP}$$

$$E_{PM2.5} = 0.03 * E_{TSP}$$

Where E is the emission factor (kg per blast) and A is the area of the blast (m^2).

The yearly emissions of each pit were calculated by multiplying the corresponding emission factor by the maximum number of blasts per day. The maximum 24-hr, annual and 1-hr emission rates for both explosive detonation and blasting for each pit can be seen in Table B.3 of Appendix B.

6.1.4 Blast Hole Drilling

Blast hole drilling will occur at each of the North, South and East pits during each year of their respective operation. The number of holes drilled, maximum number of blasts per year, and estimated number of holes per blast are presented in Table B.4 of Appendix B.

Particulate emissions are expected from blast hole drilling activities. TSP emissions from blast hole drilling activities were calculated using an emission factor of 0.59 kg per hole drilled of overburden material, obtained from Table 11.9 of the US EPA's AP-42 Chapter 11.9 Western Surface Coal Mining. Emission factors for PM_{10} and $PM_{2.5}$ were obtained from Environment and Climate Change Canada's "Pits and quarries reporting guide"[20], specifically 0.31 kg per hole was applied for both PM_{10} and $PM_{2.5}$.

TSP emissions from blast hole drilling were calculated by multiplying the emission factors by the number of holes drilled. The maximum 24-hr and annual emission rates for blast hole drilling are shown in Table B.4.

[19] United States Environmental Protection Agency. (October 1998). *AP-42 Chapter 11.9 Western Surface Coal Mining.* Retrieved from: https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s09.pdf

[20] Environment and Climate Change Canada. (May 2017). *Pits and quarries reporting guide: Section 8.2 Emissions from Boring/Blast Drilling.* Retrieved from: https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/pits-quarries-guide.html

6.1.5 Conveyor Belt System

Emissions associated with on-site conveying operations (transfer points) were calculated using emission factors from Table 11.19.2-1 of the US EPA's AP-42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing[21]. TSP and PM_{10} emission rates from conveying activities were calculated using the respective emission factors from Table 11.19.2-1, while $PM_{2.5}$ emission rates were determined by the product of the maximum $PM_{2.5}$ to PM_{10} ratio and by the respective transfer emission factor for PM_{10}.

Emission estimates do not include consideration of the fact that many, if not all, of the conveyor transfer points will be protected with a hood. The AP-42 controlled emissions factors refer to a water-spray control technology that is not applied at this site, and therefore the controlled emission factor were not used.

Emissions from the conveying operations were calculated by multiplying the mass of material transfer at each point by the number of operation hours and the emission factor. A list of the transfer points included in the assessment and the maximum 24-hr and annual emissions rates for each transfer point and year of operation are summarized in Table B.5 of Appendix B.

6.1.6 Rail Loading

Run-of-mine (ROM) coal will be loaded onto train cars for transport in the rail loading area throughout the duration of the project. A total of 120 trains are estimated to be loaded per year, or one train every three days. Each train will consist of 152 cars with an average clean coal load of 105.25 tonnes per car.

Emissions from on-site rail loading operations were calculated using an emission factor obtained from the US EPA's AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles[22]. Particulate matter is the expected contaminants resulting from conveying activities. The emission factors for TSP, PM_{10} and $PM_{2.5}$ were calculated using AP-42 Chapter 13.2.4, Equation 1, as shown below.

$$E = k(0.0016)\frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

Where E is emission factor (kg/mega gram), k is particle size multiplier (dimensionless), U is mean wind speed (m/s) and M is material moisture content (%).

[21] United States Environmental Protection Agency. (August 2004). *AP-42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.* Retrieved from: https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s1902.pdf
[22] United States Environmental Protection Agency. (November 2006). *AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles.* Retrieved from: https://www.epa.gov/sites/default/files/2020-10/documents/13.2.4_aggregate_handling_and_storage_piles.pdf

The particle size multipliers for each TSP, PM_{10} and $PM_{2.5}$ of 0.74, 0.35 and 0.053, respectively, were obtained from AP-42 Chapter 13.2.4, Section 13.2.4.3. The mean wind speed was obtained from the 90th percentile of surface station wind speed calculated from the Sparwood CS station (Data years 2014-2018). The material moisture content for ROM coal was obtained from AP-42 Chapter 13.2.4, Section 13.2.4.3 and the highest value in the range, 4.8% was used. Note that the actual moisture content is 5% based on the Feasibility Study Report Page 13; Feed Moisture. The use of the 4.8% moisture content is more conservative.

The rail loading emission rates were calculated by multiplying the mass of material used per hour by the number of operating hours and the corresponding emission factor. The maximum 24-hr and annual emission rates for each year are summarized in Table B.6 of Appendix B.

6.1.7 Stockpile and Screening Drop

There are 16 locations at the Project site where material will be transferred between bins, trucks, rail cars, stockpiles, and conveyors. These stockpile and screening drops will occur throughout the duration of the Project. The list of drop locations and mass of material dropped at each location is presented in Table B.7 in Appendix B. Three types of coal material will be used in drop operations: ROM coal, product coal and rejects.

Emissions associated with stock pile drop operations on site were calculated based on AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles[23]. Expected contaminants resulting from stock piling activities include PM. The emission factors for TSP, PM_{10} and $PM_{2.5}$ were calculated using AP-42 Chapter 13.2.4, Equation 1, similarly to rail loading.

The same particle size multipliers, wind speed parameters and moisture used for ROM coal were used to calculate the emission factors for stockpile and screening drops. Note that 4.8% moisture content was used for all three coal types, as the highest value presented in AP-42 Chapter 13.2.4, Section 13.2.4.3, but actual moisture content for product coal and rejects were 7.5% and 17%, respectively.

The stockpile and screening drop emissions were calculated by multiplying the mass of material used per hour by the number of operating hours and by the corresponding emission factor. The maximum 24-hr and annual emission rates for each year are summarized in Table B.7 of Appendix B.

[23] United States Environmental Protection Agency. November 2006. AP-42 Chapter 13.2.4. Aggregate Handling and Storage Piles. Retrieved from: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0204.pdf

6.1.8 Truck Loading

Truck loading and unloading of coal and overburden will occur at the North, South and East Pits during their respective periods of operation. Truck loading and unloading of coal and overburden will also take place at the waste pit, Coal Processing Plant (CPP), and several stockpiles throughout the duration of the project. A list of all locations and the hourly loading rates is presented in Table B.8 of Appendix B.

Emissions associated with truck loading activities on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining[24]. Expected contaminants resulting from truck loading activities include PM. Equations used to calculate the mission factors for TSP, PM_{10}, and $PM_{2.5}$ from truck loading were obtained from AP-42 Section 11.9, as shown below.

$$E_{TSP} = \frac{0.58}{(M)^{1.2}}$$

$$E_{PM_{10}} = k \times \frac{0.0596}{(M)^{0.9}} = 0.75\frac{0.0596}{(M)^{0.9}}$$

$$E_{PM_{2.5}} = k \times E_{TSP} = 0.019E_{TSP}$$

Where E is the emission factor (Kg/Mg) and M is material moisture content (%). Scaling factors (k) of 0.75 and 0.019 for PM_{10}, and $PM_{2.5}$ respectively, to account for particle size.

The moisture content for ROM coal is 5%, product coal is 7.5%, and rejects is 17%. The moisture content for overburden is estimated to be 7.9%, obtained from AP-42 Table 11.9-3.

The emissions for truck loading and unloading of coal and overburden was calculated by multiplying the hourly loading rate by number of operating days by the corresponding emission factor. The maximum 24-hr and annual emission rates for each are summarized in Table B.8 of Appendix B.

6.1.9 Bulldozing – Coal

Bulldozing of coal is expected to take place at the North, South and East pits throughout the duration of the Project. It is assumed that the first year of work at each pit will only have bulldozing operations to remove and displace overburden, therefore no coal emissions will occur in the first year of operation. The following years of operation of each pit will have multiple bulldozers in operation 24 hours a day.

Emissions associated with bulldozing of coal on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining[25].Expected contaminants resulting from bulldozing activities include PM. Equations used to calculate the mission factors for TSP, PM_{10}, and $PM_{2.5}$ from bulldozing of coal were obtained from AP-42 Section 11.9, as shown below.

[24] United States Environmental Protection Agency. October 1998. AP-42 Chapter 11.9 Western Surface Coal Mining. Retrieved from: https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf
[25] AP-42 Chapter 11.9 Western Surface Coal Mining. (US EPA, 1998). https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s09.pdf

$$E_{TSP} = \frac{35.6(s)^{1.2}}{(M)^{1.3}}$$

$$E_{PM_{10}} = k \times \frac{8.44(s)^{1.2}}{(M)^{1.4}} = 0.75 \times \frac{8.44(s)^{1.2}}{(M)^{1.4}}$$

$$E_{PM_{2.5}} = k \times E_{TSP} = 0.022 \times E_{TSP}$$

Where E is the emission factor (kg/h of bull dozer operation), s is the silt content (%), and M is material moisture content (%). Scaling factors (k) of 0.75 and 0.022 for PM_{10}, and $PM_{2.5}$ respectively, to account for particle size.

The silt content was obtained from AP-42 Table 11.9-3 and was assumed to be the highest value of the range, 11.3%, to be conservative and a moisture content of 7.5% was used.

The bulldozing coal emissions were calculated by multiplying the total hours of operation for all the bulldozers used by the corresponding emission factor. The maximum 24-hr and annual emission rates for each year at each pit are shown in Table B.9a of Appendix B.

6.1.10 Bulldozing – Overburden

Bulldozing overburden is expected to take place at four pits throughout the duration of the project. It was assumed that emissions associated with bulldozing of overburden would happen only during the first year of operation due to removal and displacement of overburden, at each of the South, North and East pits. Overburden bulldozing at the waste pit will occur from year 1 to 14 for 24 hours a day.

Emissions associated with bulldozing of overburden on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining. Expected contaminants resulting from bulldozing activities include PM. Equations used to calculate the emission factors for TSP, PM_{10}, and $PM_{2.5}$ from bulldozing of coal were obtained from AP-42 Section 11.9, as shown below.

$$E_{TSP} = \frac{2.6(s)^{1.2}}{(M)^{1.3}}$$

$$E_{PM10} = k \times \frac{0.45(s)^{1.5}}{(M)^{1.4}} = 0.75 \times \frac{0.45(s)^{1.5}}{(M)^{1.4}}$$

$$E_{PM2.5} = k \times E_{TSP} = 0.105 \times E_{TSP}$$

Where E is the emission factor (kg/h of bull dozer operation), s is the silt content (%), and M is material moisture content (%). Scaling factors (k) of 0.75 and 0.105 for PM_{10}, and $PM_{2.5}$ respectively, to account for particle size.

The bulldozing overburden emissions were calculated by multiplying the total hours of operation for all the bulldozers used by the corresponding emission factor. The maximum 24-hr and annual emission rates for each year at each pit are shown in Table B.9b of Appendix B.

6.1.11 Grading

Grading will occur at the clean coal road, waste pit areas and North, South and East pits throughout the Project duration. Grading will occur 24 hours a day at active Project areas.

Emissions associated with grading on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining. Expected contaminants resulting from grading operations include PM. Emissions of TSP, PM_{10}, and $PM_{2.5}$ associated with grading were estimated using the following emission factors from AP-42 Section 11.9.

$$E_{TSP} = 0.0034(S)^{2.5}$$

$$E_{PM_{10}} = k \times 0.0056(S)^{2.0} = 0.6 \times 0.0056(S)^{2.0}$$

$$E_{PM2.5} = k \times E_{TSP} = 0.031 \times E_{TSP}$$

Where E is emission factor (kg per vehicle-km-travelled) and S is the mean vehicle speed (Km/h). Scaling factors (k) of 0.60 and 0.031 for PM_{10}, and $PM_{2.5}$ respectively, to account for particle size.

The mean vehicle speed was obtained from US EPA AP-42 Table 11.9-3 as the geometric mean of a grader, 11.4 kph.

The grading emissions were calculated by multiplying the total number of hours per day for all graders by the vehicle speed and the corresponding emission factor. The maximum 24-hr and annual emissions rates for each year at each location are presented in Table B.10 of Appendix B.

6.1.12 Stockpile Wind Erosion

There will be several types of stockpiles on site including: clean coal product, emergency product, overflow stockpile, a rejects bin overflow stockpile bunker, and a rejects stockpile from rejects breaker conveyor. These stockpiles will vary in size throughout the duration of the project. Stockpile surface areas were estimated from aerial imagery. High wind on site can cause wind-blown coal dust and can be a source of PM emissions, which will fluctuate based on factors speed, and coal erosion potential such as wind frequency.

Emissions associated with stockpile wind erosion on site were calculated based on AP-42 Chapter 13.2.5[26]. The potential for erosion was calculated using the equation below for overburden, ground coal and uncrusted coal.

$$P = 58\ (u^* - u_t^*)^2 + 25\ (u^* - u_t^*)$$

$$P = 0\ for\ u^* \leq u_t^*$$

Where P is the erosion potential (g/m^2), u is the friction velocity (m/s), and u^*_t is the threshold friction velocity.*

[26] United States Environmental Protection Agency. November 2006. AP-42 Chapter 13.2.5 Industrial Wind Erosion. Retrieved from: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0205.pdf

The friction velocity is calculated using Equation 4 from AP-42 Chapter 13.2.5, as shown below.

$$u^* = 0.053u_{10}^+$$

Where u10+ is the fastest mile of reference anemometer period between disturbances (m/s).

The fastest mile reference is calculated using Equation 5 from AP-42 Chapter 13.2.5, as shown below.

$$u_{10}^+ = \frac{u^+ \, ln \left(\frac{10}{0.005}\right)}{ln \left(\frac{z}{0.005}\right)}$$

Where z is the anemometer height (m), and u+ is the fastest wind speed.

The typical anemometer height for ECCC stations of 10 m was assumed. The maximum wind speed value was obtained from surface station wind speed from the Sparwood CS station (Data years 2014-2018.)

The threshold friction velocities for overburden, coal and uncrusted coal were obtained from AP-42 Table 13.2.5-2.

The emission factors were calculated using Equation 2 from AP-42 Chapter 13.2.5, as shown below.

$$E = k \sum_{i=1}^{N} P_i$$

Where E is the emission factor, k is the particle size multiplier, N is the number of disturbances per year and Pi is the erosion potential corresponding to the observed fastest mile of wind for the i^{th} period between disturbances, g/m^2.

The particle size multipliers were obtained from AP-42, Chapter 13.2.5, Section 13.2.5.3 and it was assumed disturbances would occur every day to be conservative. Since the friction velocity was less than the friction threshold velocity for both overburden and uncrusted coal, the emission factors were zero. Therefore the emission factors for ground coal were used for all stockpiles, to be conservative.

The emissions for stockpile wind erosion were calculated by multiplying the stockpiles surface area by the emission factor and capture efficiency of stockpile cover for product coal stockpiles. The maximum 24-hr and annual emission rates are summarized in Table B.11 of Appendix B.

6.1.13 Rail Car Spray Bar

Emissions from the application of anti-freeze and dust binder chemical solutions to rail car tankers from spray bar at the rail load-out area will be used throughout the duration of the Project. Dust-binder solution is sprayed via a spray bar (with multiple nozzles) onto the top of each fully loaded rail car. In the winter months anti-freeze is sprayed inside the rail cars before coal product is loaded. Some of the components of these chemicals are non-volatile and are therefore not expected to be emitted in significant amounts from storage tanks or from chemical receiving operations.

The contaminants in dust binder and anti-freeze include Polyvinyl Acetate, Propylene Glycol, 2,5,8,11 Tetramethyl 6 dodecyn-5,8 Diol Ethoxylate and Glycerin. A product loss based emission factor of 2% is

assumed to be representative of average daily product losses based on review of available information technology used. This assumes approximately 2% of product sprayed is emitted to air when spray application methods are not known, based on the review of *OECD Series On Emission Scenario Documents, Number 18*[27].

The rail car spray bar emissions were calculated by multiplying maximum percent composition of each contaminant by the number of train loading days and product-loss-based emissions factors to calculate the emissions. The maximum 24-hr emissions for each year for each contaminant are summarized in Table B.12 of Appendix B.

6.1.14 Coal Cleaning Plant Steam Boiler

The Coal Cleaning Plant Steam Boiler will be used at 100% capacity for 24 hours a day for the duration of the project. Steam will be generated by a packaged 700HP water tube boiler unit using natural gas as a fuel at the nominal and maximum boiler consumption rates of 17.1 CFH / ROM t and 31.4 CFH / ROM t respectively. Hourly HDF natural gas heating consumption required for steam generation is estimated at 34,400,000 BTU/hr or 36.29 GJ/hr. Flue gas will be discharged to the atmosphere through a dedicated stack. An economiser feature included within the boiler utilizes the residual flue gas thermal energy to pre-heat the feed water stream ensuring the boiler units remain above 85% efficient. The boiler also features a low NOx burner system which ensures flue gas exhaust NOx levels remain below 30 ppmv.

Emissions associated with the CCP steam boiler were calculated based on US EPA Chapter 1.4 Natural Gas Combustion for boilers less than 100 MMBtu/hr. The expected contaminants are products of combustion. The emission factor for NOx was obtained from the Feasibility Study, Revision: 0 - 31-Mar-2020. The emission factor for CO was obtained from US EPA AP-42 Table 1.4-1, for Controlled - Low NOx burners/Flue gas recirculation. The emission factors for TSP, SO2, CH4, and VOCs were obtained from US EPA AP-42 Table 1.4-2.

The emissions for the CCP steam boiler were calculated by multiplying the air flow rate by the corresponding emission factor. The maximum 24-hr, 1-hr and annual emission rates for each year are summarized in Table B.13 of Appendix B.

6.1.15 Feeder Breaker

The feeder breaker was conservatively assumed to work at a rate of 600 tonnes per hour for 24 hours a day for the duration of the project. Emissions were calculated based on AP-42 Chapter 11.19.2 *Crushed Stone Processing and Pulverized Mineral Processing*[28]. Expected contaminants resulting from crushing activities include PM. The emission factors were obtained from AP-42 Table 11.19.2-1.

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[27] Organisation for Economic Co-operation and Development (OECD). June 2008. OECD Series On Emission Scenario Documents, Number 18, Emission Scenario Document For Insecticides, Acaricides And Products To Control Other Arthropods For Household And Professional Uses. Retrieved from: https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2008)14&doclanguage=en

[28] AP-42 Section 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing. (US EPA , 2014). Retrieved from: https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s1902.pdf

The feeder breaker emissions were calculated by multiplying the feeder breaker feed rate by the corresponding emission factor. The maximum 24-hr, 1-hr and annual emission rates for each year are presented in Table B.14 of Appendix B.

6.1.16 Natural Gas-Fired Comfort Heating

Several unit heaters, exhaust fans and make-up air units are used on site in the CPP building, Overland Surge Bin and Rejects Bin. Based on information provided the CPP will operate 6,400 hours per year and 24 hours a day when in operation. All units are fired by natural gas.

Emissions from comfort heating were calculated based on AP-42- Chapter 1.4 *Natural Gas Combustion for boilers less than 100 MMBtu/hr*. The expected contaminants resulting from comfort heating include products of combustion. The emission factors used in the calculations were obtained from AP-42 Chapter 1.4 *Natural Gas Combustion for boilers less than 100 MMBtu/hr*.

The emissions for comfort heating were calculated by multiplying the heat input rating by the corresponding emission factor. The maximum for 24-hr, 1-hr and annual emission rates are summarized in Table B.15 of Appendix B.

6.1.17 Unpaved Roads

Several types of vehicles and mobile equipment will operate on unpaved roads at the Project site including excavators, loaders, water trucks, drill rigs, dozers, graders, dump trucks, haul trucks, backhoes, and pickup trucks. For a complete list of equipment see Table B.16 of Appendix B. The magnitude of road dust emissions is dependent on surface silt content, vehicle weight, and precipitation in the area. A high material silt content means that more fine particulate is available to be re-suspended, meaning a higher magnitude of emissions. Heavier weight vehicles increase the magnitude while precipitation decreases it. The roads travelled by mobile equipment include the haul road, North, South and East pits, Waste pit, Rail Load, and CPP Area.

Emissions from onsite unpaved roads were calculated based on AP-42 Chapter 13.2.2 *Unpaved Roads*[29]. Expected contaminants resulting from unpaved roads include PM. Emission factor calculations used to calculate emissions from unpaved roads were calculated as follows.

$$E = k\left(\frac{s}{12}\right)^{a}\left(\frac{W}{3}\right)^{b}$$

Where E is the emission factor (lb vehicle per mile travelled), k, a and B are empirical constants obtained from AP-42 Table 13.2.2-2, and W is the mean vehicle weight (tons).

The AP-42 default silt content of 8.4% was used for the haul road surface material. The weight and maximum speed of each type of equipment, including information reference are presented in

[29] United States Environmental Protection Agency. November 2006. Chapter 13.2.2 Unpaved Roads. Retrieved from: https://www.epa.gov/sites/default/files/2020-10/documents/13.2.2_unpaved_roads.pdf

Table B.16 of Appendix B. The mean equipment weight for each road travelled was used in the calculations.

The emissions from unpaved roads was calculated by multiplying the total distance travelled by the emission factor. The 24-hr and annual maximum emission rates for unpaved roads with the application of dust control are also presented in Table B.16 of Appendix B.

6.1.18 Mobile Equipment

Several types of mobile equipment will be use on site included loaders, water trucks, dozers, graders, dump trucks, drills, and haul trucks. The roads travelled by mobile equipment include the haul road, North, South and East pts, Waste pit, Rail Load and CPP Area. A complete list of equipment and information on each type of equipment including engine horse power, tier and brake specific fuel is summarized in Table B.17 of Appendix B.

Emissions from mobile equipment were calculated based on the US EPA document *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d* [30]. The emission factors for NO_x, CO and TSP were obtained from Table A.4 of the document. For PM_{10} and $PM_{2.5}$, the US EPA document states that it should be assumed that all PM is PM_{10} and 97% is $PM_{2.5}$. This assumption was applied to obtain the emission factors for PM_{10} and $PM_{2.5}$. The emission factor for SO_2 was obtained using Equation 7 from the document as shown below.

$$E_{SO2} = (BSFC \times 453.1(1 - soxcnv) - E_{HC} \times soxdsl \times 2$$

Where E is the emission factor, BSFC is the in-use adjusted fuel consumption (lb/hp-hf), 453.6 is a conversion factor for lbs to g, soxcnv is the fraction of fuel sulfur converted to direct PM, 0.01 is the conversion factor from weight percent to weight fraction and soxdsl is the episodic weight percent of sulfur in nonroad diesel fuel.

The emission factor for CO_2 was obtained using Equation 6 from the document as shown below.

$$E_{CO_2} = (BSFC \times 453.6 - E_{HC}) \times 0.87 \times \left(\frac{44}{12}\right)$$

Where E is the emission factor, BSFC is the in-use adjusted fuel consumption (lb/hp-hf), 0.87 is the carbon mass fraction of diesel and 44/12 is the ratio of CO2 mass to carbon mass.

The emissions for mobile equipment were calculated by multiplying the number of working hours per unit by the horsepower and corresponding emission factor. The maximum 24-hr, 1-hr and annual emission rates are summarized in Table B.17 of Appendix B.

6.1.19 Metals and Polycyclic Aromatic Hydrocarbons

Metals and PAHs were included in the deposition assessment at sensitive receptor locations. Metal and PAH deposition rates were estimated by applying speciation profiles to estimated TSP, $PM_{10,}$ $PM_{2.5}$ and

[30] United States Environmental Protection Agency. July 2010. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d. Retrieved from: https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10081UI.txt

VOC concentration and deposition rates based on source type. Speciation profiles for VOCs were obtained from the US EPA SPECIATE 5.1 database, and specific sections of AP-42. To maintain conservatism, the final speciation factors used in this assessment were based on the maximum of all speciation factors available for the particular source and species. A summary of the speciation profile sources is provided in Table 12.

Table 12: Summary of Particle and VOCs Speciation Profiles

Emission Source Group	Particle Size Range (µm)	Profile Code	Profile Name	Profile Type	Generation Mechanism
Metals					
Coal Handling	0-2.5	212042.5	Coal Dust	PM	Dust
	0-10	2120410	Coal Dust	PM	Dust
		21204C	Coal Dust	PM	Dust
	0-30	2120430	Coal Dust	PM	Dust
Combustion	0-2.5	3195	Gas Combustion	PM	Combustion
		322022.5	Heavy Duty Diesel	PM	Combustion
		322072.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		322082.5	Heavy Duty Diesel Trucks	PM	Combustion
		322042.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		322032.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		5673	Diesel Engines	PM	Combustion
	0-10	3195	Gas Combustion	PM	Combustion
		3220210	Heavy Duty Diesel	PM	Combustion
		322022.5	Heavy Duty Diesel	PM	Combustion
		32202C	Heavy Duty Diesel	PM	Combustion
		3220310	Heavy Duty Vehicles - Diesel	PM	Combustion
		322032.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		32203C	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220410	Heavy Duty Vehicles - Diesel	PM	Combustion
		322042.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		32204C	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220710	Heavy Duty Vehicles - Diesel	PM	Combustion

Emission Source Group	Particle Size Range (µm)	Profile Code	Profile Name	Profile Type	Generation Mechanism
		322072.5	Heavy Duty Vehicles - Diesel	PM	Combustion
		32207C	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220810	Heavy Duty Diesel Trucks	PM	Combustion
		322082.5	Heavy Duty Diesel Trucks	PM	Combustion
		32208C	Heavy Duty Diesel Trucks	PM	Combustion
		5673	Diesel Engines	PM	Combustion
	0-30	3220230	Heavy Duty Diesel	PM	Combustion
		3220330	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220430	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220730	Heavy Duty Vehicles - Diesel	PM	Combustion
		3220830	Heavy Duty Diesel Trucks	PM	Combustion
Land Disturbance	0-2.5	413022.5	Soil Dust - Seattle, WA	PM	Dust
		441032.5	Excavation - Rock Crushing	PM	Dust
	0-10	4130210	Soil Dust - Seattle, WA	PM	Dust
		41302C	Soil Dust - Seattle, WA	PM	Dust
		4410310	Excavation - Rock Crushing	PM	Dust
		44103C	Excavation - Rock Crushing	PM	Dust
	0-30	4130230	Soil Dust - Seattle, WA	PM	Dust
		4410330	Excavation - Rock Crushing	PM	Dust
Haul Roads	0-2.5	91100	Unpaved Road Dust - Composite	PM	Dust
		441022.5	Excavation - Haul Road	PM	Dust
		413022.5	Soil Dust - Seattle, WA	PM	Dust
	0-10	4410210	Excavation - Haul Road	PM	Dust
		44102C	Excavation - Haul Road	PM	Dust
		4130210	Soil Dust - Seattle, WA	PM	Dust
		41302C	Soil Dust - Seattle, WA	PM	Dust
	0-30	4410230	Excavation - Haul Road	PM	Dust
		4130230	Soil Dust - Seattle, WA	PM	Dust

Emission Source Group	Particle Size Range (µm)	Profile Code	Profile Name	Profile Type	Generation Mechanism
VOCs					
Combustion	N/A	0008	Reciprocating Diesel Engine	GAS	Combustion
		95333	Diesel Exhaust Emissions from Tier 2 Off-road Engines	GAS	Combustion
		95332	Diesel Exhaust Emissions from Tier 1 Off-road Engines	GAS	Combustion
		0003	External Combustion Boiler - Natural Gas	GAS	Combustion

6.2 CALPUFF Dispersion Model

6.2.1 Model Domain

The LSA and RSA for the CALPUFF modeling assessment are illustrated in Figure 3. The CALPUFF domain include a LSA of 30km by 40km and a RSA of 86.5km by 146.5km. The LSA domain uses a grid resolution of 200m and comprises 150 grid cells in the X direction, 200 cells in the Y direction, and 10 cells in the vertical direction. The RSA domain uses a grid resolution of 500m and comprises 173 grid cells in the X direction, 293 cells in the Y direction, and 10 cells in the vertical direction. Domain resolution and other configurations were set according to the BC AQDMG or to model defaults. Detailed CALMET/CALPUFF model configurations are presented in Section 6.2.5 - Technical Dispersion Options.

6.2.2 CALMET Meteorological data

CALMET modelling was performed using measured meteorological data as well as the BC MOE recommended prognostic WRF dataset, obtained from Exponent. Surface meteorological data from the Sparwood CS was used; the meteorological station information are provided in Table 13. CALMET was configured to predict meteorological conditions for a 3-year period from January 1st, 2013 to December 31th, 2015.

To accurately represent the seasonally dependent geophysical parameters, including surface roughness length, albedo, Bowen ratio, soil heat flux, vegetation leaf area index, and anthropogenic heat flux, in the CALMET model, the following five seasons are specified following Section 4.4 of the BC ADMG:

- Season 1 (midsummer): June, July
- Season 2 (Autumn): August, September
- Season 3 (Winter 1): October, November
- Season 4 (Winter 2): December, January, February, March, April
- Season 5 (Spring): May

Other CALMET parameters were configured according to BC MOE recommended settings.

Table 13: CALMET Surface Met Data

Surface Met Data and Location (lat/long or indicate on map)	Data Source MOE, MV, MSC, Site Specific, other (specify)	Period of Record (start/end data)	% of Wind Speeds = 0.0	Anemometer Height (m)	Parameters
Sparwood CS	MSC	1 Jan 2011 - 31 Dec 2015	0.3	10 m	WS, WD, T, Stn P, RH

6.2.3 Terrain elevation and land use characterization

The terrain elevation used as input into CALMET was obtained from Canadian Digital Elevation Data (CDED) at scales of 1:50,000. The CDED data are based on the North American Datum 1983 horizontal reference datum and consist of elevations relative to Mean Sea Level.

The land cover characterization used as input into the CALMET model was obtained from the baseline thematic mapping for British Columbia (BC BTM) and Alberta Satellite Land Cover (ASLC)[31]. The landuse data were processed for CALMET use in accordance with the processing steps outlined in Section 4.2 of BC ADMG.

6.2.4 Receptor Locations

A nested receptor grid encompassing the LSA and RSA was used in accordance with the BC AQDMG. The receptor grid includes the municipalities of Sparwood and Elkford and represents the area in which air quality impacts are most likely to occur.

Specifically, receptors will be included as follows:

- 20 m receptor spacing along the Project boundary
- 50 m spacing within 500 m of the Project boundary
- 250 m spacing within 2 km of the Project boundary
- 500 m spacing within 5 km of the Project boundary
- 1,000 m spacing beyond 5 km of the Project boundary

The gridded receptors for the air modeling assessment is shown in Figure 13. A total of 17,200 discrete receptors were included for the LSA and an additional 4,312 discrete receptors were included in the RSA. Note that the 1,000 m receptor spacing extends to cover the entire RSA but is not shown to preserve figure resolution.

[31] Alberta Satellite Land Cover obtained from: https://open.alberta.ca/opendata/gda-f4c86e0b-be22-4b94-a6a3-754d17518e9d

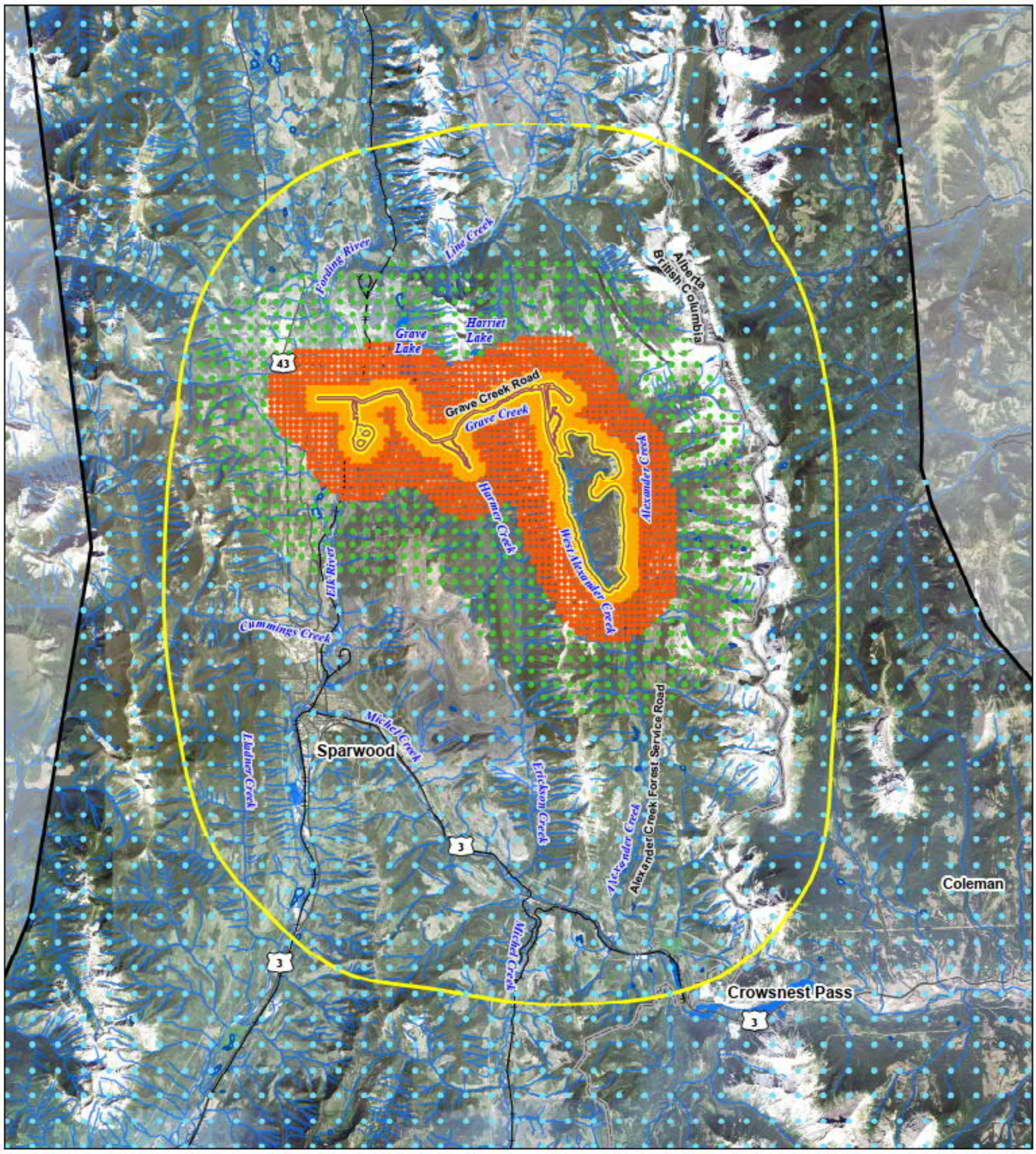


Figure 13: Air Quality Assessment Receptor Grid

Sensitive receptors were included to represent points of interest within the LSA and RSA. The sensitive receptor IDs, locations, and descriptions are provided in Table 14. The location of identified sensitive receptors within the LSA are shown in Figure 14 . Among the total of 416 sensitive receptors selected for EA multiple disciplines, 7 receptors (S60, S73,S136, S241, S267, S268, S275) were identified as duplicate receptors for the air quality assessment and 4 receptors (S198, S208, S347, N415) were identified located within the Project footprint. Therefore, 405 unique sensitive receptors representing residences, schools, campgrounds, recreational sites and culturally significant locations were selected for the air quality modeling assessment, including 143 receptors in the LSA and 262 receptors in the RSA.

Receptor locations were selected based on a desktop review, site visits, and input from BC MOE. The maximum contaminant concentrations and dustfall deposition rates were predicted at all selected sensitive receptors based on Project activity as well as with the inclusion of baseline concentrations. In addition, the frequency of exceedance of any relevant air quality objectives was evaluated for each sensitive receptor.

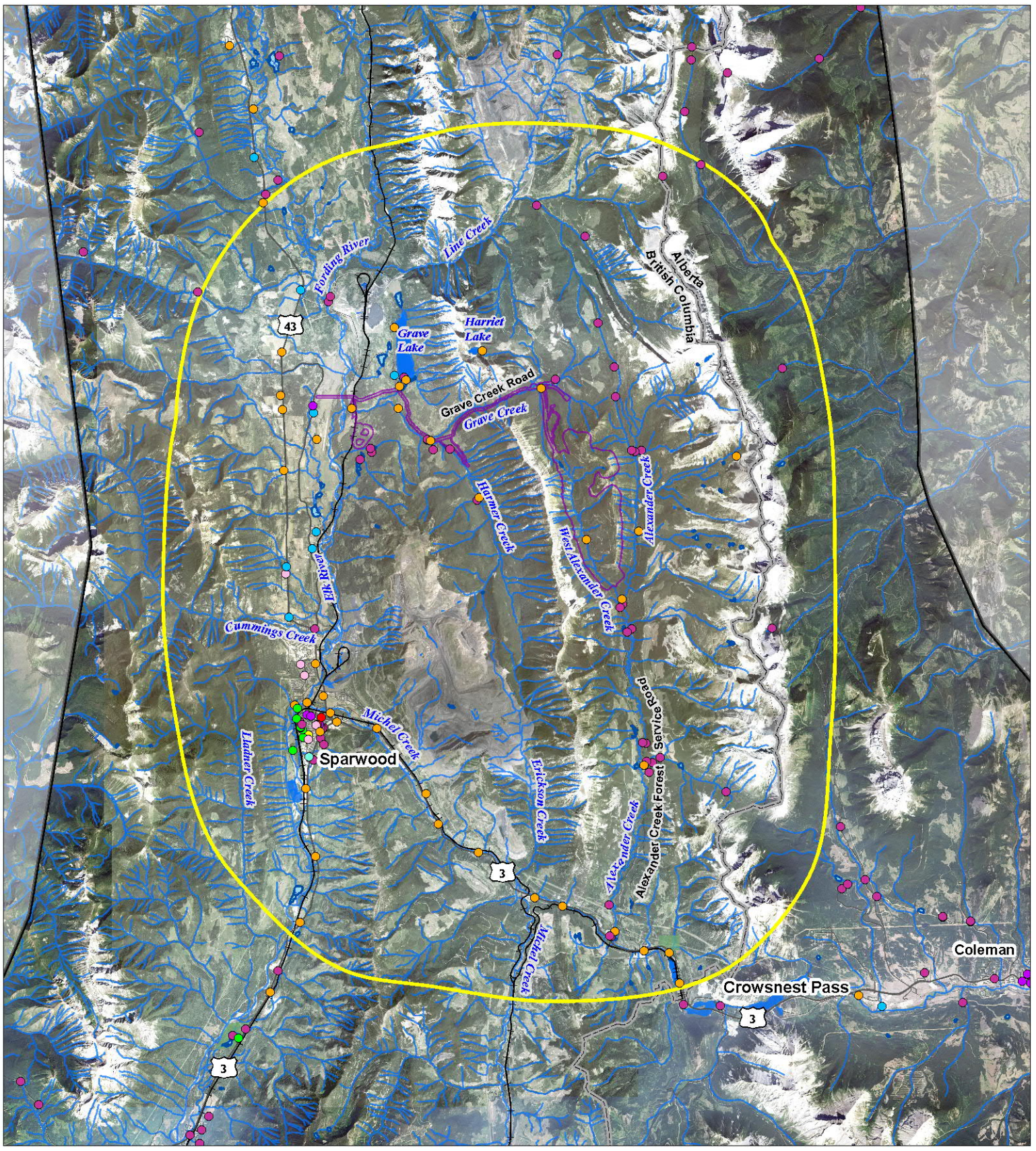


Figure 14: Air Quality Assessment Sensitive Receptors

Table 14: List of Sensitive Receptors in the LSA and RSA

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 1	628591	5472588	Trapline Cabin	Recreation	S 209	651339	5511804	Sensory and Human Health	Others
S 2	634190	5478072	Trapline Cabin	Recreation	S 210	665048	5509456	Sensory and Human Health	Others
S 3	658371	5431185	Trapline Cabin	Recreation	S 211	676085	5501284	Recreation	Recreation
S 4	651886	5431116	Trapline Cabin	Recreation	S 212	690998	5492470	Recreation	Recreation
S 5	665398	5509551	Trapline Cabin	Recreation	S 213	690445	5495025	Underground Mine Tour	Recreation
S 6	664949	5521823	Trapline Cabin	Recreation	S 214	684301	5497553	Recreation	Recreation
S 7	661584	5524621	Trapline Cabin	Recreation	S 215	684472	5498029	Recreation	Recreation
S 8	662735	5530234	Trapline Cabin	Recreation	S 216	680176	5501222	Park	Park
S 9	661654	5537359	Trapline Cabin	Recreation	S 217	680305	5501015	Recreation	Recreation
S 10	647594	5534325	Trapline Cabin	Recreation	S 218	688304	5497406	Historic Site	Other
S 11	650669	5532441	Trapline Cabin	Recreation	S 219	688934	5496617	Historic Site	Other
S 12	643031	5529604	Trapline Cabin	Recreation	S 220	680113	5501238	School	School
S 13	658045	5547785	Trapline Cabin	Recreation	S 221	684742	5498022	School	School
S 14	658118	5555178	Trapline Cabin	Recreation	S 222	681662	5500915	School	School
S 15	658031	5565602	Trapline Cabin	Recreation	S 223	651833	5511431	School	School
S 16	645241	5560075	Trapline Cabin	Recreation	S 224	690770	5494941	School	School
S 17	639369	5552051	Trapline Cabin	Recreation	S 225	651980	5511366	School	School
S 18	648790	5573822	Trapline Cabin	Recreation	S 226	640960	5486329	School	School
S 19	658311	5542371	Trapline Cabin	Recreation	S 227	640793	5486040	School	School
S 20	671886	5488846	Trapline Cabin	Recreation	S 228	638684	5480660	School	School
S 21	652020	5517950	Residence	Residence	S 229	652298	5511060	School	School
S 22	645964	5493976	Campground	Recreation	S 230	679909	5500965	School	School

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 23	638050	5483372	Campground	Recreation	S 231	680250	5500886	School	School
S 24	672841	5504589	Recreation	Recreation	S 232	690735	5495118	Place of Worship	Place of Worship
S 25	652214	5522248	Airport	Others	S 233	681092	5501506	Place of Worship	Place of Worship
S 26	683304	5498791	Campground	Recreation	S 234	669105	5499577	Place of Worship	Place of Worship
S 27	668043	5500008	Recreation	Recreation	S 235	650991	5516974	Place of Worship	Place of Worship
S 28	652063	5509664	Campground	Recreation	S 236	685266	5498228	Place of Worship	Place of Worship
S 29	649092	5543530	Campground	Recreation	S 237	685411	5498141	Place of Worship	Place of Worship
S 30	650979	5516970	Place of Worship	Place of Worship	S 238	685135	5498242	Place of Worship	Place of Worship
S 31	652480	5510932	Recreation	Recreation	S 239	684200	5498376	Place of Worship	Place of Worship
S 32	648909	5498839	Recreation	Recreation	S 240	687343	5497720	Place of Worship	Place of Worship
S 33	652022	5543276	Recreation	Recreation	S 241	685411	5498141	Place of Worship	Place of Worship
S 34	650723	5537321	Recreation	Recreation	S 242	676802	5503492	Recreation	Recreation
S 35	638643	5480781	Resort	Recreation	S 243	681174	5501468	Community Centres	Recreation
S 36	640729	5487604	Recreation	Recreation	S 244	690910	5494664	Residence	Residence
S 37	677590	5500135	Recreation	Recreation	S 245	684825	5498420	RCMP	Other

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 38	688305	5497406	Information Centre	Others	S 246	683247	5499415	Health Center	Other
S 39	690453	5495028	Recreation	Recreation	S 247	673489	5500415	Helicopters	Other
S 40	648784	5537723	Sawmill	Others	S 248	684828	5498319	Sawmill	Others
S 41	663767	5502717	Recreation	Recreation	S 249	674400	5499978	Residence	Residence
S 42	676803	5503491	Recreation	Recreation	S 250	680617	5500741	Residence	Residence
S 43	641001	5487057	Campground	Recreation	S 251	683303	5498792	Campground	Recreation
S 44	628228	5457073	Recreation	Recreation	S 252	692052	5492791	Campground	Recreation
S 45	666618	5500059	Campground	Recreation	S 253	689750	5493828	Residence	Residence
S 46	638495	5480869	Campground	Recreation	S 254	683375	5498804	Campground	Recreation
S 47	658491	5519860	Recreation	Recreation	S 255	623343	5470253	School	School
S 48	656543	5522224	Campground	Recreation	S 256	640995	5486159	School	School
S 49	652660	5527667	Campground	Recreation	S 257	639697	5483853	School	School
S 50	665139	5510311	Campground	Recreation	S 258	639663	5483807	School	School
S 51	665698	5509753	Campground	Recreation	S 259	640295	5485155	School	School
S 52	663682	5503953	Campground	Recreation	S 260	648788	5543385	School	School
S 53	664585	5514795	Campground	Recreation	S 261	648279	5541448	School	School
S 54	664229	5515774	Trap Line	Recreation	S 262	648059	5541549	School	School
S 55	665255	5509176	Recreation	Recreation	S 263	652064	5523562	School	School
S 56	657440	5521875	Campground	Recreation	S 264	683578	5499070	Hospital	Hospital
S 57	638072	5458659	Sawmill	Others	S 265	640715	5486379	Hospital	Hospital
S 58	647703	5543079	Recreation	Recreation	S 266	651903	5509789	Hospital	Hospital
S 59	638599	5480669	Recreation	Recreation	S 267	683578	5499070	Hospital	Hospital
S 60	664229	5515774	Trapping Line	Recreation	S 268	640715	5486379	Hospital	Hospital

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 61	653910	5521461	Hunting	Recreation	S 269	640318	5485743	Hospital	Hospital
S 62	654365	5521753	Hunting	Recreation	S 270	649159	5543036	Hospital	Hospital
S 63	654312	5521900	Hunting	Recreation	S 271	640305	5485100	Hospital	Hospital
S 64	655622	5524695	Campground	Recreation	S 272	683442	5498992	Hospital	Hospital
S 65	656770	5521845	Campground	Recreation	S 273	683600	5499077	Hospital	Hospital
S 66	657432	5521880	Campground	Recreation	S 274	651861	5510639	Day Care	Day Care
S 67	649229	5543221	4DayRide	Others	S 275	652298	5511060	School	School
S 68	649353	5543428	BurntRidge	Others	S 276	652394	5511320	Senior Centre	Senior Centre
S 69	655455	5524341	Crown	Others	S 277	640306	5485287	Senior Centre	Senior Centre
S 70	649337	5543199	ElkfordCrownDeadmans	Others	S 278	690389	5495487	Senior Centre	Senior Centre
S 71	649352	5543516	ElkValleyPowerLine	Others	S 279	639677	5484326	Senior Centre	Senior Centre
S 72	649370	5543511	FordingLookout	Recreation	S 280	640437	5485211	Senior Centre	Senior Centre
S 73	649352	5543516	BigWearyEast	Recreation	S 281	652236	5511049	Senior Centre	Senior Centre
S 74	683108	5487258	Great Divide Trail/Waypoints	Recreation	S 282	685789	5498094	Senior Centre	Senior Centre
S 75	682398	5489139	Great Divide Trail/Waypoints	Recreation	S 283	690176	5495468	Senior Centre	Senior Centre
S 76	682041	5490150	Great Divide Trail/Waypoints	Recreation	S 284	651262	5510032	Park	Park
S 77	681875	5491669	Great Divide Trail/Waypoints	Recreation	S 285	651448	5511675	Park	Park
S 78	681526	5491173	Great Divide Trail/Waypoints	Recreation	S 286	651682	5510533	Park	Park

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 79	681037	5491277	Great Divide Trail/Waypoints	Recreation	S 287	651647	5510845	Park	Park
S 80	680605	5490574	Great Divide Trail/Waypoints	Recreation	S 288	651562	5510915	Park	Park
S 81	678917	5493361	Great Divide Trail/Waypoints	Recreation	S 289	651423	5511287	Park	Park
S 82	680524	5497479	Great Divide Trail/Waypoints	Recreation	S 290	651562	5510953	Park	Park
S 83	680985	5501228	Great Divide Trail/Waypoints	Recreation	S 291	640336	5484909	Park	Park
S 84	678834	5501061	Great Divide Trail/Waypoints	Recreation	S 292	651631	5511050	Recreation	Recreation
S 85	677876	5503291	Great Divide Trail/Waypoints	Recreation	S 293	640372	5484865	Recreation	Recreation
S 86	674195	5504283	Great Divide Trail/Waypoints	Recreation	S 294	648882	5543381	Recreation	Recreation
S 87	672769	5507024	Great Divide Trail/Waypoints	Recreation	S 295	640471	5485273	Recreation	Recreation
S 88	668286	5508395	Great Divide Trail/Waypoints	Recreation	S 296	652488	5510270	Recreation	Recreation
S 89	665154	5509606	Great Divide Trail/Waypoints	Recreation	S 297	640454	5485054	Recreation	Recreation
S 90	664107	5515640	Great Divide Trail/Waypoints	Recreation	S 298	641331	5487011	Recreation	Recreation
S 91	664713	5521762	Great Divide Trail/Waypoints	Recreation	S 299	640369	5484752	Recreation	Recreation

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 92	663932	5523939	Great Divide Trail/Waypoints	Recreation	S 300	639762	5483833	Recreation	Recreation
S 93	663887	5525107	Great Divide Trail/Waypoints	Recreation	S 301	640184	5485064	School	School
S 94	663260	5526815	Great Divide Trail/Waypoints	Recreation	S 302	640370	5483962	Day Care	Day Care
S 95	660831	5531457	Great Divide Trail/Waypoints	Recreation	S 303	640159	5484931	Day Care	Day Care
S 96	665787	5532587	Great Divide Trail/Waypoints	Recreation	S 304	640184	5485337	Day Care	Day Care
S 97	667283	5533058	Great Divide Trail/Waypoints	Recreation	S 305	640244	5485302	Family Centre	Other
S 98	666656	5535134	Great Divide Trail/Waypoints	Recreation	S 306	651579	5513419	Place of Worship	Place of Worship
S 99	666938	5537658	Great Divide Trail/Waypoints	Recreation	S 307	639981	5483972	Senior Centre	Senior Centre
S 100	668334	5536644	Great Divide Trail/Waypoints	Recreation	S 308	640422	5485971	Senior Centre	Senior Centre
S 101	671948	5537219	Great Divide Trail/Waypoints	Recreation	S 309	648016	5541651	Place of Worship	Place of Worship
S 102	673562	5539213	Great Divide Trail/Waypoints	Recreation	S 310	648630	5541401	Place of Worship	Place of Worship
S 103	672510	5539983	Great Divide Trail/Waypoints	Recreation	S 311	648625	5543044	Place of Worship	Place of Worship
S 104	670834	5546014	Great Divide Trail/Waypoints	Recreation	S 312	648045	5543113	Place of Worship	Place of Worship

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 105	668227	5547693	Great Divide Trail/Waypoints	Recreation	S 313	649084	5542128	Recreation	Recreation
S 106	666422	5551155	Great Divide Trail/Waypoints	Recreation	S 314	648659	5543264	Park	Park
S 107	663833	5553692	Great Divide Trail/Waypoints	Recreation	S 315	651885	5510455	Place of Worship	Place of Worship
S 108	663159	5557427	Great Divide Trail/Waypoints	Recreation	S 316	652167	5511026	Place of Worship	Place of Worship
S 109	665305	5560919	Great Divide Trail/Waypoints	Recreation	S 317	651712	5512989	Place of Worship	Place of Worship
S 110	665424	5565234	Great Divide Trail/Waypoints	Recreation	S 318	639693	5485501	Place of Worship	Place of Worship
S 111	662176	5569093	Great Divide Trail/Waypoints	Recreation	S 319	640194	5485359	Place of Worship	Place of Worship
S 112	680605	5490574	Great Divide Trail	Recreation	S 320	640150	5484937	Place of Worship	Place of Worship
S 113	678829	5501057	Great Divide Trail	Recreation	S 321	640464	5485424	Place of Worship	Place of Worship
S 114	672769	5507026	Great Divide Trail	Recreation	S 322	640326	5486322	Place of Worship	Place of Worship
S 115	665000	5510326	Great Divide Trail	Recreation	S 323	640356	5486646	Place of Worship	Place of Worship
S 116	670857	5546043	Great Divide Trail	Recreation	S 324	639788	5485359	MAJVP	Others
S 117	662174	5569099	Great Divide Trail	Recreation	S 325	640550	5486278	MINVP	Others
S 118	673059	5504762	Great Divide Trail	Recreation	S 326	651782	5508535	MAJVP	Others

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 119	666654	5535133	Great Divide Trail	Recreation	S 327	652153	5505866	MINVP	Others
S 120	673167	5539901	Great Divide Trail	Recreation	S 328	665068	5502169	MINVP	Others
S 121	663361	5557334	Great Divide Trail	Recreation	S 329	666040	5502071	MAJVP	Others
S 122	665835	5565404	Great Divide Trail	Recreation	S 330	666464	5500880	MAJVP	Others
S 123	666426	5551160	Great Divide Trail	Recreation	S 331	652332	5510761	MAJVP	Others
S 124	677876	5503320	Great Divide Trail	Recreation	S 332	652743	5511512	MINVP	Others
S 125	668401	5549074	Great Divide Trail	Recreation	S 333	653000	5511139	MINVP	Others
S 126	671952	5537216	Great Divide Trail	Recreation	S 334	648504	5543046	MAJVP	Others
S 127	683066	5487224	Great Divide Trail	Recreation	S 335	649522	5543536	MAJVP	Others
S 128	684815	5498238	Great Divide Trail	Recreation	S 336	640505	5464029	MINVP	Others
S 129	680991	5501218	Great Divide Trail	Recreation	S 337	641210	5463941	MINVP	Others
S 130	680766	5501185	Great Divide Trail	Recreation	S 338	632538	5464770	MINVP	Others
S 131	683502	5498943	Great Divide Trail	Recreation	S 339	641949	5433495	MINVP	Others
S 132	666917	5537164	Great Divide Trail	Recreation	S 340	680957	5501210	Paddock Inn	Recreation
S 133	640870	5484507	Marte	Others	S 341	673739	5504960	Campground	Recreation
S 134	648794	5548189	MunroeLake_2	Park	S 342	679423	5494210	Campground	Recreation
S 135	623484	5476554	SandCreek	Others	S 343	665455	5564968	Campground	Recreation
S 136	640870	5484507	TheNotch_2	Recreation	S 344	683302	5498799	Campground	Recreation
S 137	640469	5484819	Trans Canada Trail	Recreation	S 345	670502	5525034	Campground	Recreation
S 138	647612	5494589	Trans Canada Trail	Recreation	S 346	670097	5514828	Campground	Recreation
S 139	647972	5495653	Trans Canada Trail	Recreation	S 347	662800	5518315	Sensory and Human Health	Others
S 140	647671	5495130	Trans Canada Trail	Recreation	N 348	641052	5487628	Fairy Creek Falls	Recreation
S 141	652364	5510509	Trans Canada Trail	Recreation	N 349	642780	5489457	N/A	Others

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 142	652122	5514810	Trans Canada Trail	Recreation	N 350	643340	5490083	N/A	Others
S 143	652735	5527853	Trans Canada Trail	Recreation	N 351	645380	5492804	N/A	Others
S 144	649417	5543262	Trans Canada Trail	Recreation	N 352	647222	5494917	Hotel	Recreation
S 145	640001	5485022	Trans Canada Trail	Recreation	N 353	649141	5498732	Elk Valley Provincial Park	Park
S 146	639776	5486210	Trans Canada Trail	Recreation	N 354	650376	5500536	Rest Area	Others
S 147	652402	5510835	Trans Canada Trail	Recreation	N 355	651550	5503272	N/A	Others
S 148	651554	5511148	Trans Canada Trail	Recreation	N 356	656505	5508326	N/A	Others
S 149	640367	5484865	Trans Canada Trail	Recreation	N 357	656980	5507142	N/A	Others
S 150	649402	5499076	Trans Canada Trail	Recreation	N 358	658564	5506025	N/A	Others
S 151	650689	5501376	Trans Canada Trail	Recreation	N 359	660775	5504238	N/A	Others
S 152	652440	5510908	Trans Canada Trail	Recreation	N 360	661856	5503913	N/A	Others
S 153	650187	5531867	Trans Canada Trail	Recreation	N 361	663717	5502743	Rifle Range	Recreation
S 154	638295	5483326	Trans Canada Trail	Recreation	N 362	639219	5483162	Resorts	Recreation
S 155	652084	5509641	Trans Canada Trail	Recreation	N 363	639507	5481829	Residence	Residence
S 156	640941	5486962	Trans Canada Trail	Recreation	N 364	650832	5525688	N/A	Others
S 157	640528	5485401	Trans Canada Trail	Recreation	N 365	650787	5523977	N/A	Others
S 158	640559	5486659	Trans Canada Trail	Recreation	N 366	650866	5523408	Car Park	Others
S 159	652364	5510933	Trans Canada Trail	Recreation	N 367	651573	5528111	Residence	Residence
S 160	649202	5543110	Weigert_5	Others	N 368	650913	5521027	Excavating	Others
S 161	623105	5474608	Campground	Recreation	N 369	650998	5517252	Residence	Residence
S 162	625867	5467293	Campground	Recreation	N 370	651109	5515253	Residence	Residence
S 163	624839	5458093	Recreation	Recreation	N 371	652154	5513436	RV Storage	Others
S 164	627547	5464519	Campground	Recreation	N 372	652447	5512177	Teck Coal Ltd Office	Others

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 165	625731	5440823	Campground	Recreation	N 373	654562	5510888	Elkview Operations	Others
S 166	627200	5447300	Campground	Recreation	N 374	650203	5545287	N/A	Others
S 167	629504	5459830	Campground	Recreation	N 375	649720	5535229	N/A	Others
S 168	628936	5436493	Campground	Recreation	N 376	649743	5533337	Residence	Residence
S 169	640578	5497039	Campground	Recreation	N 377	650100	5531559	N/A	Others
S 170	640741	5467819	Recreation	Recreation	N 378	633354	5449383	N/A	Others
S 171	637879	5441865	Recreation	Recreation	N 379	633656	5451564	N/A	Others
S 172	638473	5440182	Campground	Recreation	N 380	633735	5448873	N/A	Others
S 173	648850	5449709	Recreation	Recreation	N 381	633757	5448419	N/A	Others
S 174	644336	5569406	Recreation	Recreation	N 382	634568	5453778	N/A	Others
S 175	643774	5561395	Campground	Recreation	N 383	635829	5461298	N/A	Others
S 176	664397	5514686	Campground	Recreation	N 384	636164	5460725	N/A	Others
S 177	664578	5521812	Campground	Recreation	N 385	635975	5459254	N/A	Others
S 178	656550	5522250	Campground	Recreation	N 386	635733	5455809	N/A	Others
S 179	655247	5524777	Residence	Residence	N 387	636762	5461931	N/A	Others
S 180	652077	5523283	Residence	Residence	N 388	637304	5461612	N/A	Others
S 181	652190	5518610	Residence	Residence	N 389	640352	5479126	N/A	Others
S 182	663912	5554220	Great Divide Trail	Recreation	N 390	636223	5447095	N/A	Others
S 183	639746	5485349	Trans Canada Trail	Recreation	N 391	640737	5478222	N/A	Others
S 184	647530	5528051	Recreation	Recreation	N 392	638857	5463442	N/A	Others
S 185	645070	5542169	Recreation	Recreation	N 393	638343	5445324	N/A	Others
S 186	647783	5542801	Recreation	Recreation	N 394	642431	5474841	N/A	Others
S 187	648031	5543392	Recreation	Recreation	N 395	639047	5443966	N/A	Others

ID	X [m]	Y [m]	Description	Category	ID	X [m]	Y [m]	Description	Category
S 188	648703	5548200	Recreation	Recreation	N 396	639423	5442305	N/A	Others
S 189	648702	5548202	Recreation	Recreation	N 397	643417	5473023	N/A	Others
S 190	639866	5488000	Recreation	Recreation	N 398	642483	5464418	N/A	Others
S 191	668540	5487411	Recreation	Recreation	N 399	643881	5471064	N/A	Others
S 192	643248	5492243	Recreation	Recreation	N 400	644217	5469979	N/A	Others
S 193	641286	5496117	Recreation	Recreation	N 401	644361	5468643	N/A	Others
S 194	638967	5485952	Recreation	Recreation	N 402	644287	5467593	N/A	Others
S 195	647440	5451879	Recreation	Recreation	N 403	644249	5467157	N/A	Others
S 196	651637	5431207	Recreation	Recreation	N 404	623165	5470646	Butcher Shop	Others
S 197	651819	5511901	Sensory and Human Health	Others	N 405	624866	5471083	Hardware Store	Others
S 198	656671	5522201	Sensory and Human Health	Others	N 406	626238	5470095	N/A	Others
S 199	655417	5523458	Sensory and Human Health	Others	N 407	628979	5470149	Stella-Jones Inc	Others
S 200	653566	5523458	Sensory and Human Health	Others	N 408	630860	5467761	N/A	Others
S 201	655720	5524587	Sensory and Human Health	Others	N 409	634668	5461372	N/A	Others
S 202	658718	5525740	Sensory and Human Health	Others	N 410	639924	5439777	N/A	Others
S 203	658579	5519962	Sensory and Human Health	Others	N 411	640581	5437645	N/A	Others
S 204	668701	5521586	Sensory and Human Health	Others	N 412	641390	5435487	N/A	Others
S 205	664848	5518642	Sensory and Human Health	Others	N 413	642277	5429730	N/A	Others
S 206	664190	5515973	Sensory and Human Health	Others	N 414	642673	5432236	N/A	Others
S 207	663904	5502918	Sensory and Human Health	Others	N 415	662791	5518313	KNC Crown HHRA and Sensory receptor #15	Others
S 208	661018	5524247	Sensory and Human Health	Others	S416	655244	5526650	Grave Lake Receptor, requested by BC MOE	Others

6.2.5 Technical Dispersion Options

All technical options relating to the CALPUFF dispersion model were set according to the BC AQDMG or CALPUFF model defaults. This included parameters and options such as the calculation of plume dispersion coefficients, the plume path coefficients used for terrain adjustments, exponents for the wind speed profile, and wind speed categories. A list of the technical options is provided in Table 15.

Table 15: CALMET and CALPUFF model configurations

Option	Parameter	Value	BC AQDMG	Rationale
Determines whether observation data are used, or in combination with NWP model output, or NWP data only	NOOBS	1	No default	A combination of observations and NWP output will be used
Cloud Data Option: 1,2,3,4	MCLOUD	4	Recommended	-
Wind field model selection variable.	IWFCOD	1	Default	-
Compute Froude number adjustment effects?	IFRADJ	1	Default	-
Compute kinematic effects?	IKINE	0	Default	-
Use O'Brien procedure for adjustment of the vertical velocity?	IOBR	0	Default	-
Compute slope flows?	ISLOPE	1	Default	-
Extrapolate surface wind observations to upper layers?	IEXTRP	-4	Recommended	-
Extrapolate calm winds aloft?	ICALM	0	Recommended	When NWP model output is used, a value of 0 is recommended.
Layer-dependent biases.	BIAS	NZ*0	Not used	Bias is not active when NOOBS = 1.
Min. distanced btwn upper air stn and srfc for which extrap of srfc winds will be allowed.	RMIN2	-1	Recommended	-
Gridded prognostic wind field model output fields.	IPROG	14	Recommended	NWP will be used as the initial guess field.

Option	Parameter	Value	BC AQDMG	Rationale
Time step (hrs) of the NWP output used as input data	ISTEPPGS	3600	Recommended	WRF output is an hourly dataset.
Use coarse CALMET fields as initial guess field	IGFMET	0	Recommended	WRF dataset will be used as an initial guess field.
Use varying radius of influence?	LVARY	F	Recommended	-
Max radius of influence over land of the surface layer.	RMAX1	12 km	No default	As stated in the justification for R1 value, at R1 distance the influence of the observed winds and the step 1 wind field is equally weighted. And, at RMAX1 distance the influence of the observed wind is zero.
Max radius of influence over land aloft.	RMAX2	40 km	No default	Wind aloft or wind above the mixing height layer can be up to 200 m above ground. The terrain effect is negligible at layer aloft, therefore the maximum radius of influence of winds at each WRF data point is equal to the domain size which means there is no localized effect due to terrain.
Max radius of influence of influence over water.	RMAX3	40 km	No default	Wind aloft or wind above the mixing height layer can be up to 200m above body of water. As there are no terrain features on the water body, the maximum radius of influence of winds above any body of water at each WRF data point is equal to the domain size.
Min. radius of influence used in the wind field interpolation.	RMIN	0.1 km	Recommended	-
Radius of influence of terrain features	TERRAD	6 km	No default	The valley containing highway 43 is approximately 12 km in width.

Option	Parameter	Value	BC AQDMG	Rationale
Distance from a sfc stn at which the stn. obs and 1st guess field are equally weighted.	R1	6 km	No default	There is a climate station near the project site and within the valley which reports hourly data (Sparwood CS). The valley width is approximately 12 km. At half the distance of valley width or 6 km distance where the observation station is located approximately in the middle of the valley width, the influence of the observed winds and the step 1 wind field is equally weighted.
Distance from an upper air stn at which the obs and 1st guess field are equally weighted.	R2	12 km	No default	Since upper air values are from WRF data, R2 is set to 12 km or the distance of the valley width so that WRF data on the east edge of the valley will have equally weighted influence (50%) at the west edge of the valley.
Relative weighting of the prognostic wind field data.	RPROG	0	Recommended	-
Maximum acceptable divergence in the divergence min. procedure.	DIVLIM	5x10-6	Not used	-
Maximum number of iterations in the divergence min. procedure.	NITER	50	Not used	-
Number of passes in the smoothing procedure.	NSMTH	2,4,4,4,...	Recommended	-
Max number of stns used in each layer for the interpolation of data to a grid point	NINTR2	99	Recommended	-
Critical Froude number.	CRITFN	1	Recommended	-
Empirical factor controlling the influence of kinematic effects.	ALPHA	0.1	Not used	-
Multiplicative scaling factor for extrapolation of surface observations to upper layers.	FEXTR2	NZ*0	Not used	-

Option	Parameter	Value	BC AQDMG	Rationale
Number of barriers to interpolation of the wind fields.	NBAR	0	Not used	-
Level (1 to NZ) up to which barriers apply	KBAR	0	Not used	-
X and Y coordinates of barriers.	XBBAR, YBBAR, XEBAR, YEBAR	0,0,0,0	Not used	-
Diagnostic module surface temperature option.	IDIOPT1	0	Recommended	-
Diagnostic module sfc. met station to use.	ISURFT	-1	Recommended	-
Diagnostic module domain-average lapse rate option.	IDIOPT2	0	Recommended	-
Diagnostic module upper air stn to use for lapse rate to use.	IUPT	-1	Recommended	-
Depth through which the domain-scale lapse rate is computed.	ZUPT	200	Recommended	-
Initial guess field wind components	IDIOPT3	0	Recommended	-
Upper air station to use to domain-scale winds.	IUPWND	-1	Recommended	-
Bottom and top of layer through which the initial guess winds are computed.	ZUPWND	1, 1000	Recommended	-
Observed surface wind components for wind field module	IDIOPT4	0	Recommended	-
Observed upper air wind components	IDIOPT5	0	Recommended	-

6.2.6 Source Parameters

Project sources were parameterized according to the type of source and typical dispersion modelling methodology. For example, emissions from the CPP gas fired boiler, the locomotive engines, and the diesel generators were modelled as point sources. Parameters such as engine horsepower and boiler input rating were obtained from manufacturer specifications.

The emissions modelled as area sources include blasting and explosive detonation, drilling, coal loading and unloading, bulldozing, grading, mobile equipment fugitive emissions, stockpile wind erosion, and mobile equipment combustion.

Volume sources were used to represent emissions released from sources having a vertical depth (e.g., a material transfer or drop) and are characterized as equal-sided areas with the release height typically set equal to half of the vertical depth. All material transfer points such as conveyor transfer, rail loading, truck loading, stockpile and screening drop were modelled as volume sources. Comfort heating emissions from combustion of natural gas were also modelled as volume sources.

6.2.7 Building Effects

CALPUFF utilizes the BPIP algorithm to predict near-source plume effects related to building downwash and the aerodynamic turbulence induced by nearby buildings or structures. Building downwash was included in the CALPUFF modelling where sources are located within the influence area of any proposed building.

6.2.8 Wet and Dry Deposition

The assessment included an estimate of dustfall throughout the RSA, including both wet and dry deposition of particulate matter from all emission sources. Deposition rates are dependent on particle size, therefore the PM size fractions of 0 µm to 2.5 µm ($PM_{0\text{-}2.5}$), 2.5 µm to 10 µm ($PM_{2.5\text{-}10}$), and 10 to 30 µm ($PM_{10\text{-}30}$) were modelled separately within CALPUFF. The dry and wet deposition parameters used in CALPUFF for estimating deposition of different PM size fractions are listed in Table 16. The deposition parameters were selected to align with similar EA applications related to coal mining and processing.

The modelled deposition rates for each size fraction were combined in CALPOST using POSTUTIL to obtain total TSP deposition (i.e., the sum of wet and dry deposition for $PM_{0\text{-}2.5}$, $PM_{2.5\text{-}10}$, and $PM_{10\text{-}30}$). The modelled total deposition of TSP, predicted based on 24-hr maximum source emission rates, was processed in CALPOST for a 1-month averaging period for direct comparison with the BC AAQO.

Table 16: CALPUFF Modelled Deposition Parameters

Model Species	Geometric Mass Mean Diameter (µm)	Geometric Standard Deviation Diameter (µm)
PM2.5 ($PM_{0-2.5}$)	1.25	0
PM10 ($PM_{2.5-10}$)	6.25	0
TSP (PM_{10-30})	20	1.24

$PM_{0-2.5}$ = particulate matter of size 0 µm to 2.5 µm in diameter; $PM_{2.5-10}$ = particulate matter of size 2.5 µm to 10 µm in diameter; PM_{10-30} = particulate matter of size 10 µm to 30 µm in diameter;

6.2.9 NO_x to NO_2 conversion

NO_2 is primarily emitted from combustion activities. Emission estimates were based on published emission factors from sources such as AP-42, which are typically provided as total nitrogen oxides (NO_x). As the BC AAQO are based on NO_2, the CALPUFF-predicted NO_x concentrations were converted to NO_2 in post-processing. The most conservative method of estimating NO_2 concentration is to assume a full (100%) conversion of NO_x to NO_2. When representative NO and NO_2 ambient monitoring data is available, a more accurate estimate can be made based on the Ambient Ratio Method (ARM).

NO and NO_2 ambient concentrations were measured at the EVO DTAM (E262137) station for the time period from 2014 to 2016. The 3-year NO and NO_2 ambient monitoring data was used to estimate the ambient NO_2/NO_x ratio, following the ARM approach as provided in the BC AQDMG. The 1-hour NO_2/NO_x ratio is shown in comparison with total NO_x in Figure 15. Plotting the NO_2/NO_x against total NOx concentrations allowed for the development of a NO_2/NO_x relationship which is dependent on the ambient NO_x concentration.

For the annual averaging period, a single NO_2/NO_x ratio of 0.672 was estimated based on the average of annual average NO_2/NO_x ratio for each year between 2014 and 2016, as presented in Table 17.

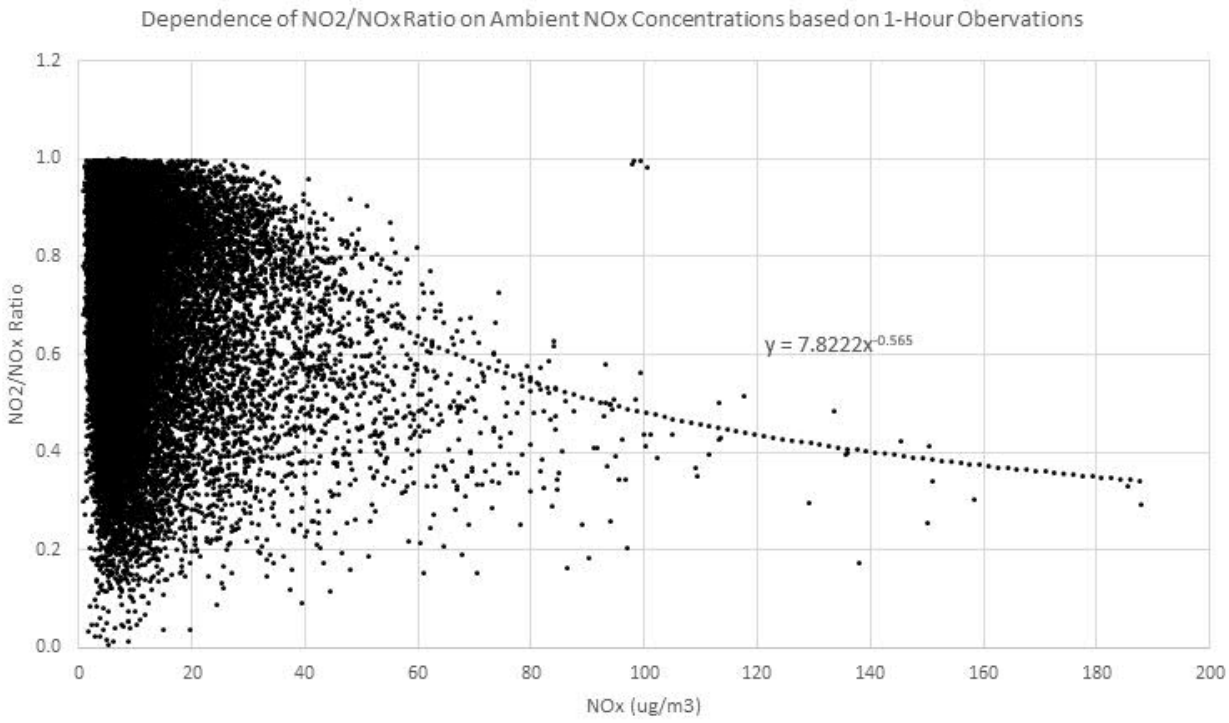


Figure 15: 1-hour NO_2/NO_x **Ratio**

Table 17: Annual NO_2/NO_x **Ratio**

	2014	2015	2016	Average of Annual Average
Annual average NO_2/NOx Ratio	0.715	0.667	0.636	0.672

6.2.10 Modeled Species and Averaging Period

Contaminant emission rates were developed using averaging periods to align with the relevant regulatory criteria. For example, NO_2 has both 1-hour and annual standards, therefore 1-hour maximum and annual maximum emission rates were developed. CALPUFF dispersion modelling was performed using the emissions rates which correspond to the averaging period being assessed.

The CALPUFF modelled contaminants including CACs and dustfall for different averaging period are summarized in Table 18. Maximum concentrations at receptors are predicted for CACs, while total depositions (dry and wet) of TSP are predicted for dustfall.

Table 18: CALPUFF Modelled Contaminants and Averaging Time Period

	NOx(1)	SO2	CO	TSP	PM10	PM2.5	Dustfall (mg/dm2.day)	VOCs(2) (3)
1-hour	√	√	√					
8-hour			√					
24-hour				√	√	√		√
30-day							√	
Annual	√	√		√		√		

Notes:

1. NOx emissions were estimated and modelled in CALPUFF and converted to NO_2 using the ARM ratio for comparison against B.C. air quality objectives.
2. Additional contaminants including VOCs and PAHs and metals in dustfall were assessed based on speciation profile of dust. The model results of VOCs and PAHs are not evaluated as part of the air quality assessment due to a lack of federal or provincial air quality standards or objectives.
3. VOCs are assessed for 24-hr averaging period and the results are used for other EA discipline studies.

6.2.11 CALPUFF Output Post-processing

For computational efficiency and to simplify post-processing, the Project sources were split across multiple CALPUFF models. CALSUM and POSTUTIL were used to sum the modelled concentration and deposition predictions from each of the CALPUFF runs to determine the predicted concentrations and depositions as a result of the Project.

6.3 Mitigation Measures

Detailed dust management and suppression measures to be implemented during Project operation are discussed in the Crown Feasibility Study Report such as installing a cover/hood/canopy on the top of major dust emission sources (e.g., hopper, coal stockpile, and all exposed conveyors), applying a dustbinder chemical solution to the rail cars, and installing a dust extraction system on the train loadout bin. In addition, a general BMP for mine projects is proposed to further minimise dust and CAC emissions throughout all phases of the Project. For example, water suppression will be applied on haul road which controls approximately 75% of fugitive dust generated from transport of ROMs[32]. The mitigation measures have been incorporated in the source emission estimates and therefore the air dispersion modelling assessment represents mitigated results.

[32] US EPA AP42 Fifth Edition, Figure 13.2.2-2

6.4 Characterization of Effects

Potential air quality effects from the Project were evaluated by comparing the maximum predicted contaminant concentrations resulting from Project activities against the relevant ambient air quality criteria. GHG emissions from the Project were compared to total provincial and national GHG emissions and against other facilities within the industry sector, as per *Canadian Environmental Assessment Act* guidance[33].

Metals, VOCs and PAHs were assessed in the Human Health Risk Assessment, but do not have air quality thresholds; therefore these contaminants were not included in the air quality assessment. However these results were predicted using speciation profiles of dust to determine maximum concentrations and deposition rates for metals, VOCs, and PAHs based on modelled dust deposition rates.

The following criteria will be used to determine residual adverse effects on intermediate VCs and receptor VCs: uncertainty; context; magnitude; extent; duration; reversibility; and frequency. Uncertainty refers to the confidence in the prediction made and is an indication of data quality. Context refers to the current and future sensitivity and resilience of the VC to change. Magnitude refers to the expected size or severity of the residual effect. Extent refers to the spatial scale over which the residual effect is expected to occur. Duration refers to the length of time the residual effect persists. Reversibility pertains to whether or not the residual effect on the VC can be reversed once the physical work or activity causing the disturbance ceases. Frequency refers to how often the residual effect occurs. These criteria definitions were obtained from BC EAO's *Guideline for the Selection of Valued Components and Assessment of Potential Effects*[34]. The qualitative terms used to rank the criteria are described in detail in Table 19[35].

[33] Canadian Environmental Assessment Agency. 2003. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment.

[34] BC EAO (British Columbia Environmental Assessment Office). (2013, September 9). *Guideline for the Selection of Valued Components and Assessment of Potential Effects*. Retrieved from British Columbia Environmental Assessment Office: https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/environmental-assessments

[35] Teck Coal Limited, 2015. *Elkview Operations Baldy Ridge Extension Project- Section B2.1 Atmospheric and Acoustic Environment*

Table 19: Definitions of Effects Criteria for Air Quality and Greenhouse gases

Criteria	Rating	Description
Context	Not Sensitive	GHG: The response of climate to further changes in GHG remains linear compared to current effect. Air quality: No additional exceedance of air quality objectives are predicted relative to the Baseline Scenario and any predicted effect is reversible.
	Moderate Sensitivity	GHG: Additional increments may cause a greater effect than previous increments. Air quality: Additional exceedances relative to Base Case are predicted and the effect is not reversible.
	High Sensitivity	GHG: Increased increments have an increased relative effect. i.e., Global warming is accelerated on a per $CO2^e$ basis Air quality: Exceedances are predicted for Project Scenario where none were predicted in the Baseline Scenario and effect is not reversible.
Magnitude	Negligible	GHG emissions change by <0.1% compared to provincial totals, or by <0.01% compared to national totals; changes are less than the industry profile.
	Low	GHG emissions change by >0.1% but <1% compared to provincial totals or targets, or by >0.01% but <0.1% compared to national totals or targets; changes are within the range of the industry profile.
	Moderate	GHG emissions change by >1% compared to provincial totals, or by >0.1% compared to national totals; changes are within the range of the industry profile.
	High	GHG emissions change by >1% compared to provincial totals, or by >0.1% compared to national totals; changes are greater than the industry profile.
	Air quality	Predicted concentrations and frequency of exceedance are provided.
Extent	Local	Effects limited to within LSA.
	Regional	Effects extend beyond LSA but contained within RSA.
	Beyond regional	Effects extend beyond RSA.
Duration	Short-term	Effects are not evident beyond duration of construction.
	Medium-term	Effects are not evident beyond operations stage.
	Long-term	Effects are evident beyond reclamation and closure.
	Permanent	Effects are not reversible
Reversibility	Reversible	Change of state in environment is not permanent.
	Irreversible	Change of state in environment is permanent.
Frequency	Infrequent	Effects confined to a specific discrete period.

Criteria	Rating	Description
	Frequent	Effects occur intermittently but repeatedly, or occur continuously, over the assessment period.
Likelihood	Unlikely	Probability of effects occurring is low.
	Likely	Probability of effects occurring is moderate.
	Highly likely	Probability of effects occurring is high.
Prediction Confidence (Uncertainty)	Low	Limited evidence is available, models and calculations are highly uncertain, and/or evidence about potential effects is contradictory.
	Moderate	Sufficient evidence is available and generally supports the prediction.
	High	Sufficient evidence is available and most or all available evidence supports the prediction.

6.5 Determination of Significance

The section describes how the significance of residual effects for specified intermediate VCs was evaluated for the assessment.

Effects from adverse residual changes to measurement indicators (see Table 1) were characterized using a categorical scale and common words to facilitate the determination of significance. The purpose of categorical classification is to provide definitions that permit a clear, thorough, and unambiguous classification of residual effects such that reviewers and readers can follow and apply the logic used in the assessment and reach the same classification for a given residual effect.

Residual effects on air quality from incremental changes to measurement indicators because of the Project and other developments were characterized using uncertainty, context, magnitude, extent, duration, reversibility, and frequency.

These criteria were evaluated for each receptor VC. For each specified intermediate VC (i.e., air quality), the significance of residual effects is a synthesis of the significance determinations for its receptor VCs. The significance determination for each intermediate VC includes a summary of the residual effects and their significance for each of the receptor VCs. For any significant adverse effect on any of the receptor VCs, then it was deemed significant adverse effect on the intermediate VC. For the effect to be deemed significant the effect must be high in magnitude, regional in extent, and long term in duration.

7.0 Effects Assessment

The assessment results section predicts and characterizes (i) the baseline air quality, (ii) residual incremental effects of the Project, and the (ii) residual cumulative effects of the Project in combination with past, present and reasonably foreseeable future developments. A key outcome of this section is to predict emissions of PM, CO, SO_x, NO_2, and GHGs from the Project to inform human and terrestrial wildlife health assessments. This residual effects assessment is conducted by:

- Describing existing conditions in the baseline air conditions and from past and existing activities that are relevant to the assessment of potential effects from the Project.
- Conducting a Project Scenario assessment to predict and characterize residual effects from the Project in combination with past and present activities in the base case.
- Conducting a Reasonable Foreseeable Development (RFD) Case to predict the cumulative effects of past and present activities, the Project, and reasonably foreseeable future activities. A determination of significance of the cumulative effects from the Project Scenario and RFD Case will be conducted.

7.1 Baseline Air Quality

As detailed in Section 5.1, baseline air quality background values were obtained from nearby air monitoring stations to account for existing projects and activities in the area. No exceedances of the BC AAQO were identified and the maximum contaminant percent contribution to BC AAQO was identified as 78.8% for $PM_{2.5}$ for the 24-hour averaging period.

Table 20 summarizes the Baseline Scenario concentrations of CACs for different averaging periods, which were used as background concentrations for assessing residual effects from the Project Scenario.

Table 20: Baseline Scenario Concentrations of CACs

Averaging period	Baseline concentrations (µg/m^3)						
	NO_2	SO_2	CO	TSP	PM_{10}	$PM_{2.5}$	VOCs
1-hour	29.4	2.4	647.6		-	-	-
8-hour	-	-	786.9		-	-	-
24-hour	-	-	-	59.9	28.7	19.7	-
30-day	-	-	-		-	-	-
Annual	7.4	0.8	-	15.2	-	5.2	-

Notes:

1. Baseline concentrations are provided for contaminants and averaging periods for which measured results were available. All other cases are represented with dashes "-" which means background concentration of the contaminant is not measured for the time period and/or BC AAQOs are not available for the averaging period of the contaminant.
2. Dustfall concentrations are measured on a monthly basis at multiple air monitoring stations. The average of maximum dustfall concentration at each station is used to represent dustfall baseline in the LSA and RSA.

The contributions from baseline concentrations of CACs as a percent of applicable air quality objectives are presented in Table 21. The baseline concentrations of PM_{10} and $PM_{2.5}$ are considered relatively high

and account for more than the half of respective BC AAQOs. The baseline TSP accounts for approximately half of the applicable 24-hr objective and 25.3 % of the annual objective.

Table 21: Percent Contributions from Baseline Concentrations of CACs

Averaging period	Percent Contributions to Applicable Air Quality Objectives						
	NO2	SO2	CO	TSP	PM10	PM2.5	VOCs
1-hour	26.0%	1.3%	4.5%	-	-	-	-
8-hour	-	-	14.3%	-	-	-	-
24-hour	-	-	-	49.9%	57.3%	78.8%	-
30-day	-	-	-	-	-	-	-
Annual	23.0%	6.1%	-	25.3%	-	64.8%	-

7.2 Residual Effects of the Project

The assessment of air quality impacts from the Project include the prediction and characterization of the residual effects in combination with past and present activities.

7.2.1 Emissions Summary

All emission sources from the Project are summarized in Table 22, including their source ID, description, general locations, contaminants of concern, and source configuration in model. For each emission source, contaminant emission rates were estimated for their respective averaging periods (i.e., 1-hr, 24hr, and annual) depending on their operation information such as capacities, operating hours or frequencies. For each source, contaminant emission rates from construction, operation (year 1- year 15) and decommissioning phases were estimated. The maximum emission rates from the 11th operation year were used in the CALPUFF modeling for the prediction of worst-case Project emissions. The emission rates of different averaging periods (1hr, 24-hr, and annual) for each emission source are presented in Appendix B. The emission estimation methods used for developing the emission inventory for each emission source category have been discussed in Section 6.1.

7.2.1.1 Emission Source Identification

Table 22: Emission Source and Contaminant Identification

Source Information				Contaminants	Included in the worst-case (Year 11) dispersion modeling assessment? (Y/N)
Source Category	Source ID	Source Description	General Location		
Blasting and Explosive Detonation	P.1.1	Blasting and Explosive Detonation in North Pit	North Pit	TSP, PM10, PM2.5, NOx, CO, SO2, CH4	Not included in Year 11 dispersion model
	P.1.2	Blasting and Explosive Detonation in East Pit	East Pit	TSP, PM10, PM2.5, NOx, CO, SO2, CH4	Not included in Year 11 dispersion model
	P.1.3	Blasting and Explosive Detonation in South Pit	South Pit	TSP, PM10, PM2.5, NOx, CO, SO2, CH4	Yes
Drilling	P.2.1	Drilling in North Pit	North Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.2.2	Drilling in East Pit	East Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.2.3	Drilling in South Pit	South Pit	TSP, PM10, PM2.5	Yes
Conveyor Transfer Points	P.5.1	Grizzly Bar Screener to Conveyor (FB-101)	ROM Drop Structure (Near CPP)	TSP, PM10, PM2.5	Yes
	P.5.2	FB-101 to Raw Coal Conveyor (CV-101) (First drop point)	ROM Drop Structure (Near CPP)	TSP, PM10, PM2.5	Yes
	P.5.3	FB-101 to Raw Coal Conveyor (CV-101) (second drop point)	ROM Drop Structure (Near CPP) - CH-102	TSP, PM10, PM2.5	Yes
	P.5.4	CV-101 to SC-101 (Raw Coal Sizing Screen)	Breaker Station Structure (Near CPP) - CH-103	TSP, PM10, PM2.5	Yes
	P.5.5	SC-101 to CV-102	Breaker Station Structure (Near CPP) - CH-104	TSP, PM10, PM2.5	Yes
	P.5.6	Rotary Breaker to CV-102	Breaker Station Structure (Near CPP) - CH-105	TSP, PM10, PM2.5	Yes
	P.5.7	Rotary Breaker to CV-103	Breaker Station Structure (Near CPP) - CH-106	TSP, PM10, PM2.5	Yes
	P.5.8	CV-102 to CPP	In CPP - CH-107	TSP, PM10, PM2.5	Yes
	P.5.9	CPP to CV-701 (rejects conveyor)	In CPP	TSP, PM10, PM2.5	Yes
	P.5.10	CPP to CV-801	In CPP	TSP, PM10, PM2.5	Yes
	P.5.11	CV-802 toCV-804	CH-802	TSP, PM10, PM2.5	Yes
	P.5.12	BN-801 to CV-802	CH-822	TSP, PM10, PM2.5	Yes
	P.5.13	RC-801/802 to CV-805	CH-826/CH-825	TSP, PM10, PM2.5	Yes
Conveyor Line Wind Erosion Emissions	P.15.1	Fugitive dust emission from wind erosion of material on conveyor lines	Along conveyor line	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
Rail Loading	P.6.1	Rail Loading in Area 1	Rail Loading in Area 1	TSP, PM10, PM2.5	Yes

Source Information				Contaminants	Included in the worst-case (Year 11) dispersion modeling assessment? (Y/N)
Source Category	Source ID	Source Description	General Location		
Stock Pile and Screening Drop Emissions	P.7.1	ROM Screening Drop at CPP	ROM Drop Structure (Near CPP)	TSP, PM10, PM2.5	Yes
	P.7.2	CV-103 to Rejects Stockpile	ROM Drop Structure (Near CPP)	TSP, PM10, PM2.5	Yes
	P.7.3	CV-701 to Rejects bin	CPP Rejects Bin	TSP, PM10, PM2.5	Yes
	P.7.5	Rejects bin to Komatsu truck	CPP Rejects Bin	TSP, PM10, PM2.5	Yes
	P.7.6	CV-801 to Overland Conveyor Feed Bin (BN-801)	BN-801	TSP, PM10, PM2.5	Yes
	P.7.7	BN-801 to Overflow Stockpile (BK-801)	Overland Conveyor Feedbin bunker	TSP, PM10, PM2.5	Yes
	P.7.8	CV-802 to Truck Loading Bin (BN-802)	Truck Loading Bin	TSP, PM10, PM2.5	Yes
	P.7.9	CV-802 to Emergency Product Stockpile Conveyor (CV-804)	Emergency Product Stockpile	TSP, PM10, PM2.5	Yes
	P.7.11	BN-802 to Road Haul Trucks	Truck Loading Bin	TSP, PM10, PM2.5	Yes
	P.7.13	Clean Coal Stockpiles to CV-805 (Train Loadout Conveyor - RC-801)	Clean Coal Stockpiles	TSP, PM10, PM2.5	Yes
	P.7.14	Clean Coal Stockpiles to CV-805 (Train Loadout Conveyor - RC-802	Clean Coal Stockpiles	TSP, PM10, PM2.5	Yes
	P.7.15	CV-805 to Train Loadout Bin (BN-803)	Train Loadout Bin	TSP, PM10, PM2.5	Yes
Truck Loading Emissions	P.8.1	Truck (Coal) Loading in North Pit	North Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.2	Truck (Coal) Loading in East Pit	East Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.3	Truck (Coal) Loading in South Pit	South Pit	TSP, PM10, PM2.5	Yes
	P.8.4	Truck (Overburden) Loading in North Pit	North Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.5	Truck (Overburden) Loading in East Pit	East Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.6	Truck (Overburden) Loading in South Pit	South Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.7	Truck (Coal) UnLoading at CPP	CPP	TSP, PM10, PM2.5	Yes
	P.8.8	Truck Loading at Rejects Stockpile (from CV-103)	Breaker Rejects Stockpile	TSP, PM10, PM2.5	Yes
	P.8.9	Truck Loading at BK-701 Rejects Bin Overflow Stockpile Bunker	CPP Rejects Bin	TSP, PM10, PM2.5	Yes
	P.8.10	Truck (Coal) UnLoading at Waste Pit (Years 1-5)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.11	Truck (Coal) UnLoading at Waste Pit (Years 6-10)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.12	Truck (Coal) UnLoading at Waste Pit (Years 11-14)	Waste Pit	TSP, PM10, PM2.5	Yes
	P.8.13	Truck (Coal) UnLoading at Waste Pit (Years 15)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model

Source Information				Contaminants	Included in the worst-case (Year 11) dispersion modeling assessment? (Y/N)
Source Category	Source ID	Source Description	General Location		
	P.8.14	Truck (Overburden) UnLoading at Waste Pit (Years 1-5)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.15	Truck (Overburden) UnLoading at Waste Pit (Years 6-10)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.16	Truck (Overburden) UnLoading at Waste Pit (Years 11-14)	Waste Pit	TSP, PM10, PM2.5	Yes
	P.8.17	Truck (Overburden) UnLoading at Waste Pit (Years 15)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.8.18	Truck Loading at BK-801 Overflow Stockpile, Overland Conveyor Feed Bin Bunker	South Pit	TSP, PM10, PM2.5	Yes
	P.8.19	Truck Loading at Emergency Stockpile	South Pit	TSP, PM10, PM2.5	Yes
	P.8.20	Truck Unloading at Stockpile ST-803	South Pit	TSP, PM10, PM2.5	Yes
	P.8.21	Truck Unloading at Stockpile ST-804	South Pit	TSP, PM10, PM2.5	Yes
Bulldozing Process Emissions (Coal)	P.9a.1	Bulldozing Coal in North Pit	North Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.9a.2	Bulldozing Coal in South Pit	South Pit	TSP, PM10, PM2.5	Yes
	P.9a.3	Bulldozing Coal in East Pit	East Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
Bulldozing Process Emissions (Overburden)	P.9b.1	Bulldozing overburden at Waste Pit (Years 1-5)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.9b.2	Bulldozing overburden at Waste Pit (Years 6-10)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.9b.3	Bulldozing overburden at Waste Pit (Years 11-14)	Waste Pit	TSP, PM10, PM2.5	Yes
	P.9b.4	Bulldozing overburden at Waste Pit (Years 15)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
Grading Process Emissions	P.10.1	Grading the Clean Coal Haul Road	Clean Coal Haul Road	TSP, PM10, PM2.5	Yes
	P.10.2a	Grading Waste Pit Areas (Years 1-5)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.10.2b	Grading Waste Pit Areas (Years 6-10)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.10.2c	Grading Waste Pit Areas (Years 11-14)	Waste Pit	TSP, PM10, PM2.5	Yes
	P.10.2d	Grading Waste Pit Areas (Years 15)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.10.3	Grading the North Pit	North Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.10.4	Grading the South Pit	South Pit	TSP, PM10, PM2.5	Yes
	P.10.5	Grading the East Pit	East Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
Stockpile Wind Erosion	P.11.1	Wind Erosion Emissions from Clean Coal Product Stockpile 1	Rail Loadout Area	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.11.2	Wind Erosion Emissions from Clean Coal Product Stockpile 2	Rail Loadout Area	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	P.11.3	Wind Erosion from Breaker Rejects Stockpile	Near CPP	TSP, PM10, PM2.5	Yes
	P.11.4	Wind Erosion from Rejects Bin Overflow Stockpile (Partially in Bunker)	Near CPP	TSP, PM10, PM2.5	Yes

Source Information				Contaminants	Included in the worst-case (Year 11) dispersion modeling assessment? (Y/N)
Source Category	Source ID	Source Description	General Location		
	P.11.5	Wind Erosion from Overland Conveyor Overflow Stockpile (Partially in Feed Bin Bunker)	Overland Conveyor Feedbin bunker	TSP, PM10, PM2.5	Yes
	P.11.6	Wind Erosion from Emergency Product Stockpile	Near Road Haul Truck Loading Bin	TSP, PM10, PM2.5	Yes
Spray Bar emissions	P.12.1	Spray bar emissions at the rail loadout	Rail Loadout Area	Polyvinyl Acetate, Propylene Glycol, 2,5,8,11 Tetramethyl 6 dodecyn-5,8 Diol Ethoxylate, Glycol	Yes
Boiler Emissions	P.13.1	CPP Boiler Combustion Emissions	CPP	Products of Combustion	Yes
Feeder Breaker Process Emissions	P.14.1	Dust and Particulate Emissions from Feeder Breaker Process of Sizing Coal Fractions	Breaker Station Structure (Near CPP)	TSP, PM10, PM2.5	Yes
Rotary Breaker Process Emissions	P.15.1	Dust and Particulate Emissions from Rotary Breaker Process of Sizing Coal Fractions	Near CPP	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
Comfort Heating Emissions	P.16.1	Volume Source - CPP	Near CPP	Products of Combustion	Yes
	P.16.2	Volume Source - Overland Surge Bin			
	P.16.3	Volume Source - Rejects Bin			
Storage Tank Emissions	P.17.1	Diesel, Reagent Storage Tank #1 - Max Volume 25,000L. Horizontal Tank). Located at the CPP	CPP	Diesel fuel	Not included in Year 11 dispersion model
Mobile Equipment Emissions	M.1.1	Mobile Equipment Combustion Emissions from Haul Road	Haul Road	Combustion Vehicle Emissions	Yes
	M.1.2	Mobile Equipment Combustion Emissions from North Pit	North Pit	Combustion Vehicle Emissions	Not included in Year 11 dispersion model
	M.1.3	Mobile Equipment Combustion Emissions from South Pit	South Pit	Combustion Vehicle Emissions	Yes
	M.1.4	Mobile Equipment Combustion Emissions from East Pit	East Pit	Combustion Vehicle Emissions	Yes
	M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	Waste Pit	Combustion Vehicle Emissions	Not included in Year 11 dispersion model
	M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	Waste Pit	Combustion Vehicle Emissions	Not included in Year 11 dispersion model
	M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	Waste Pit	Combustion Vehicle Emissions	Yes
	M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Years 15)	Waste Pit	Combustion Vehicle Emissions	Not included in Year 11 dispersion model
	M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Rail Loadout Area	Combustion Vehicle Emissions	Yes
	M.1.7	Mobile Equipment Combustion Emissions from CPP Area	Near CPP	Combustion Vehicle Emissions	Yes
Locomotive Combustion Emissions	A.2.1	Emissions from Locomotive engine #1	Rail Loadout Area	Products of Combustion	Yes
	A.2.2	Emissions from Locomotive engine #2			
	A.2.3	Emissions from Locomotive engine #3			
	F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	Clean Coal Haul Road	TSP, PM10, PM2.5	Yes
	F.1.2	Mobile Equipment Fugitive Emissions from North Pit	North Pit	TSP, PM10, PM2.5	Yes

Source Information				Contaminants	Included in the worst-case (Year 11) dispersion modeling assessment? (Y/N)
Source Category	Source ID	Source Description	General Location		
On-Road Mobile Equipment Fugitive Dust Emissions	F.1.3	Mobile Equipment Fugitive Emissions from South Pit	South Pit	TSP, PM10, PM2.5	Yes
	F.1.4	Mobile Equipment Fugitive Emissions from East Pit	East Pit	TSP, PM10, PM2.5	Yes
	F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	Waste Pit	TSP, PM10, PM2.5	Yes
	F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	Waste Pit	TSP, PM10, PM2.5	Not included in Year 11 dispersion model
	F.1.6	Mobile Equipment Fugitive Emissions from Rail Load Out	Near Rail Loadout Area	TSP, PM10, PM2.5	Yes
	F.1.7	Mobile Equipment Fugitive Emissions from CPP Area	Near CPP	TSP, PM10, PM2.5	Yes
Generator Emissions	C.1.1	Diesel Generator for the Plant	Plant Area	TSP, PM10, PM2.5, NOx, CO, SO2, VOC	Yes
	C.1.2	Diesel Generator for the Office and Shops	Office and Shops	TSP, PM10, PM2.5, NOx, CO, SO2, VOC	Yes

7.2.1.2 Air Quality Emission Summary

Table 23 summarizes annual emissions of contaminants from all sources throughout the operational mine life. Operating Year 11 was considered as the worst-case operational year for assessing air quality impacts due to the high daily and annual contaminant emissions. The 10th and 11th operational years have similar annual emissions while the 11th year has higher daily emission rates for emission sources located close to sensitive receptors and thus was selected as the worst-case for dispersion modeling.

Table 23: Contaminant Annual Emission Summary throughout the Operational Mine Life

Year	Emission Rates (tonnes/year)						
	Nitrogen Oxides	Carbon Monoxide	TSP	PM2.5	PM10	VOCs	Sulphur Dioxide
-2	28	7	7,037	197	1,931	0.97	1.37
-1	110	24	7,123	203	1,956	8.48	1.57
1	1,036	274	11,849	359	2,825	81.06	8.67
2	1,139	296	13,087	391	3,026	88.7	11.47
3	1,272	323	12,528	383	2,926	76.79	10.27
4	1,105	290	13,447	398	3,082	95.63	12.32
5	1,059	285	12,512	407	2,930	106.22	12.73
6	1,369	370	11,483	369	2,823	117.24	12.88
7	1,295	345	11,263	360	2,775	106.36	12.58
8	1,303	348	11,312	362	2,787	107.92	12.68
9	1,317	353	11,296	362	2,785	109.21	12.62
10	1,460	380	12,210	390	2,949	118.35	16.32
11	1,456	377	12,282	392	2,961	116.58	16.57
12	1,455	377	12,267	392	2,960	116.38	16.46
13	1,119	289	11,308	357	2,775	85.6	12.61
14	1,362	363	11,425	367	2,814	113.32	13
15	828	228	9,567	289	2,433	63.87	6.64
15+	8	7	6,705	189	1,881	0.43	0.05

Notes:
Bold text indicates the estimated emission rate of the contaminant is at its maximum

7.2.1.3 Greenhouse Gas Emission Summary

Annual GHG Emissions were quantified over the lifespan of the Project, specifically, the carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions generated from on-site activities. Total annual emissions presented in tonnes of carbon dioxide equivalents (CO_2e) were calculated to establish a worst-case emissions year. It was determined that the Projects' 10th operational year yielded the highest total GHG emissions. As such, this year was used as a comparison year to both Provincial and Federal Sectoral Totals (ECCC NIR, 2021)[36]. Table 24 below presents GHG emissions from the worst-case year (Year 10) for each emission source. Table 25 summarizes GHG emissions from each operational year.

[36] Retrieved from: https://unfccc.int/documents/271493

Table 24: Greenhouse Gas Emissions Summary Table - Worst Case Operating Year by Source

Source Category	Source Description	Contaminant	Year 10	
			Tonnes of Gas per Year	Total CO2e per Year
Locomotive Combustion Emissions	Locomotive Engine Emissions	CO_2	10,304	11,463
		CH_4	0.58	
		N_2O	3.84	
Mobile Equipment Emissions	Mobile Equipment Combustion Emissions from Haul Road	CO_2	68,159	68,866
		CH_4	3.55	
		N_2O	2.08	
	Mobile Equipment Combustion Emissions from North Pit	CO_2	0	0
		CH_4	0	
		N_2O	0	
	Mobile Equipment Combustion Emissions from South Pit	CO_2	97,214	98,223
		CH_4	5.06	
		N_2O	2.96	
	Mobile Equipment Combustion Emissions from East Pit	CO_2	0	0
		CH_4	0	
		N_2O	0	

Source Category	Source Description	Contaminant	Year 10	
			Tonnes of Gas per Year	Total CO2e per Year
	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CO_2	0	0
		CH_4	0	
		N_2O	0	
	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CO_2	63,244	63,901
		CH_4	3.29	
		N_2O	1.93	
	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CO_2	0	0
		CH_4	0	
		N_2O	0	
	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CO_2	0	0
		CH_4	0	
		N_2O	0	
	Mobile Equipment Combustion Emissions from Rail Load Out	CO_2	2,789	2,818
		CH_4	0.15	
		N_2O	0.09	
	Mobile Equipment Combustion Emissions from CPP Area	CO_2	4,957	5,008
		CH_4	0.26	
		N_2O	0.15	

Source Category	Source Description	Contaminant	Year 10	
			Tonnes of Gas per Year	Total CO2e per Year
Generator Emissions	Diesel Generator for the Plant	CO_2	15.38	15.40
		CH_4	1.6E-04	
		N_2O	4.6E-05	
	Diesel Generator for the Office and Shops	CO_2	15.38	15.40
		CH_4	1.6E-04	
		N_2O	4.6E-05	
CPP Boiler Emissions	CPP Natural Gas Fired Boiler	CO_2	11,612	11,636
		CH_4	0.22	
		N_2O	0.06	
Comfort Heating Emissions (Nat. Gas)	Volume Source CPP	CO_2	9,160	9,214
		CH_4	0.18	
		N_2O	0.17	
	Volume Source - Overland Surge Bin	CO_2	128.19	128.95
		CH_4	2.5E-03	
		N_2O	2.4E-03	
	Volume Source - Rejects Bin	CO_2	58.27	58.61
		CH_4	1.1E-03	
		N_2O	1.1E-03	

Source Category	Source Description	Contaminant	Year 10	
			Tonnes of Gas per Year	Total CO2e per Year
Blasting and Explosive Detonation Emissions	Blasting and Explosive Detonation in North Pit	CO_2	0	2,730
	Blasting and Explosive Detonation in East Pit	CO_2	0	
	Blasting and Explosive Detonation in South Pit	CO_2	2,730	
Mobile Emissions	Skidding – Deere 948L-II	CO_2	11.97	12.28
		CH_4	3.3E-04	
		N_2O	1.0E-03	
	Feller – Deere 959m	CO_2	9.54	9.79
		CH_4	2.6E-04	
		N_2O	8.1E-04	
	Truck/Trailer – Kenworth w900 - X15	CO_2	36.28	36.66
		CH_4	1.9E-03	
		N_2O	1.1E-03	
	Loading Logging Truck – Cat 966m	CO_2	1.5E-04	1.6E-04
		CH_4	4.1E-09	
		N_2O	1.3E-08	

Source Category	Source Description	Contaminant	Year 10	
			Tonnes of Gas per Year	Total CO2e per Year
Fugitive Emissions	Fugitive emissions from Fossil Fuel Production, Processing, Transmission and Distribution, and post-mining coal storage and handling	CH_4	5,629	140,720
Forest Sequestration	Carbon sequestration by forested areas. Accounts for baseline tree cover, expected deforestation, and projected reforestation.	CO_2	-286	-286

Table 25: Greenhouse Gases Annual Emission Summary throughout the Operational Mine Life

Year	GHG Emission Rates (tonnes/year)			
	CO2	CH4	N2O	CO2e
-2	10,595	0.29	0.24	10,675
-1	30,478	1.32	0.85	30,762
1	194,658	5,638	9.05	338,311
2	210,565	5,639	9.51	354,377
3	186,617	5,638	8.79	330,182
4	224,428	5,640	9.93	368,380
5	244,622	5,641	10.54	388,782
6	264,722	5,642	11.14	409,090
7	244,147	5,641	10.52	388,300
8	246,862	5,641	10.60	391,042
9	249,450	5,641	10.67	393,658
10	270,157	5,642	11.28	414,572
11	267,613	5,642	11.21	412,001
12	267,027	5,642	11.19	411,409
13	204,562	5,639	9.30	348,302
14	258,059	5,642	10.94	402,356
15	157,468	5,636	7.91	300,734
15+	*Not defined*			

As presented in Table 25 a total of 414,572 tonnes of CO_2e (0.41 Mt CO_2e) are estimated to result from the Project during Year 10, which represents the worst-case estimate of annual greenhouse gases emissions.

7.2.2 Predicted Air Quality

Dispersion modelling results are presented for the maximum predicted concentrations at gridded receptors and each selected sensitive receptors in the LSA and RSA such as residences, campgrounds, and recreation sites.

Maximum predicted dustfall deposition and concentrations of TSP, PM_{10}, $PM_{2.5}$, SO_2, CO, NO_2, SO_2, and VOCs, with and without the Baseline Case, are presented in the following sections and tables. The model results presented are for the Project Scenario with the implementation of applicable mitigation measures (e.g., fugitive dust control).

The predicted air quality for each CAC was compared against the most stringent applicable air quality criteria. For all contaminants with ambient air quality standards, the frequency of exceedance of applicable standards are also assessed for each sensitive receptor. The frequency of exceedance is calculated based on the number of exceedances (hours) of each corresponding AQ objective (e.g., $PM_{2.5}$) which occurs at each receptor location for the entire modeling period (2013 to 2015; 26,280 hours).

Post processing was performed on the predicted NO_x concentrations to convert to NO_2 using the NO_2/NO_x ratio developed from ambient monitoring data, following the ambient ratio method (ARM) approach described in the BC AQDMG. The CALPUFF dispersion modelling was conducted separately for LSA and RSA due to different computational and receptor grids.

The following tables show a summary of the predicted maximum concentrations of CACs and dustfall deposition in the LSA and RSA, with and without baseline concentrations. Table 26 and Table 27 summarize particulates and dustfall. Table 28 and Table 29 summarize other CACs. Table 30 and Table 31 present the modelling results against the 2025 CAAQS for comparison purposes. Full model results and frequencies of exceedances by all sensitive receptors are presented in Appendix D.

Table 26: Project Scenario Summary of PMs and Dustfall Model Results and Exceedance of Applicable Air Quality Objectives without Background Contributions

Contaminant	Dustfall	TSP		PM_{10}	$PM_{2.5}$	
Averaging Period	30-day	24-hour	Annual	24-hour	24-hour	Annual
Applicable Air Quality Objectives (µg/m^3)	-	120	60	50	25	8
% of receptors which exceed objective	-	5.9%	1.5%	7.2%	2.2%	0.5%
Maximum predicted result at any one receptor (µg/m^3)	10.7 (mg/dm^2/d)	2306	623	813	96	22
Maximum frequency of exceedance of objective	-	100%	N/A	100%	45%	N/A
Average exceedance frequency for receptors with exceedances	-	12%	N/A	11%	6%	N/A

Table 27: Project Scenario Summary of PMs and Dustfall Model Results and Exceedance of Applicable Air Quality Objectives with Background Contributions

Contaminant	Dustfall	TSP		PM_{10}	$PM_{2.5}$	
Averaging Period	30-day	24-hour	Annual	24-hour	24-hour	Annual
Applicable Air Quality Objectives (µg/m^3)	-	120	60	50	25	8
% of receptors which exceed objective	-	7.7%	1.5%	13.1%	11.9%	1.2%
Maximum predicted result at any one receptor (µg/m^3)	11.7 (mg/dm^2/d)	2366	638	842	116	27
Maximum frequency of exceedance of objective	-	100%	N/A	100%	100%	N/A
Average exceedance frequency for receptors with exceedances	-	16%	N/A	14%	10%	N/A

Table 28: Project Case Project Scenario Summary of CACs Model Results and Exceedance of Applicable **Air Quality Objectives without Background Contributions**

Contaminant	CO		NO_2		SO_2		VOCs
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual	24-hr
Applicable Air Quality Objectives (µg/m^3)	14,300	5,500	113	32	183	13	-
% of receptors which exceed objective	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	-
Maximum predicted result at any one receptor (µg/m^3)	920	595	255	24.5	5	0.05	75
Maximum frequency of exceedance of objective	0%	0%	10%	N/A	0%	N/A	-
Average exceedance frequency for receptors with exceedances	0%	0%	1.2%	N/A	0%	N/A	-

Note: VOCs are not assessed due to the lack of BC AAQO

Table 29: Project Scenario Summary of CACs Model Results and Exceedance of Applicable Air Quality **Objectives with Background Contributions**

Contaminant	CO		NO_2		SO_2	
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual
Applicable Air Quality Objectives (µg/m^3)	14,300	5,500	113	32	183	13
% of receptors which exceed objective	0.0%	0.0%	5.7%	0.0%	0.0%	0.0%
Maximum predicted result at any one receptor (µg/m^3)	1,568	1,82	285	31.9	7	1
Maximum frequency of exceedance of objective	0%	0%	24%	N/A	0%	N/A
Average exceedance frequency for receptors with exceedances	0%	0%	1.7%	N/A	0%	N/A

Note: VOCs are not assessed due to the lack of BC AAQO

Table 30: Project Scenario Summary of CACs Model Results and Exceedance of 2025 CAAQS without **Background Contributions**

Contaminant	NO_2 (2025 CAAQS)		SO_2 (2025 CAAQS)	
Averaging Period	1-hr	Annual	1-hr	Annual
Applicable AQ Objectives (µg/m3) (2025 CAAQS)	79	23	170	10
% of receptors which exceed objective	6.4%	0.2%	0.0%	0.0%
Maximum predicted result at any one receptor	255	24.5	5	0.05
Maximum frequency of exceedance of objective	29%	N/A	0%	N/A
Average exceedance frequency for receptors with exceedances	2%	N/A	0%	N/A

Table 31: Project Scenario Summary of CACs Model Results and Exceedance of 2025 CAAQS

Contaminant	NO_2 (2025 CAAQS)		SO_2 (2025 CAAQS)	
Averaging Period	1-hr	Annual	1-hr	Annual
Applicable AQ Objectives (µg/m3) (2025 CAAQS)	79	23	170	10
% of receptors which exceed objective	12.1%	0.2%	0.0%	0.0%
Maximum predicted result at any one receptor	285	31.9	7	1
Maximum frequency of exceedance of objective	81%	N/A	0%	N/A
Average exceedance frequency for receptors with exceedances	5%	N/A	0%	N/A

7.2.2.1 Receptors Experiencing Exceedances of CACs

Among the 405 sensitive receptors selected for the air quality assessment, the predicted maximum concentrations of PMs and CACs at a number of sensitive receptors are predicted to be above the applicable air quality objectives.

Table 32 summarizes the maximum frequencies of exceedances for the receptors exceeded any CACs objectives (i.e., exceedance frequency >0%). Note the exceedance frequencies have accounted for the baseline contributions and represent the predicted maximum exceedances for the worst-case operation year for air quality impact.

For the CACs, the predicted maximum CO and SO_2 concentrations at all sensitive receptors, with and without background contribution, are below the applicable objectives. The predicted maximum NO_2 concentrations with the background contribution exceeded the 1-hour ambient standard at 23 receptors

in the LSA but are below the NO_2 annual standard. Of these, receptor S200 was predicted to exceed the objective most frequently, with exceedances expected 23.9% of the time.

Table 32: Frequency of Exceedance for Sensitive Receptors above Any Applicable Air Quality Objectives

Contaminants	CO		NO2		SO2		Description	LSA or RSA?
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual		
S 25	0%	0%	1.75%	0%	0%	0%	Airport	LSA
S 48	0%	0%	2.26%	0%	0%	0%	Campground	LSA
S 54	0%	0%	0.01%	0%	0%	0%	Trap Line	LSA
S 56	0%	0%	0.004%	0%	0%	0%	Campground	LSA
S 61	0%	0%	2.20%	0%	0%	0%	Hunting	LSA
S 62	0%	0%	0.12%	0%	0%	0%	Hunting	LSA
S 63	0%	0%	0.19%	0%	0%	0%	Hunting	LSA
S 64	0%	0%	0.02%	0%	0%	0%	Campground	LSA
S 65	0%	0%	0.03%	0%	0%	0%	Campground	LSA
S 66	0%	0%	0.01%	0%	0%	0%	Campground	LSA
S 69	0%	0%	4.33%	0%	0%	0%	Crown	LSA
S 90	0%	0%	0.01%	0%	0%	0%	Great Divide Trail/Waypoints	LSA
S 178	0%	0%	2.81%	0%	0%	0%	Campground	LSA
S 179	0%	0%	0.02%	0%	0%	0%	Residence	LSA
S 180	0%	0%	0.33%	0%	0%	0%	Residence	LSA
S 199	0%	0%	0.84%	0%	0%	0%	Sensory and Human Health	LSA
S 200	0%	0%	23.86%	0%	0%	0%	Sensory and Human Health	LSA
S 201	0%	0%	0.10%	0%	0%	0%	Sensory and Human Health	LSA
S 205	0%	0%	0.01%	0%	0%	0%	Sensory and Human Health	LSA
S 206	0%	0%	0.03%	0%	0%	0%	Sensory and Human Health	LSA
S 263	0%	0%	0.23%	0%	0%	0%	School	LSA
N 366	0%	0%	0.02%	0%	0%	0%	N/A	LSA
N 368	0%	0%	0.01%	0%	0%	0%	N/A	LSA

7.2.2.2 Receptors Experiencing Exceedances of Particulate Matter

Table 33 summarizes the sensitive receptors with exceedance of particulate matter (TSP, PM_{10}, $PM_{2.5}$), with the Baseline Scenario included. A total of 53 receptors in the LSA are predicted to have exceedances for particulate matter. The maximum predicted concentrations of all modelled contaminants, including CACs, TSP, PM10, PM2.5, at the RSA receptors are below corresponding air quality objectives.

53 receptors are predicted with concentrations exceeded particulate matter objectives. Among the modelled particulate based indicator compounds, the predicted 24-hr PM_{10} concentrations with the

Baseline Scenario concentrations exceeded the objective at the highest number of receptors (i.e., 53 receptors or 13.1% of total receptors). The average exceedance frequency for receptors with exceedances of 24-hr PM_{10} is approximately 14%, as shown in Table 27. With the background contributions, 11.9% of total receptors exceeded the 24-hr $PM_{2.5}$ objective and the average exceedance frequency for these receptors is about 10%. Similarly, 7.7% of total receptors exceeded the 24-hr TSP objective and the average exceedance frequency is approximately 16%.

For annually averaged concentrations of $PM_{2.5}$ and TSP, a relatively lower percentage of receptors (1.2% for PM2.5 and 1.7% for TSP) exceeded the corresponding annual objectives. There are 6 receptors exceeded the annual standard for TSP and 5 receptors exceeded the annual standard for PM2.5. All the receptors with exceedances of corresponding objectives are listed in the Table 33.

Table 33: Sensitive Receptors with Predicted Exceedances of Particulate Objectives

Contaminants	PM2.5	PM10	TSP	Description
Averaging Period	24-hr	24-hr	24-hr	
S 6	0.5%	3.4%	0.1%	Trapline Cabin
S 7	57.6%	79.4%	56.7%	Trapline Cabin
S 10	0.0%	0.1%	0.0%	Trapline Cabin
S 11	0.2%	0.3%	0.0%	Trapline Cabin
S 21	0.0%	0.1%	0.0%	Residence
S 25	6.4%	29.3%	18.5%	Airport
S 47	1.5%	2.2%	0.2%	Recreation
S 48	49.0%	65.7%	64.7%	Campground
S 49	0.2%	0.5%	0.0%	Campground
S 50	0.1%	0.1%	0.0%	Campground
S 53	7.0%	10.3%	2.0%	Campground
S 54	14.6%	18.6%	5.8%	Trap Line
S 56	9.3%	19.5%	13.9%	Campground
S 61	5.7%	12.0%	4.6%	Hunting
S 62	3.1%	8.9%	3.1%	Hunting
S 63	4.0%	10.4%	4.0%	Hunting
S 64	3.6%	8.8%	4.6%	Campground
S 65	14.5%	26.3%	20.6%	Campground
S 66	9.3%	20.1%	14.2%	Campground
S 69	14.5%	42.2%	36.8%	Crown
S 89	0.1%	0.1%	0.0%	Great Divide Trail/Waypoints
S 90	18.3%	20.1%	7.0%	Great Divide Trail/Waypoints
S 91	1.0%	5.0%	0.1%	Great Divide Trail/Waypoints

Contaminants	PM2.5	PM10	TSP	Description
Averaging Period	24-hr	24-hr	24-hr	
S 92	0.5%	2.5%	0.1%	Great Divide Trail/Waypoints
S 93	0.2%	0.7%	0.0%	Great Divide Trail/Waypoints
S 94	0.0%	0.2%	0.0%	Great Divide Trail/Waypoints
S 115	0.1%	0.1%	0.0%	Great Divide Trail
S 143	0.2%	0.4%	0.0%	Trans Canada Trail
S 153	0.2%	0.3%	0.0%	Trans Canada Trail
S 176	8.6%	11.1%	2.2%	Campground
S 177	1.3%	6.9%	0.3%	Campground
S 178	57.4%	70.2%	70.3%	Campground
S 179	5.8%	15.2%	7.7%	Residence
S 180	3.5%	14.6%	6.6%	Residence
S 181	0.0%	0.4%	0.0%	Residence
S 184	0.0%	0.1%	0.0%	Recreation
S 199	23.7%	42.6%	38.9%	Sensory and Human Health
S 200	100.0%	100.0%	100.0%	Sensory and Human Health
S 201	3.7%	8.5%	4.6%	Sensory and Human Health
S 202	2.8%	4.5%	1.9%	Sensory and Human Health
S 203	1.3%	2.3%	0.1%	Sensory and Human Health
S 205	15.0%	21.6%	2.6%	Sensory and Human Health
S 206	14.7%	19.4%	5.8%	Sensory and Human Health
S 210	0.1%	0.1%	0.0%	Sensory and Human Health
S 263	3.5%	12.2%	5.3%	School
S 416	0.2%	0.8%	0.0%	N/A
N 364	0.2%	0.8%	0.0%	N/A
N 365	0.1%	0.2%	0.0%	N/A
N 366	0.2%	0.5%	0.0%	N/A
N 367	0.2%	0.6%	0.0%	N/A
N 368	0.1%	0.2%	0.0%	N/A
N 376	0.2%	0.2%	0.0%	N/A
N 377	0.2%	0.3%	0.0%	N/A

Notes:

1. Receptors S3, S4, S196, N413, N414 are located on the edge of CALPUFF computational domain so their locations have been slightly adjusted.
2. Receptors S198, S208, S347, N415 are located within the Project footprint and thus excluded from reporting.
3. Receptors S60, S73, S136, S241, S267, S268, S275 are duplicate receptors and thus excluded from reporting.

7.2.2.3 Spatial Distribution of Receptors with Greater Than 1% of Exceedance Frequency of Air Quality Objectives

As presented in Table 33, 53 receptors are predicted to have concentrations exceeding their air quality objectives. All of the 53 receptors are predicted to exceed their air quality objective for a particulate based indicator compound and a total of 31 receptors are predicted to exceed their objective greater than 1% of the time. Receptors with predicted exceedances of any air quality objectives with greater than a 1% frequency are shown in Figure 16. Of these 31 receptors, 6 receptors are also predicted to have exceedances of the maximum 1-hr NO_2 objective as presented in Table 32.

Sensitive receptors with greater than 1% of exceedance frequencies of air quality objectives are located close to the Project boundary. Of these, Receptor S 202 is the furthest away from the project boundary (approximately 2km). All other receptors with greater than 1% of exceedance frequency of air quality objectives are located within 2km of the project boundary.

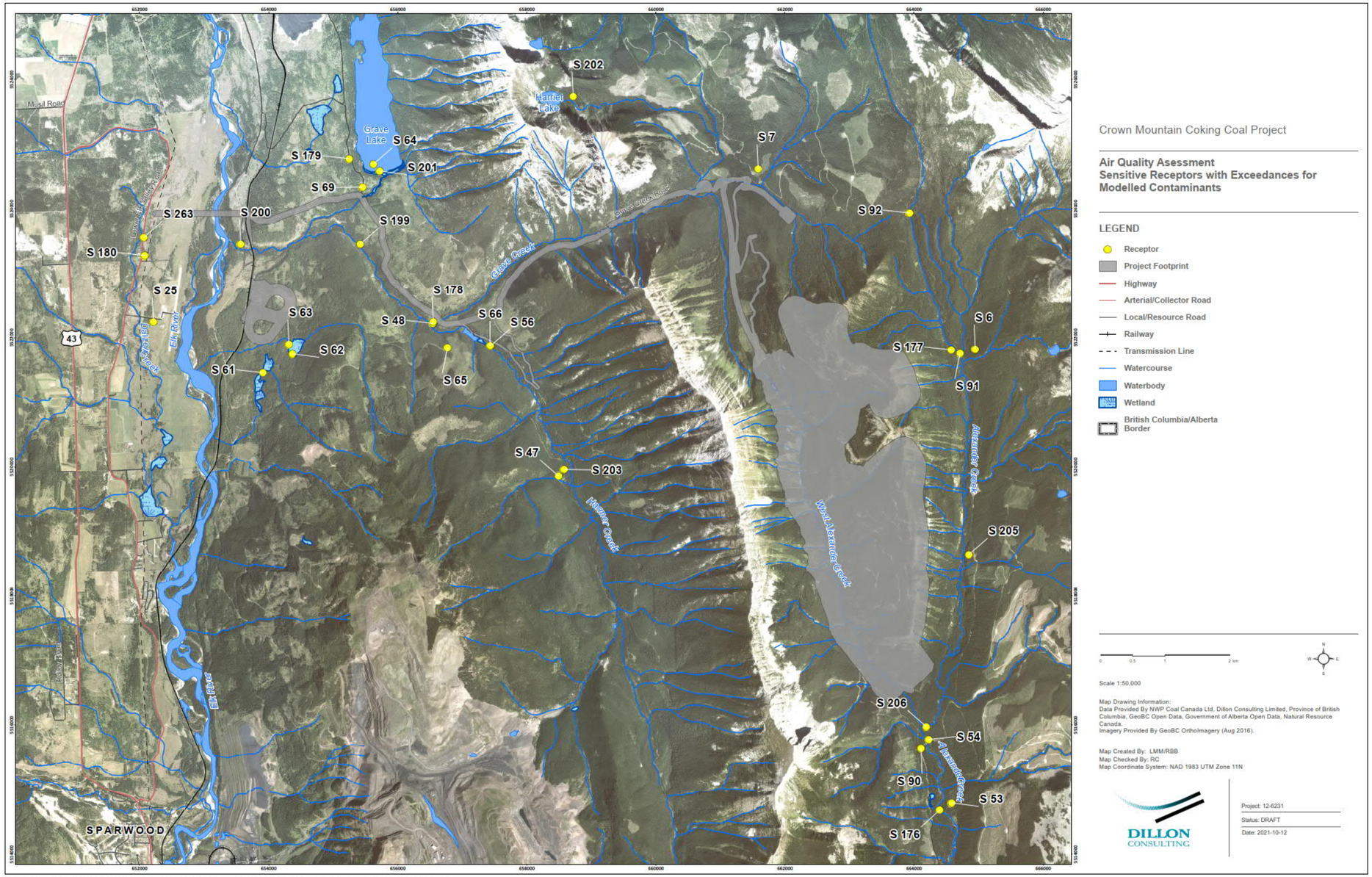


Figure 16: Sensitive Receptors with greater than 1% exceedances for modelled contaminants

7.2.3 Project Impact on Climate Change

The existing conditions at the Project site result in 0.001 Mt CO_2e of carbon sequestration due to the baseline tree cover. Carbon sequestration by forested areas has been taken into account in annual Project emissions.

The best available estimate of B.C.'s GHG emissions is provided in the ECCC NIR. A review of the 2019 GHG emission summaries from the ECCC NIR show that B.C. and Canada have an annual total GHG emission of 65.7 Mt CO_2e and 730 Mt CO_2e, respectively.

The worst-case GHG emission year represents a reasonable estimate of future peak GHGs from the Project and accounts for 0.41 Mt CO_2e. This peak would result in 0.63% and 0.06% of B.C's and Canada's total emission profile, respectively.

A review of the 2019 GHG emission summaries from the ECCC NIR show that B.C. and Canada mining sectors have an annual total GHG emission of 1.5 Mt CO_2e and 7.8 Mt CO_2e, respectively.

The worst-case GHG emission year for the Project would result in 27.4% and 5.3% of B.C's and Canada's total mining emission profile, respectively. The reported mining industry emissions are based on actual production and operations in 2019, while the worst-case GHG emissions year for the Project are based on maximum production and operation capacity. The comparison of maximum production and operation emissions versus actual will overestimate the emissions, however, this approach provides a conservative GHG emissions scenario.

B.C. is committed to reducing GHG emissions by 16% below 2007 levels by 2025, 40% by 2030, 60% by 2040, and 80% by 2050[37]. A review of the 2007 GHG emission summary from the 2007 ECCC NIR[38] show that B.C. has an annual total GHG emission of 63.1 Mt CO_2e. The future peak of potential GHG emissions from the Project result in 0.66% of B.C.'s total emissions in 2007. The Project lifespan is for 15 years and is expected to be fully decommissioned prior to 2050. Therefore any increases in GHG emissions from the Project will cease prior to the 2050 B.C. MOE target date.

7.3 Reasonably Foreseeable Development Case

This section identifies impacts of past, present, and reasonably foreseeable future projects and activities which have the potential to have residual effects on intermediate VCs and receptor VCs that overlap either spatially or temporally (or both) with the Project. Projects or activities that have already been built or conducted for which the environmental effects overlap with those of the proposed Project, and projects that are either proposed (public disclosure) or have been approved to be built, but are not yet built, for which the environmental effects overlap the proposed Project are considered. This is a conservative approach to a RFD case as some existing operations may already be captured in the baseline scenario.

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[37] BC. MOE. (2021). Climate Change. Available: https://www2.gov.bc.ca/gov/content/environment/climate-change. Accessed October 1, 2021.
[38] Environment Canada. (2009). National Inventory Report 1990-2007. Greenhouse Gas Sources and Sinks in Canada. The Canadian Government's Submission to the UN Framework Convention on Climate Change April 2009.

7.3.1 Contribution from Approved Projects

The existing projects with available emissions data that will contribute to cumulative effects are summarized in Table 34. For some projects/activities, emission data were not made publically available and thus their emission contributions were not summarized. Emissions data was obtained from Environment Canada's National Pollutant Release Inventory[39]. VOC emissions data are not available for most projects, therefore VOC emission contributions are not summarized.

The largest source of TSP, PM_{10}, and $PM_{2.5}$ emissions are the Fording River Operations which are located approximately 30 km northeast of Elkford, BC. The largest source of CO and NO_2 emissions is Grassy Mountain Coal Project located in southwestern Alberta within the Crowsnest Pass. The largest contributor of SO_2 emissions is Fording River Operations. The VOCs emission data are not available for most projects and thus VOCs emission contributions from reasonably foreseeable projects (RFP) are not summarized.

Table 34: Common Air Contaminants Emissions from Existing Sources

Project or Physical Activities	Location	Emissions (t/y)						
		NO_2	CO	SO_2	TSP	PM_{10}	$PM_{2.5}$	VOCs
Line Creek Operations	LSA	401	759	23	8,957	3,879	426	-
Elkview Operations	LSA	539	1,539	41	20,647	8,454	1,039	-
Greenhills Operations	LSA	1,047	1,228	32	26,345	10,822	1,498	-
Fording River Operations	LSA	823	1,476	72	32,415	14,241	1,865	-
Coal Mountain Operations	LSA	25	46	-	3,942	1,866	276	-
Elkhorn Quarry West (Windermere Mining Operation)	Outside RSA	7.7	1.7	0.508	0.543	0.543	0.543	0.613
Grassy Mountain Coal Project	RSA	1,182	1,815	8.4	4,434	1,118	149	-
Total Emission Contributions		4,025	6,865	177	96,741	40,381	5,254	-

Notes: "-" represents data was not available for the specified contaminant

[39] Government of Canada. (2021, January 4). *National Pollutant Release Inventory*. Retrieved from Government of Canada: https://pollution-waste.canada.ca/national-release-inventory/archives/index.cfm?do=query&lang=en

7.3.2 Contribution from Reasonably Foreseeable Projects

The emission contributions of CACs from Reasonably Foreseeable Projects are summarized in the Table 35.

Table **35: Estimated Annual CAC Emissions in the Reasonably Foreseeable Development Case**

	Annual CAC Emissions[1] (tonne/year)					
	NO_2[2]	CO	SO_2	TSP	PM_{10}	$PM_{2.5}$
Emission Contribution from Project Scenario	978	377	16.57	12,282	2,961	392
Emission Contributions from RFP	4,025	6,865	177	96,741	40,381	5,254
Total Emissions in the Reasonably Foreseeable Development Case	5,003	7,242	194	109,023	43,342	5,646

Notes:

1. Annual CAC emissions from Project Scenario are based on the Project worst-case operation year (year 11th).
2. The worst-case annual NO_x emission contribution from the Project Scenario (i.e., 1,456 ton/year) has been converted to NO_2 emissions based on the average annual NO_2/NO_x ratio of 0.672 as described in Section 6.2.9.

8.0 Conclusion

The air quality assessment included a detailed analysis of air emissions from the proposed Crown Mountain Coking Coal Project and their potential impacts on air quality and climate VCs. Air and GHG emissions generated from various Project activities are quantified for all phases of the Project, and the worst-case impact on air quality and climate are evaluated.

The indicator compounds for the assessment include TSP, PM_{10}, $PM_{2.5}$, sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), volatile organic compounds (VOCs), metals and polycyclic aromatic hydrocarbons (PAHs) in dustfall, and greenhouse gases (GHGs). The assessment of air quality and climate impacts are based on conservative estimates (e.g., use of maximum concentrations as the Baseline Scenario, use of maximum operating conditions for emission estimates and dispersion modelling) to capture the worst-case impact.

The maximum baseline concentrations of contaminants resulting from the Project were predicted using the CALPUFF dispersion model for gridded and sensitive receptors within LSA and RSA. The model results were assessed against the BC Ambient Air Quality Objectives, where applicable, without and with the Baseline Scenario. The annual air and GHG emissions throughout the Project life were also conservatively quantified to assess Project emission contributions.

The following are the results of the assessment:

- The predicted concentrations of CACs, including background contributions, are below applicable air quality objectives at all receptors except for 1-hr NO_2. The predicted concentrations of 1-hr NO_2 at several sensitive receptors located in the close vicinity to the Project footprint, with or without background contributions, exceeded the objective.
- Of the 405 sensitive receptors, the maximum predicted particulate concentrations exceeded applicable air quality objective at 53 receptors, when cumulatively considering the Project impacts and background contribution. Among the 53 receptors, 31 receptors are predicted with exceedance frequencies above 1%.
- The average exceedance frequencies of receptors which exceeded the objectives for 24-hr PM_{10} and 24-hr $PM_{2.5}$ with the baseline contributions are 14% and 10% respectively. The average exceedance frequency of dustfall is 69% for receptors with exceedances, with the background contributions.
- The sensitive receptors predicted to experience exceedances of the BC AAQOs are located close to the Project footprint and are within the LSA. The maximum distance from the sensitive receptors with exceedances frequency greater than >1% to the project footprint is about 2km (i.e., Receptor S 202). All receptors beyond 2km distance to the Project boundary are either predicted with exceedances below 1% frequency or below corresponding air quality objectives.
- The predicted maximum concentrations of indicator compounds, including CACs, particulates and dustfall, are below the corresponding objectives for receptors located within the RSA.

- The results of the GHG assessment indicate that the future peak GHG emissions are estimated to be less than 1% of the annual provincial emissions and less than 0.1% compared to the annual federal emissions.
- The Project will enter closure prior to the B.C. MOE's 2050 GHG reduction target date.

9.0 References

Bonti, C. (Director). Zerier [Motion Picture]. (2011).

British Columbia Environmental Assessment Office. Guideline for the Selection of Valued Components and Assessment of Potential Effects. (9 September 2013). https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/environmental-assessments

British Columbia Ministry of Environment and Climate Change Strategy. Climate Change. (1 October 2021). https://www2.gov.bc.ca/gov/content/environment/climate-change

British Columbia Ministry of Environment. Ambient Air Quality Objectives. (2020). https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf.

British Columbia Ministry of Environment. British Columbia Air Quality Dispersion Modelling Guideline. (2015). https://www.bcogc.ca/node/13339/download

The Canadian Biodiversity Website. Torsten Bernhardt. http://www.canadianbiodiversity.mcgill.ca/english/ecozones/montanecordillera/montanecordillera.htm

Canadian Environmental Assessment Agency. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment. (2003).

Clairant, B. Par Environ Santiset. Floras Zier. (2009).

Dillon Consulting Limited. Air Quality Baseline Report- Crown Mountain Coking Coal Project. (May 2020).

Dillon Consulting Limited. NWP Coal Canada Ltd., Air Quality Baseline Report, Crown Mountain Coking Project. (May 2020).

The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment. Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners. Catalogue No. EN106-50/2003E-PDF. ISBN 0-662-35454-0. (November 2003).

Finch, G. (2012). www.partirfortunitatbelari.com

Government of Alberta. Alberta Satellite Land Cover. https://open.alberta.ca/opendata/gda-f4c86e0b-be22-4b94-a6a3-754d17518e9d

Government of Canada, Environment and Climate Change Canada. Pits and quarries reporting guide: Section 8.2 Emissions from Boring/Blast Drilling. (May 2017). https://www.canada.ca/en/environment-climate-change/services/national-pollutant-release-inventory/report/pits-quarries-guide.html

Government of Canada. Canadian Climate Normals. https://climat.weather.gc.ca/climate_normals/index_e.html

Government of Canada. Environment Canada. National Inventory Report 1990-2007. Greenhouse Gas Sources and Sinks in Canada. The Canadian Government's Submission to the UN Framework Convention on Climate Change April 2009. (2009).

Government of Canada. Greenhouse gas emissions: drivers and impacts. (9 June 2020). https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions-drivers-impacts.html

Government of Canada. Impact Assessment Agency of Canada. Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012. (CEAA, 2020). https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/assessing-cumulative-environmental-effects-ceaa2012.html#toc008

Government of Canada. National Pollutant Release Inventory. (4 January 2021). https://pollution-waste.canada.ca/national-release-inventory/archives/index.cfm?do=query&lang=en

Government of Canada. Volatile organic compounds. (15 January 2021). https://www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/volatile-organic-compounds.html

Health Link BC. Carbon Monoxide Poisoning. (22 August 2019). https://www.healthlinkbc.ca/health-topics/hw193731

The Mining Association of Canada. Energy and GHG Emissions Management Reference Guide (June 2014). https://mining.ca/documents/energy-and-ghg-emissions-management-reference-guide/

NWP Coal Canada Ltd. Crown Mountain Coking Coal Project - First Nations Consultation Report. Vancouver. (2016).

NWP Coal Canada Ltd. Crown Mountain Coking Coal Project - Public Consultation Report. Vancouver. (2016).

NWP Coal Canada Ltd. Feasibility Study Report – Crown Mountain Coking Coal Project. (2020).

Office of Transportation and Air Quality. EPA-420-F-09-025. (April 2009).

Organisation for Economic Co-operation and Development (OECD). OECD Series on Emission Scenario Documents, Number 18, Emission Scenario Document for Insecticides, Acaricides And Products to Control Other Arthropods for Household And Professional Uses. (June 2008). https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2008)14&doclanguage=en

RAILWAY SAFETY ACT. SOR/2017-121. 9 June 2017.

Sturvowski, H. Clambisan Erroninous Neminas (Vol. 39). Santitori. (2004).

Teck Coal Limited. Elkview Operations Baldy Ridge Extension Project- Section B2.1 Atmospheric and Acoustic Environment. (2015).

United Nations Climate Change. Canada 2021 National Inventory Report (NIR). (12 April 2021). https://unfccc.int/documents/271493

United States Environmental Protection Agency AP-42 Fifth Edition, Figure 13.2.2-2.

United States Environmental Protection Agency. AP-42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing. (August 2004). https://www3.epa.gov/ttnchie1/ap42/ch11/final/c11s1902.pdf

United States Environmental Protection Agency. AP-42 Chapter 11.9 Western Surface Coal Mining. (October 1998). https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf

United States Environmental Protection Agency. AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles. (November 2006). https://www.epa.gov/sites/default/files/2020-10/documents/13.2.4_aggregate_handling_and_storage_piles.pdf

United States Environmental Protection Agency. AP-42 Chapter 13.2.5 Industrial Wind Erosion. (November 2006). https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0205.pdf

United States Environmental Protection Agency. AP-42 Chapter 13.3 Explosives Detonation. (February 1980). https://www.epa.gov/sites/default/files/2020-10/documents/13.3_explosives_detonation.pdf

United States Environmental Protection Agency. AP-42 Chapter 3.3 Gasoline and Diesel Industrial Engines. (October 1996). https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf

United States Environmental Protection Agency. AP-42 Section 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.(2014) https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s1902.pdf

United States Environmental Protection Agency. AP-42, Fifth Edition Compilation of Air Pollutant Emission Factors. Volume 1: Stationary Point and Area Sources. Section 13.3 Explosive Detonation. (1980).

United States Environmental Protection Agency. Chapter 13.2.2 Unpaved Roads. (November 2006). https://www.epa.gov/sites/default/files/2020-10/documents/13.2.2_unpaved_roads.pdf

United States Environmental Protection Agency. Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d. (July 2010). https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10081UI.txt

United States Environmental Protection Agency. Health and Environmental Effects of Particulate Matter (PM). (13 April 2020). https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm

United States Environmental Protection Agency. Nitrogen Dioxide (NO2) Pollution. (8 September 2016). https://www.epa.gov/no2-pollution/basic-information-about-no2#What%20is%20NO2

United States Environmental Protection Agency. Sulfur Dioxide (SO2) Pollution. (2 April 2019). https://www.epa.gov/so2-pollution/sulfur-dioxide-basics

Veriat, P. Lei Meniar Bloeblias. Publito Press Inte. (1964).

Appendix A

Crown Ambient Monitoring Report

DILLON CONSULTING

NWP COAL CANADA LTD

Air Quality Baseline Report

Crown Mountain Coking Coal Project

May 2020 | 12-6231

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A Dustfall Monitoring
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Acronyms and Abbreviations

– A –

AIR (Application Information Requirements): Identifies the information to be provided by a proponent in an Application for an Environmental Assessment Certificate.

ASTM: American Society for Testing and Materials

– B –

BC AAQO (British Columbia Ambient Air Quality Objectives – 2020): Air quality objectives that are non-statutory limits (i.e. not legally binding)

BC AQDMG: British Columbia Air Quality Dispersion Modelling Guidelines

BC MOE: Ministry of Environment – Government of B.C

– C –

CS (Climate Station): A facility, either on land or sea, with instruments and equipment for measuring atmospheric conditions to provide information for weather forecasts and to study the weather and climate.

– E –

EA (Environmental Assessment): Is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate possible environmental effects and to encourage decision makers to take actions that promote sustainable development. [1]

EIS (Environmental Impact Statement): A document prepared to describe the effects for proposed activities on the environment.

EPA (Environmental Protection Agency): Is an independent agency of the United States federal government for environmental protection.

[1] Government of Canada, (2015). *Draft Guidelines for the preparation of an environmental impact statement*

– G –

GHG: Greenhouse Gas

– M –

m asl(Meters above sea level): represented as a unit of measure.

Mt CO_2e (metric tonnes of CO_2 equivalents): Carbon dioxide equivalents of greenhouse gases derived by multiplying a gasses global warming potential by the tonnes of gas emitted. This unit is used for the purpose of greenhouse gas quantification.

– P –

PM: Particulate Matter

$PM_{2.5}$ (Fine Particulate Matter): Refers to tiny particles or droplets in the air that are =< 2.5 µm in width/diameter.

PM_{10} (Particulate Matter): Refers to tiny particles or droplets in the air that are =< 10 µm in width/diameter.

Executive Summary

An air quality baseline assessment was completed by Dillon Consulting Limited (Dillon) to support the provincial and federal requirements outlined in the Application Information Requirements (AIR)[2] and the Environmental Impact Statement (EIS)[3] Guidelines for the Crown Mountain Coking Coal Project (the Project).

Data presented for the baseline program will be used in conjunction with estimated Project emissions to quantify potential incremental impacts in air quality anticipated over the course of the Project. The AIR details the receptor and intermediate components that relate to air quality. In particular, air quality is an intermediate component on the pathway to potential effects for several Project receptor Valued Components (VCs).

To quantify potential incremental impacts, four (4) main scopes of work were completed in the baseline air quality report: Evaluation of the Baseline Data (Common Air Contaminants), Evaluation of the Baseline Data (Climate), Evaluation of the Baseline Data (Net Carbon Emissions) and Dustfall Monitoring.

The Evaluation of the Baseline Data (Common Air Contaminants) indicated that ambient air concentrations for the selected contaminants of concern all fall below their corresponding air quality objective as defined in the *BC Ambient Air Quality Objectives – 2020 (BC AAQO)* [4] for each of their respective averaging periods. Specific details on the methodology used to select representative stations along with a detailed comparison of each contaminant's ambient concentrations to their corresponding *BC AAQO* are presented in **Section 2.0**. An analysis of Baseline Climate conditions was completed to provide an understanding of meteorological conditions in the Project and surrounding area. Following this analysis, the predominate wind direction was observed to be southerly. A more detailed analysis including temperature and precipitation data is presented in **Section 3.0**.

Baseline Net Carbon Emissions were evaluated by establishing baseline greenhouse gas (GHG) emissions for the local and regional context surrounding the Project site. The Environment Canada and Climate Change (ECCC) National Inventory Report (NIR)[5] was utilized to provide a breakdown of sector specific GHG emissions. This detail is provided in **Section 4.0.**

As per the AIR, a Dustfall Monitoring program was developed and executed to evaluate baseline dustfall conditions surrounding the Project area. A total of nine (9) dustfall stations were deployed and data was

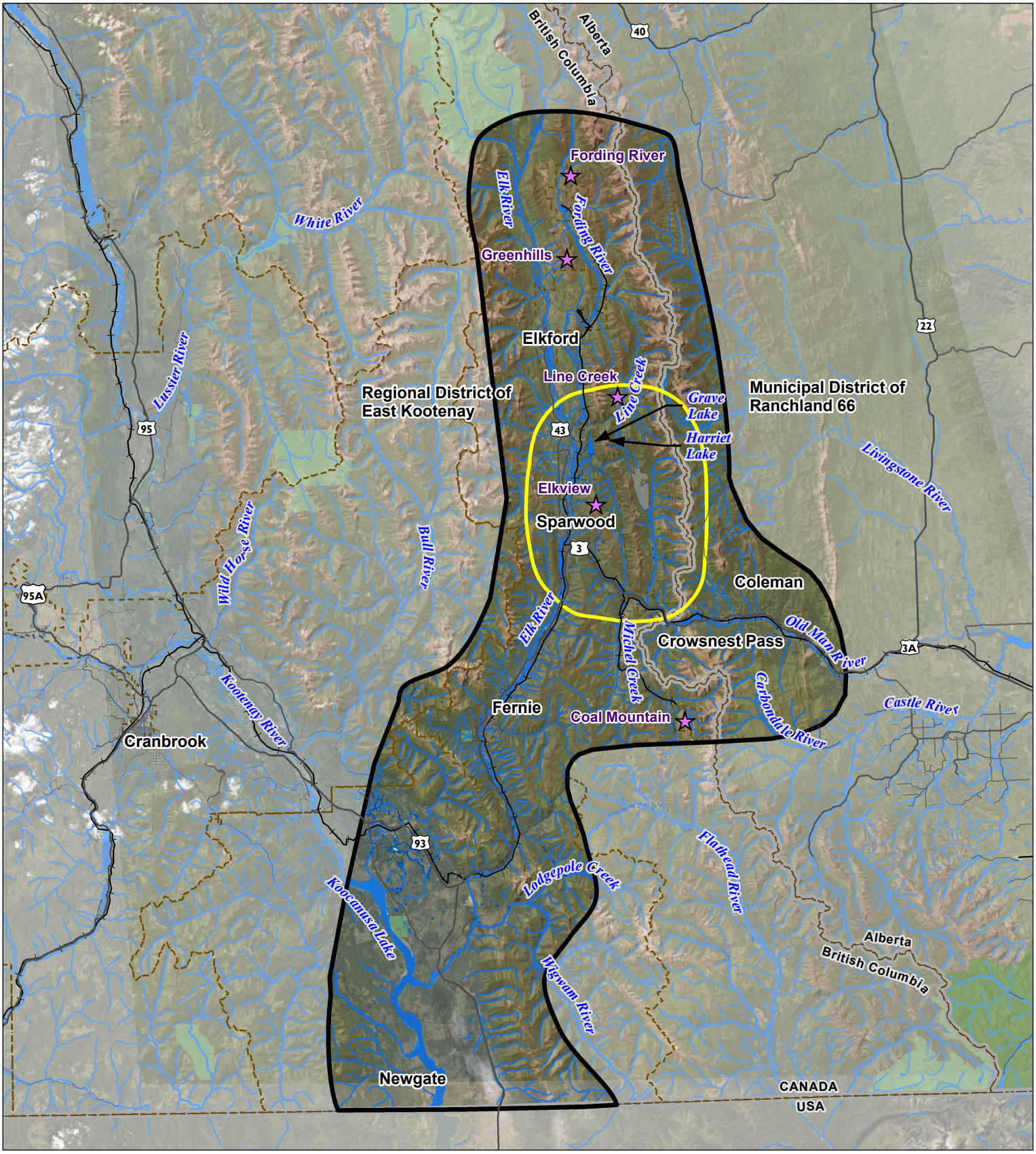
[2] Environmental Assessment Office. (2018). Application Information Requirements: Crown Mountain Coking Coal Project.
[3]Government of Canada. (2020). Guidelines for Preparation of an Environmental Impact Statement. Crown Mountain Coking Coal Project - NWP Coal Canada Ltd. Canadian Environmental Assessment Act. 2012. Retrieved from https://iaac-aeic.gc.ca/050/evaluations/document/101253?culture=en-CA
[4] British Columbia Ministry of Environment. (2020). Ambient Air Quality Objectives. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf
[5] Environment and Climate Change Canada. (2019). National Inventory Report (1990-2017) Greenhouse Gas Sources and Sinks in Canada. Retrieved from http://www.publications.gc.ca/site/eng/9.506002/publication.html

collected for a period of six (6) months. Samples were analysed for total dustfall and total metals. Details on dustfall monitor deployment and laboratory results are provided in **Section 5.0**.

1.0 Introduction

This air quality baseline report details the methodological process and findings from the air quality baseline program that was implemented to meet provincial and federal requirements outlined in the Application Information Requirements (AIR) and the Environmental Impact Statement (EIS) Guidelines for the Crown Mountain Coking Coal Project (the Project). Both the AIR and the EIS Guidelines outline information that is required in the Environmental Assessment (EA) application as it relates to air quality. The AIR details the receptor and intermediate components that relate to air quality. Data obtained through the baseline program will be used in conjunction with estimated emissions from the Project to quantify potential incremental impacts anticipated over the course of the Project related to changes in air quality. The results within this baseline report have been provided in a manner that supports the EA. Baseline results were obtained following specific guidelines and compared to their relevant standards. These guidelines and standards are documented in the methodology sections of each task comprising the scope of work.

The Project site is located 8 km east of the Elk Valley highway in the District of Sparwood, British Columbia (BC). The Elk Valley highway runs north to south with terrain elevation ranging from approximately 1,100 to 1,300 meters above sea level (m asl). There are two communities along this highway, Sparwood and Elkford. The terrain elevation at the project site is approximately 1,500 m asl and the terrain elevation on the north and south sides of the Project site gradually increase to higher than 2,300 m asl. The Project location is presented in **Figure 1.**



Crown Mountain Coking Coal Project

Air Quality Baseline Report
Regional and Local Study Areas
Figure 1

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- Regional District/Municipal Boundary
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Existing Operating Mines

0 5 10 20 km

SCALE 1:750,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia, GeoBC and Open Data BC. BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2020-09-24

FILE LOCATION: G:\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Air Quality Regional and Local Study Areas.mxd

1.1 Scope of Work

Four (4) individual scopes of work were completed to support the development of the air quality baseline report. These scopes of work include:

- Evaluation of the Baseline Data, Common Air Contaminants;
- Evaluation of the Baseline Data, Climate;
- Evaluation of the Baseline Data (GHG emissions); and
- Dustfall Monitoring.

The methodology and results for each of these scopes of work are presented in the following sections.

2.0 Common Air Contaminant Baseline Evaluation

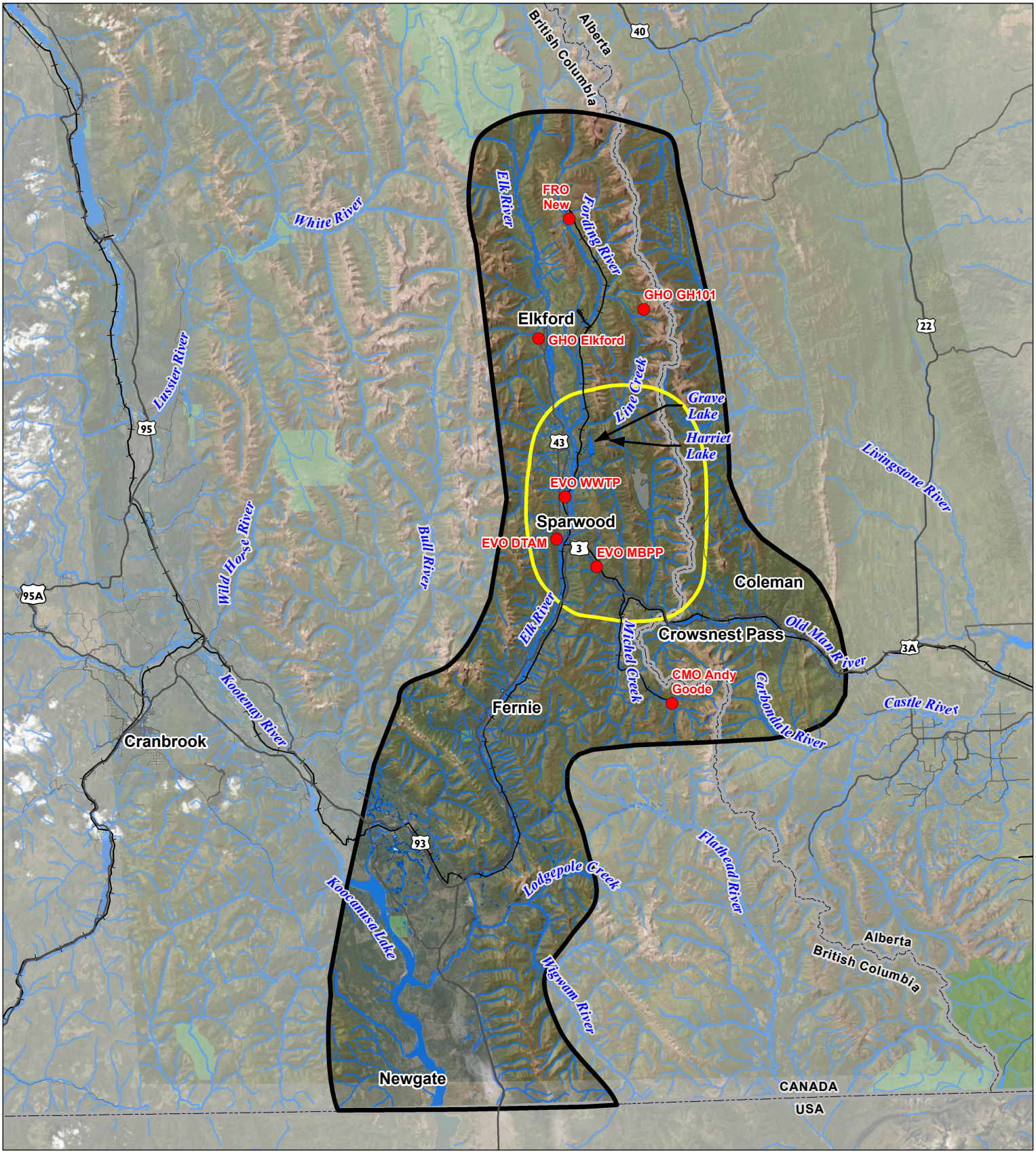
The evaluation of baseline data pertaining to common air contaminants includes an analysis of background levels of the following common air contaminants:

- Nitrogen Dioxide (NO_2);
- Particulate Matter with aerodynamic diameter less than 10µm (PM_{10});
- Particulate Matter with aerodynamic diameter less than 2.5µm ($PM_{2.5}$); and
- Sulphur Dioxide (SO_2).

The selection of these contaminants were based on requirements of the AIR along with data availability from local air monitoring stations. Volatile Organic Compound (VOC) data were not included in this baseline assessment due to the lack of available data.

2.1 Methodology

Baseline air quality was established by quantifying various contaminants of concern using existing monitoring data from the extensive air quality monitoring network in the Elk Valley. Dillon Consulting Limited (Dillon) obtained five years of monitoring data from BC's Ministry of Environment and Climate Change Strategy (ENV) from eight Teck Coal Limited monitoring stations presented in **Table 1**. These stations collect data for nearby municipalities (Fernie, Sparwood, Elkford), and existing mining operations. **Figure 2** displays each station location.



Crown Mountain Coking Coal Project

Air Quality Baseline Report
Air Monitoring Station Locations
Figure 2

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Air Monitoring Station

0 5 10 20 km

SCALE 1:750,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia, GeoBC and Open Data BC. BC Water Resource Atlas, CANVEC, BC MOE

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2020-09-24

FILE LOCATION: G:\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Air Monitoring Station Locations.mxd

Table 1: Air Quality Environmental Monitoring Stations

Station Name	Study Area	Closest Proximity
CMO Andy Goode	Regional	Coal Mountain Operations – Teck Coal Limited
EVO DTAM	Local	Elkview Operations – Teck Coal Limited
EVO MBPP	Local	Elkview Operations – Teck Coal Limited
EVO WWTP	Local	Elkview Operations – Teck Coal Limited
FRO New	Regional	Fording River Operations – Teck Coal Limited
GHO GH101	Regional	Greenhills Operations – Teck Coal Limited
GHO Elkford	Regional	Municipality of Elkford Greenhills Operations – Teck Coal Limited

ENV has stated that it will not endorse the quality of the data and that it will be the proponent's obligation to do so. As such, Dillon reviewed the data based on, but not limited to, the following:

- Review that the station locations adhere to ENV's siting criteria as detailed in the BC Ministry of Environment *Air Monitoring Site Selection and Exposure Criteria*[6];
- Verify station compliance with guidance documents provided by ENV;
- Review the data for completeness; and
- Perform qualitative and quantitative evaluations of the data to identify any gaps or outliers within the dataset.

After a review of the available data from the stations listed in **Table 1**, Dillon performed an analysis to identify if additional data was required to provide a complete historic record of baseline conditions surrounding the proposed site. A data gap analysis was completed for each station to identify the percent completeness of the data set. The *British Columbia Air Quality Dispersion Modelling Guidelines (BC AQDMG)*[7] recommends that at least one year of data is acceptable, and a data record that is 75% complete in each quarter is used. The monitoring station data sets utilized for this project consisted of a three (3) year data set. An analysis was performed to verify that there was a 75% data set completeness for each quarter. Overall, most quarterly data sets had well over a 90% completeness; however, select quarters did not meet the 75% recommendation. Due to the fact the data set for each station spanned over a three (3) year period compared to the recommended one (1) year period, the data sets were deemed to be sufficient for the purposes of the air contaminant baseline evaluation.

2.1.1 Station Selection

Following an initial data gap screening of each station, an analysis was conducted to determine which of the stations were most appropriate to use for the assessment of ambient air quality in the local air study area. The following considerations were made during site selection:

- Contaminant data availability:

[6] B.C. Ministry of Environment. (2013). Air Monitoring Site Selection and Exposure Criteria (draft, version 6). Guidance Document.
[7] British Columbia Ministry of Environment. (2015). British Columbia Air Quality Dispersion Modelling Guideline. Retrieved from https://www.bcogc.ca/node/13339/download

  - was considered to ensure that data was present to compare to BC AAQO;
- Data quality:
  - The quality of this data was examined to identify if there was any erroneous data present. Erroneous data could be the results of equipment sensors coming on and offline, calibrations, and local influence such as wildfires;
- Geographic location:
  - Station locations were assessed to ensure that sufficient geographic coverage and data capture was present to represent the ambient air quality of the study area; and
- Local influence of station results:
  - Station locations were evaluated to identify if local industry (mines) would have an influence on the data set. The presence of local industries can cause elevations in background contaminant levels not reflective of Project area baseline air quality. In these events, stations were excluded as the intent of the baseline air quality analysis was to evaluate baseline conditions for the Project area.

Based on the criteria listed above, the two following stations were selected to represent the local baseline ambient air quality:

1. EVO Downtown Sparwood Centennial Square (EVO DTAM)
2. Whispering Winds Trailer Park (WWTP)

Table 2 provides justification on why select stations were excluded and not considered for the establishment of baseline air quality criteria.

Table 2: Monitoring Station Removal Justification

Station Name	Reason for Exclusion
CMO Andy Goode	• Located approximately 2 km north of a mine and approximately 30 km south of Project site. • Results would be influenced from mine south of monitor location and not reflective of baseline conditions in Project area.
EVO MBPP	• Monitor is adjacent to Highway 3 less than 2 km southwest of mine. • Results would be influenced from both the mine and highway traffic. -Results would not be reflective of baseline conditions in Project area.
FRO New	• -Located on mine site. • Results would be heavily influenced from mine and not reflective of baseline conditions in Project area.
GHO GH101	• Only TSP data available and located in between two mines.
GHO Elkford	• Located approximately 8 km south of mine and approximately 20 km north of Project site. • Results would be influenced from mine north of site and not reflective of baseline conditions in Project area.

2.1.2 Data Comparison to Ambient Air Quality Objectives

The *BC AQDMG* states that level 3 assessments are recommended in situations where there is a need to evaluate air quality consequences under a permitting or Environmental Assessment process for large industrial developments that have considerable social, economic and environmental consequences. Given the nature of the Crown Mountain Coking Coal Project within the Elk Valley region, a level 3 assessment was considered the most appropriate methodological process for the administration of an air quality assessment.

Additionally, the guideline states that baseline levels for 1-hour cumulative prediction values should be determined as follows:

- The 99th percentile of daily maximum 1-hour values should be used for SO_2;
- The 98th percentile of daily maximum 1-hour values should be used for NO_2 and NO_x;
- The 98th percentile from screened hourly datasets for all other pollutants; and
- The 98th percentile of the 24-hour (daily) values from the screened data as the baseline level for a 24-hour cumulative prediction.

Taking into account the guidelines suggested above for a level 3 dispersion modelling assessment, an analysis of the baseline data was completed that included a statistical analysis of the common air contaminants in the study area. Air assessment results were compared to the *BC AAQO* and Pollution Control Objectives provided in **Table 3**.

Table 3: BC AAQO

Contaminant	Averaging Period	BC Air Quality Objective [µg/m^3]	Criteria
NO_2	1 hr	188	Interim Provincial AQO[1]
	1 hr	113	2020 CAAQS[2]
	Annual	60	Interim Provincial AQO[1]
	Annual	32	2020 CAAQS[2]
$PM_{2,5}$	24 hr	25	Provincial AQO[3]
	24 hr	27	2020 CAAQS[2]
	Annual	8	Provincial AQO
	Annual	8.8	2020 CAAQS[2]
PM_{10}	24 hr	50	Provincial AQO[3]
SO_2	1 hr	196	Interim Provincial AQO[1]
	1 hr	183	2020 CAAQS[2]
	Annual	13	2020 CAAQS[2]
Total Suspended Particulate (TSP)	24 hr	120	NAAQO[4]
	Annual	60	NAAQO[4]
CO	1 hr	14300	PCO[5]
	8 hr	5500	PCO[5]

Table Notes:

Bold – represents most stringent values and those that will be used in assessment

[1] Interim Provincial Air Quality Objectives - NO_2 are currently under review

[2] Canadian Council of Ministers of the Environment: 2020 Canadian Ambient Air Quality Standards

[3] Provincial Air Quality Objectives

[4] Canadian Council of Ministers of the Environment: Canadian National Ambient Air Quality Objectives

[5] Pollution Control Objectives for food-processing, agriculturally orientated, and other misc. industries

2.2 Results

As discussed in **Section 2.1,** an analysis was conducted to determine which of the eight (8) ENV stations were most appropriate to use for the assessment of ambient air quality in the local air study area. Following this analysis, two stations were selected; the EVO Downtown Sparwood Centennial Square (EVO DTAM) and the Whispering Winds Trailer Park (WWTP). **Table 4** below provides a summary of the data set available at each station.

Table 4: Air Monitoring Station Available Data

	EVO DTAM		WWTP
	Particulate	Gasses	Particulate
Contaminant	PM_{10}, $PM_{2.5}$	NO_2, CO, SO_2	PM_{10}, $PM_{2.5}$
Data Range	Jan 2014 – Dec 2016	Jan 2014 – Dec 2016	Jan 2014 – Dec 2016

Following the selection of these two stations, contaminant data was analyzed as per the *BC AQDMG.* **Table 5** provides a summary of each station's data.

Table 5: Air Monitoring Station Data Summary

Contaminant	Station	Averaging Period	Ambient Air Concentration (µg/m³)
NO_2	EVO DTAM	1 hr	29.4[1]
		Annual	7.4[6]
SO_2	EVO DTAM	1 hr	2.4[2]
		Annual	0.8[6]
CO	EVO DTAM	1 hr	647.6[3]
		8 hr	786.9[4]
PM_{10}	EVO DTAM	24 hr	29.8[5]
	WWTP	24 hr	27.6[5]
$PM_{2.5}$	EVO DTAM	24 hr	22.4[5]
		Annual	5.6[6]
	WWTP	24 hr	17.0[5]
		Annual	4.8[6]

Table Notes:

[1] NO_2 value is based on 98th percentile of daily maximum 1-hour value

[2] SO_2 value is based on 99th percentile of daily maximum 1-hour value

[3] CO 1-hr value is based on 98th percentile of 1-hour values
[4] CO 8-hr value is based on 98th percentile of rolling 8-hr average
[5] $PM_{2.5}$ and PM_{10} are based on the 98th percentile of 24-hour averages
[6] Annual averages use the annual mean of 1 hour values over the entire data set

The *BC AQDMG* specifies that when multiple monitoring sites are being used to represent local ambient air quality, the arithmetic average of these stations is calculated to represent what the baseline air quality value should be for each contaminant. **Table 6** provides a summary of this data along with each contaminant's percent contribution to *BC AAQO*.

Table 6: Percent Contribution to BC AAQO

Contaminant	Averaging Period	Ambient Air Concentration (µg/m3)	BC Air Quality Objective (µg/m3)	Criteria	Percent Contribution to Objective
NO_2	1 hr	29.4[1]	113	2020 CAAQS	26.0%
	Annual	7.4[6]	32	2020 CAAQS	23.0%
SO_2	1 hr	2.4[2]	183	2020 CAAQS	1.3%
	Annual	0.8[6]	13	2020 CAAQS	6.1%
CO	1 hr	647.6[3]	14,300	PCO*	4.5%
	8 hr	786.9[4]	5,500	PCO*	14.3%
PM_{10}	24 hr	28.7[5]	50	Provencal AQO	57.3%
$PM_{2.5}$	24 hr	19.7[5]	25	Provincial AQO	78.8%
	Annual	5.2[6]	8	Provincial AQO	64.8%

Table Notes:
[1] NO_2 value is based on 98th percentile of daily maximum 1-hour value
[2] SO_2 value is based on 99th percentile of daily maximum 1-hour value
[3] CO 1-hr value is based on 98th percentile of 1-hour values
[4] CO 8-hr value is based on 98th percentile of rolling 8-hr average
[5] $PM_{2.5}$ and PM_{10} are based on the 98th percentile of 24-hour averages
[6] Annual averages use the annual mean of 1 hour values over the entire data set

3.0 Climate Baseline Evaluation

Defining baseline climate conditions provides an understanding of meteorological conditions at the Project site and surrounding area. This information can be used for future modelling of Project conditions. The following sections discuss the methodology and findings of the analysis of existing climate data.

3.1 Methodology

To develop an understating of baseline climate, established climate normals from the Government of Canada's Climate Normals Online Database[8] were reviewed.

Data was also collected from local air monitoring stations as identified in **Table 2**, as well as Environment and Climate Change Canada (ECCC) meteorological stations, to provide a more detailed understanding of climatic conditions at both regional and site-specific levels.

3.1.1 Climate Stations and Variables

Sparwood is located in the southeast mountainous region of BC. Variables such as temperature, precipitation, wind and humidex vary based on location and elevation in the region. Multiple surface stations with both hourly and daily data were included in the preliminary assessment of local climate. The wind, temperature and precipitation recorded in the following surface stations were processed and analyzed:

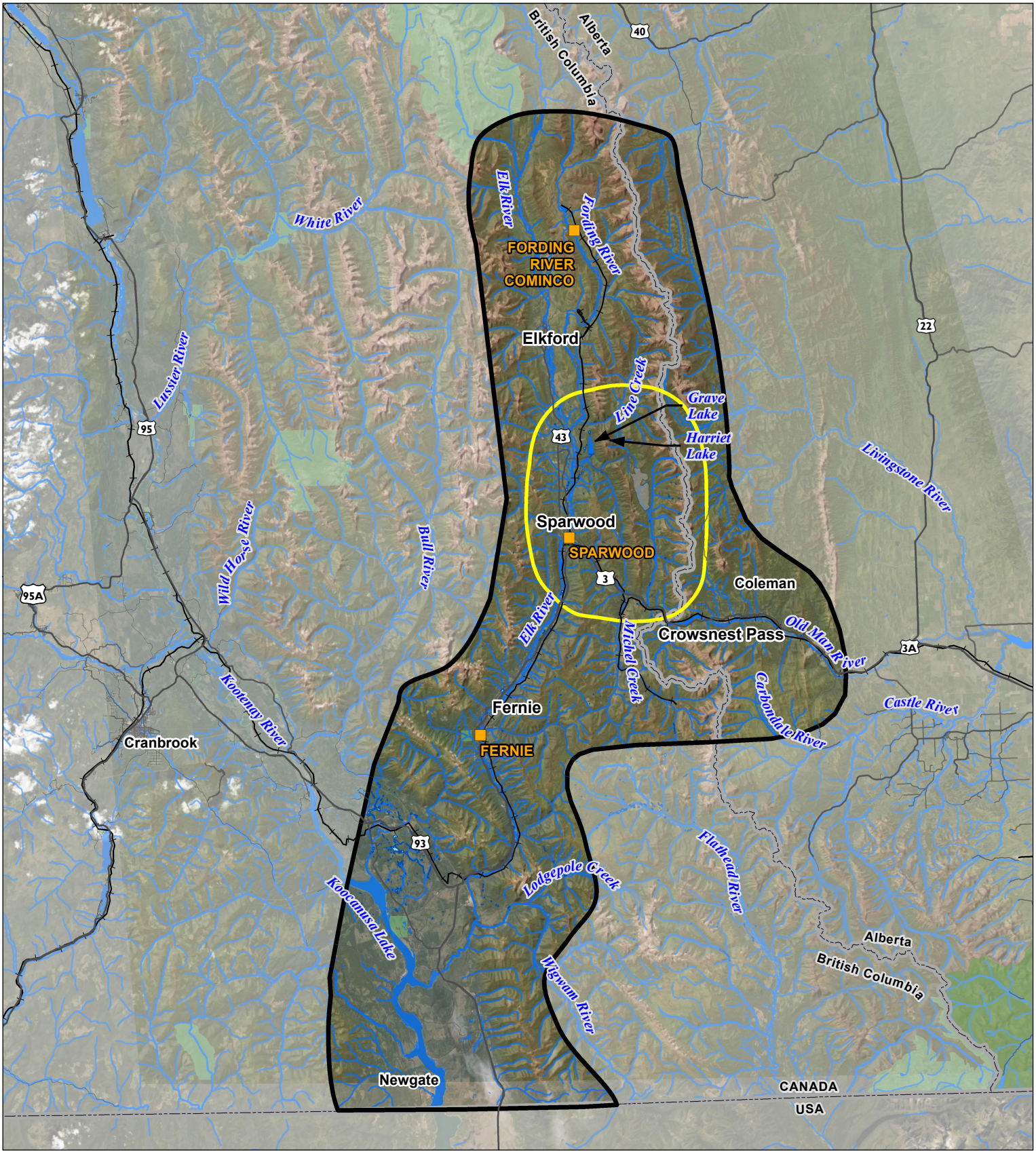
1. Sparwood CS (hourly, daily)
2. Cranbrook Airport (hourly)
3. Crowsnest (hourly)
4. Fording River Cominco (daily)
5. Fernie (daily)

Following the preliminary assessment of hourly wind data, it was concluded that any stations that could potentially represent the regional climatic conditions around the Project should be located within the Elk Valley due to the strong influence of the local topography to the local climatic conditions. Thus, 30-year averages of climatological variables (climate normals) from the following climate stations within Elk Valley were evaluated to represent the regional baseline climatic conditions:

1. Fording River Cominco
2. Sparwood
3. Fernie

[8] Government of Canada. (2019). Canadian Climate Normals: 1981-2010 Climate Normals and Averages. Retrieved from https://climate.weather.gc.ca/climate_normals/

For the purposes of establishing baseline climatic conditions, the Sparwood station was selected based on it being not only centrally located when compared to the other two stations but also due to it being the closest to the Project site. The geographic location of the three (3) climate stations selected and their proximity to the Project site is illustrated in **Figure 3**.



Crown Mountain Coking Coal Project

Air Quality Baseline Report
Climate Station Locations
Figure 3

LEGEND

- Regional Study Area
- Local Study Area
- Project Footprint
- National Park
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Climate Station Location

0 5 10 20 km

SCALE 1:750,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia, GeoBC and Open Data BC. BC Water Resource Atlas, CANVEC, Environment and Climate Change Canada Meteorological Stations

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2020-09-24

FILE LOCATION: G:\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Climate Station Locations.mxd

3.2 Results

Data was collected from local air monitoring stations identified in **Section 3.1.1**, as well as climate normals from the Government of Canada's Climate Normals Online Database to establish baseline climatic conditions both at a regional and site-specific level. The following subsections describe the acquired data.

3.2.1 Hourly Surface Station within the Elk Valley

Sparwood Airport and Sparwood CS stations are the closest hourly surface stations to the Project site. They are located along the Elk Valley highway with approximately 8 km distance between them. Sparwood CS station records wind data continuously every hour, while wind data measured at Sparwood Airport is available only during daytime periods. Therefore, windroses were generated from 5-year period (2014 – 2018) wind data measured at Sparwood CS station.

Figure 4 illustrates the prevailing winds measured at Sparwood CS station. The predominant wind directions measured at this station were the northerly and southerly directions. The most frequent winds were from the south.

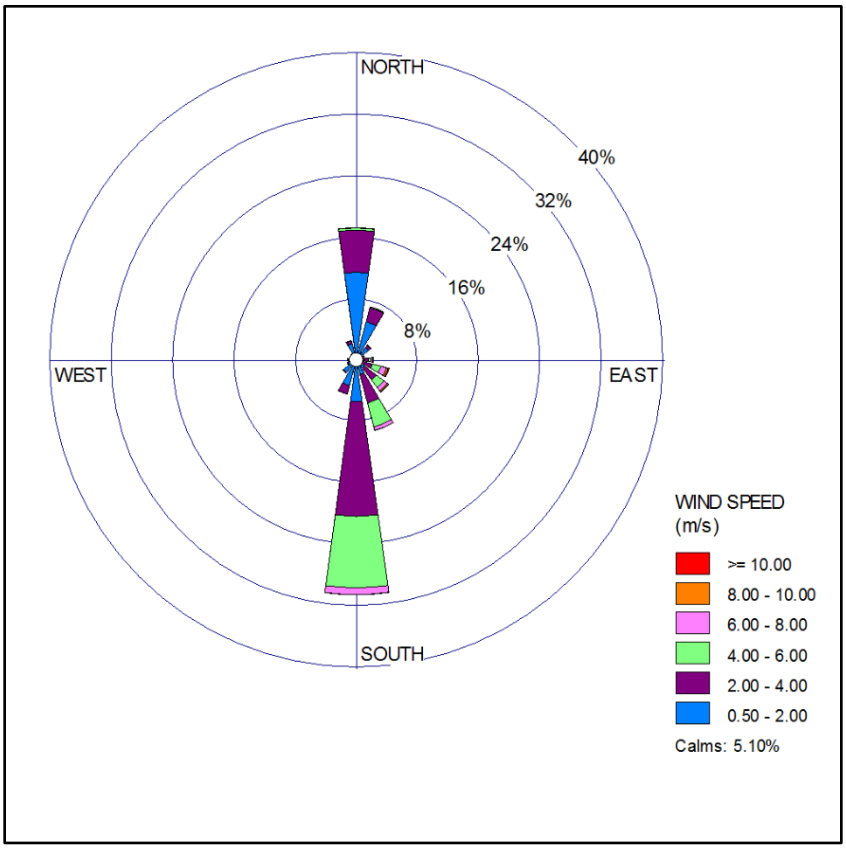


Figure 4: Windrose at Sparwood CS (2014-2018; Blowing From)

3.2.2 Climate Normals

Climate normals data was obtained from the Government of Canada's Climate Normals Online Database for the Sparwood station (Climate ID: 1157630). Data represents climate normals from 1981 to 2010. Key climate parameters including temperature and precipitation are summarized in **Table 7**. It is seen that Sparwood has a yearly average temperature of 4.4 degrees Celsius (˚C) and has a daily average temperature below 0 ˚C from November to February. Daily average temperatures are the highest between July and August. Total precipitation averages to 613.3 mm in a year with November having the highest monthly precipitation average of 72.1 mm.

Table 7: Climate Normals

1981 to 2010 Canadian Climate Normals Station Data – Sparwood Climate ID: 1157630

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature													
Daily Average (°C)	-6.5	-4.5	0.2	4.8	9.1	12.7	15.8	15.5	10.5	4.8	-2	-7.3	4.4
Daily Maximum (°C)	-2.2	0.5	5.4	10.9	15.9	19.6	23.8	24.2	18.2	10.7	1.7	-3.4	10.4
Daily Minimum (°C)	-10.7	-9.6	-5.1	-1.3	2.3	5.8	7.7	6.7	2.9	-1.1	-5.6	-11.3	-1.6
Extreme Maximum (°C)	11.9	13.8	20.6	25.6	31.3	32.5	34.9	36.5	34.2	27.2	16.9	10.5	-
Precipitation													
Rainfall (mm)	17.3	12.4	17.0	27.9	52.0	67.7	46.8	34.8	43.4	39.6	39.1	13.2	411.0
Snowfall (cm)	50.4	37.0	31.7	17.4	8.6	1.8	0.0	0.1	4.2	11.3	47.3	54.2	264.0
Precipitation (mm)	53.9	40.9	44.2	41.4	60.4	69.3	46.8	34.9	47.4	48.8	72.1	53.4	613.3

4.0 Greenhouse Gas Emissions

4.1 Methodology

Dillon compiled data to establish baseline greenhouse gas (GHG) emissions for local and regional context surrounding the Project site. The evaluation of baseline emissions included sources of emissions, sinks, or reservoirs that may be impacted as a result of the Project. The baseline data will be used to assess the existing GHG sources and sinks in the Project area to establish existing conditions. GHG production calculations followed provincial and federal guidelines, including:

- **Federal:** Environment and Climate Change Canada (2017) National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada; and
- **Provincial:** best industry practices such as those prescribed under the *Greenhouse Gas Industrial Reporting and Control Act.*

4.2 Results

To evaluate baseline GHG emissions for the Project area, total GHG emissions from BC and sector specific emissions, particularly emissions from the mining sector, were considered. The best available estimate of BC's reported GHG emissions is provided in the ECCC NIR. GHG emissions from all of Canada are also documented below for context. Results are documented in metric tonnes of CO_2 equivalents (Mt CO_2e).

A review of the 2015-2017 GHG emission summaries from the ECCC NIR show that:

- GHG emissions from all of Canada equate to an annual average of 715.33 Mt CO_2e;
- GHG emissions from the mining sector across Canada had an annual average of 4.29 Mt CO_2e;
- GHG emissions from BC had an annual average of 60.96 mega-tonnes (Mt) CO_2e;
- GHG emissions from the mining sector in BC had an annual average of 0.46 Mt CO_2e.
- GHG fugitive emissions from coal mines had an annual average of 0.9 Mt CO_2e.

Through the course of the project, it is expected that both GHG sources and sinks within the Project area will change. These changes will have an effect on the net GHG emissions in the Project area and will be addressed in the EA application.

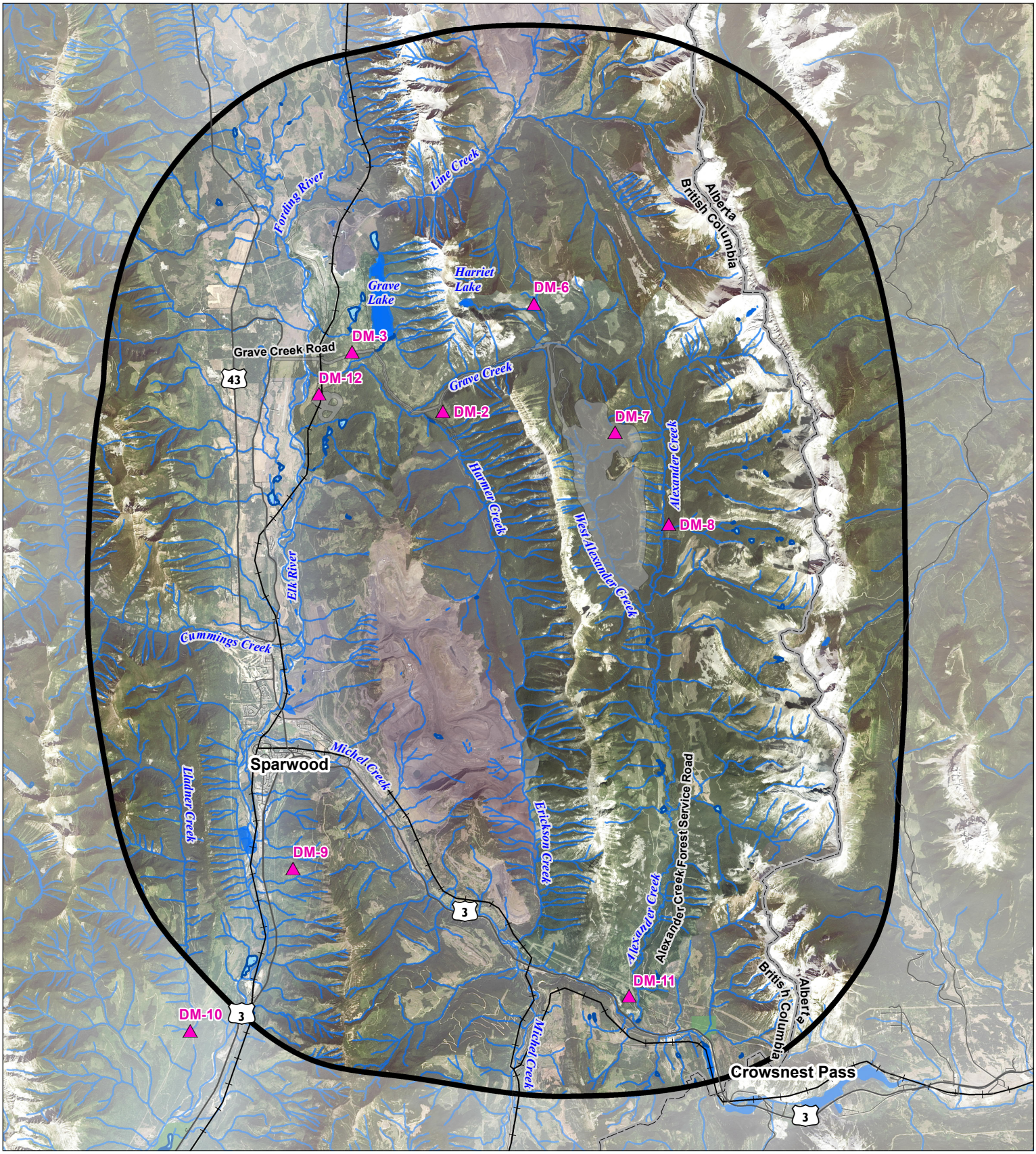
5.0 Dustfall Monitoring

5.1 Methodology

As per the AIR (EAO, 2018), the baseline program included an evaluation of dustfall within and surrounding the Project area. Dillon performed a field sampling program surrounding the proposed Project area, as well as in the nearby community and recreational areas, to satisfy this requirement. Dillon coordinated the sampling of monthly dustfall measurements for six months. Collection of field samples and redeployment of sample canisters was performed by Nupqu Development Corporation. Sampling was conducted as per ASTM Method D1739-98[9]. Sampling canisters were collected and analyzed for total dustfall and metals by an accredited laboratory, ALS Environmental (ALS) located in Burnaby, BC. Polycyclic Aromatic Hydrocarbons (PAHs) concentrations were not analysed, as discussion with the laboratory indicated that analysis for PAHs in dustfall cannot be completed. Long term sampling of PAHs in dustfall would not be a representative method of PAHs due to their volatility.

A total of nine (9) dust monitoring stations were constructed and deployed across the Project site and surrounding area. The locations of these dustfall monitoring stations are illustrated in **Figure 5** and **Table 8** lists each station and respective location. A photo-log of the deployed dustfall monitoring stations is provided in **Appendix A**.

[9] ASTM International. (2017). Designation: D1739-98 Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)



Crown Mountain Coking Coal Project

Air Quality Baseline Report
Dustfall Monitoring Locations
Figure 5

LEGEND

- Local Study Area
- Project Footprint
- Provincial Park
- Waterbody
- Wetland
- Watercourse
- Highways
- Arterial Roads
- Local/Resource Roads
- Railway (Canadian Pacific)
- BC/Alberta Border
- Dustfall Monitoring Location

0 0.5 1 2 3 4 5 km

SCALE 1:165,000

MAP DRAWING INFORMATION:
Dillon Created, ESRI Base Layers, Province of British Columbia GeoBC and Open Data BC. BC Water Resource Atlas, CANVEC.

MAP CREATED BY: RBB
MAP CHECKED BY: DG
MAP PROJECTION: NAD 1983 UTM Zone 11N

DILLON CONSULTING

PROJECT: 12-6231
STATUS: FINAL
DATE: 2020-09-24

FILE LOCATION: G:\GIS\2012 and Prior\126231 Crown Mountain\Air\MXD\126231 Baseline Air - Dustfall Monitoring Locations.mxd

Table 8: Dustfall Monitor Locations

Station ID	Latitude, Longitude
DM-2	49.831829, -114.807721
DM-3	49.84982, -114.847662
DM-6	49.862287, -114.765415
DM-7	49.824232, -114.730718
DM-8	49.797292, -114.707909
DM-9	49.700797, -114.880664
DM-10	49. 654555, -114.928772
DM-11	49.660853, -114.732091
DM-12	49.837965, -114.863112

Table 9 provides a summary of the time period for each sampling event. Each sampling event spanned a period of 30 +/- 2 days as specified in ASTM Method D1739-98. No canisters were deployed from January 2019 to May 2019 due to weather conditions and issues with site access.

Table 9: Dustfall Sampling Event Summary

Sample Event #	Month of Canister Deployment	Month of Canister Collection
1	October 2018	November 2018
2	November 2018	December 2018[1]
3	May 2019	June 2019
4	June 2019	July 2019
5	July 2019	August 2019
6	August 2019	September 2019
7	September 2019	October 2019

Table Notes:
[1] December 2018 samples were not analysed by laboratory due to laboratory administrative errors

5.2 Results

A total of 7 sampling events were conducted from 2018 to 2019; however, only 6 were used in the data analysis due to laboratory errors with samples from the discarded sampling event. Total Dustfall results are presented on a monthly basis in **Table 10** below. **Figure 6** displays these results graphically.
When analysing the results from the 6 month sampling event the following observations were made:

- DM-2 experienced the highest average 6 month dustfall accumulation when compared to the other stations (1.26 mg/dm^2.day);
- DM-2 experienced the single highest dustfall accumulation in one particular month, that being during the October 2019 sampling event (1.82 mg/dm^2.day);
- DM-9 experienced the lowest average 6 month dustfall accumulation when compared to the other stations (0.34 mg/dm^2.day);

- The highest average dustfall accumulation across all stations occurred in November 2018 (0.86 mg/dm^2.day), with the second highest being in October 2019 (0.85 mg/dm^2.day); and
- The lowest average dustfall accumulation across all stations occurred in the month of August 2019 (0.28 mg/dm^2.day), with the second lowest being in July 2019 (0.61 mg/dm^2.day).

Table 10: Total Dustfall Results

Station ID	Units	November 2018	June 2019	July 2019	August 2019	September 2019	October 2019
DM-2	mg/dm2.day	1.66	0.91	0.8	NA	1.13	1.82
DM-3	mg/dm2.day	1.64	0.78	0.76	0.36	0.79	1.12
DM-6	mg/dm2.day	0.63	0.55	0.61	0.11	0.52	0.72
DM-7	mg/dm2.day	0.66	0.84	0.7	0.77	0.94	0.52
DM-8	mg/dm2.day	0.4	0.86	0.91	0.2	0.92	0.73
DM-9	mg/dm2.day	0.39	0.51	0.32	0.1	0.39	0.34
DM-10	mg/dm2.day	NA	1.12	0.1	0.1	0.41	0.51
DM-11	mg/dm2.day	0.41	0.38	0.45	0.33	0.16	0.96
DM-12	mg/dm2.day	1.11	NA	0.83	0.28	0.62	0.93

Table Notes:
NA - No sample available for analysis

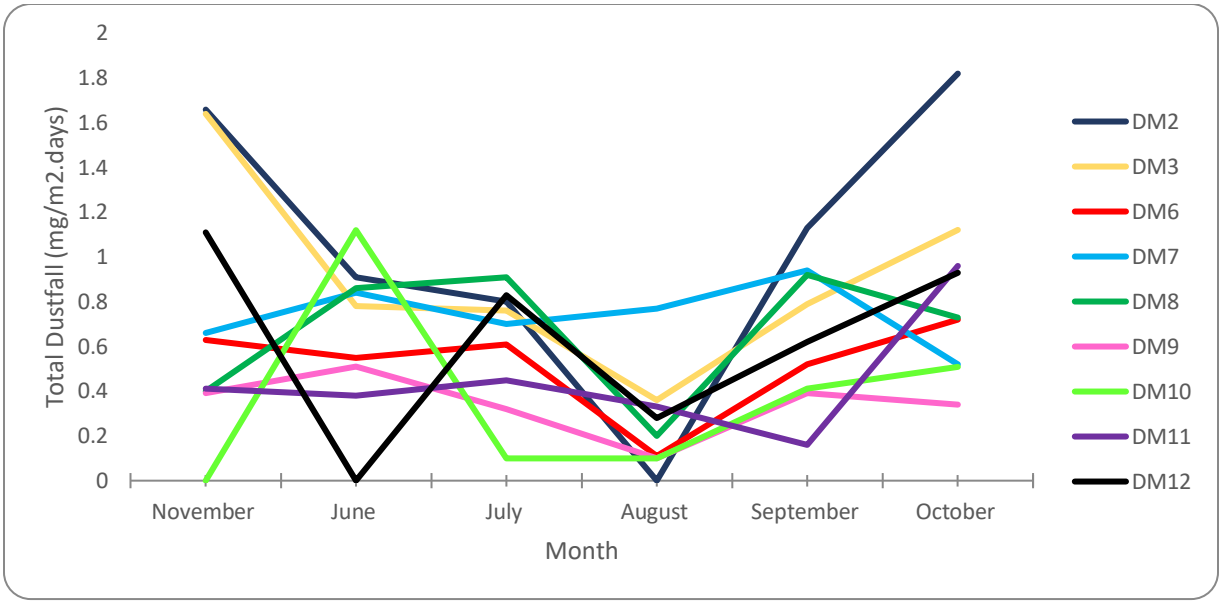


Figure 6: Total Dustfall Results

Average and maximum values of Total Dustfall at each station are presented in **Table 11** below.

Table 11: Dustfall Results

Station ID	Average [mg/dm2.day]	Maximum [mg/dm2.day]
DM-2	1.26	1.82
DM-3	0.91	1.64
DM-6	0.52	0.72
DM-7	0.74	0.94
DM-8	0.67	0.92
DM-9	0.34	0.51
DM-10	0.45	1.12
DM-11	0.45	0.96
DM-12	0.75	1.11

Field notes and photos are appended to this report in **Appendix A.** Metal results are presented in **Table 12**, which provides average and maximum values for each station through the duration of the 6 month dustfall monitoring program. Laboratory Certificates of Analysis (COAs) for each monitoring event are found in **Appendix B**.

Table 12: Dustfall Metal Results

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																	
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12	
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
Aluminum (Al)	5.41E-03	1.05E-02	2.25E-03	3.06E-03	2.02E-03	3.51E-03	3.48E-03	5.66E-03	2.81E-03	4.48E-03	1.49E-03	2.18E-03	1.87E-03	4.08E-03	2.37E-03	4.00E-03	2.25E-03	2.78E-03
Antimony (Sb)	2.88E-06	4.80E-06	2.17E-06	3.90E-06	3.50E-06	8.40E-06	3.05E-06	6.60E-06	3.18E-06	7.20E-06	1.57E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	4.78E-06	6.80E-06
Arsenic (As)	2.10E-05	7.70E-05	1.63E-05	7.30E-05	1.57E-05	7.80E-05	1.78E-05	8.00E-05	1.69E-05	7.60E-05	8.47E-06	3.90E-05	1.79E-05	7.30E-05	1.48E-05	7.20E-05	3.88E-06	5.00E-06
Barium (Ba)	5.25E-04	8.00E-04	2.13E-04	3.01E-04	1.89E-04	3.12E-04	3.21E-04	4.03E-04	1.06E-03	2.31E-03	1.06E-04	1.67E-04	1.41E-04	4.16E-04	1.30E-04	2.61E-04	2.20E-04	3.28E-04
Beryllium (Be)	9.90E-06	2.20E-05	8.40E-06	1.90E-05	1.15E-05	2.70E-05	1.46E-05	3.30E-05	1.52E-05	3.60E-05	7.82E-06	1.60E-05	1.22E-05	2.50E-05	9.85E-06	2.70E-05	1.11E-05	2.40E-05
Bismuth (Bi)	1.26E-05	2.20E-05	2.09E-05	5.84E-05	1.59E-05	3.30E-05	1.46E-05	3.30E-05	1.66E-05	3.60E-05	1.13E-05	1.60E-05	1.70E-05	3.70E-05	1.08E-05	3.00E-05	1.69E-05	2.54E-05
Boron (B)	1.96E-04	4.30E-04	1.75E-04	3.90E-04	2.30E-04	5.40E-04	2.88E-04	6.60E-04	3.05E-04	7.20E-04	1.57E-04	3.20E-04	2.42E-04	5.00E-04	1.98E-04	5.40E-04	2.22E-04	4.70E-04
Cadmium (Cd)	2.18E-06	3.22E-06	3.53E-06	1.30E-05	1.20E-06	2.70E-06	1.61E-06	3.30E-06	2.31E-06	6.30E-06	1.04E-06	1.60E-06	2.88E-06	4.83E-06	1.35E-06	4.10E-06	5.05E-06	1.52E-05
Calcium (Ca)	2.74E-02	4.30E-02	2.56E-02	3.03E-02	1.04E-02	1.82E-02	1.38E-02	2.44E-02	1.52E-02	2.18E-02	9.09E-03	1.51E-02	1.27E-02	2.05E-02	1.18E-02	2.36E-02	1.35E-02	1.84E-02
Chromium (Cr)	1.45E-05	2.20E-05	8.85E-06	1.90E-05	1.28E-05	3.50E-05	1.49E-05	3.30E-05	1.56E-05	3.60E-05	7.82E-06	1.60E-05	1.70E-05	3.70E-05	1.16E-05	2.70E-05	1.27E-05	2.40E-05
Cobalt (Co)	8.10E-06	1.22E-05	4.10E-06	6.90E-06	3.42E-06	5.40E-06	5.40E-06	6.60E-06	5.18E-06	7.20E-06	2.05E-06	3.20E-06	3.50E-06	7.10E-06	2.82E-06	5.40E-06	3.66E-06	4.70E-06
Copper (Cu)	2.74E-04	6.41E-04	3.90E-04	7.59E-04	1.82E-04	3.40E-04	3.43E-04	9.69E-04	2.86E-04	9.16E-04	4.00E-04	1.11E-03	3.14E-04	9.02E-04	2.38E-04	8.71E-04	4.05E-04	1.19E-03
Iron (Fe)	7.46E-03	1.00E-02	4.17E-03	5.40E-03	2.88E-03	5.34E-03	6.02E-03	9.70E-03	3.91E-03	6.32E-03	2.19E-03	2.92E-03	2.91E-03	6.86E-03	3.24E-03	6.10E-03	4.47E-03	5.96E-03
Lead (Pb)	1.54E-05	2.38E-05	1.16E-05	1.79E-05	2.66E-04	1.55E-03	1.25E-05	1.92E-05	1.12E-05	1.75E-05	7.38E-06	1.00E-05	9.78E-06	1.86E-05	8.54E-06	1.30E-05	1.23E-05	1.78E-05
Lithium (Li)	9.90E-05	2.20E-04	8.40E-05	1.90E-04	1.15E-04	2.70E-04	1.46E-04	3.30E-04	1.52E-04	3.60E-04	7.82E-05	1.60E-04	1.22E-04	2.50E-04	9.85E-05	2.70E-04	1.11E-04	2.40E-04
Magnesium (Mg)	7.44E-03	8.84E-03	7.96E-03	9.99E-03	2.53E-03	3.44E-03	3.60E-03	4.91E-03	3.95E-03	5.67E-03	2.26E-03	2.75E-03	4.03E-03	6.76E-03	2.65E-03	4.45E-03	4.22E-03	6.13E-03
Manganese (Mn)	2.89E-04	4.40E-04	2.19E-04	2.69E-04	1.13E-04	1.78E-04	2.10E-04	3.27E-04	1.75E-04	2.29E-04	1.08E-04	1.56E-04	1.48E-04	2.49E-04	1.50E-04	3.53E-04	1.35E-04	1.60E-04
Molybdenum (Mo)	3.48E-06	6.50E-06	2.54E-06	5.80E-06	1.31E-06	2.70E-06	2.67E-06	6.60E-06	2.09E-06	3.60E-06	1.04E-06	1.60E-06	2.22E-06	4.50E-06	2.04E-06	5.40E-06	3.15E-06	4.70E-06
Nickel (Ni)	3.59E-05	5.40E-05	1.98E-05	3.10E-05	1.67E-05	3.20E-05	2.31E-05	3.30E-05	2.53E-05	3.60E-05	9.98E-06	1.60E-05	1.75E-05	3.50E-05	1.30E-05	2.70E-05	1.63E-05	2.40E-05
Phosphorus (P)	3.26E-03	5.55E-03	1.54E-02	3.47E-02	2.34E-03	5.11E-03	4.72E-03	1.54E-02	4.41E-03	1.54E-02	3.70E-03	6.56E-03	7.32E-03	1.57E-02	4.01E-03	9.11E-03	9.63E-03	1.54E-02

Metal	Monitoring Stations Metal Results (mg/dm^2.day)																	
	DM 2		DM 3		DM 6		DM 7		DM8		DM9		DM10		DM11		DM12	
	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
Potassium (K)	8.38E-03	1.41E-02	2.24E-02	4.84E-02	4.77E-03	9.00E-03	8.83E-03	2.63E-02	8.22E-03	2.26E-02	7.65E-03	1.01E-02	1.68E-02	3.20E-02	7.23E-03	1.23E-02	1.55E-02	2.94E-02
Selenium (Se)	1.96E-05	4.30E-05	1.72E-05	3.90E-05	2.30E-05	5.40E-05	2.88E-05	6.60E-05	3.05E-05	7.20E-05	1.57E-05	3.20E-05	2.42E-05	5.00E-05	1.98E-05	5.40E-05	2.22E-05	4.70E-05
Silicon (Si)	8.14E-03	1.73E-02	3.42E-03	5.33E-03	2.91E-03	4.40E-03	5.09E-03	9.20E-03	3.78E-03	5.26E-03	2.30E-03	3.67E-03	2.93E-03	6.00E-03	4.01E-03	8.31E-03	3.13E-03	4.23E-03
Silver (Ag)	5.20E-07	8.10E-07	5.18E-07	1.74E-06	2.55E-07	5.40E-07	3.40E-07	6.60E-07	3.80E-07	7.20E-07	2.27E-07	3.20E-07	3.42E-07	5.80E-07	2.17E-07	5.40E-07	3.82E-07	6.00E-07
Sodium (Na)	2.32E-03	5.90E-03	4.45E-03	1.18E-02	2.00E-03	5.80E-03	3.10E-03	6.12E-03	2.85E-03	6.30E-03	2.36E-03	3.30E-03	3.86E-03	6.70E-03	2.32E-03	9.00E-03	3.79E-03	6.08E-03
Strontium (Sr)	9.72E-05	2.65E-04	5.17E-05	8.93E-05	3.81E-05	1.15E-04	6.19E-05	1.75E-04	6.25E-05	1.42E-04	3.15E-05	9.40E-05	4.28E-05	1.17E-04	3.79E-05	1.18E-04	6.02E-05	1.07E-04
Thallium (Tl)	1.96E-06	4.30E-06	1.72E-06	3.90E-06	2.30E-06	5.40E-06	2.88E-06	6.60E-06	3.05E-06	7.20E-06	1.57E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	2.22E-06	4.70E-06
Tin (Sn)	1.96E-06	4.30E-06	2.12E-06	6.20E-06	2.30E-06	5.40E-06	2.88E-06	6.60E-06	3.05E-06	7.20E-06	1.62E-06	3.20E-06	2.42E-06	5.00E-06	1.98E-06	5.40E-06	3.96E-06	1.34E-05
Titanium (Ti)	1.96E-04	4.30E-04	1.72E-04	3.90E-04	2.30E-04	5.40E-04	2.88E-04	6.60E-04	3.05E-04	7.20E-04	1.57E-04	3.20E-04	2.42E-04	5.00E-04	1.98E-04	5.40E-04	2.22E-04	4.70E-04
Uranium (U)	8.54E-07	1.16E-06	5.58E-07	9.10E-07	3.67E-07	6.20E-07	6.52E-07	1.11E-06	5.67E-07	7.50E-07	2.43E-07	3.20E-07	4.10E-07	9.80E-07	3.32E-07	7.10E-07	4.30E-07	6.80E-07
Vanadium (V)	3.30E-05	6.50E-05	1.95E-05	3.90E-05	2.30E-05	5.40E-05	2.98E-05	6.60E-05	3.13E-05	7.20E-05	1.57E-05	3.20E-05	2.42E-05	5.00E-05	2.15E-05	5.40E-05	2.30E-05	4.70E-05
Zinc (Zn)	1.75E-03	7.28E-03	6.15E-04	1.34E-03	8.57E-04	2.60E-03	9.76E-04	2.87E-03	9.32E-04	2.81E-03	6.05E-04	1.74E-03	7.98E-04	2.15E-03	5.83E-04	1.78E-03	8.89E-04	2.04E-03

6.0 References

ASTM International. (2017). Designation: D1739-98 Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter).

British Columbia Ministry of Environment. (2020). Ambient Air Quality Objectives. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/prov_aqo_fact_sheet.pdf.

B.C. Ministry of Environment. (2013). Air Monitoring Site Selection and Exposure Criteria (draft, version 6). Guidance Document.

British Columbia Ministry of Environment. (2015). *British Columbia Air Quality Dispersion Modelling Guideline.* Retrieved from https://www.bcogc.ca/node/13339/download.

Environment and Climate Change Canada. (2019). *National Inventory Report (1990-2017) Greenhouse Gas Sources and Sinks in Canada.* Retrieved from http://www.publications.gc.ca/site/eng/9.506002/publication.html.

Environmental Assessment Office. (2018). Application Information Requirements: Crown Mountain Coking Coal Project.

Government of Canada. (2020). *Guidelines for Preparation of an Environmental Impact Statement. Crown Mountain Coking Coal Project NWP Coal Canada Ltd. Canadian Environmental Assessment Act. 2012.* Retrieved from https://iaac-aeic.gc.ca/050/evaluations/document/101253?culture=en-CA.

Government of Canada. (2019). Canadian Climate Normals: 1981-2010 Climate Normals and Averages. Retrieved from https://climate.weather.gc.ca/climate_normals/.

Appendix A

Dustfall Monitoring

DILLON CONSULTING

Dustfall Monitoring Station Pictures

Dust Monitoring Station ID	Coordinates	Status	Image
DM-2	Latitude: 49.831829 Longitude: -114.807721	Deployed	
DM-3	Latitude: 49.84982 Longitude: -114.847662	Deployed	
DM-6	Latitude: 49.862287 Longitude:-114.765415	Deployed	

Dust Monitoring Station ID	Coordinates	Status	Image
DM-7	Latitude: 49.824232 Longitude: -114.730718	Deployed	
DM-8	Latitude: 49.797292 Longitude: -114.707909	Deployed	
DM-9	Latitude: 49.700797 Longitude: -114.880664	Deployed	

Dust Monitoring Station ID	Coordinates	Status	Image
DM-10	Latitude: 49. 654555 Longitude: -114.928772	Deployed	
DM-11	Latitude: 49.660853 Longitude: -114.732091	Deployed	
DM-12	Latitude: 49.837965 Longitude: -114.863112	Deployed	

Dustfall Monitor Replacement Field Sheet – November 2018

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:30	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 2.25 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-3	11:00	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-6	12:15	wind; S/ 2km; partly cloudy; -4°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W,N,E,S,ID
DM-7	13:30	wind; S/ 2km; partly cloudy; - 4°C	~ DEPTH= 8 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow. Photos: W,N,E,S,ID
DM-8	16:30	wind; 0 km; partly cloudy; 3°C	~ DEPTH= 5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow… Photos: W,N,E,S,ID
DM-9	09:30	wind; 0 km; partly cloudy; 1°C	~ DEPTH= 2.5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W, N, E, S, ID.
DM-10	7:30	wind; 0 km; partly cloudy; -3°C	0 cm	Stand has been knocked over and broken into several pieces. Jar is empty. Relocation and installation will take place afternoon of Nov. 3, 2018. Reestablished at 49.66082, -114.92907. Station was redeployed at 19:15 on November 3, 2018.
DM-11	17:15	wind; 0 km; partly cloudy; 3°C	~ DEPTH= 2 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Contents of jar completely frozen, ~4 cm of contents snow. Photos: W, N, E, S, D
DM-12	10:40	wind; S/2 km; partly cloudy; 1°C	~ DEPTH= 5 cm	Stand is in good condition, no apparent damage. Sample does not show signs of tampering. Photos: W, ID, N, E, S

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days - Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - December 2018

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	9:19	Cloudy -17°C	~ depth =7 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: E, N, W, S, label, inside jar.
DM-3	9:51	Cloudy -19°C	~ depth =7 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: N, W, S, E, label, inside jar..
DM-6	8:35	Cloudy -17°C	~ depth =11 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: W, N, E, S, label, inside jar.
DM-7	9:55	Cloudy -20°C		Stand and jar knocked over, appears stand was knocked over by snowmobiles. Sample lost.
DM-8	11:12	Cloudy -7°C	~ depth =13 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: E, N, W, S, label, Inside jar.
DM-9	12:37	Sunny -8°C	~depth = 6 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: W, N, E, S, label, inside jar
DM-10	14:00	Partly Cloudy, -7°C	~ depth =5 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: inside jar, S, label, E, N, W.
DM-11	11:50	Cloudy -7°C	~ depth =5 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: Inside jar, N, label, W, S, E
DM-12	7:40	Cloudy -17°C	~ depth =6 cm	Contents completely frozen. No signs of tampering. Stand is in good condition. No damage noted. Photos: S, W, N, E, label, inside Jar

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - May 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	16:40	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-3	18:30	12°C	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-6	18:50	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken. Sample jar deployed.
DM-7	15:18	14°C	N/A	Stand broken over the winter. Re- assembled. New stand not needed, minor repairs only.
DM-8	11:22	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken.
DM-9	9:40	14°C	N/A	Stand broken over the winter. Re- assembled. New stand not needed, minor repairs only.
DM-10	8:45	wind; 0 km; Sunny;	N/A	Stand made it through the winter in good condition. Minor vandalism to wind screen. No repairs needed. Photos taken.
DM-11	17:35	17°C	N/A	Stand made it through the winter in good condition. No repairs needed. Photos taken.
DM-12	18:05	wind; 0 km; partly cloudy;	N/A	Stand made it through the winter. Some minor vandalism. Stand still structurally sound. No repairs needed. Photos taken.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - June 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	10:45	wind; 2 km/ S; Sunny; 18°C	0	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Contents of jar have evaporated completely. Photos: W, S, E, N, jar.
DM-3	12:40	wind; 3 km/ N; partly cloudy; 20°C	0	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Contents of jar have evaporated completely. Photos: W, S, E, N, jar.
DM-6	11:10	wind; 4 km /S; partly cloudy; 16°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:45	wind; 5 km/ S; Sunny; 15°C	1	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-8	15:00	wind; 4 km/ S; partly cloudy; 17°C	1.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	9:05	wind; 0 km; Sunny; 13°C	0.1	Stand remains in good condition, no signs of new vandalism. Site information label missing, will replace at next collection date. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	8:20	wind; 0 km; Cloudy; 9°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar
DM-11	15:40	wind;7 km/ W; partly cloudy, light rain; 20°C	0.1	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	10:22	wind; 0 km; Sunny; 18°C	0.1	Stand remains in good condition, no signs of new vandalism. Sample has been tampered with. Cigar put out in jar. Sample will be discarded. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - July 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	10:15	wind; 2 km/ S; Sunny; 17°C	3.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-3	12:40	wind; 4 km/ W; partly cloudy; 19°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-6	10:43	wind; 4 km /W; partly cloudy; 15°C	7.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:30	wind; 5 km/ S; Sunny; 14°C	9	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-8	14:45	wind; 4 km/ S; partly cloudy; 18°C	8	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	9:10	wind; 3 km/S; Sunny; 16°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	8:15	wind; 1 km/ S; Sunny; 13°C	4.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-11	15:40	wind;3 km/ W; partly cloudy, light rain; 23°C	2.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	13:30	wind; 5 km/W; Sunny; 20°C	5	Stand remains in good condition, no signs of new vandalism. Samples do not appear to have been tampered with. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - August 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	12:00	wind; 2 km/N; Cloudy; 14°C	2	Stand remains in good condition, some vandalism. Sample shot with a shotgun, jar punctured. Sample will not be sent; W, S, E, N, jar.
DM-3	12:25	wind; 2 km/ N; Cloudy; 17°C	0.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-6	10:20	wind; 6 km /W; Cloudy; 14°C	7.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-7	11:12	wind; 0 km/ N; partly cloudy; 14°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-8	13:55	wind; 0 km/ partly cloudy; 16°C	8	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, N, E, S, jar.
DM-9	8:40	wind; 4 km/N; Cloudy; 10°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-10	7:45	wind; 0 km/ S; Cloudy, light rain; 10°C	7	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-11	14:45	wind;3 km/ E; partly cloudy; 20°C	2.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Photos: W, S, E, N, jar.
DM-12	9:30	wind; 0 km; Cloudy; 11°C	6	Stand remains in good condition, no signs of new vandalism. Samples do not appear to have been tampered with. Photos: jar, W, S, E, N.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - September 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:45	wind; 3 km/ S; Sunny; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-3	12:15	wind; 3 km/ N; partly cloudy; 7°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-6	10:00	wind; 2 km /N; partly cloudy; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-7	10:45	wind; 0 km; Sunny; 7°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-8	9:45	wind; 2 km/ N; partly cloudy; 8°C	1.5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-9	8:30	wind; 0 km; Sunny; 5°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-10	7:30	wind; 0 km; Cloudy; 5°C	3	Possible vandalism, stand remains in good condition, sample intact.
DM-11	14:30	wind;2 km/ W; partly cloudy; 18°C	3	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.
DM-12	0:30	wind; 2 km; Sunny; 9°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Dustfall Monitor Replacement Field Sheet - October 2019

Canister ID	Date/Time of Canister Replacement	Weather During Replacement (Wind, Temp, Precipitation)	Approximate Depth of Liquid/Snow in Canister (cm) **DO NOT PLACE TAPE MEASURE IN CANISTER**	Condition of Stand and Other Comments (Good, Damaged, Altered…)
DM-2	11:45	wind; 1 km/ S; Sunny; -1°C	6	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-3	12:15	wind; 3 km/ N; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-6	10:00	wind; 0 km; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-7	10:45	wind; 0 km; Sunny; -1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-8	9:45	wind; 0 km; Sunny; -1°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-9	8:30	wind; 0 km; Sunny; -4°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-10	7:30	wind; 0 km; Sunny; -5°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-11	14:30	wind;3 km/ E ;Sunny; 1°C	5	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.
DM-12	0:30	wind; 4 km N; Sunny; 2°C	4	Stand remains in good condition, no signs of new vandalism. Sample does not appear to have been tampered with. Sample frozen. Stand disassembled.

Notes:

- Canisters should be replaced +/- 2 days from initial date of deployment, with a maximum deployment time of 32 days
- Canisters should have the following information recorded on them prior to shipping to laboratory:
- Date and Time of Removal
- Station ID (DM-#)
- Dillon Consulting Limited
- Project # 126231

Appendix B

Laboratory Certificates of Analysis

DILLON CONSULTING

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 16-NOV-18
Report Date: 27-NOV-18 18:18 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2197752

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2197752-1	L2197752-2	L2197752-3	L2197752-4	L2197752-5
	Description					
	Sampled Date	03-NOV-18	03-NOV-18	03-NOV-18	03-NOV-18	03-NOV-18
	Sampled Time	11:30	11:00	12:15	13:30	16:30
	Client ID	DM2	DM3	DM6	DM7	DM8
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	1.66	1.64	0.63	0.66	0.40
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.0105	0.00283	0.00178	0.00487	0.00341
	Antimony (Sb)-Total (mg/dm2.day)	0.0000030	0.0000023	<0.0000017	<0.0000031	<0.0000032
	Arsenic (As)-Total (mg/dm2.day)	<0.0000087 DLM	<0.000012 DLM	<0.0000034 DLM	<0.0000063 DLM	<0.0000065 DLM
	Barium (Ba)-Total (mg/dm2.day)	0.000800	0.000301	0.000126	0.000305	0.000230
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000062	<0.0000060	<0.0000086	<0.000016	<0.000016
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000062	<0.0000060	<0.0000086	<0.000016	<0.000016
	Boron (B)-Total (mg/dm2.day)	<0.00012	0.00014	<0.00017	<0.00031	<0.00032
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000322	0.0000130	<0.00000086	<0.0000016	<0.0000016
	Calcium (Ca)-Total (mg/dm2.day)	0.0295	0.0216	0.00432	0.00951	0.00846
	Chromium (Cr)-Total (mg/dm2.day)	0.0000219	0.0000075	<0.0000086	<0.000016	<0.000016
	Cobalt (Co)-Total (mg/dm2.day)	0.0000097	0.0000069	<0.0000017	0.0000041	0.0000033
	Copper (Cu)-Total (mg/dm2.day)	<0.000062 DLB	<0.000095 DLB	<0.000017 DLB	<0.000063 DLB	<0.000029 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.00993	0.00540	0.00132	0.00442	0.00251
	Lead (Pb)-Total (mg/dm2.day)	0.0000168	0.0000130	0.00000444	0.0000098	0.0000078
	Lithium (Li)-Total (mg/dm2.day)	<0.000062	<0.000060	<0.000086	<0.00016	<0.00016
	Magnesium (Mg)-Total (mg/dm2.day)	0.00884	0.00999	<0.0012 DLB	<0.0025 DLB	<0.0023 DLB
	Manganese (Mn)-Total (mg/dm2.day)	0.000275	0.000205	0.0000549	0.000149	0.000107
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000405	0.00000320	<0.00000086	0.0000021	<0.0000016
	Nickel (Ni)-Total (mg/dm2.day)	0.0000462	0.0000283	<0.0000086	0.000018	0.000021
	Phosphorus (P)-Total (mg/dm2.day)	0.00225	0.0347	<0.00086	<0.0016	<0.0016
	Potassium (K)-Total (mg/dm2.day)	0.00725	0.0484	0.00153	0.0029	0.0029
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	<0.000031	<0.000032
	Silicon (Si)-Total (mg/dm2.day)	0.0173	0.00403	0.00239	0.0072	0.0047
	Silver (Ag)-Total (mg/dm2.day)	0.00000055	0.00000174	<0.00000017	<0.00000031	<0.00000032
	Sodium (Na)-Total (mg/dm2.day)	0.00072	0.0118	<0.00086	<0.0016	<0.0016
	Strontium (Sr)-Total (mg/dm2.day)	0.0000806	0.0000525	0.0000142	0.0000333	0.0000256
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000031	<0.0000032
	Tin (Sn)-Total (mg/dm2.day)	0.0000012	0.0000013	<0.0000017	<0.0000031	<0.0000032
	Titanium (Ti)-Total (mg/dm2.day)	0.00012	<0.00012	<0.00017	<0.00031	<0.00032
	Uranium (U)-Total (mg/dm2.day)	0.00000116	0.00000053	0.00000017	0.00000045	<0.00000032
	Vanadium (V)-Total (mg/dm2.day)	0.000065	0.000026	<0.000017	<0.000031	<0.000032
	Zinc (Zn)-Total (mg/dm2.day)	<0.00037 DLB	<0.00071 DLB	<0.0010 DLB	<0.00094 DLB	<0.00097 DLB

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2197752-6	L2197752-7	L2197752-8		
	Description					
	Sampled Date	03-NOV-18	03-NOV-18	03-NOV-18		
	Sampled Time	09:30	17:15	10:40		
	Client ID	DM9	DM11	DM12		
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.39	0.41	1.11		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00155	0.00400	0.00230		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011 DLM	<0.0000015 DLM	0.0000068 DLM		
	Arsenic (As)-Total (mg/dm2.day)	<0.0000023	<0.0000044	<0.0000044		
	Barium (Ba)-Total (mg/dm2.day)	0.000116	0.000261	0.000247		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000057	<0.0000074	<0.0000074		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000057	<0.0000074	<0.0000074		
	Boron (B)-Total (mg/dm2.day)	<0.00011	<0.00015	<0.00015		
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000131	0.00000098	0.00000411		
	Calcium (Ca)-Total (mg/dm2.day)	0.00856	0.0103	0.0158		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000057	0.0000097	0.0000123		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000016	0.0000039	0.0000037		
	Copper (Cu)-Total (mg/dm2.day)	<0.000034 DLB	<0.000030 DLB	<0.000059 DLB		
	Iron (Fe)-Total (mg/dm2.day)	0.00206	0.00377	0.00596		
	Lead (Pb)-Total (mg/dm2.day)	0.00000622	0.00000981	0.00000970		
	Lithium (Li)-Total (mg/dm2.day)	<0.000057	<0.000074	<0.000074		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00200	0.00213	0.00613		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000670	0.000116	0.000140		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000096	0.00000142	0.00000284		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000089	0.0000171	0.0000178		
	Phosphorus (P)-Total (mg/dm2.day)	0.00656	<0.00074	0.0154		
	Potassium (K)-Total (mg/dm2.day)	0.00970	0.00214	0.0294		
	Selenium (Se)-Total (mg/dm2.day)	<0.000011	<0.000015	<0.000015		
	Silicon (Si)-Total (mg/dm2.day)	0.00258	0.00831	0.00353		
	Silver (Ag)-Total (mg/dm2.day)	0.00000029	0.00000022	0.00000060		
	Sodium (Na)-Total (mg/dm2.day)	0.00321	0.00078	0.00608		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000197	0.0000336	0.0000746		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011	<0.0000015	<0.0000015		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000011	<0.0000015	0.0000015		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00011	<0.00015	<0.00015		
	Uranium (U)-Total (mg/dm2.day)	0.00000020	0.00000043	0.00000038		
	Vanadium (V)-Total (mg/dm2.day)	<0.000011	0.000025	0.000019		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00034 DLB	<0.00044 DLB	<0.00044 DLB		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Barium (Ba)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Calcium (Ca)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Manganese (Mn)-Total	B	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Copper (Cu)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Magnesium (Mg)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Zinc (Zn)-Total	MB-LOR	L2197752-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # 1

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope			☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510			Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2			Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070	Fax:		Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only):				ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM2	03-Nov-18	11:30	Air	1
	DM3	03-Nov-18	11:00	Air	1
	DM6	03-Nov-18	12:15	Air	1
	DM7	03-Nov-18	13:30	Air	1
	DM8	03-Nov-18	16:30	Air	1
	DM9	03-Nov-18	9:30	Air	1
	DM11	03-Nov-18	17:15	Air	1
	DM12	03-Nov-18	10:40	Air	1

L2197752-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	3-Nov-18		JC	NOV 16 2018	10:15 am	13+13 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-JUN-19
Report Date: 27-JUN-19 13:45 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2295045

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2295045-1	L2295045-2	L2295045-3	L2295045-4	L2295045-5
	Description	Air	Air	Air	Air	Air
	Sampled Date	14-JUN-19	14-JUN-19	14-JUN-19	14-JUN-19	14-JUN-19
	Sampled Time	09:19	09:51	08:35	09:55	11:12
	Client ID	DM2	DM3	DM6	DM10	DM8
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.91	0.78	0.55	1.12	0.86
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00474	0.00306	0.00258	0.00184	0.00305
	Antimony (Sb)-Total (mg/dm2.day)	0.0000025	0.0000017	<0.0000015	<0.0000012	0.0000019
	Arsenic (As)-Total (mg/dm2.day)	<0.000077 DLM	<0.000073 DLM	<0.000078 DLM	<0.000073 DLM	0.000076 DLM
	Barium (Ba)-Total (mg/dm2.day)	0.000278	0.000175	0.000202	0.0000814	0.000643
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000064	<0.0000058	<0.0000074	<0.0000060	<0.0000055
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000064	<0.0000058	<0.0000074	<0.0000060	<0.0000055
	Boron (B)-Total (mg/dm2.day)	<0.00013	<0.00012	<0.00015	<0.00012	<0.00011
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000167	0.00000093	0.00000082	0.00000483	0.00000152
	Calcium (Ca)-Total (mg/dm2.day)	0.0246	0.0242	0.0156	0.0147	0.0172
	Chromium (Cr)-Total (mg/dm2.day)	0.0000090	0.0000063	<0.0000074	<0.0000060	0.0000067
	Cobalt (Co)-Total (mg/dm2.day)	0.0000049	0.0000037	0.0000036	0.0000020	0.0000050
	Copper (Cu)-Total (mg/dm2.day)	0.0000395	0.0000198	0.0000137	0.0000449	0.0000186
	Iron (Fe)-Total (mg/dm2.day)	0.00583	0.00443	0.00356	0.00261	0.00496
	Lead (Pb)-Total (mg/dm2.day)	0.0000100	0.00000653	0.00000633	0.00000523	0.00000787
	Lithium (Li)-Total (mg/dm2.day)	<0.000064	<0.000058	<0.000074	<0.000060	<0.000055
	Magnesium (Mg)-Total (mg/dm2.day)	0.00637	0.00523	0.00344	0.00585	0.00398
	Manganese (Mn)-Total (mg/dm2.day)	0.000282	0.000227	0.000178	0.000173	0.000185
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000200	0.00000174	0.00000128	0.00000239	0.00000212
	Nickel (Ni)-Total (mg/dm2.day)	0.0000212 DLB	0.0000159 DLB	0.0000166 DLB	0.0000104	0.0000237 DLB
	Phosphorus (P)-Total (mg/dm2.day)	<0.0019	<0.0023	<0.0015	0.0114	<0.0017
	Potassium (K)-Total (mg/dm2.day)	0.00432	0.00504	0.00316	0.0320	0.00368
	Selenium (Se)-Total (mg/dm2.day)	<0.000013	<0.000012	<0.000015	<0.000012	<0.000011
	Silicon (Si)-Total (mg/dm2.day)	0.00776	0.00533	0.00437	0.00345	0.00526
	Silver (Ag)-Total (mg/dm2.day)	0.00000022	0.00000016	0.00000021	0.00000029	0.00000030
	Sodium (Na)-Total (mg/dm2.day)	0.00103	0.00082	<0.00074	0.00460	0.00068
	Strontium (Sr)-Total (mg/dm2.day)	0.0000549	0.0000474	0.0000378	0.0000280	0.0000517
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000013	<0.0000012	<0.0000015	<0.0000012	<0.0000011
	Tin (Sn)-Total (mg/dm2.day)	<0.0000013	<0.0000012	<0.0000015	<0.0000012	<0.0000011
	Titanium (Ti)-Total (mg/dm2.day)	<0.00013	<0.00012	<0.00015	<0.00012	<0.00011
	Uranium (U)-Total (mg/dm2.day)	0.00000060	0.00000039	0.00000036	0.00000023	0.00000053
	Vanadium (V)-Total (mg/dm2.day)	0.000018 DLB	0.000012 DLB	<0.000015 DLB	<0.000012 DLB	0.000016 DLB
	Zinc (Zn)-Total (mg/dm2.day)	<0.00027	<0.00024	<0.00022	<0.00025	<0.00020

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2295045-6	L2295045-7	L2295045-9		
	Description	Air	Air	Air		
	Sampled Date	12-JUN-19	14-JUN-19	14-JUN-19		
	Sampled Time	12:37	14:00	11:45		
	Client ID	DM9	DM11	DM7		
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.51	0.38	0.84		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00218	0.00220	0.00345		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012 DLM	<0.0000011 DLM	0.0000020 DLM		
	Arsenic (As)-Total (mg/dm2.day)	<0.000039	<0.000072	<0.000080		
	Barium (Ba)-Total (mg/dm2.day)	0.000129	0.000104	0.000332		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058	<0.0000055	<0.0000051		
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000058	<0.0000055	<0.0000051		
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00011	<0.00010		
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000067	0.00000057	0.00000130		
	Calcium (Ca)-Total (mg/dm2.day)	0.0103	0.0135	0.0176		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000058	<0.0000055	0.0000073		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000026	0.0000020	0.0000061		
	Copper (Cu)-Total (mg/dm2.day)	0.0000151	0.0000115	0.0000223		
	Iron (Fe)-Total (mg/dm2.day)	0.00292	0.00268	0.00591		
	Lead (Pb)-Total (mg/dm2.day)	0.00000463	0.00000419	0.00000943		
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000055	<0.000051		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00256	0.00266	0.00405		
	Manganese (Mn)-Total (mg/dm2.day)	0.000156	0.000127	0.000207		
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000105	0.00000095	0.00000195		
	Nickel (Ni)-Total (mg/dm2.day)	0.0000130	0.0000083	0.0000258		
	Phosphorus (P)-Total (mg/dm2.day)	<0.0017 DLB	<0.0011 DLB	<0.0015 DLB		
	Potassium (K)-Total (mg/dm2.day)	0.00641	0.00370	0.00365		
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000011	<0.000010		
	Silicon (Si)-Total (mg/dm2.day)	0.00367	0.00408	0.00548		
	Silver (Ag)-Total (mg/dm2.day)	0.00000014	<0.00000011	0.00000028		
	Sodium (Na)-Total (mg/dm2.day)	0.00199	0.00063	0.00073		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000247	0.0000297	0.0000530		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000010		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000011	<0.0000010		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00011	<0.00010		
	Uranium (U)-Total (mg/dm2.day)	0.00000022	0.00000019	0.00000057		
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000011	0.000016		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00017 DLB	<0.00017 DLB	0.000569		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Barium (Ba)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Calcium (Ca)-Total	B	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Duplicate	Copper (Cu)-Total	DUP-H	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Phosphorus (P)-Total	MB-LOR	L2295045-1, -2, -3, -4, -5, -6, -7, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2295045-1, -2, -3, -4, -5, -6, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Ch

L2295045-COFC

COC # 1

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Report To		Report		Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF ☑ Excel ☑ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca		Analysis Request
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231		
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact: Brent Mack	Sampler: T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM2	14-Jun-19	9:19	Air	1
	DM3	14-Jun-19	9:51	Air	1
	DM6	14-Jun-19	8:35	Air	1
	DM10	14-Jun-19	9:55	Air	1
	DM8	14-Jun-19	11:12	Air	1
	DM9	14-Jun-19	12:37	Air	1
	DM11	14-Jun-19	14:00	Air	1
	DM12	14-Jun-19	7:40	Air	1
	DM7	14-Jun-19	11:45	Air	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	14-Jun-19		HM	6/15	12:50p	7.1 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-JUL-19
Report Date: 31-JUL-19 09:23 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2313408

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2313408-1 Air 16-JUL-19 10:15 DM2	L2313408-2 Air 16-JUL-19 12:40 DM3	L2313408-3 Air 16-JUL-19 10:43 DM6	L2313408-4 Air 16-JUL-19 08:15 DM10	L2313408-5 Air 16-JUL-19 14:45 DM8
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.80	0.76	0.61	<0.10	0.91
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00277	0.00187	0.00351	0.00102	0.00448
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Arsenic (As)-Total (mg/dm2.day)	0.0000054	0.0000038	0.0000047	0.0000020	0.0000056
	Barium (Ba)-Total (mg/dm2.day)	0.000385	0.000240	0.000312	0.0000492	0.00109
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000091	<0.0000064	<0.000013	<0.0000076	<0.000015
	Bismuth (Bi)-Total (mg/dm2.day)	<0.0000091	0.0000584	0.000033	<0.0000076	<0.000015
	Boron (B)-Total (mg/dm2.day)	<0.00018	<0.00013	<0.00026	<0.00015	<0.00030
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000135	0.00000192	<0.0000013	<0.00000076	0.0000019
	Calcium (Ca)-Total (mg/dm2.day)	0.0194	0.0277	0.0108	0.00596	0.0156
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000091	<0.0000064	<0.000013	<0.0000076	<0.000015
	Cobalt (Co)-Total (mg/dm2.day)	0.0000052	0.0000034	0.0000052	<0.0000015	0.0000069
	Copper (Cu)-Total (mg/dm2.day)	<0.000081 DLB	0.000677	<0.00034 DLB	<0.00026 DLB	<0.000089 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.00460	0.00382	0.00534	0.00142	0.00632
	Lead (Pb)-Total (mg/dm2.day)	0.00000728	0.0000127	0.0000144	0.00000597	0.0000106
	Lithium (Li)-Total (mg/dm2.day)	<0.000091	<0.000064	<0.00013	<0.000076	<0.00015
	Magnesium (Mg)-Total (mg/dm2.day)	0.00638	0.00773	0.00306	0.00190	0.00408
	Manganese (Mn)-Total (mg/dm2.day)	0.000219	0.000268	0.000161	0.000103	0.000190
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000170	0.00000127	0.0000016	<0.00000076	0.0000021
	Nickel (Ni)-Total (mg/dm2.day)	0.0000225	0.0000151	0.000022	<0.0000076	0.000030
	Phosphorus (P)-Total (mg/dm2.day)	0.00188	0.0135	0.0023	0.00321	0.0018
	Potassium (K)-Total (mg/dm2.day)	0.00371	0.0189	0.0049	0.00870	0.0056
	Selenium (Se)-Total (mg/dm2.day)	<0.000018	<0.000013	<0.000026	<0.000015	<0.000030
	Silicon (Si)-Total (mg/dm2.day)	0.00428	0.00281	0.0044	0.00161	0.0050
	Silver (Ag)-Total (mg/dm2.day)	0.00000024	0.00000021	0.00000031	<0.00000015	0.00000040
	Sodium (Na)-Total (mg/dm2.day)	0.00187	0.00194	<0.0013	0.00091	<0.0015
	Strontium (Sr)-Total (mg/dm2.day)	0.0000362	0.0000346	0.0000318	0.0000112	0.0000489
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Tin (Sn)-Total (mg/dm2.day)	<0.0000018	<0.0000013	<0.0000026	<0.0000015	<0.0000030
	Titanium (Ti)-Total (mg/dm2.day)	<0.00018	<0.00013	<0.00026	<0.00015	<0.00030
	Uranium (U)-Total (mg/dm2.day)	0.00000051	0.00000076	0.00000062	<0.00000015	0.00000075
	Vanadium (V)-Total (mg/dm2.day)	<0.000018	<0.000013	<0.000026	<0.000015	<0.000030
	Zinc (Zn)-Total (mg/dm2.day)	<0.00033 DLB	<0.00050 DLB	<0.00047 DLB	<0.00027 DLB	<0.00053 DLB

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2313408-6 Air 16-JUL-19 09:10 DM9	L2313408-7 Air 16-JUL-19 15:40 DM11	L2313408-8 Air 16-JUL-19 11:30 DM7	L2313408-9 Air 16-JUL-19 13:30 DM12	
Sample ID **Description** **Sampled Date** **Sampled Time** **Client ID**						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.32	0.45	0.70	0.83	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00122	0.00170	0.00566	0.00164	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000011	0.0000011	<0.0000034	0.0000042	
	Arsenic (As)-Total (mg/dm2.day)	0.0000020	0.0000035	0.0000068	0.0000050	
	Barium (Ba)-Total (mg/dm2.day)	0.0000863	0.000115	0.000380	0.000328	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000057	<0.0000055	<0.000017	<0.0000098	
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000146	0.0000074	<0.000017	<0.0000098	
	Boron (B)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00034	<0.00020	
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000080	0.00000109	<0.0000017	0.0000152	
	Calcium (Ca)-Total (mg/dm2.day)	0.00705	0.00827	0.0115	0.0109	
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000057	0.0000134	<0.000017	<0.0000098	
	Cobalt (Co)-Total (mg/dm2.day)	0.0000015	0.0000022	0.0000060	0.0000033	
	Copper (Cu)-Total (mg/dm2.day)	0.00034 DLB	<0.00015 DLB	<0.00034 DLB	<0.000078 DLB	
	Iron (Fe)-Total (mg/dm2.day)	0.00177	0.00337	0.0097	0.00386	
	Lead (Pb)-Total (mg/dm2.day)	0.00000769	0.00000806	0.0000151	0.00000968	
	Lithium (Li)-Total (mg/dm2.day)	<0.000057	<0.000055	<0.00017	<0.000098	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00205	0.00238	0.00369	0.00372	
	Manganese (Mn)-Total (mg/dm2.day)	0.000114	0.000124	0.000202	0.000148	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000074	0.00000130	0.0000019	0.00000199	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000063	0.0000106	0.000024	0.0000114	
	Phosphorus (P)-Total (mg/dm2.day)	0.00348	0.00317	<0.0017	0.00968	
	Potassium (K)-Total (mg/dm2.day)	0.00738	0.00908	0.0042	0.0168	
	Selenium (Se)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000034	<0.000020	
	Silicon (Si)-Total (mg/dm2.day)	0.00184	0.00223	0.0092	0.00276	
	Silver (Ag)-Total (mg/dm2.day)	0.00000018	0.00000013	<0.00000034	0.00000024	
	Sodium (Na)-Total (mg/dm2.day)	0.00159	0.00129	<0.0017	0.00410	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000166	0.0000168	0.0000502	0.0000369	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000011	<0.0000011	<0.0000034	<0.0000020	
	Tin (Sn)-Total (mg/dm2.day)	0.0000014	<0.0000011	<0.0000034	<0.0000020	
	Titanium (Ti)-Total (mg/dm2.day)	<0.00011	<0.00011	<0.00034	<0.00020	
	Uranium (U)-Total (mg/dm2.day)	0.00000020	0.00000029	0.00000111	<0.00000020	
	Vanadium (V)-Total (mg/dm2.day)	<0.000011	<0.000011	<0.000034	<0.000020	
	Zinc (Zn)-Total (mg/dm2.day)	<0.00031 DLB	<0.00033 DLB	<0.00051 DLB	<0.00059 DLB	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Barium (Ba)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Copper (Cu)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Lead (Pb)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Manganese (Mn)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2313408-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

L2313408-COFC

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # 1

Page 1 of 1

Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca				○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca				○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca				
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231				Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:				
Contact:		LSD:				
Address:						
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		ALS Contact: Brent Mack		Sampler: T. Phillips		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total dust fall	Total metals	Number of Containers
	DM2	16-Jul-19	10:15	Air	X	X	1
	DM3	16-Jul-19	12:40	Air	X	X	1
	DM6	16-Jul-19	10:43	Air	X	X	1
	DM10	16-Jul-19	8:15	Air	X	X	1
	DM8	16-Jul-19	14:45	Air	X	X	1
	DM9	16-Jul-19	9:10	Air	X	X	1
	DM11	16-Jul-19	15:40	Air	X	X	1
	DM7	16-Jul-19	11:30	Air	X	X	1
	DM12	16-Jul-19	13:30	Air	X	X	

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	16-Jul-19		JC	JUL 19 2019	10:50Am	18/17 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 22-AUG-19
Report Date: 05-SEP-19 12:23 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2333896

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2333896-1 Air 16-AUG-19 09:30 DM12	L2333896-2 Air 16-AUG-19 12:25 DM3	L2333896-3 Air 16-AUG-19 10:20 DM6	L2333896-4 Air 16-AUG-19 07:45 DM10	L2333896-5 Air 16-AUG-19 13:05 DM8
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.28	0.36	0.11	<0.10	0.20
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00278	0.00162	0.00145	0.000648	0.00165
	Antimony (Sb)-Total (mg/dm2.day)	0.0000043	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Arsenic (As)-Total (mg/dm2.day)	0.0000027	0.0000022	0.0000016	<0.0000019	0.0000025
	Barium (Ba)-Total (mg/dm2.day)	0.000153	0.000149	0.000201	0.0000426	0.00168
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000059	<0.0000069	<0.0000069	<0.0000093	<0.0000098
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000177	0.0000241	<0.0000069	<0.0000093	0.0000141
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00014	<0.00014	<0.00019	<0.00020
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000217	0.00000138	0.00000091	<0.00000093	0.00000122
	Calcium (Ca)-Total (mg/dm2.day)	0.0107	0.0303	0.00690	0.00490	0.0130
	Chromium (Cr)-Total (mg/dm2.day)	0.0000089	<0.0000069	<0.0000069	<0.0000093	<0.0000098
	Cobalt (Co)-Total (mg/dm2.day)	0.0000031	0.0000029	0.0000034	<0.0000019	0.0000041
	Copper (Cu)-Total (mg/dm2.day)	0.000580	0.000759	0.000231	0.000290	0.000916
	Iron (Fe)-Total (mg/dm2.day)	0.00422	0.00307	0.00247	0.00085	0.00274
	Lead (Pb)-Total (mg/dm2.day)	0.0000108	0.00000868	0.00000631	0.00000630	0.00000960
	Lithium (Li)-Total (mg/dm2.day)	<0.000059	<0.000069	<0.000069	<0.000093	<0.000098
	Magnesium (Mg)-Total (mg/dm2.day)	0.00359	0.00900	0.00275	0.00129	0.00357
	Manganese (Mn)-Total (mg/dm2.day)	0.000160	0.000269	0.000113	0.0000777	0.000188
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000430	0.00000097	0.00000083	<0.00000093	<0.00000098
	Nickel (Ni)-Total (mg/dm2.day)	0.0000120	0.0000115	0.0000147	<0.0000093	0.0000168
	Phosphorus (P)-Total (mg/dm2.day)	0.0112	0.00865	0.00511	0.00119	0.00163
	Potassium (K)-Total (mg/dm2.day)	0.0105	0.0124	0.00731	0.00255	0.00342
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000014	<0.000014	<0.000019	<0.000020
	Silicon (Si)-Total (mg/dm2.day)	0.00423	0.00261	0.00270	0.00107	0.00200
	Silver (Ag)-Total (mg/dm2.day)	0.00000033	0.00000031	0.00000018	<0.00000019	<0.00000020
	Sodium (Na)-Total (mg/dm2.day)	0.00204	0.00184	0.00181	0.00110	0.00134
	Strontium (Sr)-Total (mg/dm2.day)	0.0000455	0.0000440	0.0000189	0.0000109	0.0000484
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000014	<0.0000014	<0.0000019	<0.0000020
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00014	<0.00014	<0.00019	<0.00020
	Uranium (U)-Total (mg/dm2.day)	0.00000068	0.00000037	0.00000035	<0.00000019	0.00000055
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000014	<0.000014	<0.000019	<0.000020
	Zinc (Zn)-Total (mg/dm2.day)	<0.00071 DLB	<0.00041 DLB	<0.00041 DLB	<0.00056 DLB	<0.00059 DLB

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2333896-6 Air 16-AUG-19 08:40 DM9	L2333896-7 Air 16-AUG-19 14:45 DM11	L2333896-8 Air 16-AUG-19 11:12 DM7		
Sample ID		L2333896-6	L2333896-7	L2333896-8		
Description		Air	Air	Air		
Sampled Date		16-AUG-19	16-AUG-19	16-AUG-19		
Sampled Time		08:40	14:45	11:12		
Client ID		DM9	DM11	DM7		
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.10	0.33	0.77		
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00148	0.00154	0.00256		
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Arsenic (As)-Total (mg/dm2.day)	0.0000017	0.0000019	0.0000046		
	Barium (Ba)-Total (mg/dm2.day)	0.0000625	0.0000624	0.000290		
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000079	<0.0000079	<0.0000076		
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000150	<0.0000079	<0.0000076		
	Boron (B)-Total (mg/dm2.day)	<0.00016	<0.00016	<0.00015		
	Cadmium (Cd)-Total (mg/dm2.day)	<0.00000079	<0.00000079	0.00000091		
	Calcium (Ca)-Total (mg/dm2.day)	0.00586	0.00602	0.0100		
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000079	0.0000081	<0.0000076		
	Cobalt (Co)-Total (mg/dm2.day)	0.0000018	<0.0000016	0.0000058		
	Copper (Cu)-Total (mg/dm2.day)	0.000712	0.000124	0.000462		
	Iron (Fe)-Total (mg/dm2.day)	0.00196	0.00213	0.00732		
	Lead (Pb)-Total (mg/dm2.day)	0.00000841	0.00000457	0.0000102		
	Lithium (Li)-Total (mg/dm2.day)	<0.000079	<0.000079	<0.000076		
	Magnesium (Mg)-Total (mg/dm2.day)	0.00174	0.00261	0.00491		
	Manganese (Mn)-Total (mg/dm2.day)	0.0000964	0.0000975	0.000243		
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.00000079	0.00000228	0.00000138		
	Nickel (Ni)-Total (mg/dm2.day)	<0.0000079	<0.0000079	0.0000217		
	Phosphorus (P)-Total (mg/dm2.day)	0.00304	0.00911	0.0154		
	Potassium (K)-Total (mg/dm2.day)	0.00483	0.0123	0.0263		
	Selenium (Se)-Total (mg/dm2.day)	<0.000016	<0.000016	<0.000015		
	Silicon (Si)-Total (mg/dm2.day)	0.00208	0.00228	0.00294		
	Silver (Ag)-Total (mg/dm2.day)	<0.00000016	<0.00000016	0.00000021		
	Sodium (Na)-Total (mg/dm2.day)	0.00150	0.00114	0.00612		
	Strontium (Sr)-Total (mg/dm2.day)	0.0000166	0.0000142	0.0000317		
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Tin (Sn)-Total (mg/dm2.day)	<0.0000016	<0.0000016	<0.0000015		
	Titanium (Ti)-Total (mg/dm2.day)	<0.00016	<0.00016	<0.00015		
	Uranium (U)-Total (mg/dm2.day)	0.00000026	0.00000018	0.00000057		
	Vanadium (V)-Total (mg/dm2.day)	<0.000016	<0.000016	<0.000015		
	Zinc (Zn)-Total (mg/dm2.day)	<0.00047 DLB	<0.00047 DLB	0.000396		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	B	L2333896-1, -2, -3, -4, -5, -6, -7, -8
Method Blank	Zinc (Zn)-Total	MB-LOR	L2333896-1, -2, -3, -4, -5, -6, -7, -8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

L2333896-COFC

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COC # 1

Page 1 of 1

Report To		Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:				
Contact:		LSD:				
Address:						
Phone:	Fax:	Quote #:				
Lab Work Order # (lab use only)		ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	16-Aug-19	9:30	Air	1
	DM3	16-Aug-19	12:25	Air	1
	DM6	16-Aug-19	10:20	Air	1
	DM10	16-Aug-19	7:45	Air	1
	DM8	16-Aug-19	13:55	Air	1
	DM9	16-Aug-19	8:40	Air	1
	DM11	16-Aug-19	14:45	Air	1
	DM7	16-Aug-19	11:12	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	20-Aug-19		JH	22 Aug 19	10:00AM	2.0 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 19-SEP-19
Report Date: 30-SEP-19 16:12 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2350731

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L2350731-1	L2350731-2	L2350731-3	L2350731-4	L2350731-5
Description	Air	Air	Air	Air	Air
Sampled Date	16-SEP-19	16-SEP-19	16-SEP-19	16-SEP-19	17-SEP-19
Sampled Time	12:30	12:15	10:00	07:30	09:45
Client ID	DM12	DM3	DM6	DM10	DM8
Grouping / **Analyte**					
DUSTFALL					
Particulates Total Dustfall (mg/dm2.day)	0.62	0.79	0.52	0.41	0.92
Metals Aluminum (Al)-Total (mg/dm2.day)	0.00217	0.00189	0.000729	0.00408	0.00180
Antimony (Sb)-Total (mg/dm2.day)	0.0000039	0.0000024	0.0000084	<0.0000025	<0.0000018
Arsenic (As)-Total (mg/dm2.day)	0.0000026	0.0000028	0.0000012	0.0000075	0.0000035
Barium (Ba)-Total (mg/dm2.day)	0.000212	0.000195	0.0000270	0.000416	0.00231
Beryllium (Be)-Total (mg/dm2.day)	<0.0000086	<0.0000063	<0.0000058	<0.000013	<0.0000091
Bismuth (Bi)-Total (mg/dm2.day)	0.0000254	0.0000121	0.0000123	0.000037	0.0000130
Boron (B)-Total (mg/dm2.day)	<0.00017	<0.00013	<0.00012	<0.00025	<0.00018
Cadmium (Cd)-Total (mg/dm2.day)	0.00000138	0.00000127	0.00000062	0.0000046	0.00000132
Calcium (Ca)-Total (mg/dm2.day)	0.0118	0.0226	0.00668	0.0174	0.0151
Chromium (Cr)-Total (mg/dm2.day)	0.0000087	0.0000070	<0.0000058	0.000037	0.0000103
Cobalt (Co)-Total (mg/dm2.day)	0.0000035	0.0000038	<0.0000012	0.0000071	0.0000046
Copper (Cu)-Total (mg/dm2.day)	0.00119	0.000714	0.000333	0.000902	0.000484
Iron (Fe)-Total (mg/dm2.day)	0.00391	0.00379	0.00106	0.00686	0.00303
Lead (Pb)-Total (mg/dm2.day)	0.0000137	0.0000105	0.00155	0.0000186	0.0000141
Lithium (Li)-Total (mg/dm2.day)	<0.000086	<0.000063	<0.000058	<0.00013	<0.000091
Magnesium (Mg)-Total (mg/dm2.day)	0.00344	0.00679	0.00180	0.00676	0.00567
Manganese (Mn)-Total (mg/dm2.day)	0.000125	0.000167	0.0000622	0.000249	0.000153
Molybdenum (Mo)-Total (mg/dm2.day)	0.00000194	0.00000227	<0.00000058	0.0000045	0.00000216
Nickel (Ni)-Total (mg/dm2.day)	0.0000163	0.0000169	0.0000063	0.000035	0.0000240
Phosphorus (P)-Total (mg/dm2.day)	0.00436	0.0120	0.00086	0.0157	0.0154
Potassium (K)-Total (mg/dm2.day)	0.00833	0.0201	0.00270	0.0292	0.0226
Selenium (Se)-Total (mg/dm2.day)	<0.000017	<0.000013	<0.000012	<0.000025	<0.000018
Silicon (Si)-Total (mg/dm2.day)	0.00274	0.00353	0.00089	0.0060	0.00212
Silver (Ag)-Total (mg/dm2.day)	0.00000027	0.00000030	<0.00000012	0.00000058	0.00000034
Sodium (Na)-Total (mg/dm2.day)	0.00213	0.00280	0.00149	0.0067	0.00566
Strontium (Sr)-Total (mg/dm2.day)	0.0000369	0.0000421	0.0000109	0.0000467	0.0000581
Thallium (Tl)-Total (mg/dm2.day)	<0.0000017	<0.0000013	<0.0000012	<0.0000025	<0.0000018
Tin (Sn)-Total (mg/dm2.day)	<0.0000017	<0.0000013	<0.0000012	<0.0000025	<0.0000018
Titanium (Ti)-Total (mg/dm2.day)	<0.00017	<0.00013	<0.00012	<0.00025	<0.00018
Uranium (U)-Total (mg/dm2.day)	0.00000042	0.00000091	0.00000016	0.00000098	0.00000053
Vanadium (V)-Total (mg/dm2.day)	<0.000017	<0.000013	<0.000012	<0.000025	<0.000018
Zinc (Zn)-Total (mg/dm2.day)	0.000667	<0.00049 DLB	0.000443	<0.00076 DLB	<0.00049 DLB

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2350731-6 Air 16-SEP-19 08:30 DM9	L2350731-7 Air 16-SEP-19 14:30 DM11	L2350731-8 Air 16-SEP-19 10:45 DM7	L2350731-9 Air 16-SEP-19 11:45 DM2	
Sample ID **Description** **Sampled Date** **Sampled Time** **Client ID**						
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.39	0.16	0.94	1.13	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00122	0.000865	0.00172	0.00326	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	0.0000023	
	Arsenic (As)-Total (mg/dm2.day)	0.0000015	0.0000014	0.0000027	0.0000058	
	Barium (Ba)-Total (mg/dm2.day)	0.0000765	0.0000650	0.000213	0.000426	
	Beryllium (Be)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000086	<0.0000058	
	Bismuth (Bi)-Total (mg/dm2.day)	0.0000107	0.0000063	0.0000090	0.0000193	
	Boron (B)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00017	<0.00012	
	Cadmium (Cd)-Total (mg/dm2.day)	0.00000109	<0.00000058	<0.00000086	0.00000195	
	Calcium (Ca)-Total (mg/dm2.day)	0.00764	0.00898	0.00961	0.0207	
	Chromium (Cr)-Total (mg/dm2.day)	<0.0000058	<0.0000058	<0.0000086	0.0000107	
	Cobalt (Co)-Total (mg/dm2.day)	0.0000016	0.0000018	0.0000038	0.0000085	
	Copper (Cu)-Total (mg/dm2.day)	0.00111	0.000871	0.000969	0.000641	
	Iron (Fe)-Total (mg/dm2.day)	0.00191	0.00140	0.00394	0.00696	
	Lead (Pb)-Total (mg/dm2.day)	0.0000100	0.0000116	0.0000192	0.0000193	
	Lithium (Li)-Total (mg/dm2.day)	<0.000058	<0.000058	<0.000086	<0.000058	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00246	0.00167	0.00253	0.00744	
	Manganese (Mn)-Total (mg/dm2.day)	0.0000852	0.0000842	0.000129	0.000231	
	Molybdenum (Mo)-Total (mg/dm2.day)	0.00000110	0.00000089	0.00000210	0.00000315	
	Nickel (Ni)-Total (mg/dm2.day)	0.0000078	0.0000073	0.0000159	0.0000355	
	Phosphorus (P)-Total (mg/dm2.day)	0.00524	0.00203	0.00479	0.00555	
	Potassium (K)-Total (mg/dm2.day)	0.0101	0.00408	0.00883	0.0125	
	Selenium (Se)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	<0.000012	
	Silicon (Si)-Total (mg/dm2.day)	0.00200	0.00147	0.00241	0.00495	
	Silver (Ag)-Total (mg/dm2.day)	0.00000027	0.00000014	0.00000024	0.00000081	
	Sodium (Na)-Total (mg/dm2.day)	0.00256	0.00106	0.00256	0.00210	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000173	0.0000150	0.0000284	0.0000494	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000012	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000012	<0.0000012	<0.0000017	<0.0000012	
	Titanium (Ti)-Total (mg/dm2.day)	<0.00012	<0.00012	<0.00017	<0.00012	
	Uranium (U)-Total (mg/dm2.day)	0.00000026	0.00000019	0.00000055	0.00000091	
	Vanadium (V)-Total (mg/dm2.day)	<0.000012	<0.000012	<0.000017	0.000021	
	Zinc (Zn)-Total (mg/dm2.day)	0.000598	<0.00031 DLB	<0.00057 DLB	0.000488	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Calcium (Ca)-Total	MB-LOR	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Zinc (Zn)-Total	MB-LOR	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9
Laboratory Control Sample	Thallium (Tl)-Total	MES	L2350731-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
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L2350731-COFC

1 of 1

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope	☑ PDF ☑ Excel ☑ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510	Email 1: rpope@dillon.ca		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2	Email 2: ldilley@dillon.ca		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070 Fax:	Email 3: dgay@dillon.ca		**Analysis Request**
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: 126231		
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	16-Sep-19	12:30	Air	1
	DM3	16-Sep-19	12:15	Air	1
	DM6	16-Sep-19	10:00	Air	1
	DM10	16-Sep-19	7:30	Air	1
	DM8	17-Sep-19	9:45	Air	1
	DM9	16-Sep-19	8:30	Air	1
	DM11	16-Sep-19	14:30	Air	1
	DM7	16-Sep-19	10:45	Air	1
	DM2	16-Sep-19	11:45	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	18-Sep-19		JG	19 Sep 19	12:15 PM	19, 20 °C				

DILLON CONSULTING LIMITED
ATTN: Richard Pope
510 - 3820 Cessna Drive
Richmond BC V7B 0A2

Date Received: 30-OCT-19
Report Date: 07-NOV-19 13:30 (MT)
Version: FINAL

Client Phone: 604-278-7847

Certificate of Analysis

Lab Work Order #: L2374201

Project P.O. #: NOT SUBMITTED
Job Reference: 126231
C of C Numbers:
Legal Site Desc:

<Original signed by>

Brent Mack, B.Sc.
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2374201-1	L2374201-2	L2374201-3	L2374201-4	L2374201-5
	Description	Air	Air	Air	Air	Air
	Sampled Date	15-OCT-19	15-OCT-19	15-OCT-19	15-OCT-19	15-OCT-19
	Sampled Time	14:15	14:00	12:00	09:25	15:45
	Client ID	DM12	DM3	DM6	DM10	DM8
Grouping	**Analyte**					
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.93	1.12	0.72	0.51	0.73
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00236	0.00222	0.00205	0.00174	0.00248
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Arsenic (As)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Barium (Ba)-Total (mg/dm2.day)	0.000161	0.000216	0.000268	0.000115	0.000427
	Beryllium (Be)-Total (mg/dm2.day)	<0.000024	<0.000019	<0.000027	<0.000025	<0.000036
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000024	<0.000019	<0.000027	<0.000025	<0.000036
	Boron (B)-Total (mg/dm2.day)	<0.00047	<0.00039	<0.00054	<0.00050	<0.00072
	Cadmium (Cd)-Total (mg/dm2.day)	<0.0000024	0.0000027	<0.0000027	0.0000033	0.0000063
	Calcium (Ca)-Total (mg/dm2.day)	0.0184	0.0274	0.0182	0.0205	0.0218
	Chromium (Cr)-Total (mg/dm2.day)	<0.000024	<0.000019	0.000035	<0.000025	<0.000036
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Copper (Cu)-Total (mg/dm2.day)	<0.00012 DLB	<0.000077 DLB	<0.00016 DLB	<0.000074 DLB	<0.00018 DLB
	Iron (Fe)-Total (mg/dm2.day)	0.0044	0.0045	0.0035	0.0028	0.0039
	Lead (Pb)-Total (mg/dm2.day)	0.0000178	0.0000179	0.0000118	0.0000128	0.0000175
	Lithium (Li)-Total (mg/dm2.day)	<0.00024	<0.00019	<0.00027	<0.00025	<0.00036
	Magnesium (Mg)-Total (mg/dm2.day)	0.00422	0.00904	0.00294	0.00436	0.00411
	Manganese (Mn)-Total (mg/dm2.day)	0.000104	0.000179	0.000109	0.000135	0.000229
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000047 DLB	<0.0000058 DLB	<0.0000027	<0.0000025	<0.0000036
	Nickel (Ni)-Total (mg/dm2.day)	<0.000024	0.000031	0.000032	<0.000025	<0.000036
	Phosphorus (P)-Total (mg/dm2.day)	0.0075	0.0211	0.0034	0.0051	0.0043
	Potassium (K)-Total (mg/dm2.day)	0.0123	0.0294	0.0090	0.0115	0.0111
	Selenium (Se)-Total (mg/dm2.day)	<0.000047	<0.000039	<0.000054	<0.000050	<0.000072
	Silicon (Si)-Total (mg/dm2.day)	<0.0024	0.0022	<0.0027	<0.0025	<0.0036
	Silver (Ag)-Total (mg/dm2.day)	<0.00000047	<0.00000039	<0.00000054	<0.00000050	<0.00000072
	Sodium (Na)-Total (mg/dm2.day)	0.0046	0.0075	0.0058	0.0060	0.0063
	Strontium (Sr)-Total (mg/dm2.day)	0.000107	0.0000893	0.000115	0.000117	0.000142
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000047	<0.0000039	<0.0000054	<0.0000050	<0.0000072
	Tin (Sn)-Total (mg/dm2.day)	0.0000134	0.0000062	<0.0000054	<0.0000050	<0.0000072
	Titanium (Ti)-Total (mg/dm2.day)	<0.00047	<0.00039	<0.00054	<0.00050	<0.00072
	Uranium (U)-Total (mg/dm2.day)	<0.00000047	<0.00000039	<0.00000054	<0.00000050	<0.00000072
	Vanadium (V)-Total (mg/dm2.day)	<0.000047	<0.000039	<0.000054	<0.000050	<0.000072
	Zinc (Zn)-Total (mg/dm2.day)	0.00204	0.00134	0.00260	0.00215	0.00281

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2374201-6 Air 15-OCT-19 10:24 DM9	L2374201-7 Air 15-OCT-19 14:15 DM11	L2374201-8 Air 15-OCT-19 12:45 DM7	L2374201-9 Air 15-OCT-19 01:37 DM2	
DUSTFALL						
Particulates	Total Dustfall (mg/dm2.day)	0.34	0.96	0.52	1.82	
Metals	Aluminum (Al)-Total (mg/dm2.day)	0.00126	0.00392	0.00263	0.00578	
	Antimony (Sb)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	0.0000048	
	Arsenic (As)-Total (mg/dm2.day)	0.0000043	<0.0000054	<0.0000066	0.0000079	
	Barium (Ba)-Total (mg/dm2.day)	0.000167	0.000172	0.000403	0.000734	
	Beryllium (Be)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	<0.000022	
	Bismuth (Bi)-Total (mg/dm2.day)	<0.000016	0.000030	<0.000033	<0.000022	
	Boron (B)-Total (mg/dm2.day)	<0.00032	<0.00054	<0.00066	<0.00043	
	Cadmium (Cd)-Total (mg/dm2.day)	0.0000016	0.0000041	<0.0000033	0.0000027	
	Calcium (Ca)-Total (mg/dm2.day)	0.0151	0.0236	0.0244	0.0430	
	Chromium (Cr)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	<0.000022	
	Cobalt (Co)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	0.0000122	
	Copper (Cu)-Total (mg/dm2.day)	<0.00019 DLB	<0.00024 DLB	<0.00020 DLB	0.000547	
	Iron (Fe)-Total (mg/dm2.day)	0.00252	0.0061	0.0048	0.0100	
	Lead (Pb)-Total (mg/dm2.day)	0.0000073	0.0000130	0.0000114	0.0000238	
	Lithium (Li)-Total (mg/dm2.day)	<0.00016	<0.00027	<0.00033	<0.00022	
	Magnesium (Mg)-Total (mg/dm2.day)	0.00275	0.00445	0.00390	0.00818	
	Manganese (Mn)-Total (mg/dm2.day)	0.000129	0.000353	0.000327	0.000440	
	Molybdenum (Mo)-Total (mg/dm2.day)	<0.0000016	<0.0000054 DLB	<0.0000066 DLB	<0.0000065 DLB	
	Nickel (Ni)-Total (mg/dm2.day)	<0.000016	<0.000027	<0.000033	0.000054	
	Phosphorus (P)-Total (mg/dm2.day)	0.0022	0.0079	<0.0033	0.0047	
	Potassium (K)-Total (mg/dm2.day)	0.0075	0.0121	0.0071	0.0141	
	Selenium (Se)-Total (mg/dm2.day)	<0.000032	<0.000054	<0.000066	<0.000043	
	Silicon (Si)-Total (mg/dm2.day)	<0.0016	0.0057	<0.0033	0.0064	
	Silver (Ag)-Total (mg/dm2.day)	<0.00000032	<0.00000054	<0.00000066	0.00000078	
	Sodium (Na)-Total (mg/dm2.day)	0.0033	0.0090	0.0059	0.0059	
	Strontium (Sr)-Total (mg/dm2.day)	0.0000940	0.000118	0.000175	0.000265	
	Thallium (Tl)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	<0.0000043	
	Tin (Sn)-Total (mg/dm2.day)	<0.0000032	<0.0000054	<0.0000066	<0.0000043	
	Titanium (Ti)-Total (mg/dm2.day)	<0.00032	<0.00054	<0.00066	<0.00043	
	Uranium (U)-Total (mg/dm2.day)	<0.00000032	0.00000071	<0.00000066	0.00000109	
	Vanadium (V)-Total (mg/dm2.day)	<0.000032	<0.000054	<0.000066	<0.000043	
	Zinc (Zn)-Total (mg/dm2.day)	0.00174	0.00178	0.00287	0.00728	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Zinc (Zn)-Total	B	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Copper (Cu)-Total	MB-LOR	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Molybdenum (Mo)-Total	MB-LOR	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9
Laboratory Control Sample	Silver (Ag)-Total	MES	L2374201-1, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
DUSTFALLS-T.DM2-VA	Dustfall	Dustfalls Total+Fixed & Vol (mg/dm2.day)	BCMOE DUSTFALLS

Dustfall analysis is carried out in accordance with procedures published by the B.C. Ministry of Environment Laboratory.

MET-DUST(DM2)-MS-VA	Dustfall	Total Metals in Dustfalls by ICPMS	EPA 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental

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L2374201-COFC

COC # 1

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Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Dillon Consulting			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Richard Pope			☑ PDF	☑ Excel	☑ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	3820 Cessna Drive Suite 510			Email 1:	rpope@dillon.ca			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Richmond, BC, V7B 0A2			Email 2:	ldilley@dillon.ca			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	(604) 295-7070	Fax:		Email 3:	dgay@dillon.ca			
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				Analysis Request
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	126231			Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:				PO / AFE:				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				ALS Contact:	Brent Mack	Sampler:	T. Phillips	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	DM12	15-Oct-19	14:15	Air	1
	DM3	15-Oct-19	14:00	Air	1
	DM6	15-Oct-19	12:00	Air	1
	DM10	15-Oct-19	9:25	Air	1
	DM8	15-Oct-19	15:45	Air	1
	DM9	15-Oct-19	10:24	Air	1
	DM11	15-Oct-19	14:15	Air	1
	DM7	15-Oct-19	12:45	Air	1
	DM2	15-Oct-19	1:37	Air	1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Tyler Phillips	17-Oct-19		JG	Oct 30 '19	10:00AM	13 °C				

Appendix B

Emission Calculation Workbook

Calculation Sheet B.1
Locomotive Engine Emissions

B.1

Locomotive Engine Emissions

Crown Mountain Coking Coal Mine

Description

Emissions from the locomotive engines used to drive the train for the transportation of coal product offsite. The typical train will require four (4) locomotive engines, each will be AC 4400hp, 6 axle. Rail emissions are regulated by the Railway Safety Act. The trains loading time is expected to be approximately 8-10hrs. Expected contaminants are products of combustion.

Table A.2.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Locomotive Engine Emissions	Hours per day at Loadout	hrs	-	-	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-
		Number of trains loaded	Trains loaded per yer	-	-	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	-
		Number of locomotives per train	Number of locomotives per train	-	-	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-
		Total locomotive hours at rail loadout	hrs/yr	-	-	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	-

Table A.2.2a - Emissions Calculations

Source ID	Description	Locomotive HP	Contaminant	Cas No.	Emission Factor (g/bhp-h) (1)	Quality Rating	Emissions (g/s)	Reference
B.1	Locomotive Engine Emissions at rail loadout	4,400	Nitrogen Oxides	10102-44-0	7.4	C	9.04E+00	Table 1: Line-haul locomotive emission standards. SOR/2017-121 June 9, 2017 (RAILWAY SAFETY ACT)
			Carbon Monoxide	630-08-0	2.2	C	2.69E+00	Table 1: Line-haul locomotive emission standards. SOR/2017-121 June 9, 2017 (RAILWAY SAFETY ACT)
			Particulate Matter	NA-TSP	0.22	C	2.69E-01	Table 1: Line-haul locomotive emission standards. SOR/2017-121 June 9, 2017 (RAILWAY SAFETY ACT)
			PM2.5	N/A - PM2.5	0.2134	C	2.61E-01	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
			PM10	N/A - PM10	0.22	C	2.69E-01	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
			VOCs	NA-VOC	0.57915	C	7.08E-01	Table 1: Line-haul locomotive emission standards. SOR/2017-121 June 9, 2017 (RAILWAY SAFETY ACT)
			Sulphur Dioxide	SO2 - NA	0.00358	C	4.37E-03	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009

Notes

(1) Assumed worst case locomotive engine operating scenario being four (4) Tier 1 Locomotive Engines. The model AC4400 locomotives only started manufacturing in 1993.

(2) The higher heating value for Fuel Oil No. 2 is estimated conservitively to be 38.50GJ/kl as noted in Environment Canada SOR/2016-151. Reference: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-151/page-27.html.

(3) Worst case SO2 emission factor taken from nearest largest diesel engine as per suggestion from US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009. Link: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100500B.PDF?Dockey=P100500B.PDF

Table A.2.2b - GHG Emission Factors

Source ID	Description	Locomotive HP	Contaminant	Cas No.	GHG Emission Factors for diesel train (g/L)	Emission Factor (g/gal)	Adapted Emission Factor (g/bhp-hr)	Reference
B.1	Locomotive Engine Emissions at rail loadout	4,400	Carbon Dioxide (CO2)	124-38-9	2,681	10,147.59	487.86	National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada (2019), Part 2, Table A6-13
			Methane (CH4)	74-82-8	0.15	0.57	0.03	
			Nitrous Oxide (N2O)	10024-97-2	1.0	3.79	0.18	

Table A.2.3 - Conversion Factors

Conversion	Value	
1GJ = 947817BTU	947817	
1kl = 264.172 US Gal	264.172	
1lbs = 453.592grams	453.592	
Mol/L	0.0409	
lbs/SCF to kg/m3	16	
CFS to m3/s	0.0283	
seconds per hour	3600	
Fuel density (g/gal)	3200	
Diesel fuel sulfur content (ppm)	11	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table 2
Mol mass SO2	64	
Mol mass S	32	
TSP to PM10	1	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
TSP to PM2.5	0.97	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
HC to VOC ratio	1.053	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
Higher heating value (Diesel)	**38.5**	
gal to L	3.785	
Conversion factor (bhp-hr/gal) for g/gal to g/bhp-hr	20.8	US EPA Emission Factors for Locomotives - Office of Transportation and Air Quality; EPA-420-F-09-025 - April 2009
grams to tonnes	0.000001	

Table A.2.4 - Fixed Inputs

Parameter	Unit	Value	Reference
Number of hours per year	hr/yr	8760	Number of hours per year
Number of seconds per year	sec/yr	31,536,000	Number of sec per year

Table A.2.5a - Maximum 24-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Nitrogen Oxides	10102-44-0	g/s	-	-	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	15.07	-
	Carbon Monoxide	630-08-0	g/s	-	-	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48	-
	Particulate Matter	N/A - TSP	g/s	-	-	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	-
	PM2.5	N/A - PM2.5	g/s	-	-	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	-
	PM10	N/A - PM10	g/s	-	-	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	-
	VOCs	N/A - VOC	g/s	-	-	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-

Table A.2.5b - Maximum 1-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Nitrogen Oxides	10102-44-0	g/s	-	-	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	36.18	-
	Carbon Monoxide	630-08-0	g/s	-	-	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	10.76	-
	Particulate Matter	N/A - TSP	g/s	-	-	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
	PM2.5	N/A - PM2.5	g/s	-	-	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	-
	PM10	N/A - PM10	g/s	-	-	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
	VOCs	N/A - VOC	g/s	-	-	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	2.83	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	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	0.02	-

Table A.2.5c - Maximum Annual Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Nitrogen Oxides	10102-44-0	g/s	-	-	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	4.96	-
	Carbon Monoxide	630-08-0	g/s	-	-	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	-
	Particulate Matter	N/A - TSP	g/s	-	-	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-
	PM2.5	N/A - PM2.5	g/s	-	-	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-
	PM10	N/A - PM10	g/s	-	-	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-
	VOCs	N/A - VOC	g/s	-	-	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	0.0024	-

Table A.2.5d - Maximum Annual GHG Emission Rates

Source	Contaminant	CAS #	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Carbon Dioxide (CO_2)	124-38-9	tonnes/yr	-	-	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	10,303.70	-
	Methane (CH_4)	74-82-8	tonnes/yr	-	-	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	-
	Nitrous Oxide (N_2O)	10024-97-2	tonnes/yr	-	-	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	3.84	-

Table A.2.5e - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
B.1	Nitrogen Oxides	10102-44-0	tonnes/yr	-	-	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	156.29	-
	Carbon Monoxide	630-08-0	tonnes/yr	-	-	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	46.46	-
	Particulate Matter	N/A - TSP	tonnes/yr	-	-	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	-
	PM2.5	N/A - PM2.5	tonnes/yr	-	-	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	4.51	-
	PM10	N/A - PM10	tonnes/yr	-	-	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	4.65	-
	VOCs	N/A - VOC	tonnes/yr	-	-	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	-
	Sulphur Dioxide	SO2 - NA	tonnes/yr	-	-	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	-

Calculation Sheet B.2
Emissions from Emergency Diesel Generators

B.2

Emissions from Emergency Diesel Generators

Crown Mountain Coking Coal Mine

Description

Emissions associated with emergency generators were calculated based on AP-42 Chapter 3.3 Gasoline and Diesel Industrial Engines (US EPA 1996). Expected contaminants resulting from the diesel generators include products of combustion.

Table C.1.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	Diesel Generator for the Plant	Operating hours per year	hr/year	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	-
C.1.2	Diesel Generator for the Office and Shops	Operating hours per year	hr/year	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	-

Table C.1.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Engine Power	kW	250	Requested information
Number of operating hours per day	hr/day	24	conservative estimate (assumption)

Table C.1.2 - Emission Factors

Contaminant	CAS #	Emission Factor	Units	Reference
Nitrogen Oxides (as NO2)	10102-44-0	0.018848	kg/kW-hr	US EPA AP-42 Table 3.3-1
Carbon Monoxide (CO)	630-08-0 - CO	0.00406144		
TSP	N/A - TSP	0.0013376		
PM10	N/A - PM10	0.0013376		
PM2.5	N/A - PM2.5	0.0013376		
Sulphur Dioxide (SO2)	7446-09-5 - SO2	0.0012464		
VOC*	N/A - VOC	0.001528573		
CO2	124-38-9	0.70		
CH4	74-82-8	2.0	g/GJ	Canada's Greenhouse Gas Quantification Requirements (Dec. 2019), Table 2-6
		0.000007	kg/kW-hr	EF conversion
N2O	10024-97-2	0.58	g/GJ	Canada's Greenhouse Gas Quantification Requirements (Dec. 2019), Table 2-6
		0.0000021	kg/kW-hr	EF conversion

**TOC (total organic compounds) emission factor available by AP-42 and used for VOC herein*

Table C.1.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31,536,000
s/day	86400
s/hr	3600
g/GJ to kg/kW-hr	0.0000036
grams to tonnes	0.000001

Table C.1.4a - Maximum 24-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	TSP	N/A - TSP	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	PM10	N/A - PM10	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	PM2.5	N/A - PM2.5	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	VOC	N/A - VOC	g/s	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-
C.1.2	TSP	N/A - TSP	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	PM10	N/A - PM10	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	PM2.5	N/A - PM2.5	g/s	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	VOC	N/A - VOC	g/s	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	-

Table C.1.4b - Maximum Annual Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	TSP	N/A - TSP	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	PM2.5	N/A - PM2.5	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	NOx	10102-44-0	g/s	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	-
	SO2	SO2 - NA	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	VOC	N/A - VOC	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
C.1.2	TSP	N/A - TSP	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	PM2.5	N/A - PM2.5	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	NOx	10102-44-0	g/s	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	-
	SO2	SO2 - NA	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
	VOC	N/A - VOC	g/s	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-

Table C.1.4c - Maximum 1-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	NOx	10102-44-0	g/s	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	-
	SO2	SO2 - NA	g/s	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	-
	CO	630-08-0	g/s	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	-
	VOC	N/A - VOC	g/s	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	-
C.1.2	NOx	10102-44-0	g/s	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	1.309	-
	SO2	SO2 - NA	g/s	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	0.087	-
	CO	630-08-0	g/s	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282	-
	VOC	N/A - VOC	g/s	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	-

Table C.1.4d - Maximum Annual GHG Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	CO2	124-38-9	tonnes/year	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	-
	CH4	74-82-8	tonnes/year	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	-
	N2O	10024-97-2	tonnes/year	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	-
C.1.2	CO2	124-38-9	tonnes/year	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	15.38	-
	CH4	74-82-8	tonnes/year	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	-
	N2O	10024-97-2	tonnes/year	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	-

Table C.1.4e - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
C.1.1	TSP	N/A - TSP	tonnes/year	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	0.03	0.03	0.03	-
	PM10	N/A - PM10	tonnes/year	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	0.03	0.03	0.03	-
	PM2.5	N/A - PM2.5	tonnes/year	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	0.03	0.03	0.03	-
	NOx	10102-44-0	tonnes/year	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	-
	SO2	SO2 - NA	tonnes/year	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	0.03	0.03	0.03	-
	VOC	N/A - VOC	tonnes/year	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	0.03	0.03	0.03	-
C.1.2	TSP	N/A - TSP	tonnes/year	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	0.03	0.03	0.03	-
	PM10	N/A - PM10	tonnes/year	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	0.03	0.03	0.03	-
	PM2.5	N/A - PM2.5	tonnes/year	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	0.03	0.03	0.03	-
	NOx	10102-44-0	tonnes/year	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	-
	SO2	SO2 - NA	tonnes/year	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	0.03	0.03	0.03	-
	VOC	N/A - VOC	tonnes/year	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	0.03	0.03	0.03	-

Calculation Sheet B.3
Blasting and Explosive Detonation Emissions

B.3

Blasting and Explosive Detonation Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with blasting activities on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from blasting activities include particulate matter (PM).
Emissions associated with explosive detonation on site were calculated based on AP-42 Chapter 13.3 Explosives Detonation (US EPA 1980). Expected contaminants resulting from explosive detonation activities typically include nitrogen oxides (NOx), carbon monoxide (CO), methane (CH4) and sulfur dioxide (SO2).

Table P.1.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	Typical Blasting Depth	m	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-
		Typical Blasting Area (horizontal area of blast)	m2	2,222	2,222	5,556	5,556	5,556	5,556	5,556	0	0	0	0	0	0	0	0	0	0	-
		Number of Blasts per year	blasts/year	92.45	92.45	214.83	293.92	224.29	121.50	10.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Maximum Number of Blasts per day	blasts/day	3	3	2	2	1.70	1.15	1	1	1	1	1	1	1	1	1	1	1	-
		ANFO explosive usage	kg/year	1,030,978	1,030,978	5,989,542	8,194,525	6,253,292	3,387,497	281,586	0	0	0	0	0	0	0	0	0	0	-
		Emulsion explosive usage	kg/year	226,312	226,312	1,314,777	1,798,798	1,372,674	743,597	61,812	0	0	0	0	0	0	0	0	0	0	-
		Total explosive usage	kg/year	1,257,290	1,257,290	7,304,319	9,993,324	7,625,966	4,131,093	343,398	0	0	0	0	0	0	0	0	0	0	-
		Mass of explosive per blast	tonnes/blast	13.6	13.6	34	34	34	34	34	0	0	0	0	0	0	0	0	0	0	-

Table P.1.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P1.2	Blasting and Explosive Detonation in East Pit	Typical Blasting Depth	m	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-
		Typical Blasting Area (horizontal area of blast)	m2	0.00	0.00	0.00	0.00	5,555.56	5,555.56	5,555.56	8,333.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Number of Blasts per year	blasts/year	0.00	0.00	0.00	0.00	38.99	194.74	176.68	8.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Maximum Number of Blasts per day	blasts/day	1.00	1.00	1.00	1.00	1.00	1.85	1.63	1.00	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		ANFO explosive usage	kg/year	0	0	0	0	1,086,991	5,429,372	4,925,810	334,813	0	0	0	0	0	0	0	0	0	-
		Emulsion explosive usage	kg/year	0	0	0	0	238,608	1,191,813	1,081,275	73,495	0	0	0	0	0	0	0	0	0	-
		Total explosive usage	kg/year	0	0	0	0	1,325,599	6,621,185	6,007,086	408,308	0	0	0	0	0	0	0	0	0	-
		Mass of explosive per blast	tonnes/blast	0	0	0	0	34	34	34	51	0	0	0	0	0	0	0	0	0	-

Table P.1.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P1.3	Blasting and Explosive Detonation in South Pit	Typical Blasting Depth	m	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	-
		Typical Blasting Area (horizontal area of blast)	m2	0.00	0.00	0.00	0.00	0.00	0.00	5,555.56	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	8,333.33	-
		Number of Blasts per year	blasts/year	0.00	0.00	0.00	0.00	0.00	0.00	137.61	208.67	213.41	214.88	213.43	283.23	288.61	286.49	219.37	219.68	108.67	-
		Maximum Number of Blasts per day	blasts/day	1.00	1.00	1.00	1.00	1.00	1.00	1.27	1.93	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	2.00	-
		ANFO explosive usage	kg/year	0	0	0	0	0	0	3,836,567	8,726,589	8,924,731	8,986,255	8,925,560	11,844,807	12,069,765	11,980,876	9,173,854	9,186,891	4,544,690	-
		Emulsion explosive usage	kg/year	0	0	0	0	0	0	842,173	1,915,593	1,959,087	1,972,593	1,959,269	2,600,080	2,649,461	2,629,948	2,013,773	2,016,635	997,615	-
		Total explosive usage	kg/year	0	0	0	0	0	0	4,678,740	10,642,181	10,883,818	10,958,848	10,884,830	14,444,887	14,719,226	14,610,824	11,187,627	11,203,526	5,542,305	-
		Mass of explosive per blast	tonnes/blast	0	0	0	0	0	0	34	51	51	51	51	51	51	51	51	51	51	-

Table P.1.2a - Blasting Emission Factors - North Pit

Contaminant	Units	Emission Factors - North Pit																	Reference
		Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	
TSP (≤ 30 µm)	kg/blast	23.05	23.05	91.10	91.10	91.10	91.10	91.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	US EPA AP-42 Table 11.9-2
PM10	kg/blast	11.98	11.98	47.37	47.37	47.37	47.37	47.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
PM2.5	kg/blast	0.69	0.69	2.73	2.73	2.73	2.73	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	

Table P.1.2b - Blasting Emission Factors - East Pit

Contaminant	Units	Emission Factors - East Pit																	Reference
		Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	
TSP (≤ 30 µm)	kg/blast	0.00	0.00	0.00	0.00	91.10	91.10	91.10	167.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	US EPA AP-42 Table 11.9-2
PM10	kg/blast	0.00	0.00	0.00	0.00	47.37	47.37	47.37	87.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
PM2.5	kg/blast	0.00	0.00	0.00	0.00	2.73	2.73	2.73	5.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	

Table P.1.2c - Blasting Emission Factors - South Pit

Contaminant	Units	Emission Factors - South Pit																	Reference
		Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	
TSP (≤ 30 µm)	kg/blast	0.00	0.00	0.00	0.00	0.00	0.00	91.10	167.36	167.36	167.36	167.36	167.36	167.36	167.36	167.36	167.36	167.36	-	US EPA AP-42 Table 11.9-2
PM10	kg/blast	0.00	0.00	0.00	0.00	0.00	0.00	47.37	87.03	87.03	87.03	87.03	87.03	87.03	87.03	87.03	87.03	87.03	-	
PM2.5	kg/blast	0.00	0.00	0.00	0.00	0.00	0.00	2.73	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	5.02	-	

Table P.1.2c - Explosive Detonation Emission Factors for ANFO types of explosives

Contaminant	Emission Factor	Units	Reference
NOx	8	kg/Mg	US EPA AP-42 Table 13.3-1
CO	34	kg/Mg	
SO2	1	kg/Mg	
CH4	–	kg/Mg	
CO2	0.189	tonnes CO2/tonne ANFO	The Mining Association of Canada, *Energy and GHG Emissions Management Reference Guide (June 2014)* accessed from: https://mining.ca/documents/energy-and-ghg-emissions-management-reference-guide/

Table P.1.3 - Conversion Factors

Conversion	Value
g/kg	1000
g/tonne	1000000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.1.4a - Maximum 24-hr Emission Rates

Source	Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	TSP	g/s	0.80	0.80	2.11	2.11	1.80	1.22	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM10	g/s	0.42	0.42	1.10	1.10	0.93	0.63	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	g/s	0.02	0.02	0.06	0.06	0.05	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	g/s	89.25	89.25	148.75	148.75	126.72	85.73	74.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.2	Blasting and Explosive Detonation in East Pit	TSP	g/s	0.00	0.00	0.00	0.00	1.05	1.95	1.72	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM10	g/s	0.00	0.00	0.00	0.00	0.55	1.01	0.90	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	g/s	0.00	0.00	0.00	0.00	0.03	0.06	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	g/s	0.00	0.00	0.00	0.00	74.38	137.40	121.53	111.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.3	Blasting and Explosive Detonation in South Pit	TSP	g/s	0.00	0.00	0.00	0.00	0.00	0.00	1.34	3.73	3.87	3.87	3.87	5.81	5.81	5.81	5.81	5.81	3.87	-
		PM10	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.70	1.94	2.01	2.01	2.01	3.02	3.02	3.02	3.02	3.02	2.01	-
		PM2.5	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.12	0.12	0.12	0.17	0.17	0.17	0.17	0.17	0.12	-
		CO2	g/s	0.00	0.00	0.00	0.00	0.00	0.00	94.65	214.88	223.13	223.13	223.13	334.69	334.69	334.69	334.69	334.69	223.13	-

Table P.1.4b - Maximum Annual Emission Rates

Source	Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	TSP	g/s	0.07	0.07	0.62	0.85	0.65	0.35	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	g/s	0.00	0.00	0.02	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		NOx (as NO2)	g/s	0.32	0.32	1.85	2.54	1.93	1.05	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		SO2	g/s	0.04	0.04	0.23	0.32	0.24	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	g/s	7.54	7.54	43.78	59.89	45.70	24.76	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.2	Blasting and Explosive Detonation in East Pit	TSP	g/s	0.00	0.00	0.00	0.00	0.11	0.56	0.51	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	g/s	0.00	0.00	0.00	0.00	0.003	0.02	0.02	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		NOx (as NO2)	g/s	0.00	0.00	0.00	0.00	0.34	1.68	1.52	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		SO2	g/s	0.00	0.00	0.00	0.00	0.04	0.21	0.19	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	g/s	0.00	0.00	0.00	0.00	7.94	39.68	36.00	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.3	Blasting and Explosive Detonation in South Pit	TSP	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.40	1.11	1.13	1.14	1.13	1.50	1.53	1.52	1.16	1.17	0.58	-
		PM2.5	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		NOx (as NO2)	g/s	0.00	0.00	0.00	0.00	0.00	0.00	1.19	2.70	2.76	2.78	2.76	3.66	3.73	3.71	2.84	2.84	1.41	-
		SO2	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.34	0.35	0.35	0.35	0.46	0.47	0.46	0.35	0.36	0.18	-
		CO2	g/s	0.00	0.00	0.00	0.00	0.00	0.00	28.04	63.78	65.23	65.68	65.23	86.57	88.21	87.56	67.05	67.14	33.22	-

Table P.1.4c - Maximum 1-hr Emission Rates

Source	Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	NOx (as NO2)	g/s	3.78	3.78	6.30	6.30	5.36	3.63	3.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO	g/s	16.06	16.06	26.76	26.76	22.80	15.42	13.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		SO2	g/s	0.47	0.47	0.79	0.79	0.67	0.45	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.2	Blasting and Explosive Detonation in East Pit	NOx (as NO2)	g/s	0.000	0.000	0.000	0.000	3.148	5.816	5.144	4.722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CO	g/s	0.000	0.000	0.000	0.000	13.380	24.717	21.862	20.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		SO2	g/s	0.0000	0.0000	0.0000	0.0000	0.3935	0.7270	0.6430	0.5903	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
P.1.3	Blasting and Explosive Detonation in South Pit	NOx (as NO2)	g/s	0.000	0.000	0.000	0.000	0.000	0.000	4.006	9.095	9.444	9.444	9.444	14.167	14.167	14.167	14.167	14.167	9.444	-
		CO	g/s	0.000	0.000	0.000	0.000	0.000	0.000	17.027	38.656	40.139	40.139	40.139	60.208	60.208	60.208	60.208	60.208	40.139	-
		SO2	g/s	0.000	0.000	0.000	0.000	0.000	0.000	0.501	1.137	1.181	1.181	1.181	1.771	1.771	1.771	1.771	1.771	1.181	-

Table P.1.4d - Maximum GHG Emission Rates (CO2, tonnes/year)

Source	Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	CO2	tonnes/ye	237.63	237.63	1,380.52	1,888.74	1,441.31	780.78	64.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.2	Blasting and Explosive Detonation in East Pit	CO2	tonnes/ye	0.00	0.00	0.00	0.00	250.54	1,251.40	1,135.34	77.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.3	Blasting and Explosive Detonation in South Pit	CO2	tonnes/ye	0.00	0.00	0.00	0.00	0.00	0.00	884.28	2,011.37	2,057.04	2,071.22	2,057.23	2,730.08	2,781.93	2,761.45	2,114.46	2,117.47	1,047.50	-

Table P.1.4e - Maximum Annual Emission Rates in tonnes/year

Source	Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.1.1	Blasting and Explosive Detonation in North Pit	TSP	tonnes/yr	2.13	2.13	19.57	26.78	20.43	11.07	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM10	tonnes/yr	1.11	1.11	10.18	13.92	10.63	5.76	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	tonnes/yr	0.06	0.06	0.59	0.80	0.61	0.33	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		NOx (as NO2)	tonnes/yr	10.06	10.06	58.43	79.95	61.01	33.05	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		SO2	tonnes/yr	1.26	1.26	7.30	9.99	7.63	4.13	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	tonnes/yr	237.63	237.63	1,380.52	1,888.74	1,441.31	780.78	64.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.2	Blasting and Explosive Detonation in East Pit	TSP	tonnes/yr	0.00	0.00	0.00	0.00	3.55	17.74	16.10	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM10	tonnes/yr	0.00	0.00	0.00	0.00	1.85	9.23	8.37	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		PM2.5	tonnes/yr	0.00	0.00	0.00	0.00	0.11	0.53	0.48	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		NOx (as NO2)	tonnes/yr	0.00	0.00	0.00	0.00	10.60	52.97	48.06	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		SO2	tonnes/yr	0.00	0.00	0.00	0.00	1.33	6.62	6.01	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CO2	tonnes/yr	0.00	0.00	0.00	0.00	250.54	1,251.40	1,135.34	77.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.1.3	Blasting and Explosive Detonation in South Pit	TSP	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	12.54	34.92	35.72	35.96	35.72	47.40	48.30	47.95	36.71	36.77	18.19	-
		PM10	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	6.52	18.16	18.57	18.70	18.57	24.65	25.12	24.93	19.09	19.12	9.46	-
		PM2.5	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.01	-
		NOx (as NO2)	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	37.43	85.14	87.07	87.67	87.08	115.56	117.75	116.89	89.50	89.63	44.34	-
		SO2	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	4.68	10.64	10.88	10.96	10.88	14.44	14.72	14.61	11.19	11.20	5.54	-
		CO2	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	884.28	2,011.37	2,057.04	2,071.22	2,057.23	2,730.08	2,781.93	2,761.45	2,114.46	2,117.47	1,047.50	-

Notes:

Emission factors sourced from Chapter 11.9 Western Surface Coal Mining of AP-42 (US EPA 1998) for blasting in depths less than 21 m.

Maximum emission rates for a 1-hr averaging period were calculated based on a worst AP-42 Chapter 13.3

Emission factors were sourced from AP-42 Chapter 13.3 Explosives Detonation. Emission factors applied for ANFO (ammonium nitrate with fuel oil) type of explosive.

Calculation Sheet B.4

Blasting Hole Drilling Emissions

B.4

Blast Hole Drilling Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with drilling activities on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from blasting activities include particulate matter (PM).

Table P.2.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.2.1	Drilling in North Pit	Number of holes drilled per year	holes/year	3,170.42	3,170	18,419	25,199	19,230	10,417	866	0	0	0	0	0	0	0	0	0	0	-
		Number of holes per blast (estimated)	holes/blast	34	34	86	86	86	86	86	0	0	0	0	0	0	0	0	0	0	-
		Maximum number of blasts per day	blasts/day	3	3	2	2	1.70	1.15	1	1	1	1	1	1	1	1	1	1	1	-
P.2.2	Drilling in East Pit	Number of holes drilled per year	holes/year	0.00	0.00	0.00	0.00	3,342.67	16,696.17	15,147.64	1,029.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Number of holes per blast (estimated)	holes/blast	0.00	0.00	0.00	0.00	86	86	86	129	0	0	0	0	0	0	0	0	0	-
		Maximum number of blasts per day	blasts/day	1.00	1.00	1.00	1.00	1.00	1.85	1.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
P.2.3	Drilling in South Pit	Number of holes drilled per year	holes/year	0.00	0.00	0.00	0.00	0.00	0.00	11,798.04	26,835.62	27,444.94	27,634.14	27,447.49	36,424.63	37,116.41	36,843.06	28,211.03	28,251.12	13,975.63	-
		Number of holes per blast (estimated)	holes/blast	0.00	0.00	0.00	0.00	0.00	0.00	85.74	128.60	128.60	128.60	128.60	128.60	128.60	128.60	128.60	128.60	128.60	-
		Maximum number of blasts per day	blasts/day	1.00	1.00	1.00	1.00	1.00	1.00	1.27	1.93	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	2.00	-

Table P.2.2 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP (≤ 30 µm)	0.59	kg/hole	US EPA AP-42 Table 11.9-4
PM10	0.31	kg/hole	Environment Canada Pits and quaries reporting guide, Section 8.2
PM2.5	0.31	kg/hole	Emissions from Boring/Blast Hole Drilling.

Table P.2.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.2.1	TSP	g/s	0.70	0.70	1.17	1.17	1.00	0.67	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	g/s	0.37	0.37	0.62	0.62	0.52	0.35	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	0.37	0.37	0.62	0.62	0.52	0.35	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.2.2	TSP	g/s	0.00	0.00	0.00	0.00	0.59	1.08	0.96	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	g/s	0.00	0.00	0.00	0.00	0.31	0.57	0.50	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	0.00	0.00	0.00	0.00	0.31	0.57	0.50	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.2.3	TSP	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.75	1.69	1.76	1.76	1.76	2.63	2.63	2.63	2.63	2.63	1.76	-
	PM10	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.89	0.92	0.92	0.92	1.38	1.38	1.38	1.38	1.38	0.92	-
	PM2.5	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.89	0.92	0.92	0.92	1.38	1.38	1.38	1.38	1.38	0.92	-

Table P.2.4b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.2.1	TSP	g/s	0.059	0.059	0.345	0.471	0.360	0.195	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	0.031	0.031	0.181	0.248	0.189	0.102	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
P.2.2	TSP	g/s	0.000	0.000	0.000	0.000	0.063	0.312	0.283	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	0.000	0.000	0.000	0.000	0.033	0.164	0.149	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
P.2.3	TSP	g/s	0.000	0.000	0.000	0.000	0.000	0.000	0.221	0.502	0.513	0.517	0.514	0.681	0.694	0.689	0.528	0.529	0.261	-
	PM2.5	g/s	0.000	0.000	0.000	0.000	0.000	0.000	0.116	0.264	0.270	0.272	0.270	0.358	0.365	0.362	0.277	0.278	0.137	-

Table P.2.4c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.2.1	TSP	tonnes/yr	1.87	1.87	10.87	14.87	11.35	6.15	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	0.98	0.98	5.71	7.81	5.96	3.23	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	0.98	0.98	5.71	7.81	5.96	3.23	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.2.2	TSP	tonnes/yr	0.00	0.00	0.00	0.00	1.97	9.85	8.94	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	0.00	0.00	0.00	0.00	1.04	5.18	4.70	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	0.00	0.00	0.00	0.00	1.04	5.18	4.70	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.2.3	TSP	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	6.96	15.83	16.19	16.30	16.19	21.49	21.90	21.74	16.64	16.67	8.25	-
	PM10	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	3.66	8.32	8.51	8.57	8.51	11.29	11.51	11.42	8.75	8.76	4.33	-
	PM2.5	tonnes/yr	0.00	0.00	0.00	0.00	0.00	0.00	3.66	8.32	8.51	8.57	8.51	11.29	11.51	11.42	8.75	8.76	4.33	-

Calculation Sheet B.5
Conveyor Belt System Emissions

B.5

Conveyor Belt System Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with conveying operations (transfer points) on site were calculated based on Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing of AP-42 (US EPA 1998).

Expected contaminants resulting from conveying activities include particulate matter (PM).

Table P.5.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.5.1	Grizzly Bar Screener to Conveyor (FB-101)	Mass of material transferred via conveyor	tonnes/hr	-	-	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	-	Assumed max transfer rate throughout timeframe (used max from CV-101
P.5.2	FB-101 to Raw Coal Conveyor (CV-101) (First drop point)	Mass of material transferred via conveyor	tonnes/hr	-	-	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	-	Assumed max transfer rate throughout timeframe (used max from CV-101
P.5.3	FB-101 to Raw Coal Conveyor (CV-101) (second drop point)	Mass of material transferred via conveyor	tonnes/hr	-	-	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	-	Assumed max transfer rate throughout timeframe (used max from CV-101
P.5.4	CV-101 to SC-101 (Raw Coal Sizing Screen)	Mass of material transferred via conveyor	tonnes/hr	-	-	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	-	Assumed max transfer rate throughout timeframe (used max from CV-101
P.5.5	SC-101 to CV-102	Mass of material transferred via conveyor	tonnes/hr	-	-	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	-	Assumed max transfer rate throughout timeframe (used max from CV-102
P.5.6	Rotary Breaker to CV-102	Mass of material transferred via conveyor	tonnes/hr	-	-	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	-	Assumed max transfer rate throughout timeframe (used max from CV-102
P.5.7	Rotary Breaker to CV-103	Mass of material transferred via conveyor	tonnes/hr	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	Assumed max transfer rate throughout
P.5.8	CV-102 to CPP	Mass of material transferred via conveyor	tonnes/hr	-	-	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	-	Assumed max transfer rate throughout timeframe (used max from CV-102
P.5.9	CPPto CV-701 (rejects conveyor)	Mass of material transferred via conveyor	tonnes/hr	-	-	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	-	Assumed max transfer rate throughout timeframe (used max from CV-701
P.5.10	CPP to CV-801	Mass of material transferred via conveyor	tonnes/hr	-	-	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	-	Assumed max transfer rate throughout timeframe (used max from CV-801
P.5.11	CV-802 toCV-804	Mass of material transferred via conveyor	tonnes/hr	-	-	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	-	Assumed max transfer rate throughout timeframe (used max from CV-804
P.5.12	BN-801 to CV-802	Mass of material transferred via conveyor	tonnes/hr	-	-	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	-	Assumed max transfer rate throughout timeframe (used max from CV-802
P.5.13	RC-801/802 to CV-805	Mass of material transferred via conveyor	tonnes/hr	-	-	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	-	Assumed max transfer rate throughout timeframe (used max from CV-805

Note. 1. Conservatively assumed Production equipment may run at maximum capacity during all production years. Not operating during commissioning or decommissioning

2. Conveyor transfer rates obtained from Feasibility Study (Revision: 0 - 31-Mar-2020) in APPENDIX A – FLOWSHEETS AND P&ID'S drawing number A355-P-2-0001 Revision A

Table P.5.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Number of conveyor lines	–	1	-
Number of conveyor transfer points	–	1	-
Number of operating hours per year	hr/yr	*8760*	Conservative estimate (client data not available at time of assessment)
Number of operating hours per day	hr/day	*24*	See 06.24.2020 information Requests

Table P.5.2 - Emission Factors

Contaminant	Emission Factor (Uncontrolled)	Emission Factor (Controlled)	Units	Reference
TSP	0.0015	0.00007	kg/tonne	US EPA AP-42 Table 11.19.2-1
PM10	0.00055	0.000023	kg/tonne	
PM2.5	0.000155	0.0000065	kg/tonne	

Note 1. Emissions factor estimates do not include consideration of the fact that many, if not all, of the conveyor transfer points will be protected with a hood. The AP42 Controlled emissions Factors refers to a water-spray control technology that is not applied at this site, and therefore the controlled emission factor is not used.

Table P.5.3 - PM2.5 EF Estimation

Activity	Emission Factors (kg/Mg)			Ratio of PM2.5/ PM10
	TPM	PM-10	PM-2.5	
Primary Crushing	ND	ND	ND	-
Primary Crushing (controlled)	ND	ND	ND	-
Secondary Crushing	ND	ND	ND	-
Secondary Crushing (controlled)	ND	ND	ND	-
Tertiary Crushing	0.0027	0.0012	ND	-
Tertiary Crushing (controlled)	0.0006	0.00027	0.00005	0.185
Fines Crushing	0.0195	0.0075	ND	-
Fines Crushing (controlled)	0.0015	0.0006	0.000035	0.058
Screening	0.0125	0.0043	ND	-
Screening (controlled)	0.0011	0.00037	0.000025	0.068
Fines Screening	0.15	0.036	ND	-
Fines Screening (controlled)	0.0018	0.0011	ND	-
Conveyor Transfer Point	0.0015	0.00055	ND	-
Conveyor Transfer Point (controlled)	0.00007	2.30E-05	6.50E-06	0.283
Wet Drilling - Unfragmented Stone	ND	4.00E-05	ND	-
Truck Unloading - Fragmented Stone	ND	8.00E-06	ND	-
Truck Unloading - Conveyor, crushed stone	ND	5.00E-05	ND	-

Note:

1. Emission factors are from Table 11.19.2-1 "Crushed Stone Processing Operations"
2. Max ratio of PM2.5 to PM10 used as a conservative assumption of an approximated PM2.5 emissions factor. Underlying studies for Table 11.19.2-1 were largely completed for the estimation of PM10 emissions, which is the rationale for selecting PM10 as the denominator, rather than TSP.

Table P.5.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.5.1	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.2	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.3	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.4	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.5	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.6	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.7	N/A - TSP	g/s	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
	N/A - PM10	g/s	-	-	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	0.02	-
	N/A - PM2.5	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.5.8	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM10	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.9	N/A - TSP	g/s	-	-	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	-
	N/A - PM10	g/s	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.10	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM10	g/s	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.11	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM10	g/s	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.12	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM10	g/s	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.13	N/A - TSP	g/s	-	-	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	-
	N/A - PM10	g/s	-	-	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	-
	N/A - PM2.5	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-

Table P.5.4b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.5.1	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.2	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.3	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.4	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.5	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.6	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.7	N/A - TSP	g/s	-	-	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
	N/A - PM2.5	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.5.8	N/A - TSP	g/s	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	-
	N/A - PM2.5	g/s	-	-	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	0.03	-
P.5.9	N/A - TSP	g/s	-	-	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.10	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.11	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.12	N/A - TSP	g/s	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-
	N/A - PM2.5	g/s	-	-	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	0.02	-
P.5.13	N/A - TSP	g/s	-	-	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	-
	N/A - PM2.5	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-

Notes:
Emission factors were sourced from AP-42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.
Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum tonnage of material transferred per hour.

Table P.5.4c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.5.1	N/A - TSP	tonnes/yr	-	-	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	-
	N/A - PM10	tonnes/yr	-	-	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	-
	N/A - PM2.5	tonnes/yr	-	-	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	-
P.5.2	N/A - TSP	tonnes/yr	-	-	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	-
	N/A - PM10	tonnes/yr	-	-	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	-
	N/A - PM2.5	tonnes/yr	-	-	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	-
P.5.3	N/A - TSP	tonnes/yr	-	-	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	-
	N/A - PM10	tonnes/yr	-	-	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	-
	N/A - PM2.5	tonnes/yr	-	-	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	-
P.5.4	N/A - TSP	tonnes/yr	-	-	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	7.88	-
	N/A - PM10	tonnes/yr	-	-	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	2.89	-
	N/A - PM2.5	tonnes/yr	-	-	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	-
P.5.5	N/A - TSP	tonnes/yr	-	-	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	-
	N/A - PM10	tonnes/yr	-	-	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	-
	N/A - PM2.5	tonnes/yr	-	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	-
P.5.6	N/A - TSP	tonnes/yr	-	-	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	-
	N/A - PM10	tonnes/yr	-	-	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	-
	N/A - PM2.5	tonnes/yr	-	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	-
P.5.7	N/A - TSP	tonnes/yr	-	-	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	-
	N/A - PM10	tonnes/yr	-	-	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	-
	N/A - PM2.5	tonnes/yr	-	-	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	-
P.5.8	N/A - TSP	tonnes/yr	-	-	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	7.75	-
	N/A - PM10	tonnes/yr	-	-	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	-
	N/A - PM2.5	tonnes/yr	-	-	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	-
P.5.9	N/A - TSP	tonnes/yr	-	-	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	-
	N/A - PM10	tonnes/yr	-	-	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	-
	N/A - PM2.5	tonnes/yr	-	-	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	-
P.5.10	N/A - TSP	tonnes/yr	-	-	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	-
	N/A - PM10	tonnes/yr	-	-	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	-
	N/A - PM2.5	tonnes/yr	-	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-
P.5.11	N/A - TSP	tonnes/yr	-	-	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	-
	N/A - PM10	tonnes/yr	-	-	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	-
	N/A - PM2.5	tonnes/yr	-	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-
P.5.12	N/A - TSP	tonnes/yr	-	-	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	5.78	-
	N/A - PM10	tonnes/yr	-	-	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	2.12	-
	N/A - PM2.5	tonnes/yr	-	-	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	-
P.5.13	N/A - TSP	tonnes/yr	-	-	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	26.28	-
	N/A - PM10	tonnes/yr	-	-	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	9.64	-
	N/A - PM2.5	tonnes/yr	-	-	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	2.72	-

Calculation Sheet B.6

Rail Loading Emissions

B.6

Rail Loading Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with rail loading operations on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from conveying activities include particulate matter (PM).

Table P.6.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.6.1	Rail Loading in Area 1	Mass of material loaded on rail	tonnes/hr	-	-	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	-	Assumed max transfer rate throughout timeframe (used max from CV-805
P.6.1	Rail Loading in Area 1	Number of trains per year	Trains per Year	-	-	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	-	There is a requirement to load 120 trains per year which equates to a train every 3 days. Each train will consist of 152 cars with an average clean coal load of 105.25 tonnes per car (See 06.24.2020 information Requests) and Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data.

Note. 1. Conservatively assumed Production equipment may run at maximum capacity during all production years. Not operating during commissioning or decominishing

Table P.6.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Number of operating hours per year	hr/yr	*1217*	There is a requirement to load 120 trains per year which equates to a train every 3 days. Each train will consist of 152 cars with an average clean coal load of 105.25 tonnes per car (See 06.24.2020 information Requests) and Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data.
Number of Rail Cars per Train	Cars/Train	*152*	
Average clean coal load per car	Tonnes/Rail Car	*105.25*	
Number of operating hours per day	hr/day	*10*	The clean coal transportation system and load-out facilities is planned to operate at a maximum of 10hrs per day. Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data.

Table P.6.2 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP	1.01E-03	kg/tonne	US EPA AP-42 Chapter 13.2.4, Equation (1)
PM10	4.78E-04	kg/tonne	
PM2.5	7.24E-05	kg/tonne	

Table P.6.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.6.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.6.1	TSP	g/s	-	-	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	2.34E-01	-
	PM10	g/s	-	-	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	1.11E-01	-
	PM2.5	g/s	-	-	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	1.68E-02	-

Table P.6.4b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.6.1	TSP	g/s	-	-	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	7.80E-02	-
	PM10	g/s	-	-	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	3.69E-02	-
	PM2.5	g/s	-	-	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	5.58E-03	-

Notes:
Emission factors were sourced from AP-42 Chapter 11.9 Western Surface Coal Mining.
Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum tonnage of material loaded on train per hour.

Table P.6.4c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.6.1	TSP	tonnes/year	-	-	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	2.46	-
	PM10	tonnes/year	-	-	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
	PM2.5	tonnes/year	-	-	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	-

Calculation Sheet B.7
Stock Pile and Screening Drop Emissions

B.7

Stock Pile and Screening Drop Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with stock pile drop operations on site were calculated based on AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles (US EPA 2006). Expected contaminants resulting from stock piling activities include particulate matter (PM).

Table P.7.1a - Activity Inputs

Source	ID for Worksheet Reference	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.7.1	ROM Coal Moisture Content	ROM Screening Drop at CPP	Mass of material dropped on ROM screen, based on max conveyor rate	tonnes/hr			600	600	600	600	600	600	600	600	600	600	600	600	600	600	600		Assumed max transfer rate throughout timeframe (used max from CV-101
P.7.2	Rejects Moisture	CV-103 to Rejects Stockpile	Mass of material dropped, based on max conveyor rate	tonnes/hr			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		Assumed max transfer rate throughout timeframe (used max from CV-103
P.7.3	Rejects Moisture	CV-701 to Rejects bin	Mass of material dropped in bin, based on max conveyor rate	tonnes/hr			475	475	475	475	475	475	475	475	475	475	475	475	475	475	475		Assumed max transfer rate throughout timeframe (used max from CV-701
P.7.4	Rejects Moisture	Rejects bin to Overflow stockpile	Mass of material dropped, based on max conveyor rate	tonnes/hr			475	475	475	475	475	475	475	475	475	475	475	475	475	475	475		Assumed max transfer rate throughout timeframe (used max from CV-701
P.7.5	Rejects Moisture	Rejects bin to Komatsu truck	Mass of material dropped, based on max conveyor rate	tonnes/hr			475	475	475	475	475	475	475	475	475	475	475	475	475	475	475		Assumed max transfer rate throughout timeframe (used max from CV-701
P.7.6	Product Coal Moisture	CV-801 to Overland Conveyor Feed Bin (BN-801)	Mass of material dropped in bin, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-801
P.7.7	Product Coal Moisture	BN-801 to Overflow Stockpile (BK-801)	Mass of material dropped, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-801
P.7.8	Product Coal Moisture	CV-802 to Truck Loading Bin (BN-802)	Mass of material dropped in bin, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-801
P.7.9	Product Coal Moisture	CV-802 to Emergency Product Stockpile Conveyor (CV-804)	Mass of material dropped, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-802
P.7.10	Product Coal Moisture	Emergency Product Stockpile to Road Haul Trucks		tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-804
P.7.11	Product Coal Moisture	BN-802 to Road Haul Trucks	Mass of material dropped, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-804
P.7.12	Product Coal Moisture	Road Haul Trucks to Clean Coal Stockpiles (2 X 25,000t)	Mass of material dropped, based on max conveyor rate	tonnes/hr			440	440	440	440	440	440	440	440	440	440	440	440	440	440	440		Assumed max transfer rate throughout timeframe (used max from CV-804
P.7.13	Product Coal Moisture	Clean Coal Stockpiles to CV-805 (Train Loadout Conveyor - RC-801	Mass of material dropped, based on max conveyor rate	tonnes/hr			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		Assumed max transfer rate throughout timeframe (used max from CV-805
P.7.14	Product Coal Moisture	Clean Coal Stockpiles to CV-805 (Train Loadout Conveyor - RC-802	Mass of material dropped, based on max conveyor rate	tonnes/hr			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000		Assumed max transfer rate throughout timeframe (used max from CV-805
P.7.15	Product Coal Moisture	CV-805 to Train Loadout Bin (BN-803)	Mass of material dropped in bin, based on max conveyor rate	tonnes/hr			2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000		Assumed max transfer rate throughout timeframe (used max from CV-805
P.7.16	Product Coal Moisture	BN-803 to Rail Cars	Mass of material dropped, based on max conveyor rate	tonnes/hr			2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000		Assumed max transfer rate throughout timeframe (used max from CV-805

Note.

1. All Conveyor maximum transfer rates obtained from Feasibility Study Report Dated 31 March 2020. Page 86: Drawing No. A355-P-2-0001 (drawing dated 8/14/19)

Table P.7.1b - Fixed Inputs

Parameter	Unit	Value	Reference
TSP Particle Size Multipier	–	0.74	
PM10 Particle Size	–	0.35	US EPA AP-42 Chapter 13.2.4, Section 13.2.4.3
PM2.5 Particle Size	–	0.053	
Mean wind speed (U)	m/s	5.00	90th percentile of surface station wind speed calculated
ROM Coal Moisture Content	%	4.8	Actual moisture content is 5%. Feasibility Study Report
Product Coal Moisture	%	4.8	Acutal moisture content is 7.5%. Feasibility Study Report
Rejects Moisture	%	4.8	Actual moisture content is 17%. Feasibility Study Report,
Overburden moisture	%	4.8	Actual moisture content is 7.9%. US EPA AP-42 Table Table
Number of stockpiles (with	–	2	Feasibility Study Report
Number of operating hours	hr/yr	*6400*	6400 coal on hours(See 06.24.2020
Number of operating hours	hr/yr	*8376*	24/7 349 days (See 06.24.2020
Number of operating hours per year - Train Loadout	hr/yr	*1217*	There is a requirement to load 120 trains per year which equates to a train every 3 days. Each train will consist of 152 cars with an average clean coal load of 105.25 tonnes per car (See 06.24.2020 information Requests)
Number of operating hours per day	hr/day	*24*	The clean coal transportation system and load-out facilities is planned for a seven day per week, 24-hour per day operation (See 06.24.2020 information Requests)

Table P.7.2 - Emission Factors

ID for Worksheet Reference	Contaminant	CAS	Match Function	Emission Factor	Units	Reference
ROM Coal Moisture Content	TSP	N/A - TSP	ROM Coal Moisture ContentTSP	1.01E-03	kg/Mg	US EPA AP-42 Table 11.9-2
	PM10	N/A - PM10	ROM Coal Moisture ContentPM10	4.78E-04	kg/Mg	
	PM2.5	N/A - PM2.5	ROM Coal Moisture ContentPM2.5	7.24E-05	kg/Mg	
Product Coal Moisture	TSP	N/A - TSP	Product Coal Moisture TSP	1.01E-03	kg/Mg	US EPA AP-42 Table 11.9-2
	PM10	N/A - PM10	Product Coal Moisture PM10	4.78E-04	kg/Mg	
	PM2.5	N/A - PM2.5	Product Coal Moisture PM2.5	7.24E-05	kg/Mg	
Rejects Moisture	TSP	N/A - TSP	Rejects Moisture TSP	1.01E-03	kg/Mg	US EPA AP-42 Table 11.9-2
	PM10	N/A - PM10	Rejects Moisture PM10	4.78E-04	kg/Mg	
	PM2.5	N/A - PM2.5	Rejects Moisture PM2.5	7.24E-05	kg/Mg	

Table P.7.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.7.4a - Maximum 24-hr Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.7.1	ROM Coal Moisture Content	TSP	g/s	0.00E+00	0.00E+00	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	1.68E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	7.97E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	1.21E-02	0.00E+00
P.7.2	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	2.81E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	1.33E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	2.01E-03	0.00E+00
P.7.3	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	0.00E+00
P.7.4	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	0.00E+00
P.7.5	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	6.31E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	9.55E-03	0.00E+00
P.7.6	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.7	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.8	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.9	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.10	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.11	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.12	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	5.84E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	8.85E-03	0.00E+00
P.7.13	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	0.00E+00
P.7.14	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.33E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	2.01E-02	0.00E+00
P.7.15	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	0.00E+00
P.7.16	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	4.02E-02	0.00E+00

Table P.7.4c - Maximum Annual Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.7.1	ROM Coal Moisture Content	TSP	g/s	0.00E+00	0.00E+00	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	0.00E+00
P.7.2	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	0.00E+00
P.7.3	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.4	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.5	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.6	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.7	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.8	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.9	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.10	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.11	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.12	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.13	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
P.7.14	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
P.7.15	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	0.00E+00
P.7.16	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	0.00E+00

Notes:

Emission factors were sourced from AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles.

Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum tonnage of material dropped per hour.

Table P.7.4c - Maximum Annual Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.7.1	ROM Coal Moisture Content	TSP	g/s	0.00E+00	0.00E+00	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	1.23E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	5.82E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	8.81E-03	0.00E+00
P.7.2	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	2.05E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	9.70E-03	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	1.47E-03	0.00E+00
P.7.3	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.4	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.5	Rejects Moisture	TSP	g/s	0.00E+00	0.00E+00	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	9.74E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	4.61E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	6.98E-03	0.00E+00
P.7.6	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.7	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.8	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.9	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.10	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.11	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.12	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	9.02E-02	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	4.27E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	6.46E-03	0.00E+00
P.7.13	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
P.7.14	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	2.05E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	9.70E-02	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
P.7.15	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	0.00E+00
P.7.16	Product Coal Moisture	TSP	g/s	0.00E+00	0.00E+00	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	4.10E-01	0.00E+00
		PM10	g/s	0.00E+00	0.00E+00	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	1.94E-01	0.00E+00
		PM2.5	g/s	0.00E+00	0.00E+00	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	2.94E-02	0.00E+00

Notes:

Emission factors were sourced from AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles.

Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum tonnage of material dropped per hour.

Calculation Sheet B.8

Truck Loading Emissions

B.8

Truck Loading Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with truck loading activities on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from truck loading activities include particulate matter (PM).

Table P.8.1a - Activity Inputs

Source	ID for Worksheet	Source Description	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.8.1	ROM Coal Moisture Content	Truck (Coal) Loading in North Pit	Mg/hr	0	0	600	600	511	231	19	0	0	0	0	0	0	0	0	0	0	0	Estimated by max production rate
P.8.2	ROM Coal Moisture Content	Truck (Coal) Loading in East Pit	Mg/hr	0	0	0	0	89	369	327	22	0	0	0	0	0	0	0	0	0	0	Estimated by max production rate
P.8.3	ROM Coal Moisture Content	Truck (Coal) Loading in South Pit	Mg/hr	0	0	0	0	0	0	255	578	600	600	600	600	600	600	600	600	600	0	Estimated by max production rate
P.8.4	Overburden moisture content	Truck (Overburden) Loading in North Pit	Mg/hr	*638*	*638*	*3705*	*5069*	*3868*	*2095*	*174*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated by total annual BCM Waste.
P.8.5	Overburden moisture content	Truck (Overburden) Loading in East Pit	Mg/hr	*0*	*0*	*0*	*0*	*224*	*1119*	*1016*	*69*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated by total annual BCM Waste. Assuming East Pit accounts for 1/3 of all waste
P.8.6	Overburden moisture content	Truck (Overburden) Loading in South Pit	Mg/hr	*0*	*0*	*0*	*0*	*448*	*2239*	*2031*	*138*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated by total annual BCM Waste. Assuming East Pit accounts for 2/3 of all waste
P.8.7	ROM Coal Moisture Content	Truck (Coal) UnLoading at CPP	Mg/hr	*0*	0	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	0	Obtained from Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.8	Rejects Moisture	Truck Loading at Rejects Stockpile (from CV-103)	Mg/hr	*0*	0	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	0	Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.9	Rejects Moisture	Truck Loading at BK-701 Rejects Bin Overflow Stockpile Bunker	Mg/hr	*0*	*0*	203	203	217	259	291	294	294	294	294	294	294	294	294	294	294	0	Estimated max coal rejects rate determined based on annual average LOM Yield, less the waste fraction rejected at the breaker station. Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.10	Rejects Moisture	Truck (Coal) UnLoading at Waste Pit (Years 1-5)	Mg/hr	*0*	*0*	203	203	217	259	291	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated max coal rejects rate determined based on annual average LOM Yield, less the waste fraction rejected at the breaker station. Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020

P.8.11	Rejects Moisture	Truck (Coal) UnLoading at Waste Pit (Years 6-10)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	294	294	294	294	294	*0*	*0*	*0*	*0*	*0*	*0*	Estimated max coal rejects rate determined based on annual average LOM Yield, less the waste fraction rejected at the breaker station. Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.12	Rejects Moisture	Truck (Coal) UnLoading at Waste Pit (Years 11-14)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	294	294	294	294		*0*	Estimated max coal rejects rate determined based on annual average LOM Yield, less the waste fraction rejected at the breaker station. Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.13	Rejects Moisture	Truck (Coal) UnLoading at Waste Pit (Years 15)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	294	*0*	Estimated max coal rejects rate determined based on annual average LOM Yield, less the waste fraction rejected at the breaker station. Estimated using data provided in Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.14	Overburden moisture content	Truck (Overburden) UnLoading at Waste Pit (Years 1-5)	Mg/hr	*638*	*638*	*3705*	*5069*	*4540*	*5454*	*5594*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated by total annual BCM Waste.
P.8.15	Overburden moisture content	Truck (Overburden) UnLoading at Waste Pit (Years 6-10)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*5605*	*5520*	*5558*	*5521*	*7327*	*0*	*0*	*0*	*0*	*0*	*0*	Estimated by total annual BCM Waste.
P.8.16	Overburden moisture content	Truck (Overburden) UnLoading at Waste Pit (Years 11-14)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*7466*	*7411*	*5674*	*5683*	*0*	*0*	Estimated by total annual BCM Waste.
P.8.17	Overburden moisture content	Truck (Overburden) UnLoading at Waste Pit (Years 15)	Mg/hr	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2811*	*0*	Estimated by total annual BCM Waste.
P.8.18	Product Coal Moisture	Truck Loading at BK-801 Overflow Stockpile, Overland Conveyor Feed Bin Bunker	Mg/hr	*0*	0	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	Assumed max loading scenario would not exceed complete exhaustion of emergency stockpile in any 24hr period
P.8.19	Product Coal Moisture	Truck Loading at Emergency Stockpile	Mg/hr	*0*	0	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	0	Assumed max loading scenario would not exceed complete exhaustion of emergency stockpile in any 24hr period
P.8.20	Product Coal Moisture	Truck Unloading at Stockpile ST-803	Mg/hr	*0*	0	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	Assumed operating at 1/2 max total capacity. See Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020
P.8.21	Product Coal Moisture	Truck Unloading at Stockpile ST-804	Mg/hr	*0*	0	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	Assumed operating at 1/2 max total capacity. See Table 3-2: Crown Mountain CHPP Capacity and Operating Data , Feasibility Study dated 31MAR2020

Table P.8.1b - Fixed Inputs

Parameter	Unit	Value	Reference
ROM Coal Moisture Content	%	5	*Feasibility Study Report Page 13; Feed Moisture.*
Product Coal Moisture	%	7.5	*Feasibility Study Report Page 82: Crown Mountain CHPP Capacity and Operating Data; and Crown Mountain Decision Note - Product Dewatering (dated 22 August 2019)*
Rejects Moisture	%	17	*Feasibility Study Report, Crown Mountain Decision Note - Tailings Dewatering; Table 1: Expected Rejects Moisture Content.*
Overburden moisture content	%	7.9	US EPA AP-42 Table Table 11.9-3
Scaling factor for size ≤10µm	–	0.75	US EPA AP-42 Table 11.9-2
Scaling factor for size ≤2.5µm	–	0.019	
Number of operating hours per year	hr/yr	*8376*	24/7 349 days (See 06.24.2020 information Requests)
CPP Hours	hr/yr	*6400*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
Number of operating hours per day	hr/day	*24*	24/7 349 days (See 06.24.2020 information Requests)
Raw Coal Conveyor Max Rate	*tonnes/hr*	*600*	*Feasibility Study Report*
Breaker Rejects rate	*%*	*5.5*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
North deposit breaker rejects rate (LOM)	*%*	*6.9*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
South deposit breaker rejects rate (LOM)	*%*	*6.2*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
ROM Coal capacity (nom)	*Mt/yr*	*3.85*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
LOM North Deposit Yield	*%*	*60.6*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
LOM South Deposit Yield	*%*	*45.5*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
Average Density of Overburden	*tonnes/BCM*	*2.6*	*Obtained verbally from Client during meeting on 19AUG2020*
Average Density of Product Coal	*kg/m3*	*850*	*Feasibility Study Report Table 3-1: Material Design Criteria*
Estiamted BK-801 Overflow Stockpile Volume	*m3*	*178*	*Estimated from Storage pile dimensions*
Estimated BK-801 Overflow Stockpile Tonnage	*tonnes*	*151*	*Estimated from Density and Storage pile volume*
Max capacity of Emergency Product Stockpile	*tonnes*	*5000*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
Max Clean Coal Overland Conveyor Capacity	*tonnes/hr*	*440*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*
Annual Average Hourly CPP ROM Coal Capacity	*tonnes/hr*	*601.5625*	*Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data*

Table P.8.2 - Emission Factors

ID for Worksheet Reference	Contaminant	Match Function	Emission Factor	Units	Reference
ROM Coal Moisture Content	TSP	ROM Coal Moisture ContentTSP	0.0841	kg/Mg	
	PM10	ROM Coal Moisture ContentPM10	0.0105	kg/Mg	US EPA AP-42 Table 11.9-2
	PM2.5	ROM Coal Moisture ContentPM2.5	0.0016	kg/Mg	
Product Coal Moisture	TSP	Product Coal Moisture TSP	0.0517	kg/Mg	
	PM10	Product Coal Moisture PM10	0.0073	kg/Mg	US EPA AP-42 Table 11.9-2
	PM2.5	Product Coal Moisture PM2.5	0.0010	kg/Mg	
Rejects Moisture	TSP	Rejects Moisture TSP	0.0194	kg/Mg	
	PM10	Rejects Moisture PM10	0.0035	kg/Mg	US EPA AP-42 Table 11.9-2
	PM2.5	Rejects Moisture PM2.5	0.0004	kg/Mg	
Overburden moisture content	TSP	Overburden moisture contentTSP	0.0486	kg/Mg	
	PM10	Overburden moisture contentPM10	0.0070	kg/Mg	US EPA AP-42 Table 11.9-2
	PM2.5	Overburden moisture contentPM2.5	0.0009	kg/Mg	

Table P.8.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.8.4a - Maximum 24-hr Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	14.0	14.0	11.9	5.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.1	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.8	1.8	1.5	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	2.1	8.6	7.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.2	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.3	1.1	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	5.9	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	0.0
P.8.3	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Overburden moisture content	TSP	g/s	8.6	8.6	50.0	68.4	52.2	28.3	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.4	Overburden moisture content	PM10	g/s	1.2	1.2	7.2	9.8	7.5	4.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.3	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	3.0	15.1	13.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.5	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.4	2.2	2.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	6.0	30.2	27.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.6	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.9	4.3	3.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	0.0
P.8.7	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
P.8.8	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.1	1.1	1.2	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	0.0
P.8.9	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.1	1.1	1.2	1.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.10	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0
P.8.11	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.6	1.6	1.6	0.0	0.0
P.8.12	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0
P.8.13	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	8.6	8.6	50.0	68.4	61.2	73.6	75.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.14	Overburden moisture content	PM10	g/s	1.2	1.2	7.2	9.8	8.8	10.5	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.3	1.2	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.6	74.5	75.0	74.5	98.8	0.0	0.0	0.0	0.0	0.0	0.0
P.8.15	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	10.7	10.7	10.7	14.2	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.9	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.7	100.0	76.5	76.7	0.0	0.0
P.8.16	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	14.3	11.0	11.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	1.9	1.5	1.5	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.9	0.0
P.8.17	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0

P.8.18	Product Coal Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
P.8.19	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
P.8.20	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
P.8.21	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table P.8.4b - Maximum annual Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	13.4	13.4	11.4	5.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.1	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.7	1.7	1.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	2.0	8.3	7.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.2	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.2	1.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	5.7	12.9	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	0.0
P.8.3	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Overburden moisture content	TSP	g/s	8.2	8.2	47.8	65.4	49.9	27.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.4	Overburden moisture content	PM10	g/s	1.2	1.2	6.8	9.4	7.1	3.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.2	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	2.9	14.4	13.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.5	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.4	2.1	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	5.8	28.9	26.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.6	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.8	4.1	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	0.0
P.8.7	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
P.8.8	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.0	1.0	1.1	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0
P.8.9	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.0	1.0	1.1	1.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.10	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
P.8.11	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	0.0	0.0
P.8.12	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0
P.8.13	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	8.2	8.2	47.8	65.4	58.6	70.3	72.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.14	Overburden moisture content	PM10	g/s	1.2	1.2	6.8	9.4	8.4	10.1	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.2	1.1	1.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.3	71.2	71.7	71.2	94.5	0.0	0.0	0.0	0.0	0.0	0.0
P.8.15	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	10.2	10.3	10.2	13.5	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.8	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.3	95.6	73.2	73.3	0.0	0.0
P.8.16	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	13.7	10.5	10.5	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.8	1.4	1.4	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.3	0.0
P.8.17	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0

P.8.18	Product Coal Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0.0
P.8.19	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
P.8.20	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
P.8.21	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table P.8.4b - Maximum annual Emission Rates

Source	ID for Worksheet Reference	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	13.4	13.4	11.4	5.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.1	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.7	1.7	1.4	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	2.0	8.3	7.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.2	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.2	1.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	5.7	12.9	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	0.0
P.8.3	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Overburden moisture content	TSP	g/s	8.2	8.2	47.8	65.4	49.9	27.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.4	Overburden moisture content	PM10	g/s	1.2	1.2	6.8	9.4	7.1	3.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.2	0.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	2.9	14.4	13.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.5	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.4	2.1	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	5.8	28.9	26.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.6	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.8	4.1	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ROM Coal Moisture Content	TSP	g/s	0.0	0.0	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	13.4	0.0
P.8.7	ROM Coal Moisture Content	PM10	g/s	0.0	0.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	0.0
	ROM Coal Moisture Content	PM2.5	g/s	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
P.8.8	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.0	1.0	1.1	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0
P.8.9	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	1.0	1.0	1.1	1.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.10	Rejects Moisture	PM10	g/s	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0
P.8.11	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5	1.5	1.5	0.0	0.0
P.8.12	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.0	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Rejects Moisture	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0
P.8.13	Rejects Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
	Rejects Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	8.2	8.2	47.8	65.4	58.6	70.3	72.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P.8.14	Overburden moisture content	PM10	g/s	1.2	1.2	6.8	9.4	8.4	10.1	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.2	0.2	0.9	1.2	1.1	1.3	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.3	71.2	71.7	71.2	94.5	0.0	0.0	0.0	0.0	0.0	0.0
P.8.15	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	10.2	10.3	10.2	13.5	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	1.8	0.0	0.0	0.0	0.0	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.3	95.6	73.2	73.3	0.0	0.0
P.8.16	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.8	13.7	10.5	10.5	0.0	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.8	1.4	1.4	0.0	0.0
	Overburden moisture content	TSP	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.3	0.0
P.8.17	Overburden moisture content	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0
	Overburden moisture content	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0

P.8.18	Product Coal Moisture	PM10	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0.0
P.8.19	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
P.8.20	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Product Coal Moisture	TSP	g/s	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
P.8.21	Product Coal Moisture	PM10	g/s	0.0	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Product Coal Moisture	PM2.5	g/s	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Calculation Sheet B.9a

Bulldozing Emissions - Coal

B.9a

Bulldozing Emissions - Coal

Crown Mountain Coking Coal Mine

Description

Emissions associated with bulldozing of coal on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from bulldozing activities include particulate matter (PM).

Table P.9.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.9a.1	Bulldozing of Coal in North Pit	Number of CAT D11 Dozers	#	0	See Notes	5	6	6	6	6	0	0	0	0	0	0	0	0	0	0	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	0	See Notes	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-	
		CAT D11 Operating Hours	hr/year	0.00	See Notes	8,153	9,436	7,279	3,716	302.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
		CAT 834 Operating Hours	hr/year	0.00	See Notes	1,008	1,195	949	460	35.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
		Total Bulldozing hours	hr/year	0.00	See Notes	9,161	10,631	8,228	4,176	338.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
P.9a.2	Bulldozing of Coal in South Pit	Number of CAT D11 Dozers	#	-	-	-	-	-	-	See Notes	6	6	6	6	7	7	7	6	6	4	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	See Notes	1	1	1	1	1	1	1	1	1	1	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	See Notes	9,958	9,557	9,706	9,745	11,451	11,723	11,839	9,737	10,130	5,507	-	
		CAT834 Operating Hours	hr/year	-	-	-	-	-	-	See Notes	1,292	1,056	1,210	1,176	1,483	1,495	1,528	1,332	1,332	683	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	See Notes	11,250	10,614	10,917	10,921	12,934	13,218	13,367	11,069	11,462	6,190	-	
P.9a.3	Bulldozing of Coal in East Pit	Number of CAT D11 Dozers	#	-	-	-	-	See Notes	6	6	6	0	0	0	0	0	0	0	0	0	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	See Notes	1	1	1	0	0	0	0	0	0	0	0	0	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	See Notes	5,956	5,292	382.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	See Notes	738	629	49.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	
		Total Bulldozing hours	hr/year	-	-	-	-	See Notes	6,693	5,921	431.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	

Table P.9.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Coal silt content (s)	%	11.3	US EPA AP-42 Table 11.9-3
Product Coal Moisture Content (M)	%	7.5	*Feasibility Study Report Page 82: Crown Mountain*
Scaling factor for size ≤10µm	–	0.75	US EPA AP-42 Table 11.9-2
Scaling factor for size ≤2.5µm	–	0.022	
Number of operating hours per day	hr/day	24	24/7 349 days (See 06.24.2020

Table P.9.2 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP	47.6	kg/hr	US EPA AP-42 Table 11.9-2
PM10	14.3	kg/hr	
PM2.5	1.05	kg/hr	

Table P.9.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.9.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9a.1	TSP	g/s	-	-	79.33	92.55	92.55	92.55	92.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	g/s	-	-	23.87	27.84	27.84	27.84	27.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	-	-	1.75	2.04	2.04	2.04	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.9a.2	TSP	g/s	-	-	-	-	-	-	-	92.55	92.55	92.55	92.55	105.77	105.77	105.77	92.55	92.55	66.10	-
	PM10	g/s	-	-	-	-	-	-	-	27.84	27.84	27.84	27.84	31.82	31.82	31.82	27.84	27.84	19.89	-
	PM2.5	g/s	-	-	-	-	-	-	-	2.04	2.04	2.04	2.04	2.33	2.33	2.33	2.04	2.04	1.45	-
P.9a.3	TSP	g/s	-	-	-	-	-	92.55	92.55	92.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	g/s	-	-	-	-	-	27.84	27.84	27.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	-	-	-	-	-	2.04	2.04	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Table P.9.4b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9a.1	TSP	g/s	-	-	13.83	16.04	12.42	6.30	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	-	-	0.30	0.35	0.27	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.9a.2	TSP	g/s	-	-	-	-	-	-	-	16.98	16.02	16.48	16.48	19.52	19.95	20.17	16.71	17.30	9.34	-
	PM2.5	g/s	-	-	-	-	-	-	-	0.37	0.35	0.36	0.36	0.43	0.44	0.44	0.37	0.38	0.21	-
P.9a.3	TSP	g/s	-	-	-	-	-	10.10	8.94	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	g/s	-	-	-	-	-	0.22	0.20	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Table P.9.4c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9a.1	TSP	tonnes/yr	-	-	436.01	#####	391.61	198.76	16.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	-	-	131.18	#####	117.82	59.80	4.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	-	-	9.59	11.13	8.62	4.37	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.9a.2	TSP	tonnes/yr	-	-	-	-	-	-	-	535.46	505.16	519.59	519.79	615.61	629.10	636.22	526.82	545.53	294.60	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	161.10	151.98	156.33	156.39	185.21	189.27	191.42	158.50	164.13	88.64	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	11.78	11.11	11.43	11.44	13.54	13.84	14.00	11.59	12.00	6.48	-
P.9a.3	TSP	tonnes/yr	-	-	-	-	-	318.57	281.79	20.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	-	-	-	-	-	95.85	84.78	6.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	-	-	-	-	-	7.01	6.20	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

B.9.b

Bulldozing Emissions - Overburden

Crown Mountain Coking Coal Mine

Description

Emissions associated with bulldozing of overburden on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from bulldozing activities include particulate matter (PM).

Table P.9.5 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.9b.1	Bulldozing overburden at Waste Pit (Years 1-5)	Number of CAT D11 Dozers	#	-	-	5	6	6	6	6	-	-	-	-	-	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	8153	9436	8545	9671	9716	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	1008	1195	1113	1198	1155	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	9161	10631	9658	10869	10870	-	-	-	-	-	-	-	-	-	-	-	
P.9b.2	Bulldozing overburden at Waste Pit (Years 6-10)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	6	6	6	6	7	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	10340	9557	9706	9745	11451	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	1342	1056	1210	1176	1483	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	11682	10614	10917	10921	12934	-	-	-	-	-	-	
P.9b.3	Bulldozing overburden at Waste Pit (Years 11-14)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	7	7	6	6	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	11723	11839	9737	10130	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	1495	1528	1332	1332	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	13218	13367	11069	11462	-	-	
P.9b.4	Bulldozing overburden at Waste Pit (Years 15)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P.9b.5	Bulldozing of Overburden in North Pit	Number of CAT D11 Dozers	#	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	462	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	1,236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P.9b.6	Bulldozing of Overburden in South Pit	Number of CAT D11 Dozers	#	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	4122	-	-	-	-	-	-	-	-	-	-	-	
		CAT834 Operating Hours	hr/year	-	-	-	-	-	-	490	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	4611	-	-	-	-	-	-	-	-	-	-	-	
P.9b.7	Bulldozing of Overburden in East Pit	Number of CAT D11 Dozers	#	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	1265	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	165	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	1430	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table P.9.6- Fixed Inputs

Parameter	Unit	Value	Reference
Overburden silt content (s)	%	15.1	US EPA AP-42 Table 11.9-3
Moisture Content (M)	%	2.2	US EPA AP-42 Table 11.9-3
Scaling factor for size ≤10µm	–	0.75	US EPA AP-42 Table 11.9-2
Scaling factor for size ≤2.5µm	–	0.105	
Number of operating hours per day	hr/day	24	24/7 349 days (See 06.24.2020 information Requests)

Table P.9.7 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP	24.2	kg/hr	US EPA AP-42 Table 11.9-2
PM10	6.6	kg/hr	
PM2.5	2.55	kg/hr	

Table P.9.8 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.9.9a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	g/s	-	-	40.41	47.14	47.14	47.14	47.14	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	10.94	12.77	12.77	12.77	12.77	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	4.24	4.95	4.95	4.95	4.95	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	g/s	-	-	-	-	-	-	-	47.14	47.14	47.14	47.14	53.87	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	-	12.77	12.77	12.77	12.77	14.59	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	4.95	4.95	4.95	4.95	5.66	-	-	-	-	-	-
P.9b.3	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	53.87	53.87	47.14	47.14	-	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	14.59	14.59	12.77	12.77	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	5.66	5.66	4.95	4.95	-	-
P.9b.4	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	g/s	-	13.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	3.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	1.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	g/s	-	-	-	-	-	-	47.14	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	12.77	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	4.95	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	g/s	-	-	-	-	47.14	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	12.77	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	4.95	-	-	-	-	-	-	-	-	-	-	-	-	-

Table P.9.9b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	g/s	-	-	7.04	8.17	7.42	8.36	8.36	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	0.74	0.86	0.78	0.88	0.88	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	g/s	-	-	-	-	-	-	-	8.98	8.16	8.39	8.40	9.94	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	0.94	0.86	0.88	0.88	1.04	-	-	-	-	-	-
P.9b.3	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	10.16	10.28	8.51	8.81	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	1.07	1.08	0.89	0.93	-	-
P.9b.4	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	g/s	-	0.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	g/s	-	-	-	-	-	-	3.55	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	0.96	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	g/s	-	-	-	-	1.10	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-

Table P.9.9c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	tonnes/yr	-	-	222.09	257.73	234.15	263.51	263.54	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	60.16	69.81	63.42	71.38	71.38	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	23.32	27.06	24.59	27.67	27.67	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	tonnes/yr	-	-	-	-	-	-	-	283.21	257.31	264.66	264.77	313.57	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	76.71	69.70	71.69	71.72	84.94	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	29.74	27.02	27.79	27.80	32.92	-	-	-	-	-	-
P.9b.3	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	320.44	324.07	268.34	277.87	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	86.80	87.78	72.68	75.27	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	33.65	34.03	28.18	29.18	-	-
P.9b.4	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	tonnes/yr	-	29.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	8.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	3.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	tonnes/yr	-	-	-	-	-	-	111.80	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	30.28	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	30.28	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	tonnes/yr	-	-	-	-	34.67	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	9.39	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-

Calculation Sheet B.9b

Bulldozing Emissions - Overburden

B.9.b

Bulldozing Emissions - Overburden

Crown Mountain Coking Coal Mine

Description

Emissions associated with bulldozing of overburden on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from bulldozing activities include particulate matter (PM).

Table P.9.5 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.9b.1	Bulldozing overburden at Waste Pit (Years 1-5)	Number of CAT D11 Dozers	#	-	-	5	6	6	6	6	-	-	-	-	-	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	8153	9436	8545	9671	9716	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	1008	1195	1113	1198	1155	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	9161	10631	9658	10869	10870	-	-	-	-	-	-	-	-	-	-	-	
P.9b.2	Bulldozing overburden at Waste Pit (Years 6-10)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	6	6	6	6	7	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	10340	9557	9706	9745	11451	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	1342	1056	1210	1176	1483	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	11682	10614	10917	10921	12934	-	-	-	-	-	-	
P.9b.3	Bulldozing overburden at Waste Pit (Years 11-14)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	7	7	6	6	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	11723	11839	9737	10130	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	1495	1528	1332	1332	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	13218	13367	11069	11462	-	-	
P.9b.4	Bulldozing overburden at Waste Pit (Years 15)	Number of CAT D11 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P.9b.5	Bulldozing of Overburden in North Pit	Number of CAT D11 Dozers	#	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	462	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	1,236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P.9b.6	Bulldozing of Overburden in South Pit	Number of CAT D11 Dozers	#	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	-	-	4122	-	-	-	-	-	-	-	-	-	-	-	
		CAT834 Operating Hours	hr/year	-	-	-	-	-	-	490	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	-	-	4611	-	-	-	-	-	-	-	-	-	-	-	
P.9b.7	Bulldozing of Overburden in East Pit	Number of CAT D11 Dozers	#	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	Assumed First year with activity hours was associated with Overburden removal/displacement.
		Number of CAT 834 Dozers	#	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT D11 Operating Hours	hr/year	-	-	-	-	1265	-	-	-	-	-	-	-	-	-	-	-	-	-	
		CAT 834 Operating Hours	hr/year	-	-	-	-	165	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total Bulldozing hours	hr/year	-	-	-	-	1430	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table P.9.6- Fixed Inputs

Parameter	Unit	Value	Reference
Overburden silt content (s)	%	15.1	US EPA AP-42 Table 11.9-3
Moisture Content (M)	%	2.2	US EPA AP-42 Table 11.9-3
Scaling factor for size ≤10µm	–	0.75	US EPA AP-42 Table 11.9-2
Scaling factor for size ≤2.5µm	–	0.105	
Number of operating hours per day	hr/day	24	24/7 349 days (See 06.24.2020 information Requests)

Table P.9.7 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP	24.2	kg/hr	US EPA AP-42 Table 11.9-2
PM10	6.6	kg/hr	
PM2.5	2.55	kg/hr	

Table P.9.8 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.9.9a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	g/s	-	-	40.41	47.14	47.14	47.14	47.14	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	10.94	12.77	12.77	12.77	12.77	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	4.24	4.95	4.95	4.95	4.95	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	g/s	-	-	-	-	-	-	-	47.14	47.14	47.14	47.14	53.87	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	-	12.77	12.77	12.77	12.77	14.59	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	4.95	4.95	4.95	4.95	5.66	-	-	-	-	-	-
P.9b.3	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	53.87	53.87	47.14	47.14	-	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	14.59	14.59	12.77	12.77	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	5.66	5.66	4.95	4.95	-	-
P.9b.4	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	g/s	-	13.47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	3.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	1.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	g/s	-	-	-	-	-	-	47.14	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	12.77	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	4.95	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	g/s	-	-	-	-	47.14	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	12.77	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	4.95	-	-	-	-	-	-	-	-	-	-	-	-	-

Table P.9.9b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	g/s	-	-	7.04	8.17	7.42	8.36	8.36	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	0.74	0.86	0.78	0.88	0.88	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	g/s	-	-	-	-	-	-	-	8.98	8.16	8.39	8.40	9.94	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	0.94	0.86	0.88	0.88	1.04	-	-	-	-	-	-
P.9b.3	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	10.16	10.28	8.51	8.81	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	1.07	1.08	0.89	0.93	-	-
P.9b.4	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	g/s	-	0.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	g/s	-	-	-	-	-	-	3.55	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	0.96	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	g/s	-	-	-	-	1.10	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-

Table P.9.9c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.9b.1	TSP	tonnes/yr	-	-	222.09	257.73	234.15	263.51	263.54	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	60.16	69.81	63.42	71.38	71.38	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	23.32	27.06	24.59	27.67	27.67	-	-	-	-	-	-	-	-	-	-	-
P.9b.2	TSP	tonnes/yr	-	-	-	-	-	-	-	283.21	257.31	264.66	264.77	313.57	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	76.71	69.70	71.69	71.72	84.94	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	29.74	27.02	27.79	27.80	32.92	-	-	-	-	-	-
P.9b.3	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	320.44	324.07	268.34	277.87	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	86.80	87.78	72.68	75.27	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	33.65	34.03	28.18	29.18	-	-
P.9b.4	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.5	TSP	tonnes/yr	-	29.96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	8.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	3.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P.9b.6	TSP	tonnes/yr	-	-	-	-	-	-	111.80	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	30.28	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	30.28	-	-	-	-	-	-	-	-	-	-	-
P.9b.7	TSP	tonnes/yr	-	-	-	-	34.67	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	9.39	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	3.64	-	-	-	-	-	-	-	-	-	-	-	-	-

Calculation Sheet B.10
Grading Emissions

B.10

Grading Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with grading on site were calculated based on AP-42 Chapter 11.9 Western Surface Coal Mining (US EPA 1998). Expected contaminants resulting from grading operations include particulate matter (PM).

Table P.10.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.10.1	Grading the Clean Coal Haul Road	Number of CAT 24M Graders	#	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-
		Number of CAT 16M Graders	#	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 24M Grader Use	hr/year	0	241	2,383	2,588	2,099	2,838	3,286	3,583	3,066	3,303	3,318	3,562	3,444	3,438	2,225	3,570	1,867	-
		CAT 16M Grader Use	hr/year	0	1,356	1,443	1,428	1,333	1,368	1,183	1,082	1,178	1,154	1,118	1,160	1,150	1,099	1,084	1,286	612	
		Total Annual Grader Use	hr/year	0	1,597	3,827	4,016	3,432	4,206	4,469	4,665	4,244	4,457	4,436	4,722	4,594	4,537	3,310	4,856	2,478	-
		Annual Vehicle Kilometers	km/year	0	18,207	43,622	45,782	39,129	47,947	50,945	53,182	48,378	50,806	50,572	53,836	52,372	51,722	37,731	55,358	28,252	-
P.10.2a	Grading Waste Pit Areas (Years 1-5)	Number of CAT 24M Graders	#	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
		Number of CAT 16M Graders	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M Grader Use	hr/year	-	-	2,383	2,588	2,099	2,838	3,286	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M Grader Use	hr/year	-	-	1,443	1,428	1,333	1,368	1,183	-	-	-	-	-	-	-	-	-	-	-
		Total Annual Grader Use	hr/year	-	-	3,827	4,016	3,432	4,206	4,469	-	-	-	-	-	-	-	-	-	-	-
		Annual Vehicle Kilometers	km/year	-	-	43,622	45,782	39,129	47,947	50,945	-	-	-	-	-	-	-	-	-	-	-
P.10.2b	Grading Waste Pit Areas (Years 6-10)	Number of CAT 24M Graders	#	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-
		Number of CAT 16M Graders	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-
		CAT 24M Grader Use	hr/year	-	-	-	-	-	-	-	3,583	3,066	3,303	3,318	3,562	-	-	-	-	-	-
		CAT 16M Grader Use	hr/year	-	-	-	-	-	-	-	1,082	1,178	1,154	1,118	1,160	-	-	-	-	-	-
		Total Annual Grader Use	hr/year	-	-	-	-	-	-	-	4,665	4,244	4,457	4,436	4,722	-	-	-	-	-	-
		Annual Vehicle Kilometers	km/year	-	-	-	-	-	-	-	53,182	48,378	50,806	50,572	53,836	-	-	-	-	-	-
P.10.2c	Grading Waste Pit Areas (Years 11-14)	Number of CAT 24M Graders	#	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-
		Number of CAT 16M Graders	#	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
		CAT 24M Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	3,444	3,438	2,225	3,570	-	-
		CAT 16M Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	1,150	1,099	1,084	1,286	-	-
		Total Annual Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	4,594	4,537	3,310	4,856	-	-
		Annual Vehicle Kilometers	km/year	-	-	-	-	-	-	-	-	-	-	-	-	52,372	51,722	37,731	55,358	-	-
P.10.2d	Grading Waste Pit Areas (Year 15)	Number of CAT 24M Graders	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		Number of CAT 16M Graders	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CAT 24M Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,867	-
		CAT 16M Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	612	-
		Total Annual Grader Use	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,478	-
		Annual Vehicle Kilometers	km/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28,252	-
P.10.3	Grading the North Pit	Number of CAT 24M Graders	#	0	1	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	-
		Number of CAT 16M Graders	#	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-
		CAT 24M Grader Use	hr/year	0	241	2,383	2,588	1,788	1,090	102	0	0	0	0	0	0	0	0	0	0	-
		CAT 16M Grader Use	hr/year	0	1,356	1,443	1,428	1,136	526	37	0	0	0	0	0	0	0	0	0	0	-
		Total Annual Grader Use	hr/year	0	1,597	3,827	4,016	2,924	1,616	139	0	0	0	0	0	0	0	0	0	0	-
		Annual Vehicle Kilometers	km/year	0	18,207	43,622	45,782	33,334	18,421	1,586	0	0	0	0	0	0	0	0	0	0	-
P.10.4	Grading the South Pit	Number of CAT 24M Graders	#	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-
		Number of CAT 16M Graders	#	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 24M Grader Use	hr/year	-	-	-	-	-	-	1,394	3,451	3,066	3,303	3,318	3,562	3,444	3,438	2,225	3,570	1,867	-
		CAT 16M Grader Use	hr/year	-	-	-	-	-	-	502	1,042	1,178	1,154	1,118	1,160	1,150	1,099	1,084	1,286	612	-
		Total Annual Grader Use	hr/year	-	-	-	-	-	-	1,896	4,493	4,244	4,457	4,436	4,722	4,594	4,537	3,310	4,856	2,478	-
		Annual Vehicle Kilometers	km/year	-	-	-	-	-	-	21,611	51,217	48,378	50,806	50,572	53,836	52,372	51,722	37,731	55,358	28,252	-

P.10.5	Grading the East Pit	Number of CAT 24M Graders	#	-	-	-	-	2	2	2	2	0	0	0	0	0	0	0	0	0	-
		Number of CAT 16M Graders	#	-	-	-	-	1	1	1	1	0	0	0	0	0	0	0	0	0	-
		CAT 24M Grader Use	hr/year	-	-	-	-	311	1,748	1,790	132	0	0	0	0	0	0	0	0	0	-
		CAT 16M Grader Use	hr/year	-	-	-	-	197	842	644	40	0	0	0	0	0	0	0	0	0	-
		Total Annual Grader Use	hr/year	-	-	-	-	508	2,590	2,434	172	0	0	0	0	0	0	0	0	0	-
		Annual Vehicle Kilometers	km/year	-	-	-	-	5,794	29,525	27,747	1,965	0	0	0	0	0	0	0	0	0	-

Table P.10.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Mean vehicle speed	kph	11.4	US EPA AP-42 Table 11.9-2
Maximum Number of	hr/day	24	See 06.24.2020 information Requests

Table P.10.2 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP (≤ 30 µm)	1.492	kg/VKT	US EPA AP-42 Table 11.9-2
PM10	0.4367	kg/VKT	
PM2.5	0.046	kg/VKT	

Table P.10.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.10.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.10.1	TSP	g/s	0.000	9.449	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	-
	PM10	g/s	0.000	2.766	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	-
	PM2.5	g/s	0.000	0.293	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	-
P.10.2a	TSP	g/s	-	-	14.173	14.173	14.173	14.173	14.173	-	-	-	-	-	-	-	-	-	-	-
	PM10	g/s	-	-	4.148	4.148	4.148	4.148	4.148	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	0.439	0.439	0.439	0.439	0.439	-	-	-	-	-	-	-	-	-	-	-
P.10.2b	TSP	g/s	-	-	-	-	-	-	-	14.173	14.173	14.173	14.173	14.173	-	-	-	-	-	-
	PM10	g/s	-	-	-	-	-	-	-	4.148	4.148	4.148	4.148	4.148	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	0.439	0.439	0.439	0.439	0.439	-	-	-	-	-	-
P.10.2c	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	14.173	14.173	14.173	14.173	-	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	4.148	4.148	4.148	4.148	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.439	0.439	0.439	0.439	-	-
P.10.2d	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.173	-
	PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.148	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.439	-
P.10.3	TSP	g/s	0.000	9.449	14.173	14.173	14.173	14.173	14.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM10	g/s	0.000	2.766	4.148	4.148	4.148	4.148	4.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	0.000	0.293	0.439	0.439	0.439	0.439	0.439	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
P.10.4	TSP	g/s	-	-	-	-	-	-	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	14.173	-
	PM10	g/s	-	-	-	-	-	-	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	4.148	-
	PM2.5	g/s	-	-	-	-	-	-	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	0.439	-
P.10.5	TSP	g/s	-	-	-	-	14.173	14.173	14.173	14.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM10	g/s	-	-	-	-	4.148	4.148	4.148	4.148	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	-	-	-	-	0.439	0.439	0.439	0.439	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

Table P.10.4b - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.10.1	TSP	g/s	0.000	0.861	2.064	2.166	1.851	2.268	2.410	2.516	2.289	2.404	2.392	2.547	2.478	2.447	1.785	2.619	1.337	-
	PM2.5	g/s	0.000	0.027	0.064	0.067	0.057	0.070	0.075	0.078	0.071	0.075	0.074	0.079	0.077	0.076	0.055	0.081	0.041	-
P.10.2a	TSP	g/s	-	-	2.064	2.166	1.851	2.268	2.410	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	g/s	-	-	0.064	0.067	0.057	0.070	0.075	-	-	-	-	-	-	-	-	-	-	-
P.10.2b	TSP	g/s	-	-	-	-	-	-	-	2.516	2.289	2.404	2.392	2.547	-	-	-	-	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	0.078	0.071	0.075	0.074	0.079	-	-	-	-	-	-
P.10.2c	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	2.478	2.447	1.785	2.619	-	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.077	0.076	0.055	0.081	-	-
P.10.2d	TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.337	-
	PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.041	-
P.10.3	TSP	g/s	0.000	0.861	2.064	2.166	1.577	0.871	0.075	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	0.000	0.027	0.064	0.067	0.049	0.027	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
P.10.4	TSP	g/s	-	-	-	-	-	-	1.022	2.423	2.289	2.404	2.392	2.547	2.478	2.447	1.785	2.619	1.337	-
	PM2.5	g/s	-	-	-	-	-	-	0.032	0.075	0.071	0.075	0.074	0.079	0.077	0.076	0.055	0.081	0.041	-
P.10.5	TSP	g/s	-	-	-	-	0.274	1.397	1.313	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	PM2.5	g/s	-	-	-	-	0.008	0.043	0.041	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

Notes:
Emission factors were sourced from AP-42 Chapter 11.9 Western Surface Coal Mining.

Table P.10.4c - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.10.1	TSP	tonnes/yr	0.00	27.16	65.08	68.30	58.38	71.53	76.00	79.34	72.18	75.80	75.45	80.32	78.13	77.16	56.29	82.59	42.15	-
	PM10	tonnes/yr	0.000	7.950	19.048	19.991	17.086	20.937	22.246	23.223	21.125	22.185	22.083	23.508	22.869	22.585	16.476	24.173	12.337	-
	PM2.5	tonnes/yr	0.00	0.84	2.02	2.12	1.81	2.22	2.36	2.46	2.24	2.35	2.34	2.49	2.42	2.39	1.75	2.56	1.31	-
P.10.2a	TSP	tonnes/yr	-	-	65.08	68.30	58.38	71.53	76.00	-	-	-	-	-	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	19.048	19.991	17.086	20.937	22.246	-	-	-	-	-	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	2.02	2.12	1.81	2.22	2.36	-	-	-	-	-	-	-	-	-	-	-
P.10.2b	TSP	tonnes/yr	-	-	-	-	-	-	-	79.34	72.18	75.80	75.45	80.32	-	-	-	-	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	23.223	21.125	22.185	22.083	23.508	-	-	-	-	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	2.46	2.24	2.35	2.34	2.49	-	-	-	-	-	-
P.10.2c	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	78.13	77.16	56.29	82.59	-	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	22.869	22.585	16.476	24.173	-	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	2.42	2.39	1.75	2.56	-	-
P.10.2d	TSP	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42.15	-
	PM10	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.337	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.31	-
P.10.3	TSP	tonnes/yr	0.00	27.16	65.08	68.30	49.73	27.48	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	0.00	7.95	19.05	19.99	14.56	8.04	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	0.00	0.84	2.02	2.12	1.54	0.85	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
P.10.4	TSP	tonnes/yr	-	-	-	-	-	-	32.24	76.41	72.18	75.80	75.45	80.32	78.13	77.16	56.29	82.59	42.15	-
	PM10	tonnes/yr	-	-	-	-	-	-	9.44	22.36	21.13	22.19	22.08	23.51	22.87	22.59	16.48	24.17	12.34	-
	PM2.5	tonnes/yr	-	-	-	-	-	-	1.00	2.37	2.24	2.35	2.34	2.49	2.42	2.39	1.75	2.56	1.31	-
P.10.5	TSP	tonnes/yr	-	-	-	-	8.64	44.05	41.40	2.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	tonnes/yr	-	-	-	-	2.53	12.89	12.12	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	tonnes/yr	-	-	-	-	0.27	1.37	1.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Calculation Sheet B.11

Stock Pile Wind Erosion Emissions

Stock Pile Wind Erosion Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with stockpile wind erosion on site were calculated based on AP-42 Chapter 13.2.5 (US EPA 2006). Expected contaminants resulting from stockpile wind erosion include particulate matter (PM).

Table P.11.1a - Activity Inputs

Source	Source Description	Location	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Height	Footprint Area (m2)	Approximated Radius (m)	Approximated Area of Curved Surface (m2)
P.11.1	Clean Coal Product Stockpile #1 (ST-803)	ST-803 at Rail Loadout	Estimated Surface Area	m2	0	0	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	0	22	6701	46	7422
P.11.2	Clean Coal Product Stockpile #2 (ST-804)	ST-804 at Rail Loadout	Estimated Surface Area	m2	0	0	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	7422	0	22	6701	46	7422
P.11.3	Emergency Product Stockpile	CV-804 Haul Truck Loadout	Estimated Surface Area	m2	0	0	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	1512	0	14.5	1217	20	1512
P.11.4	Overflow Stockpile for CH-821 (BK-801)	BK-801 Overland Conveyor Feed Bin Bunker	Estimated Surface Area	m2	0	0	141	141	141	141	141	141	141	141	141	141	141	141	141	141	141	0	5	107	6	141
P.11.5	Rejects Bin Overflow Stockpile Bunker (BK-701)	CPP - CH-711	Estimated Surface Area	m2	0	0	147	147	147	147	147	147	147	147	147	147	147	147	147	147	147	0	5.5	107	6	147
P.11.6	Rejects Stockpile from Rejects Breaker Conveyor	Breaker Station - CV-103	Estimated Surface Area	m2	0	0	294	294	294	294	294	294	294	294	294	294	294	294	294	294	294	0	7	227	9	294
																							Provided	Provided	Calculated	Calculated

Note.

1. Assumed maximum number of disturbances (N = 365) for each stockpile, being a minimum of 1 disturbance per day
2. Stockpile surface areas estimated from Height and Footprint of piles derived from CAD drawing A355-2020-03-09.nwd and the Feasibility Study Page 101/ A355-P1-0001 REVB. DWG, and Page 104 (REV B)/ A355-P1-0004 REVC. DWG.

Table P.11.1b - Fixed Inputs

Parameter	Unit	Value	Reference	Assumption
TSP Particle Size Multipier (k)	–	1		–
PM10 Particle Size Multiplier (k)	–	0.5	US EPA AP-42, Chapter 13.2.5, Section 13.2.5.3	–
PM2.5 Particle Size Multiplier (k)	–	0.075		–
Number of disturbances (N) per year	disturbances/year	365	Assuming disturbance every day	–
Site mean wind speed	m/s	5.00	90th percentile of surface station wind speed calculated from the SparwoodCS station (Data years 2014-2018.)	–
Fastest wind speed (u+)	m/s	16.94	Max value obtained from surface station wind speed from the SparwoodCS station (Data years 2014-2018.	–
Threshold friction velocity (ut) for Overburden	m/s	1.02		Value for overburden
Threshold friction velocity (ut) for Ground Coal	m/s	0.55		Value for ground coal
Threshold friction velocity (ut) for Uncrusted Coal Pile	m/s	1.12		Value for Uncrusted Coal Pile
Anemometer height (z)	m	10		Typical value for ECCC stations
Number of stockpiles (with dedicated fabric stockpile cover)	#	2	Feasibility Study and client response to info request dated 24.06.2020	–
Capture efficiency of stocpile cover for product coal stockpiles	%	90		*Waterproof canvas, used for buildings and structures. Assumed impervious.*

Table P.11.2 - Estimated Parameters

Parameter	Unit	Value	Reference
m)	m/s	16.94	US EPA AP-42 Chapter 13.2.5, Equation (5)
Friction velocity (u*)	m/s	0.89782	US EPA AP-42 Chapter 13.2.5, Equation (4)
Erosion Potential (P) for Overburden Piles	g/m2	0.00	US EPA AP-42 Chapter 13.2.5, Equation (3)
Erosion Potential (P) for Ground coal piles	g/m2	15.71	US EPA AP-42 Chapter 13.2.5, Equation (3)
Erosion Potential (P) for Uncrusted Coal Piles	g/m2	0.00	US EPA AP-42 Chapter 13.2.5, Equation (3)

Table P.11.3 - Emission Factors

Contaminant	Emission Factor	Units	Reference	Notes
TSP	0.00	g/m2/year		
PM10	0.00	g/m2/year	US EPA AP-42 Chapter 13.2.5, Equation (2)	
PM2.5	0.00	g/m2/year		Overburden
TSP	5734.98	g/m2/year		
PM10	2867.49	g/m2/year	US EPA AP-42 Chapter 13.2.5, Equation (2)	
PM2.5	430.12	g/m2/year		Ground Coal
TSP	0.00	g/m2/year		
PM10	0.00	g/m2/year	US EPA AP-42 Chapter 13.2.5, Equation (2)	
PM2.5	0.00	g/m2/year		Uncrusted Coal Pile

Table P.11.4 - Conversion Factors

Conversion	Value
s/yr	31536000
grams to tonnes	0.000001

Table P.11.1b - Fixed Inputs

Parameter	Unit	Value	Reference	Assumption
TSP Particle Size Multipier (k)	–	1	US EPA AP-42,	–
PM10 Particle Size Multiplier (k)	–	0.5	Chapter 13.2.5,	–
PM2.5 Particle Size Multiplier (k)	–	0.075	Section 13.2.5.3	–
Number of disturbances (N)	disturbances/year	365	Assuming	–
Site mean wind speed	m/s	5.00	90th percentile of	–
Fastest wind speed (u+)	m/s	16.94	Max value obtained	–
Threshold friction velocity (ut) for Overburden	m/s	1.02		Value for overburden
Threshold friction velocity (ut) for Ground Coal	m/s	0.55		Value for ground coal
Threshold friction velocity (ut) for Uncrusted Coal Pile	m/s	1.12		Value for Uncrusted Coal Pile
Anemometer height (z)	m	10		Typical value for ECCC stations
Number of stockpiles (with dedicated fabric stockpile cover)	#	2	Feasibility Study	–
Capture efficiency of stocpile cover for product coal stockpiles	%	90		*Waterproof canvas, used for buildings and structures. Assumed impervious.*

Table P.11.2 - Estimated Parameters

Parameter	Unit	Value	Reference
Corrected fastest wind speed (to reference height of 10 m)	m/s	16.94	US EPA AP-42
Friction velocity (u*)	m/s	0.89782	US EPA AP-42
Erosion Potential (P) for Overburden Piles	g/m2	0.00	US EPA AP-42
Erosion Potential (P) for Ground coal piles	g/m2	15.71	US EPA AP-42
Erosion Potential (P) for Uncrusted Coal Piles	g/m2	0.00	US EPA AP-42

Table P.11.3 - Emission Factors

Contaminant	Emission Factor	Units	Reference	Notes
TSP	0.00	g/m2/year	US EPA AP-42	
PM10	0.00	g/m2/year	Chapter 13.2.5,	
PM2.5	0.00	g/m2/year	Equation (2)	Overburden
TSP	5734.98	g/m2/year	US EPA AP-42	
PM10	2867.49	g/m2/year	Chapter 13.2.5,	
PM2.5	430.12	g/m2/year	Equation (2)	Ground Coal
TSP	0.00	g/m2/year	US EPA AP-42	
PM10	0.00	g/m2/year	Chapter 13.2.5,	
PM2.5	0.00	g/m2/year	Equation (2)	Uncrusted Coal Pile

Table P.11.4 - Conversion Factors

Conversion	Value
s/yr	31536000
grams to tonnes	0.000001

Table P.11.5 - Maximum 24-hr and annual Emission Rates

Source	Contaminant	Unit	Capture Efficiency Percentage of Stockpile Cover	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.11.1	TSP	g/s	90%	0.0E+00	0.0E+00	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	0.0E+00
P.11.2	TSP	g/s	90%	0.0E+00	0.0E+00	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	1.3E-01	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	6.7E-02	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	1.0E-02	0.0E+00
P.11.3	TSP	g/s	0%	0.0E+00	0.0E+00	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	2.7E-01	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	1.4E-01	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	2.1E-02	0.0E+00
P.11.4	TSP	g/s	0%	0.0E+00	0.0E+00	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	0.0E+00
P.11.5	TSP	g/s	0%	0.0E+00	0.0E+00	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	0.0E+00
P.11.6	TSP	g/s	0%	0.0E+00	0.0E+00	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	5.3E-02	0.0E+00
	PM10	g/s		0.0E+00	0.0E+00	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	2.7E-02	0.0E+00
	PM2.5	g/s		0.0E+00	0.0E+00	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	4.0E-03	0.0E+00

Note.
1. Assumed worst case emission factor (Ground Coal) for all storage piles

Table P.11.6 - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Capture Efficiency Percentage of Stockpile Cover (0 if none used)	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.11.1	TSP	g/s	90%	0.00	0.00	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	0.00
	PM10	g/s		0.00	0.00	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	0.00
	PM2.5	g/s		0.00	0.00	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.00
P.11.2	TSP	g/s	90%	0.00	0.00	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	4.26	0.00
	PM10	g/s		0.00	0.00	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	0.00
	PM2.5	g/s		0.00	0.00	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.00
P.11.3	TSP	g/s	0%	0.00	0.00	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	0.00
	PM10	g/s		0.00	0.00	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	4.34	0.00
	PM2.5	g/s		0.00	0.00	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.00
P.11.4	TSP	g/s	0%	0.00	0.00	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.00
	PM10	g/s		0.00	0.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.00
	PM2.5	g/s		0.00	0.00	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.00
P.11.5	TSP	g/s	0%	0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.00
	PM10	g/s		0.00	0.00	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.00
	PM2.5	g/s		0.00	0.00	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.00
P.11.6	TSP	g/s	0%	0.00	0.00	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	0.00
	PM10	g/s		0.00	0.00	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.00
	PM2.5	g/s		0.00	0.00	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.00

Calculation Sheet B.12

Rail Car Spray Bar Emissions

B.12

Rail Car Spray Bar Emissions - Anti-freeze and Dustbinder Chemical

Crown Mountain Coking Coal Mine

Description

Emissions from the application of anti-freeze and dust binder chemical solutions to rail car tankers from spray bar at the rail load-out area. Dust-binder solution is sprayed via a spray bar (with multiple nozzles) onto the top of each fully loaded rail car. In the winter months anti-freeze is sprayed inside the rail cars before coal product is loaded. Some of components of these chemicals are voltile and are therefore not expected to be emitted in significant amounts from storage tanks or from chemical receiving operations.

Video of spray bar and polymer-based dut suppressant being applied: http://www.railshopservices.com/coal-respray.html

Table P.12.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.12.1	Dustbinder chemical solution - spray bar application	Max Annual Usage	kg	-	-	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	174983	-	Annual Max usage rates obtained from Table 7-6 and 7-7 of the Feasibility Study
	Antifreeze solution - spray bar application	Max Annual Usage	kg	-	-	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	350283	-	Annual Max usage rates obtained from Table 7-6 and 7-7 of the Feasibility Study

Note 1. Maximum Usage rates from both the South Pit operations and North Pit Operations was used. A more refined approach could be implmented by taking the respective usage rate for the year in which each operation is underway (by applying the maximum usage rate for the South Pit operations during the years in which the South Pit is mainly active, and by applying the maximum usage rate for the North Pit operations during the years in which the North Pit is mainly active).

Table P.12.2 - Composition of Dust-Binder Solution **MECP ACB**

Product Name	Common Name	Component	CAS	Max % Composition	Volatile?	Averaging Period	Concentration	Limiting Effect
APS2	Dust Binder	Polyvinyl Acetate	9003-20-7	30	No	24hr	15	Health & Particulate
		Propylene Glycol	57-55-6	30	Yes	24hr	120	Particulate
		2,5,8,11 Tetramethyl 6 dodecyn-5,8 Diol Ethoxylate	169117-72-0	1	N/A	Not listed	Not listed	Not listed
SCR1	Anti-freeze	Glycerin	56-81-5	68	No	24hr	120	Health & Particulate

Table P.12.3 - Inputs and Emissions Factor

Parameter	Unit	Value	Reference
Averaging period	days	365	-
Number of operating hours per day	hr/day	*10*	The clean coal transportation system and load-out facilities is planned to operate at a maximum of 10hrs per day. Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data.
Number of Train loading days per year	Days/year	*120*	There is a requirement to load 120 trains per year which equates to a train every ~3 days. Only one train is loaded in a day. (See 06.24.2020 information Requests) and Feasibility Study Report Table 3-2: Crown Mountain CHPP Capacity and Operating Data.
Product loss based emissions factor	%	2%	Product loss emission factor of 2% assumed to be representative of average daily product losses based on review of available information technology used. Similar emission factors were derived in pesticide spray applications, where it can be conservatively assumed that approximately 2% of product sprayed is emitted to air when spray application methods are not known. Noted in the Organisation for Economic Co-operation and Development (OECD), OECD SERIES ON EMISSION SCENARIO DOCUMENTS Number 18 EMISSION SCENARIO DOCUMENT FOR INSECTICIDES, ACARICIDES AND PRODUCTS TO CONTROL OTHER ARTHROPODS FOR HOUSEHOLD AND PROFESSIONAL USES (link: https://www.echa.europa.eu/documents/10162/16908203/pt18_oecd_esd_household_professional_uses_en.pdf)

Table P.12.4 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
mile/km	0.621371
g/lb	453.592
kg to tonnes	*0.001*

Table P.12.5 - Maximum 24-hr Emission Rates

Source	Contaminant	CAS #	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.12.1	Polyvinyl Acetate	9003-20-7	g/s	-	-	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	-
	Propylene Glycol	57-55-6	g/s	-	-	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	0.10126	-
	2,5,8,11 Tetramethyl 6 dodecyn-5,8 Diol Ethoxylate	169117-72-0	g/s	-	-	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	0.00338	-
P.12.2	Glycerin	56-81-5	g/s	-	-	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	0.22974	-

Table P.12.6 - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	CAS #	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.12.1	Polyvinyl Acetate	9003-20-7	tonnes/yr	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	Propylene Glycol	57-55-6	tonnes/yr	-	-	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	-
	2,5,8,11 Tetramethyl 6 dodecyn-5,8 Diol Ethoxylate	169117-72-0	tonnes/yr	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
P.12.2	Glycerin	56-81-5	tonnes/yr	-	-	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	-

Calculation Sheet B.13

CPP Boiler Emissions

B.13

CPP Boiler Emissions

Crown Mountain Coking Coal Mine

Description

Emissions from the Coal Cleaning Plant Steam Boiler. Steam will be generated by a package 700HP water tube boiler unit , Natural gas will be used to fuel the boilers and the nominal and maximum boiler natural gas consumption rates are 17.1 CFH / ROM t and 31.4 CFH / ROM t respectively. Hourly HDF natural gas heating consumption required for steam generation is estimated at 34,400,000 BTU/hr or 36.29 GJ/hr. This would be required all year. Flue gas will be discharged to the atmosphere through a dedicated stack. An economiser feature included within the boiler utilizes the residual flue gas thermal energy to pre-heat the feed water stream ensuring the boiler units remain above 85% efficient. The boiler also features a low NOx burner system which ensures flue gas exhaust NOx levels remain below 30ppmv. Calculated based on US EPA Chapter 1.4 Natural Gas Combustion for boilers less than 100 MMBtu/hr. Expected contaminants are products of combustion.

Table P.13.1 - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15	Notes
P.13.1	CPP Natural Gas Fired Boiler	24hr Operating Capacity	%	-	-	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	Assumed steam boiler operating at full capacity through the Site's production years

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Table P.13.2 - Emissions Calculations

Source ID	Description	Input BTU Rating (BTU/hr)	Temperature (Deg C) (1)	Air Flow rate (m3/s) (6)	Contaminant	Cas No.	Emission Factor (lb/106 scf input)(2)	Emission Factor (kg/106 m3 input)(2)	Emission Factor (ppmv)	Quality Rating	Emissions (g/s)	Reference
S6	Boiler #1	34,000,000	165	2.23	Nitrogen Oxides	10102-44-0	-	-	30	A	1.26E-01	Feasibility Study Design Notes (flue gas limit of 30ppmv)
					Carbon Monoxide	630-08-0	84	1344	100	B	2.55E-01	US EPA AP 42 Table 1.4-1
					Particulate Matter	NA-TSP	0.0048	0.0768	5.2	A	2.05E-05	US EPA AP 42 Table 1.4-2
					Methane	74-82-8	2.3	36.8	-	B	9.84E-03	US EPA AP 42 Table 1.4-2
					VOCs	NA-VOC	5.5	88	-	C	2.35E-02	US EPA AP 42 Table 1.4-2
					Sulphur Dioxide(3)	SO2 - NA	0.6	9.6	0.39	A	2.28E-03	US EPA AP 42 Table 1.4-2
					Carbon Dioxide (CO2)	124-38-9	120000			A		US EPA AP 42 Table 1.4-3
					Nitrous Oxide (N2O)	10024-97-2	0.64			E		US EPA AP 42 Table 1.4-4

Notes

(1) The exhaust temperature of the flue gas from the boilers is estimated to be equivalent to the temperature of the recirculating heating fluid, which is anticipated to be no more than the designed steam temperature.

(2) Emission factor for NOx obtained from the Feasibility Study, Revision: 0 - 31-Mar-2020. Assumed 30ppmv at STP.

(3) Assumed typical 2000 grains of sulfur per million cubit feet of natural gas for sulfur dioxide emission factor calculation

(4) Emission factor for CO obtained from US EPA AP 42 Table 1.4-1, for Controlled - Low NOx burners/Flue gas recirculation.

(5) Emission factor for TSP, SO2, CH4, and VOCs obtained from US EAP AP 42 Table 1.4-2

(6) Assumed Fuel flowrate (m3/s) = [Equipment input rating (BTU/hr) / Fuel HHV (BTU/scf)] x 0.02832 (m3/ft3) x 0.000278 (hr/s)

(7) Emission Factor for N2O obtained from US EPA AP-42 Table 1.4-2 for Controlled-low-NOx burner

Table P.13.3 - Conversion Factors

Conversion	Value
1GJ = 947817BTU	947817
1kl = 264.172 US Gal	264.172
1lbs = 453.592grams	453.592
lb to tonne	0.0004536
1000PPM to 1%	1000
Btu/scf	1020
Air/Gas	11.36
XS Air	15%
Mol/L	0.0409
lbs/SCF to kg/m3	16
lb/MMBTU to lb/10^6 scf	1020
BTU to MMBTU	0.000001
CFS to m3/s	0.0283
seconds per hour	3600
Mol weight of NO2 (g/mol)	46.01
Mol weight of SO2 (g/mol)	64.066
Mol weight of CO (g/mol)	28.011
grams to tonnes	0.000001

Table P.13.4 - Fixed Inputs

Parameter	Unit	Value	Reference
Number of operating hours per year - CPP	hr/yr	*6400*	6400 coal on hours (See 06.24.2020 information Requests)
Number of operating hours per day	hr/day	*24*	See 06.24.2020
Number of hours per year	hr/yr	*8760*	Number of hours per year
Number of seconds per year	sec/yr	31,536,000	Number of seconds per year

Table P.13.5a - Maximum 24-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.13.1	Nitrogen Oxides	10102-44-0	g/s	-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	-
	Carbon Monoxide	630-08-0	g/s	-	-	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	-
	Particulate Matter	N/A - TSP	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	N/A - PM2.5	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	N/A - PM10	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	Methane	74-82-8	g/s	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
	VOCs	N/A - VOC	g/s	-	-	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	0.02	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Table P.13.5b - Maximum 1-hr Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.13.1	Nitrogen Oxides	10102-44-0	g/s	-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	-
	Carbon Monoxide	630-08-0	g/s	-	-	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	-
	Particulate Matter	N/A - TSP	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	N/A - PM2.5	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	N/A - PM10	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	Methane	74-82-8	g/s	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
	VOCs	N/A - VOC	g/s	-	-	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	0.02	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Table P.13.5c - Maximum Annual Emission Rates

Source	Contaminant	CAS	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.13.1	Nitrogen Oxides	10102-44-0	g/s	-	-	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
	Carbon Monoxide	630-08-0	g/s	-	-	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	-
	Particulate Matter	N/A - TSP	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM2.5	N/A - PM2.5	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	PM10	N/A - PM10	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
	Methane	74-82-8	g/s	-	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
	VOCs	N/A - VOC	g/s	-	-	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	0.02	-
	Sulphur Dioxide	SO2 - NA	g/s	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

Table P.13.5d - Maximum Annual GHG Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.13.1	Carbon Dioxide (CO_2)	tonnes/year	-	-	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	11,612	-
	Methane (CH_4)	tonnes/year	-	-	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	-
	Nitrous Oxide (N_2O)	tonnes/year	-	-	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-

Notes:

Maximum emission rates for a 1-hr and 24-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum boiler activity per hour.

Boiler package roughly 236.7 inches in height (6m). Min stack height is approximately 1.4m. Therefore total release height is estimated to be 7.4m.

Conservatively assummed 1m diameter exhaust, which results in an outlet velocity of approximately 2.84m/s (derived from 2.23m3/s divided by 0.785m2)

Table P.13.5e - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.13.1	Nitrogen Oxides	tonnes/year	-	-	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	-
	Carbon Monoxide	tonnes/year	-	-	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	-
	Particulate Matter	tonnes/year	-	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-
	PM2.5	tonnes/year	-	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-
	PM10	tonnes/year	-	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	-
	Methane	tonnes/year	-	-	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	-
	VOCs	tonnes/year	-	-	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	-
	Sulphur Dioxide	tonnes/year	-	-	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-

Calculation Sheet B.14

Feeder Breaker Emissions

B.14

Feeder Breaker Emissions

Crown Mountain Coking Coal Mine

Description

Emissions associated with the feeder breaker (FB-101) crushing operations on site after the grizzly bar, before the Rotary Breaker Station. Emissions were calculated based on Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing of AP-42 (US EPA 1998). Expected contaminants resulting from crushing activities include particulate matter (PM).

Table P.14.1a - Activity Inputs

Source	Source Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.14.1	Feeder Breaker Feed Rate	Mass of material sent	tonnes/hr	-	-	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	-

Table P.14.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Number of operating hours per year	hr/yr	*8760*	Conservative estimate (client data not available at time of assessment)
Number of operating hours per day	hr/day	*24*	See 06.24.2020 information Requests

Table P.14.2 - Emission Factors

Contaminant	Emission Factor	Units	Reference
TSP	0.0027	kg/Mg	US EPA AP-42 Table 11.19.2-1
PM10	0.0012	kg/Mg	
PM2.5	0.0012	kg/Mg	

Table P.14.3 - Conversion Factors

Conversion	Value
g/kg	1000
s/yr	31536000
s/day	86400
s/hr	3600
grams to tonnes	0.000001

Table P.14.4a - Maximum 24-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.14.1	TSP	g/s	-	-	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	-
	PM10	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-
	PM2.5	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-

Table P.14.4b - Maximum 1-hr Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.14.1	TSP	g/s	-	-	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	-
	PM10	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-
	PM2.5	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-

Table P.14.4c - Maximum Annual Emission Rates

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.14.1	TSP	g/s	-	-	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	*0.45*	-
	PM10	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-
	PM2.5	g/s	-	-	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	*0.20*	-

Table P.14.4d - Maximum Annual Emission Rates in tonnes/year

Source	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.14.1	TSP	tonnes/yr	-	-	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	14.19	-
	PM10	tonnes/yr	-	-	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	-
	PM2.5	tonnes/yr	-	-	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	-

Notes:

Emission factors were sourced from AP-42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing. Emission factors for tertiary crushing can be applied as a conservative upper-bound value for primary crushing.

Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum tonnage of material processed per hour.

Calculation Sheet B.15

Natural Gas-Fired Emissions from Comfort Heating

B.15
Natural Gas-Fired Emissions from Comforting Heating

P. 16.1a - Comfort heating equipment - 24hr and 1hr ERs

Source ID	Source Description	Enclosed Structure	Unit Type	Make/Model	Heat Input Rating (kW)	Heat Input Rating (Btu/hr)	Contaminant	Emission Factor (lb/10^6 scf)	Emission Factor (kg/10^6 m^3)(1)	Updated Emission Rate (g/hr)	Emission Rate (g/s)
P.16.1	Volume Source - CPP	CPP Building	Unit Heaters		7,670	26,171,126	Nitrogen Oxides	100	1600	387.94	1.10E-01
							Carbon Monoxide	84	1344	325.87	9.22E-02
							Sulphur Dioxide	0.6	9.6	2.33	6.58E-04
							Particulate Matter	7.6	121.6	29.48	8.34E-03
							Particulate Matter	5.7	91.2	22.11	6.25E-03
							Particulate Matter	1.9	30.4	7.37	2.08E-03
							VOCs	5.5	88	21.34	6.03E-03
							Carbon Dioxide (CO2)	120000	1920000	465,529.94	
							Methane (CH4)	2.3	36.8	8.92	2.52E-03
							Nitrous Oxide (N2O)	2.2	35.2	8.53	
			Make-up air				Nitrogen Oxides	100	1600	387.94	1.10E-01
							Carbon Monoxide	84	1344	325.87	9.22E-02
							Sulphur Dioxide	0.6	9.6	2.33	6.58E-04
							Particulate Matter	7.6	121.6	29.48	8.34E-03
							Particulate Matter	5.7	91.2	22.11	6.25E-03
							Particulate Matter	1.9	30.4	7.37	2.08E-03
							VOCs	5.5	88	21.34	6.03E-03
							Carbon Dioxide (CO2)	120000	1920000	465,529.94	
							Methane (CH4)	2.3	36.8	8.92	2.52E-03
							Nitrous Oxide (N2O)	2.2	35.2	8.53	
			Exhaust fans				Nitrogen Oxides	100	1600	387.94	1.10E-01
							Carbon Monoxide	84	1344	325.87	9.22E-02
							Sulphur Dioxide	0.6	9.6	2.33	6.58E-04
							Particulate Matter	7.6	121.6	29.48	8.34E-03
							Particulate Matter	5.7	91.2	22.11	6.25E-03
							Particulate Matter	1.9	30.4	7.37	2.08E-03
							VOCs	5.5	88	21.34	6.03E-03
							Carbon Dioxide (CO2)	120000	1920000	465,529.94	
							Methane (CH4)	2.3	36.8	8.92	2.52E-03
							Nitrous Oxide (N2O)	2.2	35.2	8.53	
		Tailings Thickener	Unit Heaters		100	341,214	Nitrogen Oxides	100	1600	15.17	4.29E-03
							Carbon Monoxide	84	1344	12.75	3.61E-03
							Sulphur Dioxide	0.6	9.6	0.09	2.58E-05
							Particulate Matter	7.6	121.6	1.15	3.26E-04
							Particulate Matter	5.7	91.2	0.86	2.45E-04
							Particulate Matter	1.9	30.4	0.29	8.15E-05
							VOCs	5.5	88	0.83	2.36E-04
							Carbon Dioxide (CO2)	120000	1920000	18,208.47	
							Methane (CH4)	2.3	36.8	0.35	9.87E-05
							Nitrous Oxide (N2O)	2.2	35.2	0.33	
		Coal Thickener	Unit Heaters		50	170,607	Nitrogen Oxides	100	1600	7.59	2.15E-03
							Carbon Monoxide	84	1344	6.37	1.80E-03
							Sulphur Dioxide	0.6	9.6	0.05	1.29E-05
							Particulate Matter	7.6	121.6	0.58	1.63E-04
							Particulate Matter	5.7	91.2	0.43	1.22E-04
							Particulate Matter	1.9	30.4	0.14	4.08E-05
							VOCs	5.5	88	0.42	1.18E-04
							Carbon Dioxide (CO2)	120000	1920000	9,104.24	
							Methane (CH4)	2.3	36.8	0.17	4.94E-05
							Nitrous Oxide (N2O)	2.2	35.2	0.17	

		Flocculant Shed	Unit Heaters		20	68,243	Nitrogen Oxides	100	1600	3.03	8.58E-04
							Carbon Monoxide	84	1344	2.55	7.21E-04
							Sulphur Dioxide	0.6	9.6	0.02	5.15E-06
							Particulate Matter	7.6	121.6	0.23	6.52E-05
							Particulate Matter	5.7	91.2	0.17	4.89E-05
							Particulate Matter	1.9	30.4	0.06	1.63E-05
							VOCs	5.5	88	0.17	4.72E-05
							Carbon Dioxide (CO2)	120000	1920000	3,641.69	
							Methane (CH4)	2.3	36.8	0.07	1.97E-05
							Nitrous Oxide (N2O)	2.2	35.2	0.07	
		Steam Generation Building	Unit Heaters		20	68,243	Nitrogen Oxides	100	1600	3.03	8.58E-04
							Carbon Monoxide	84	1344	2.55	7.21E-04
							Sulphur Dioxide	0.6	9.6	0.02	5.15E-06
							Particulate Matter	7.6	121.6	0.23	6.52E-05
							Particulate Matter	5.7	91.2	0.17	4.89E-05
							Particulate Matter	1.9	30.4	0.06	1.63E-05
							VOCs	5.5	88	0.17	4.72E-05
							Carbon Dioxide (CO2)	120000	1920000	3,641.69	
							Methane (CH4)	2.3	36.8	0.07	1.97E-05
							Nitrous Oxide (N2O)	2.2	35.2	0.07	
P.16.2	Volume Source - Overland Surge Bin	Overland Surge Bin	Unit Heaters		110	375,336	Nitrogen Oxides	100	1600	16.69	4.72E-03
							Carbon Monoxide	84	1344	14.02	3.97E-03
							Sulphur Dioxide	0.6	9.6	0.10	2.83E-05
							Particulate Matter	7.6	121.6	1.27	3.59E-04
							Particulate Matter	5.7	91.2	0.95	2.69E-04
							Particulate Matter	1.9	30.4	0.32	8.97E-05
							VOCs	5.5	88	0.92	2.60E-04
							Carbon Dioxide (CO2)	120000	1920000	20,029.32	
							Methane (CH4)	2.3	36.8	0.38	1.09E-04
							Nitrous Oxide (N2O)	2.2	35.2	0.37	
P.16.3	Volume Source - Rejects Bin	Rejects Bin	Unit Heaters		50	170,607	Nitrogen Oxides	100	1600	7.59	2.15E-03
							Carbon Monoxide	84	1344	6.37	1.80E-03
							Sulphur Dioxide	0.6	9.6	0.05	1.29E-05
							Particulate Matter	7.6	121.6	0.58	1.63E-04
							Particulate Matter	5.7	91.2	0.43	1.22E-04
							Particulate Matter	1.9	30.4	0.14	4.08E-05
							VOCs	5.5	88	0.42	1.18E-04
							Carbon Dioxide (CO2)	120000	1920000	9,104.24	
							Methane (CH4)	2.3	36.8	0.17	4.94E-05
							Nitrous Oxide (N2O)	2.2	35.2	0.17	

Notes:
(1) Emission factor taken from US EPA Chapter 1.4 Natural Gas Combustion for boilers less than 100 MMBtu/hr.
(2) Feasibility study indicates that the CPP will operate for approximately 6400 hrs/year
(3) Conversion of Kw to BTU/hr used was 1BTU/hr equals 0.00029307107 kilowatts

Table P.16.1b - Fixed Inputs

Parameter	Unit	Value	Reference
Number of operating hours per year	hr/yr	*8760*	Conservative estimate (client data not available at time of assessment)
Number of operating hours per year - CPP	hr/yr	*6400*	6400 coal on hours (See 06.24.2020 information Requests)
Number of operating hours per day	hr/day	*24*	See 06.24.2020 information Requests

Table P.16.2 - Conversion Factors

Conversion	Value
Btu/hr to kW	0.000293071
lb/10^6 scf to kg/10^6 m3	16
lb/MMBtu to lb/10^6 scf	1020
Btu/hr to MMBtu/hr	0.000001
lb to gram	453.592
tonnes to gram	1,000,000
grams to tonnes	0.000001

P. 16.3 - Comfort heating equipment - Annual ERs

Source ID	Source Description	Enclosed Structure	Unit Type	Heat Input Rating (kW)	Heat Input Rating (Btu/hr)	Contaminant	Emission Factor (kg/10^6 m^3)(1)	Emission Rate (g/s)
P.16.1	Volume Source - CPP	CPP Building	Unit Heaters	7,670	26,171,126	Nitrogen Oxides	1600	8.02E-02
						Carbon Monoxide	1344	6.73E-02
						Sulphur Dioxide	9.6	4.81E-04
						Particulate Matter	121.6	6.09E-03
						Particulate Matter	91.2	4.57E-03
						Particulate Matter	30.4	1.52E-03
						VOCs	88	4.41E-03
						Methane	36.8	1.84E-03
			Make-up air			Nitrogen Oxides	1600	8.02E-02
						Carbon Monoxide	1344	6.73E-02
						Sulphur Dioxide	9.6	4.81E-04
						Particulate Matter	121.6	6.09E-03
						Particulate Matter	91.2	4.57E-03
						Particulate Matter	30.4	1.52E-03
						VOCs	88	4.41E-03
						Methane	36.8	1.84E-03
			Exhaust fans			Nitrogen Oxides	1600	8.02E-02
						Carbon Monoxide	1344	6.73E-02
						Sulphur Dioxide	9.6	4.81E-04
						Particulate Matter	121.6	6.09E-03
						Particulate Matter	91.2	4.57E-03
						Particulate Matter	30.4	1.52E-03
						VOCs	88	4.41E-03
						Methane	36.8	1.84E-03
		Tailings Thickener	Unit Heaters	100	341,214	Nitrogen Oxides	1600	3.14E-03
						Carbon Monoxide	1344	2.63E-03
						Sulphur Dioxide	9.6	1.88E-05
						Particulate Matter	121.6	2.38E-04
						Particulate Matter	91.2	1.79E-04
						Particulate Matter	30.4	5.96E-05
						VOCs	88	1.72E-04
						Methane	36.8	7.21E-05
		Coal Thickener	Unit Heaters	50	170,607	Nitrogen Oxides	1600	1.57E-03
						Carbon Monoxide	1344	1.32E-03
						Sulphur Dioxide	9.6	9.41E-06
						Particulate Matter	121.6	1.19E-04
						Particulate Matter	91.2	8.94E-05
						Particulate Matter	30.4	2.98E-05
						VOCs	88	8.62E-05
						Methane	36.8	3.61E-05
		Flocculant Shed	Unit Heaters	20	68,243	Nitrogen Oxides	1600	6.27E-04
						Carbon Monoxide	1344	5.27E-04
						Sulphur Dioxide	9.6	3.76E-06
						Particulate Matter	121.6	4.77E-05
						Particulate Matter	91.2	3.57E-05
						Particulate Matter	30.4	1.19E-05
						VOCs	88	3.45E-05
						Methane	36.8	1.44E-05
		Steam Generation Building	Unit Heaters	20	68,243	Nitrogen Oxides	1600	6.27E-04
						Carbon Monoxide	1344	5.27E-04
						Sulphur Dioxide	9.6	3.76E-06
						Particulate Matter	121.6	4.77E-05
						Particulate Matter	91.2	3.57E-05
						Particulate Matter	30.4	1.19E-05
						VOCs	88	3.45E-05
						Methane	36.8	1.44E-05
P.16.2	Volume Source - Overland Surge Bin	Overland Surge Bin	Unit Heaters	110	375,336	Nitrogen Oxides	1600	3.45E-03
						Carbon Monoxide	1344	2.90E-03
						Sulphur Dioxide	9.6	2.07E-05
						Particulate Matter	121.6	2.62E-04
						Particulate Matter	91.2	1.97E-04
						Particulate Matter	30.4	6.55E-05
						VOCs	88	1.90E-04
						Methane	36.8	7.93E-05
P.16.3	Volume Source - Rejects Bin	Rejects Bin	Unit Heaters	50	170,607	Nitrogen Oxides	1600	1.57E-03
						Carbon Monoxide	1344	1.32E-03
						Sulphur Dioxide	9.6	9.41E-06
						Particulate Matter	121.6	1.19E-04
						Particulate Matter	91.2	8.94E-05
						Particulate Matter	30.4	2.98E-05
						VOCs	88	8.62E-05
						Methane	36.8	3.61E-05

Notes:
(1) Emission factor taken from US EPA Chapter 1.4 Natural Gas Combustion for boilers less than 100 MMBtu/hr.
(2) Feasibility study incates that the CPP will operate for approximately 6400 hrs/year
(3) Conversion of Kw to BTU/hr used was 1BTU/hr equals 0.00029307107 kilowatts

P.16.4 - Comfort heating equipment - GHG Emission Rates (tonnes/year)

Source ID	Source Description	Enclosed Structure	Unit Type	Heat Input Rating (kW)	Heat Input Rating (Btu/hr)	Contaminant	CAS #	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.16.1	Volume Source - CPP	CPP Building	Unit Heaters	7,670	26,171,126	Carbon Dioxide (CO2)	124-38-9	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	-
						Methane (CH4)	74-82-8	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
						Nitrous Oxide (N2O)	10024-97-2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
			Make-up air			Carbon Dioxide (CO2)	124-38-9	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	-
						Methane (CH4)	74-82-8	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
						Nitrous Oxide (N2O)	10024-97-2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
			Exhaust fans			Carbon Dioxide (CO2)	124-38-9	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	2,979.39	-
						Methane (CH4)	74-82-8	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
						Nitrous Oxide (N2O)	10024-97-2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	-
		Tailings Thickener	Unit Heaters	100	341,214	Carbon Dioxide (CO2)	124-38-9	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	116.53	-
						Methane (CH4)	74-82-8	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
						Nitrous Oxide (N2O)	10024-97-2	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		Coal Thickener	Unit Heaters	50	170,607	Carbon Dioxide (CO2)	124-38-9	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	-
						Methane (CH4)	74-82-8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
						Nitrous Oxide (N2O)	10024-97-2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		Flocculant Shed	Unit Heaters	20	68,243	Carbon Dioxide (CO2)	124-38-9	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	-
						Methane (CH4)	74-82-8	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-
						Nitrous Oxide (N2O)	10024-97-2	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-
		Steam Generation Building	Unit Heaters	20	68,243	Carbon Dioxide (CO2)	124-38-9	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	23.307	-
						Methane (CH4)	74-82-8	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-
						Nitrous Oxide (N2O)	10024-97-2	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-
P.16.2	Volume Source - Overland Surge Bin	Overland Surge Bin	Unit Heaters	110	375,336	Carbon Dioxide (CO2)	124-38-9	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	128.19	-
						Methane (CH4)	74-82-8	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
						Nitrous Oxide (N2O)	10024-97-2	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
P.16.3	Volume Source - Rejects Bin	Rejects Bin	Unit Heaters	50	170,607	Carbon Dioxide (CO2)	124-38-9	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	58.267	-
						Methane (CH4)	74-82-8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
						Nitrous Oxide (N2O)	10024-97-2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-

P.16.5 - Comfort heating equipment - Criteria Air Contaminant Emission Rates (tonnes/year)

Source ID	Source Description	Enclosed Structure	Unit Type	Heat Input Rating (kW)	Heat Input Rating (Btu/hr)	Contaminant	CAS #	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
P.16.1	Volume Source - CPP	CPP Building	Unit Heaters	7,670	26,171,126	Nitrogen Oxides	10102-44-0	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483
						Carbon Monoxide	630-08-0	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086
						Sulphur Dioxide	SO2 - NA	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
						Particulate Matter	N/A - TSP	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189
						Particulate Matter	N/A - PM10	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142
						Particulate Matter	N/A - PM2.5	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
						VOCs	N/A - VOC	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137
			Make-up air			Nitrogen Oxides	10102-44-0	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483
						Carbon Monoxide	630-08-0	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086
						Sulphur Dioxide	SO2 - NA	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
						Particulate Matter	N/A - TSP	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189
						Particulate Matter	N/A - PM10	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142
						Particulate Matter	N/A - PM2.5	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
						VOCs	N/A - VOC	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137
			Exhaust fans			Nitrogen Oxides	10102-44-0	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483	2.483
						Carbon Monoxide	630-08-0	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086	2.086
						Sulphur Dioxide	SO2 - NA	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
						Particulate Matter	N/A - TSP	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189	0.189
						Particulate Matter	N/A - PM10	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.142
						Particulate Matter	N/A - PM2.5	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
						VOCs	N/A - VOC	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137
		Tailings Thickener	Unit Heaters	100	341,214	Nitrogen Oxides	10102-44-0	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
						Carbon Monoxide	630-08-0	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082
						Sulphur Dioxide	SO2 - NA	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - TSP	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
						Particulate Matter	N/A - PM10	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
						Particulate Matter	N/A - PM2.5	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
						VOCs	N/A - VOC	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		Coal Thickener	Unit Heaters	50	170,607	Nitrogen Oxides	10102-44-0	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049
						Carbon Monoxide	630-08-0	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
						Sulphur Dioxide	SO2 - NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						Particulate Matter	N/A - TSP	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
						Particulate Matter	N/A - PM10	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
						Particulate Matter	N/A - PM2.5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						VOCs	N/A - VOC	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Flocculant Shed	Unit Heaters	20	68,243	Nitrogen Oxides	10102-44-0	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
						Carbon Monoxide	630-08-0	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
						Sulphur Dioxide	SO2 - NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						Particulate Matter	N/A - TSP	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - PM10	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - PM2.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						VOCs	N/A - VOC	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Steam Generation Building	Unit Heaters	20	68,243	Nitrogen Oxides	10102-44-0	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
						Carbon Monoxide	630-08-0	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
						Sulphur Dioxide	SO2 - NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						Particulate Matter	N/A - TSP	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - PM10	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - PM2.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						VOCs	N/A - VOC	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
P.16.2	Volume Source - Overland Surge Bin	Overland Surge Bin	Unit Heaters	110	375,336	Nitrogen Oxides	10102-44-0	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107
						Carbon Monoxide	630-08-0	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
						Sulphur Dioxide	SO2 - NA	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						Particulate Matter	N/A - TSP	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
						Particulate Matter	N/A - PM10	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
						Particulate Matter	N/A - PM2.5	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
						VOCs	N/A - VOC	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
P.16.3	Volume Source - Rejects Bin	Rejects Bin	Unit Heaters	50	170,607	Nitrogen Oxides	10102-44-0	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049
						Carbon Monoxide	630-08-0	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
						Sulphur Dioxide	SO2 - NA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
						Particulate Matter	N/A - TSP	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
						Particulate Matter	N/A - PM10	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
						Particulate Matter	N/A - PM2.5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
						VOCs	N/A - VOC	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

P. 16.6- Comfort heating equipment - 24 hr and 1 hr ER

Source ID	Source Description	Contaminant	Cas No.	Emission Rate (g/s)
P.16.1	Volume Source - CPP	Nitrogen Oxides	10102-44-0	3.37E-01
		Carbon Monoxide	630-08-0	2.83E-01
		Sulphur Dioxide	SO2 - NA	2.02E-03
		Particulate Matter	N/A - TSP	2.56E-02
		Particulate Matter	N/A - PM10	1.92E-02
		Particulate Matter	N/A - PM2.5	6.41E-03
		VOCs	-	1.86E-02
		Methane	-	0.00E+00

P. 16.7 - Comfort heating equipment - annual ER

Source ID	Source Description	Contaminant	Cas No.	Emission Rate (g/s)
P.16.1	Volume Source - CPP	Nitrogen Oxides	10102-44-0	2.46E-01
		Carbon Monoxide	630-08-0	2.07E-01
		Sulphur Dioxide	SO2 - NA	1.48E-03
		Particulate Matter	N/A - TSP	1.87E-02
		Particulate Matter	N/A - PM10	1.40E-02
		Particulate Matter	N/A - PM2.5	4.68E-03
		VOCs	-	1.36E-02
		Methane	-	5.67E-03

Calculation Sheet B.16

Fugitive Dust Emissions- On-Road Mobile Equipment

Fugitive Dust Emissions - On-Road Mobile Equipment

Crown Mountain Coking Coal Mine

Description

Emissions from on site unpaved roads were calculated based on AP-42 Chapter 13.2.2 Unpaved Roads (US EPA 2006). Expected contaminants resulting from unpaved roads include particulate matter (PM).

Table F.1.1a - Activity Inputs

Source	Source Description	Equipment Model	Max Operating Speed (mph)	Speed Limit (mph)	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15	Total Miles Travelled	Weighted Average	Mean Vehicle Weight for Source	Notes
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	1.4	31.1	Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2282692	0	243	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	0	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	0		2		
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	0	7750	18315	17267	15420	21069	21118	37470	22128	26462	25041	22117	**18681**	19689	23768	27276	15682	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	0	461	1090	1028	918	1254	1257	2230	1317	1575	1491	1316	**1112**	1172	1415	1624	933	-				
		CAT 994K (Loader)	16.8		Number of trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	0	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	0		1		
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	0	7104	16789	15828	14135	19313	19358	34348	20284	24257	22954	20274	**17124**	18049	21787	25003	14375	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	0	461	1090	1028	918	1254	1257	2230	1317	1575	1491	1316	**1112**	1172	1415	1624	933	-				
		CAT 992K (Loader)	15.4		Number of trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	0	1	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	2	0		4		
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	0	4502	23175	25511	21771	27428	31335	34503	31415	32068	32493	34791	**33992**	33823	23508	33785	18524	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	0	145	746	821	701	883	1009	1111	1011	1032	1046	1120	**1094**	1089	757	1087	596	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	0	1	5	6	6	6	6	6	6	6	6	7	**7**	7	6	6	4	0		5		
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	0	7045	74190	85864	77757	88011	88414	94096	86973	88327	88677	104202	**106676**	107739	88607	92185	50113	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	0	774	8153	9436	8545	9671	9716	10340	9557	9706	9745	11451	**11723**	11839	9737	10130	5507	-				
		CAT D11/D10T (Dozer)	9.1		Number of trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	0	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	0		0		
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	0	6602	14413	17093	15922	17131	16511	19185	15103	17310	16821	21214	**21379**	21848	19041	19041	9764	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	0	462	1008	1195	1113	1198	1155	1342	1056	1210	1176	1483	**1495**	1528	1332	1332	683	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 24M (Grader)	25.4		Number of Units	Count	0	1	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	2	0		3		
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	0	6116	60529	65745	53322	72086	83472	91016	77881	83889	84274	90482	**87480**	87318	56523	90687	47412	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	0	241	2383	2588	2099	2838	3286	3583	3066	3303	3318	3562	**3444**	3438	2225	3570	1867	-				
		CAT 24M (Grader)	25.4		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	0	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	0		1		
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	0	42139	44847	44352	41416	42496	36740	33610	36584	35851	34743	36045	**35725**	34155	33692	39941	19002	-				
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	0	1356	1443	1428	1333	1368	1183	1082	1178	1154	1118	1160	**1150**	1099	1084	1286	612	-				
		CAT 16M (Grader)	31.1		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	0	10	17	17	15	16	18	20	18	18	19	20	**20**	19	15	20	11	0		210		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	0	83211	763407	828209	694783	910273	1054913	1170744	1058522	1074133	1092035	1154382	**1124923**	1118809	771319	1130045	619485	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	0	2678	24572	26657	22363	29299	33954	37683	34071	34573	35149	37156	**36208**	36011	24826	36373	19939	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	0	2	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	2	0		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	0	27054	4590	8590	4809	12181	9320	2138	3463	11284	7845	7637	**8891**	3610	2729	11009	2275	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	0	1816	308	577	323	818	626	144	232	757	527	513	**597**	242	183	739	153	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	0	8	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	0	108215	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	0	7263	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	0	3	5	5	4	4	4	4	4	4	4	4	**4**	4	4	4	4	0		15		
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	565020	565020	565020	565020	565020	565020	565020	565020	565020	565020	565020	565,020.00	565020	565020	565020	565020	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0				
		Western Star 6900XD (Haul Truck)	31.1		Number of Trips	trips/day	86	86	86	86	86	86	86	86	86	86	86	86	**86**	86	86	86	86	86				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	0	2	4	4	4	4	4	4	4	4	4	4	**4**	4	4	4	2	0		0		
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Trips	trips/day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
		Pick-up Trucks	100.0		Number of Units	Count	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1		
		Pick-up Trucks	100.0		Distance travelled	mi/year	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800	262800				
		Pick-up Trucks	100.0		Number of Hours	hr/year	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457				
		Pick-up Trucks	100.0		Number of Trips	trips/day	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40				
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	1.4	9.3	Number of Units	Count	0	0	2	2	2	2	2	0	0	0	0	0	**0**	0	0	0	0	-	0	0	0	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	0	0	15233	18208	13864	7202	600	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	0	0	10880	13006	9903	5144	429	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	0	1	1	1	1	1	1	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	0	7750	18315	17267	13137	8095	658	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	0	461	1090	1028	782	482	39	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	0	1	1	1	1	1	1	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	0	7104	16789	15828	12042	7420	603	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	0	461	1090	1028	782	482	39	0	0	0	0	0	**0**	0	0	0	0	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	0	1	2	2	2	2	2	0	0	0	0	0	**0**	0	0	0	0	-		0		
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	0	4502	23175	25511	18547	10538	976	0	0	0	0	0	**0**	0	0	0	0	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	0	145	746	821	597	339	31	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	0	1	2	2	2	3	3	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	0	13926	80903	110687	84466	45756	3803	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	0	1393	8090	11069	8447	4576	380	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	0	1	5	6	6	6	6	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	0	7045	74190	85864	66242	33814	2753	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	0	774	8153	9436	7279	3716	303	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	0	1	1	1	1	1	1	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	0	6602	14413	17093	13564	6582	514	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	0	462	1008	1195	949	460	36	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 24M (Grader)	25.4		Number of Units	Count	0	1	2	2	2	2	2	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	0	6116	60529	65745	45426	27696	2599	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	0	241	2383	2588	1788	1090	102	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	0	1	1	1	1	1	1	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	0	42139	44847	44352	35283	16327	1144	0	0	0	0	0	**0**	0	0	0	0	-				

		CAT 16M (Grader)	31.1		Number of Hours	hr/year	0	1356	1443	1428	1136	526	37	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	0	10	17	17	15	16	18	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	0	83211	763407	828209	591896	349733	32845	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	0	2678	24572	26657	19051	11257	1057	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	0	2	2	2	2	2	2	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	0	27054	4590	8590	4097	4680	290	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	0	1816	308	577	275	314	19	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	0	8	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	0	108215	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	0	7263	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	0	3	5	5	4	4	4	0	0	0	0	0	**0**	0	0	0	0	-		0		
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	0	40622	207608	236792	179154	67656	4604	0	0	0	0	0	**0**	0	0	0	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	0	1307	6682	7622	5766	2178	148	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	0	2	4	4	4	4	4	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	0	9022	20282	23196	19660	8368	642	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Units	Count	-	-	-	-	-	-	2	2	2	2	2	3	**3**	3	2	2	1	-		16		
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	-	-	8175	17859	18857	17725	18503	25431	**27463**	27713	18940	19172	9849	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	-	-	5839	12756	13469	12660	13217	18165	**19616**	19795	13529	13694	7035	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	-	-	-	-	1	1	1	1	1	1	**1**	1	1	1	1	-		5		
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	-	-	-	-	8958	36086	22128	26462	25041	22117	**18681**	19689	23768	27276	15682	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	-	-	-	-	533	2148	1317	1575	1491	1316	**1112**	1172	1415	1624	933	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	-	-	-	-	1	1	1	1	1	1	**1**	1	1	1	1	-		2		
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	-	-	-	-	8212	33079	20284	24257	22954	20274	**17124**	18049	21787	25003	14375	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	-	-	-	-	533	2148	1317	1575	1491	1316	**1112**	1172	1415	1624	933	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	2	2	2	2	2	2	**2**	2	2	2	2	-		9		
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	13293	33228	31415	32068	32493	34791	**33992**	33823	23508	33785	18524	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	428	1069	1011	1032	1046	1120	**1094**	1089	757	1087	596	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	-	-	3	3	3	3	3	3	**3**	3	3	3	2	-		14		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	-	-	51822	117873	120550	121381	120561	159992	**163031**	161830	123915	124091	66686	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	-	-	5182	11787	12055	12138	12056	15999	**16303**	16183	12391	12409	6669	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	-	-	-	-	6	6	6	6	6	7	**7**	7	6	6	4	-		12		
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	-	-	-	-	37506	90619	86973	88327	88677	104202	**106676**	107739	88607	92185	50113	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	-	-	-	-	4122	9958	9557	9706	9745	11451	**11723**	11839	9737	10130	5507	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	-	-	-	-	1	1	1	1	1	1	**1**	1	1	1	1	-		1		
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	-	-	-	-	4566	12045	9846	11285	10966	13830	**13937**	14244	12414	12414	6365	-				
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	CAT 834 (Rubber Tire Dozer)	14.3	9.3	Number of Hours	hr/year	-	-	-	-	-	-	490	1292	1056	1210	1176	1483	**1495**	1528	1332	1332	683	-	1027608		218	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 24M (Grader)	25.4		Number of Units	Count	-	-	-	-	-	-	2	2	2	2	2	2	**2**	2	2	2	2	-		3		
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	-	-	-	-	12996	32171	28584	30790	30931	33210	**32108**	32048	20746	33285	17402	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	-	-	-	-	1394	3451	3066	3303	3318	3562	**3444**	3438	2225	3570	1867	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	-	-	-	-	1	1	1	1	1	1	**1**	1	1	1	1	-		0		
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	4677	9712	10978	10758	10425	10816	**10720**	10249	10110	11985	5702	-				
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	502	1042	1178	1154	1118	1160	**1150**	1099	1084	1286	612	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	18	20	18	18	19	20	**20**	19	15	20	11	-		140		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	134281	338318	317624	322309	327681	346389	**337549**	335715	231445	339086	185885	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	14404	36290	34071	34573	35149	37156	**36208**	36011	24826	36373	19939	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	2	2	2	2	2	2	**2**	2	2	2	2	-		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	2474	1288	2166	7060	4908	4778	**5563**	2259	1708	6888	1423	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	265	138	232	757	527	513	**597**	242	183	739	153	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	0	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	0	0	0	0	0	0	**0**	0	0	0	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	4	4	4	4	4	4	**4**	4	4	4	4	-		3		
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	18821	32242	37112	35839	42047	41959	**41364**	46144	52060	40037	17073	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	2019	3458	3981	3844	4510	4501	**4437**	4950	5584	4295	1831	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	-	-	-	-	4	4	4	4	4	4	**4**	4	4	4	2	-		15		
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	-	-	81492	180999	198657	203547	199582	219976	**219400**	218476	200956	207469	117784	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	-	-	8741	19415	21309	21834	21409	23596	**23534**	23435	21556	22255	12634	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Units	Count	-	-	-	-	2	2	2	2	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	2410	11542	10496	685	0	0	0	0	**0**	0	0	0	0	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	1721	8245	7497	489	0	0	0	0	**0**	0	0	0	0	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	-	-	1	1	1	1	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	-	-	1267	7200	6382	768	0	0	0	0	**0**	0	0	0	0	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	-	-	136	772	685	82	0	0	0	0	**0**	0	0	0	0	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	-	-	1	1	1	1	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	-	-	1267	7200	6382	768	0	0	0	0	**0**	0	0	0	0	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	-	-	136	772	685	82	0	0	0	0	**0**	0	0	0	0	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	-	-	2	2	2	2	0	0	0	0	**0**	0	0	0	0	-		0		
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	-	-	-	-	967	5068	5121	383	0	0	0	0	**0**	0	0	0	0	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	-	-	104	544	549	41	0	0	0	0	**0**	0	0	0	0	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	2	3	3	3	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	13688	68368	62027	4216	0	0	0	0	**0**	0	0	0	0	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	1468	7334	6653	452	0	0	0	0	**0**	0	0	0	0	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	-	-	6	6	6	6	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	-	-	11515	54196	48155	3477	0	0	0	0	**0**	0	0	0	0	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	-	-	1265	5956	5292	382	0	0	0	0	**0**	0	0	0	0	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	-	-	1	1	1	1	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	-	-	1537	6877	5863	462	0	0	0	0	**0**	0	0	0	0	-				
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	CAT 834 (Rubber Tire Dozer)	14.3	9.3	Number of Hours	hr/year	-	-	-	-	165	738	629	50	0	0	0	0	**0**	0	0	0	0	-	0		0	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 24M (Grader)	25.4		Number of Units	Count	-	-	-	-	2	2	2	2	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	-	-	2898	16293	16686	1234	0	0	0	0	**0**	0	0	0	0	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	-	-	311	1748	1790	132	0	0	0	0	**0**	0	0	0	0	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	-	-	1	1	1	1	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	-	-	1840	7852	6004	373	0	0	0	0	**0**	0	0	0	0	-				
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	-	-	197	842	644	40	0	0	0	0	**0**	0	0	0	0	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	-	-	15	16	18	20	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	-	-	30873	168198	172405	12980	0	0	0	0	**0**	0	0	0	0	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	-	-	3312	18042	18493	1392	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	2	2	2	2	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	446	4693	3176	49	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	48	503	341	5	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	0	0	0	0	0	0	0	0	**0**	0	0	0	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	-	-	4	4	4	4	0	0	0	0	**0**	0	0	0	0	-		0		
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	-	-	9345	32538	24164	1237	0	0	0	0	**0**	0	0	0	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	-	-	1002	3490	2592	133	0	0	0	0	**0**	0	0	0	0	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	-	-	4	4	4	4	0	0	0	0	**0**	0	0	0	0	-		0		
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	31859	125034	104628	6944	0	0	0	0	**0**	0	0	0	0	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	3417	13412	11223	745	0	0	0	0	**0**	0	0	0	0	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Units	Count	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-		0		
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-		0		
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	10163	9582	8557	11691	11718	-	-	-	-	-	-	-	-	-	-	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	1090	1028	918	1254	1257	-	-	-	-	-	-	-	-	-	-	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-		0		
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	10163	9582	8557	11691	11718	-	-	-	-	-	-	-	-	-	-	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	1090	1028	918	1254	1257	-	-	-	-	-	-	-	-	-	-	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-				

F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	Komatsu HD1500 (Water Truck)	31.1	9.3	Distance travelled	mi/year	-	-	6954	7655	6533	8230	9403	-	-	-	-	-	-	-	-	-	-	0	0	0	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	746	821	701	883	1009	-	-	-	-	-	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-		0		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	5	6	6	6	6	-	-	-	-	-	-	-	-	-	-		0		
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	74190	85864	77757	88011	88414	-	-	-	-	-	-	-	-	-	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	8153	9436	8545	9671	9716	-	-	-	-	-	-	-	-	-	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-		0		
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	9396	11143	10380	11168	10764	-	-	-	-	-	-	-	-	-	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	-	-	1008	1195	1113	1198	1155	-	-	-	-	-	-	-	-	-	-				
		CAT 24M (Grader)	25.4		Number of Units	Count	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-		0		
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	22216	24131	19571	26458	30637	-	-	-	-	-	-	-	-	-	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	2383	2588	2099	2838	3286	-	-	-	-	-	-	-	-	-	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-		0		
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	13457	13308	12427	12752	11024	-	-	-	-	-	-	-	-	-	-				
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	1443	1428	1333	1368	1183	-	-	-	-	-	-	-	-	-	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	17	17	15	16	18	-	-	-	-	-	-	-	-	-	-		0		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	229071	248516	208480	273140	316542	-	-	-	-	-	-	-	-	-	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	24572	26657	22363	29299	33954	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	2872	5375	3009	7621	5831	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	308	577	323	818	626	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	5	5	4	4	4	-	-	-	-	-	-	-	-	-	-		0		
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	21934	27305	27827	22911	19402	-	-	-	-	-	-	-	-	-	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	2353	2929	2985	2458	2081	-	-	-	-	-	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-		0		
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-				
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	1.4	9.3	Number of Units	Count	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	0	0	0	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	0	0	0	
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	-	-	-	-	-	20793	12279	14684	13896	12273	-	-	-	-	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	-	-	-	-	-	2230	1317	1575	1491	1316	-	-	-	-	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	0	0	0	
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	-	-	-	-	-	20793	12279	14684	13896	12273	-	-	-	-	-				
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	-	-	-	-	-	2230	1317	1575	1491	1316	-	-	-	-	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	0	0	0	
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	10353	9427	9622	9750	10440	-	-	-	-	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	1111	1011	1032	1046	1120	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	0	0	0	
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	-	-	-	-	-	6	6	6	6	7	-	-	-	-	-	0	0	0	
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	-	-	-	-	-	94096	86973	88327	88677	104202	-	-	-	-	-				
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	-	-	-	-	-	10340	9557	9706	9745	11451	-	-	-	-	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	0	0	0	
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	-	-	-	-	-	12508	9846	11285	10966	13830	-	-	-	-	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	-	-	-	-	-	-	-	1342	1056	1210	1176	1483	-	-	-	-	-				
		CAT 24M (Grader)	25.4		Number of Units	Count	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	0	0	0	
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	-	-	-	-	-	33406	28584	30790	30931	33210	-	-	-	-	-				
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	-	-	-	-	-	3583	3066	3303	3318	3562	-	-	-	-	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	0	0	0	
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	10085	10978	10758	10425	10816	-	-	-	-	-				
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	1082	1178	1154	1118	1160	-	-	-	-	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	20	18	18	19	20	-	-	-	-	-	0	0	0	
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	351298	317624	322309	327681	346389	-	-	-	-	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	37683	34071	34573	35149	37156	-	-	-	-	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	0	0	0	
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	1338	2166	7060	4908	4778	-	-	-	-	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	144	232	757	527	513	-	-	-	-	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	0	0	0	
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	4	4	4	4	4	-	-	-	-	-	0	0	0	
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	14175	17074	15614	18240	19590	-	-	-	-	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	1521	1831	1675	1957	2101	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	0	0	0	
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-				
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	1.4	9.3	Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-	557103	301	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**1**	1	1	1	-	-			
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**10366**	10926	13189	15136	-	-			
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**1112**	1172	1415	1624	-	-			
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**1**	1	1	1	-	-			
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**10366**	10926	13189	15136	-	-			
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**1112**	1172	1415	1624	-	-			
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**2**	2	2	2	-	-			
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**10200**	10149	7054	10138	-	-			
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**1094**	1089	757	1087	-	-			
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**7**	7	6	6	-	-			
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**106676**	107739	88607	92185	-	-			
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**11723**	11839	9737	10130	-	-			
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**1**	1	1	1	-	-			
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**13937**	14244	12414	12414	-	-			
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**1495**	1528	1332	1332	-	-			
		CAT 24M (Grader)	25.4		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**2**	2	2	2	-	-			
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**32108**	32048	20746	33285	-	-			
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**3444**	3438	2225	3570	-	-			
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**1**	1	1	1	-	-			
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**10720**	10249	10110	11985	-	-			
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**1150**	1099	1084	1286	-	-			
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**20**	19	15	20	-	-			
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**337549**	335715	231445	339086	-	-			
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**36208**	36011	24826	36373	-	-			
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**2**	2	2	2	-	-			
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**5563**	2259	1708	6888	-	-			
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**597**	242	183	739	-	-			
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**4**	4	4	4	-	-			
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**19616**	21491	22776	17405	-	-			
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**2104**	2305	2443	1867	-	-			

		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-			
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-		0		
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	**0**	0	0	0	-	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-		0		
		CAT 6050/Komatsu PC5500 (Excavator)	1.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT 994K (Loader)	16.8		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-				
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8702	-		0		
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	933	-				
		CAT 992K (Loader)	15.4		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-				
		CAT 992K (Loader)	15.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8702	-		0		
		CAT 992K (Loader)	15.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	933	-				
		Komatsu HD1500 (Water Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-				
		Komatsu HD1500 (Water Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5559	-		0		
		Komatsu HD1500 (Water Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	596	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-		0		
		CAT MD6250/Pit Viper PV-275 (Drill)	10.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT D11/D10T (Dozer)	9.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-				
		CAT D11/D10T (Dozer)	9.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50113	-		0		
		CAT D11/D10T (Dozer)	9.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5507	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-				
		CAT 834 (Rubber Tire Dozer)	14.3		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6365	-		0		
		CAT 834 (Rubber Tire Dozer)	14.3		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	683	-				
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	CAT 24M (Grader)	25.4	9.3	Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	0	0	0	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean Vehicle Weight based on Year 11 Data.
		CAT 24M (Grader)	25.4		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17402	-		0		
		CAT 24M (Grader)	25.4		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1867	-				
		CAT 16M (Grader)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-				
		CAT 16M (Grader)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5702	-		0		
		CAT 16M (Grader)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	612	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-				
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	185885	-		0		
		CAT 793F/Komatsu 830E (Dump Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19939	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-				
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1423	-		0		
		CAT 740 - Buy (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	153	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-		0		
		CAT 740 - Rent (Articulated Dump Truck)	14.9		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-				
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7489	-		0		
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803	-				
		CAT 390D (Backhoe)	0.0		Number of Units	Count	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
		CAT 390D (Backhoe)	0.0		Distance travelled	mi/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-		0		
		CAT 390D (Backhoe)	0.0		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-				
F.1.6	Mobile Equipment Fugitive Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	31.1	9.3	Number of Units	Count	0	3	5	5	4	4	4	4	4	4	4	4	**4**	4	4	4	4	-	81666	63	63	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean
		Western Star 6900XD (Haul Truck)	31.1		Distance travelled	mi/year	0	81666	81666	81666	81666	81666	81666	81666	81666	81666	81666	81666	**81666**	81666	81666	81666	81666	-				
		Western Star 6900XD (Haul Truck)	31.1		Number of Hours	hr/year	0	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	**8760**	8760	8760	8760	8760	-				
F.1.7	Mobile Equipment Fugitive Emissions from CPP Area	CAT 994K (Loader)	16.8	9.3	Number of Units	Count	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	-	46613	267	267	Distance Travelled Estimated from Number of trips (provided by client) and estimated length of Haul Road. Mean
		CAT 994K (Loader)	16.8		Distance travelled	mi/year	0	0	46613	46613	46613	46613	46613	46613	46613	46613	46613	46613	**46613**	46613	46613	46613	46613	-				
		CAT 994K (Loader)	16.8		Number of Hours	hr/year	0	0	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	**5000**	5000	5000	5000	5000	-				

Table F.1.1c -Equipment information

Equipment Model	Equipment	Maximum Speed (mph)	Notes	Reference
CAT 6050/Komatsu PC5500 (Excavator)	591.9	1.4		https://www.cat.com/en_US/products/new/equipment/hydraulic-mining-shovels/hydraulic-mining-shovels/18560111.html=
CAT 994K (Loader)	267.4	16.8		https://www.cat.com/en_US/products/new/equipment/wheel-loaders/large-wheel-loaders/1000001147.html=
CAT 992K (Loader)	110.0	15.4		https://www.constructionequipmentguide.com/charts/excavators
Komatsu HD1500 (Water Truck)	275.0	31.1		https://www.komatsuamerica.com/equipment/trucks/mechanical/hd1500-7
CAT MD6250/Pit Viper PV-275 (Drill)	86.5	10.0	weight of tower plus main frame	https://www.epiroc.com/en-za/products/drill-rigs/surface-blasthole-drill-rigs/pv-275
CAT D11/D10T (Dozer)	114.9	9.1		https://www.cat.com/en_US/products/new/equipment/dozers/large-dozers/272975224004687 2.html
CAT 834 (Rubber Tire Dozer)	52.6	14.3		https://www.cat.com/en_US/products/new/equipment/wheel-dozers/wheel-dozers/18483684.html
CAT 24M (Grader)	80.8	25.4		https://www.cat.com/en_US/products/new/equipment/motor-graders/motor-graders/1000034758.html
CAT 16M (Grader)	35.7	31.1		https://drive.google.com/drive/folders/1_gr9Dd3D-etlMVqcYWeTPKeVBTy6NL1t
CAT 793F/Komatsu 830E (Dump Truck)	425.5	31.1		https://www.cat.com/en_US/products/new/equipment/off-highway-trucks/mining-trucks/18092621.html
CAT 740 - Buy (Articulated Dump Truck)	75.7	14.9		https://www.cat.com/en_US/products/new/equipment/articulated-trucks/three-axle-articulated-trucks/302717362097310.html
CAT 740 - Rent (Articulated Dump Truck)	75.7	14.9		https://www.cat.com/en_US/products/new/equipment/articulated-trucks/three-axle-articulated-trucks/302717362097310.html
Western Star 6900XD (Haul Truck)	62.6	31.1	This is the Laden weight (includes loaded material) in Metric Tonnes	https://www.westernstartrucks.com/_Assets/Brochures/40TonDumpBrochure.pdf
Pick-up Trucks	7.5	100.0	Assumed Ford F250 super duty, F-250 SRW, 6.7-liter, crew cab.	https://media.ford.com/content/dam/fordmedia/North%20America/US/product/2020/f-series-super-duty/2020-Super-Duty-Tech-Specs.pdf
CAT 390D (Backhoe)	68.0		Metric tonnes	https://machine.market/specification-23701

Table F.1.2 - Emission Factors - Year 11

Source	Source Descripti	Mean Equipment Weight (tons)	Contaminant	Emission Factor Unit	Emission Factor based on Average Vehicle Weight for Year 11)	Reference
F.1.1	Mobile Equipment	243	TSP	lb/VMT	23.5	US EPA AP-42 Chapter 13.2.2, Equation (1a)
			PM10	lb/VMT	6.7	
			PM2.5	lb/VMT	0.7	
F.1.2	Mobile Equipment	0	TSP	lb/VMT	0.0	
			PM10	lb/VMT	0.0	
			PM2.5	lb/VMT	0.0	
F.1.3	Mobile Equipment	218	TSP	lb/VMT	22.3	
			PM10	lb/VMT	6.4	
			PM2.5	lb/VMT	0.6	
F.1.4	Mobile Equipment	0	TSP	lb/VMT	0.0	
			PM10	lb/VMT	0.0	
			PM2.5	lb/VMT	0.0	
F.1.5a	Mobile Equipment	0	TSP	lb/VMT	0.0	
			PM10	lb/VMT	0.0	
			PM2.5	lb/VMT	0.0	
F.1.5b	Mobile Equipment	0	TSP	lb/VMT	0.0	
			PM10	lb/VMT	0.0	
			PM2.5	lb/VMT	0.0	
F.1.5c	Mobile Equipment	301	TSP	lb/VMT	25.8	
			PM10	lb/VMT	7.4	
			PM2.5	lb/VMT	0.7	
F.1.5d	Mobile Equipment	0	TSP	lb/VMT	0.0	
			PM10	lb/VMT	0.0	
			PM2.5	lb/VMT	0.0	
F.1.6	Mobile Equipment	63	TSP	lb/VMT	9.0	
			PM10	lb/VMT	2.3	
			PM2.5	lb/VMT	0.2	
F.1.7	Mobile Equipment	267	TSP	lb/VMT	17.3	
			PM10	lb/VMT	4.5	
			PM2.5	lb/VMT	0.4	

Table F.1.3 - Conversion Factors

Conversion	Value
g/kg	1000
g/tonnes	1E-06
s/yr	3.2E+07
s/day	86400
s/hr	3600
mile/km	0.62137
lb/VMT to g/VKT	281.9
g/lb	453.592
lb/ton	2000
mi/km	0.62137

Table F.1.4a - Maximum 24-hr Emission Rates (Using Year 11 Mean Vehicle Weights) (Uncontrolled)

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	g/s	479	479	479	479	479	479	479	479	479	479	479	479	**479**	479	479	479	479	479
		PM10	g/s	136	136	136	136	136	136	136	136	136	136	136	136	**136**	136	136	136	136	136
		PM2.5	g/s	14	14	14	14	14	14	14	14	14	14	14	14	**14**	14	14	14	14	14
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	g/s	205	205	205	205	205	205	205	205	205	205	205	205	**205**	205	205	205	205	205
		PM10	g/s	58	58	58	58	58	58	58	58	58	58	58	58	**58**	58	58	58	58	58
		PM2.5	g/s	6	6	6	6	6	6	6	6	6	6	6	6	**6**	6	6	6	6	6
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	g/s	129	129	129	129	129	129	129	129	129	129	129	129	**129**	129	129	129	129	129
		PM10	g/s	37	37	37	37	37	37	37	37	37	37	37	37	**37**	37	37	37	37	37
		PM2.5	g/s	4	4	4	4	4	4	4	4	4	4	4	4	**4**	4	4	4	4	4
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	g/s	7	7	7	7	7	7	7	7	7	7	7	7	**7**	7	7	7	7	7
		PM10	g/s	2	2	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	2	2
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	g/s	7	7	7	7	7	7	7	7	7	7	7	7	**7**	7	7	7	7	7
		PM10	g/s	2	2	2	2	2	2	2	2	2	2	2	2	**2**	2	2	2	2	2
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0

Table F.1.4b - Maximum Annual Emission Rates (Uncontrolled)

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	g/s	479	479	479	479	479	479	479	479	479	479	479	479	**479**	479	479	479	479	479
		PM2.5	g/s	14	14	14	14	14	14	14	14	14	14	14	14	**14**	14	14	14	14	14
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	g/s	205	205	205	205	205	205	205	205	205	205	205	205	**205**	205	205	205	205	205
		PM2.5	g/s	6	6	6	6	6	6	6	6	6	6	6	6	**6**	6	6	6	6	6
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	g/s	129	129	129	129	129	129	129	129	129	129	129	129	**129**	129	129	129	129	129
		PM2.5	g/s	4	4	4	4	4	4	4	4	4	4	4	4	**4**	4	4	4	4	4
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	g/s	7	7	7	7	7	7	7	7	7	7	7	7	**7**	7	7	7	7	7
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	g/s	7	7	7	7	7	7	7	7	7	7	7	7	**7**	7	7	7	7	7
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0

Notes:
Emission factor equation sourced from AP-42 Chapter 13.2.2 (US EPA 2006). Equation (1a) applied.
Maximum emission rates for a 1-hr averaging period were calculated based on a worst-case emission scenario which assumes a maximum vehicle activity per hour.

Table F.1.4c - Maximum Annual Emission Rates in tonnes/year (Uncontrolled)

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	tonnes/year	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092	15092
		PM10	tonnes/year	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302	4302
		PM2.5	tonnes/year	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	tonnes/year	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471	6471
		PM10	tonnes/year	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845	1845
		PM2.5	tonnes/year	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	tonnes/year	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059	4059
		PM10	tonnes/year	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157	1157
		PM2.5	tonnes/year	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116	116
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	tonnes/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	tonnes/year	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207	207
		PM10	tonnes/year	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
		PM2.5	tonnes/year	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34	5.34
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	tonnes/year	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227	227
		PM10	tonnes/year	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
		PM2.5	tonnes/year	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85

Table F.1.4d - Maximum Annual Emission Rates - 75% dust reduction applied

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	g/s	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
		PM10	g/s	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1
		PM2.5	g/s	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	g/s	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30
		PM10	g/s	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62
		PM2.5	g/s	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	g/s	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18
		PM10	g/s	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17
		PM2.5	g/s	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	g/s	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
		PM10	g/s	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
		PM2.5	g/s	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	g/s	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
		PM10	g/s	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
		PM2.5	g/s	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Table F.1.4e - Maximum Annual Emission Rates in tonnes/year - 75% dust reduction applied

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	tonnes/year	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773	3,773
		PM10	tonnes/year	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075
		PM2.5	tonnes/year	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	tonnes/year	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618	1,618
		PM10	tonnes/year	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461	461
		PM2.5	tonnes/year	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12	46.12
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	tonnes/year	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015
		PM10	tonnes/year	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289	289
		PM2.5	tonnes/year	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92	28.92
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	tonnes/year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	tonnes/year	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70	51.70
		PM10	tonnes/year	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34	13.34
		PM2.5	tonnes/year	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	tonnes/year	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73	56.73
		PM10	tonnes/year	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63	14.63
		PM2.5	tonnes/year	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46

Table F.1.4f - Maximum 24-hr Emission Rates (Using Year 11 Mean Vehicle Weights) - 75% dust reduction applied

Source	Source Description	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 15
F.1.1	Mobile Equipment Fugitive Emissions from Haul Road	TSP	g/s	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
		PM10	g/s	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10
		PM2.5	g/s	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41
F.1.2	Mobile Equipment Fugitive Emissions from North Pit	TSP	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PM10	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		PM2.5	g/s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F.1.3	Mobile Equipment Fugitive Emissions from South Pit	TSP	g/s	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30
		PM10	g/s	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62	14.62
		PM2.5	g/s	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46
F.1.4	Mobile Equipment Fugitive Emissions from East Pit	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5a	Mobile Equipment Fugitive Emissions from Waste Pit (Years 1-5)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5b	Mobile Equipment Fugitive Emissions from Waste Pit (Years 6-10)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.5c	Mobile Equipment Fugitive Emissions from Waste Pit (Years 11-14)	TSP	g/s	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18	32.18
		PM10	g/s	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17	9.17
		PM2.5	g/s	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
F.1.5d	Mobile Equipment Fugitive Emissions from Waste Pit (Year 15)	TSP	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM10	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PM2.5	g/s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
F.1.6	Fugitive Emissions from Mobile Equipment - Rail Loadout Area	TSP	g/s	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
		PM10	g/s	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
		PM2.5	g/s	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
F.1.7	Fugitive Emissions from Mobile Equipment - CPP Area	TSP	g/s	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
		PM10	g/s	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
		PM2.5	g/s	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Calculation Sheet - B.17

Mobile Equipment Emissions

Mobile Equipment Emissions

Crown Mountain Coking Coal Mine

Description

Emissions from mobile equipment were calculated based on the US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d" (US EPA July 2010). Expected contaminants resulting from blasting activities include particulate matter (PM).

Table M.1.1a - Activity Inputs

Source	Source Description	Equipment Model	Equipment Description	Parameter	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	0	1,384	3,271	3,083	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 994K (Loader)		Number of Hours	hr/year	0.00	461.33	1,090.17	1,027.81	917.87	1,254.11	1,257.00	2,230.37	1,317.16	1,575.13	1,490.54	1,316.47	1,111.97	1,171.99	1,414.76	1,623.60	933.45	-
		CAT 994K (Loader)		Number of Units	#	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	0	1,384	3,271	3,083	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 992K (Loader)		Number of Hours	hr/year	0.00	461.33	1,090.17	1,027.81	917.87	1,254.11	1,257.00	2,230.37	1,317.16	1,575.13	1,490.54	1,316.47	1,111.97	1,171.99	1,414.76	1,623.60	933.45	-
		CAT 992K (Loader)		Number of Units	#	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	0	435	2,238	2,463	2,102	2,648	3,026	3,332	3,033	3,096	3,138	3,359	3,282	3,266	2,270	3,262	1,789	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	0.00	144.91	745.93	821.11	700.73	882.83	1,008.59	1,110.53	1,011.15	1,032.16	1,045.83	1,119.82	1,094.10	1,088.66	756.64	1,087.44	596.24	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	0	2,323	24,458	28,307	25,634	29,014	29,147	31,021	28,672	29,119	29,234	34,352	35,168	35,518	29,211	30,391	16,521	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	0.00	774.20	8,152.79	9,435.56	8,544.69	9,671.50	9,715.78	10,340.22	9,557.42	9,706.30	9,744.74	11,450.72	11,722.66	11,839.45	9,737.08	10,130.25	5,506.93	-
		CAT D11/D10T (Dozer)		Number of Units	#	0	1	5	6	6	6	6	6	6	6	6	7	7	7	6	6	4	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	0	1,385	3,024	3,586	3,340	3,594	3,464	4,025	3,168	3,631	3,529	4,450	4,485	4,584	3,995	3,995	2,048	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	0.00	461.68	1,007.90	1,195.30	1,113.39	1,197.95	1,154.62	1,341.64	1,056.15	1,210.48	1,176.31	1,483.50	1,495.01	1,527.86	1,331.56	1,331.56	682.78	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	0	722	7,149	7,765	6,298	8,514	9,859	10,750	9,198	9,908	9,954	10,687	10,332	10,313	6,676	10,711	5,600	-
		CAT 24M (Grader)		Number of Hours	hr/year	0.00	240.80	2,383.03	2,588.40	2,099.29	2,838.05	3,286.29	3,583.31	3,066.16	3,302.71	3,317.86	3,562.28	3,444.11	3,437.70	2,225.31	3,570.34	1,866.63	-
		CAT 24M (Grader)		Number of Units	#	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	0	4,069	4,330	4,283	3,999	4,103	3,548	3,245	3,533	3,462	3,355	3,481	3,450	3,298	3,253	3,857	1,835	-
		CAT 16M (Grader)		Number of Hours	hr/year	0.00	1,356.31	1,443.48	1,427.54	1,333.05	1,367.81	1,182.53	1,081.79	1,177.53	1,153.94	1,118.28	1,160.17	1,149.89	1,099.33	1,084.44	1,285.58	611.63	-
		CAT 16M (Grader)		Number of Units	#	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	8,035	73,715	79,972	67,089	87,897	101,863	113,048	102,212	103,719	105,448	111,468	108,623	108,033	74,479	109,118	59,818	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	0.00	2,678.31	24,571.69	26,657.47	22,362.91	29,298.86	33,954.38	37,682.61	34,070.52	34,573.01	35,149.21	37,155.98	36,207.76	36,010.98	24,826.36	36,372.64	19,939.28	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	0	10	17	17	15	16	18	20	18	18	19	20	20	19	15	20	11	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	5,447	924	1,730	968	2,453	1,877	431	697	2,272	1,580	1,538	1,790	727	549	2,217	458	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	0.00	1,815.69	308.09	576.51	322.78	817.51	625.51	143.50	232.39	757.34	526.51	512.55	596.74	242.31	183.16	738.86	152.68	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	21,788	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	0	7,262.74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		Pick-up Trucks	Pick-up Trucks	Number of Annual Operating Hours	hr/year	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	-
		Pick-up Trucks		Number of Hours	hr/year	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	8457	-
		Pick-up Trucks		Number of Units	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	0	3,496	24,182	23,284	21,943	21,570	18,282	17,309	19,031	17,425	17,211	18,079	17,691	17,446	17,277	20,096	7,893	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	0.00	1,843.70	15,147.10	12,733.22	12,189.74	13,444.17	11,441.38	12,197.62	13,218.40	11,906.12	10,744.50	11,476.51	11,150.22	10,191.46	9,249.23	13,934.45	5,258.71	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	0	3	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	umber of Annual Operating Hours in North P	hr/year	0.00	0.00	10,880.43	13,005.50	9,902.50	5,143.99	428.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		0.00	0.00	10,880.43	13,005.50	9,902.50	5,143.99	428.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	0	0	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	0	1,384	3,271	3,083	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 994K (Loader)		Number of Hours	hr/year	0.00	461.33	1,090.17	1,027.81	781.95	481.84	39.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)		Number of Units	#	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	0	1,384	3,271	3,083	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 992K (Loader)		Number of Hours	hr/year	0.00	461.33	1,090.17	1,027.81	781.95	481.84	39.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)		Number of Units	#	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	0	435	2,238	2,463	2,102	2,648	3,026	3,332	3,033	3,096	3,138	3,359	3,282	3,266	2,270	3,262	1,789	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	0.00	144.91	745.93	821.11	596.96	339.19	31.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	0	1	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	umber of Annual Operating Hours in North P	hr/year	0.00	1,392.58	8,090.30	11,068.66	8,446.56	4,575.62	380.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		0.00	1,392.58	8,090.30	11,068.66	8,446.56	4,575.62	380.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	0	1	2	2	2	3	3	0	0	0	0	0	0	0	0	0	0	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	0	2,323	24,458	28,307	25,634	29,014	29,147	31,021	28,672	29,119	29,234	34,352	35,168	35,518	29,211	30,391	16,521	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	0.00	774.20	8,152.79	9,435.56	7,279.35	3,715.85	302.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)		Number of Units	#	0	1	5	6	6	6	6	0	0	0	0	0	0	0	0	0	0	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	0	1,385	3,024	3,586	3,340	3,594	3,464	4,025	3,168	3,631	3,529	4,450	4,485	4,584	3,995	3,995	2,048	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	0.00	461.68	1,007.90	1,195.30	948.51	460.26	35.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	0	722	7,149	7,765	6,298	8,514	9,859	10,750	9,198	9,908	9,954	10,687	10,332	10,313	6,676	10,711	5,600	-
		CAT 24M (Grader)		Number of Hours	hr/year	0.00	240.80	2,383.03	2,588.40	1,788.42	1,090.40	102.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)		Number of Units	#	0	1	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	0	4,069	4,330	4,283	3,999	4,103	3,548	3,245	3,533	3,462	3,355	3,481	3,450	3,298	3,253	3,857	1,835	-
		CAT 16M (Grader)		Number of Hours	hr/year	0.00	1,356.31	1,443.48	1,427.54	1,135.64	525.52	36.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)		Number of Units	#	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	8,035	73,715	79,972	67,089	87,897	101,863	113,048	102,212	103,719	105,448	111,468	108,623	108,033	74,479	109,118	59,818	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	0.00	2,678.31	24,571.69	26,657.47	19,051.28	11,256.81	1,057.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	0	10	17	17	15	16	18	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	5,447	924	1,730	968	2,453	1,877	431	697	2,272	1,580	1,538	1,790	727	549	2,217	458	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	0.00	1,815.69	308.09	576.51	274.98	314.09	19.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	0	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	0	21,788	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	0	7,262.74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	0	3,496	24,182	23,284	21,943	21,570	18,282	17,309	19,031	17,425	17,211	18,079	17,691	17,446	17,277	20,096	7,893	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	0.00	1,307.48	6,682.24	7,621.59	5,766.40	2,177.63	148.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	0	3	5	5	4	4	4	0	0	0	0	0	0	0	0	0	0	-
		CAT 390D (Backhoe)	Backhoe/excavator	umber of Annual Operating Hours in North P	hr/year	0.00	9,021.64	20,281.97	23,196.19	19,659.82	8,367.99	641.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)		Number of Hours		0.00	9,021.64	20,281.97	23,196.19	19,659.82	8,367.99	641.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)		Number of Units	#	0	2	4	4	4	4	4	0	0	0	0	0	0	0	0	0	0	-

M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	umber of Annual Operating Hours in South P	hr/year	-	-	-	-	-	-	5,839.42	12,756.08	13,469.13	12,660.39	13,216.74	18,165.35	19,616.08	19,794.72	13,528.87	13,694.02	7,034.73	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	-	-	-	-	5,839.42	12,756.08	13,469.13	12,660.39	13,216.74	18,165.35	19,616.08	19,794.72	13,528.87	13,694.02	7,034.73	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-	-	-	-	-	2	2	2	2	2	3	3	3	2	2	1	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	533.23	2,147.96	1,317.16	1,575.13	1,490.54	1,316.47	1,111.97	1,171.99	1,414.76	1,623.60	933.45	-
		CAT 994K (Loader)		Number of Units	#	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	533.23	2,147.96	1,317.16	1,575.13	1,490.54	1,316.47	1,111.97	1,171.99	1,414.76	1,623.60	933.45	-
		CAT 992K (Loader)		Number of Units	#	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	3,026	3,332	3,033	3,096	3,138	3,359	3,282	3,266	2,270	3,262	1,789	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	-	-	-	-	427.86	1,069.50	1,011.15	1,032.16	1,045.83	1,119.82	1,094.10	1,088.66	756.64	1,087.44	596.24	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	umber of Annual Operating Hours in South P	hr/year	-	-	-	-	-	-	5,182.20	11,787.34	12,054.97	12,138.08	12,056.09	15,999.23	16,303.09	16,183.02	12,391.47	12,409.08	6,668.62	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	-	-	-	-	5,182.20	11,787.34	12,054.97	12,138.08	12,056.09	15,999.23	16,303.09	16,183.02	12,391.47	12,409.08	6,668.62	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-	-	-	-	-	3	3	3	3	3	3	3	3	3	3	2	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	29,147	31,021	28,672	29,119	29,234	34,352	35,168	35,518	29,211	30,391	16,521	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	4,121.56	9,958.16	9,557.42	9,706.30	9,744.74	11,450.72	11,722.66	11,839.45	9,737.08	10,130.25	5,506.93	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	-	-	-	-	6	6	6	6	6	7	7	7	6	6	4	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	3,464	4,025	3,168	3,631	3,529	4,450	4,485	4,584	3,995	3,995	2,048	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	489.80	1,292.07	1,056.15	1,210.48	1,176.31	1,483.50	1,495.01	1,527.86	1,331.56	1,331.56	682.78	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	9,859	10,750	9,198	9,908	9,954	10,687	10,332	10,313	6,676	10,711	5,600	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	1,394.09	3,450.91	3,066.16	3,302.71	3,317.86	3,562.28	3,444.11	3,437.70	2,225.31	3,570.34	1,866.63	-
		CAT 24M (Grader)		Number of Units	#	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	3,548	3,245	3,533	3,462	3,355	3,481	3,450	3,298	3,253	3,857	1,835	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	501.65	1,041.82	1,177.53	1,153.94	1,118.28	1,160.17	1,149.89	1,099.33	1,084.44	1,285.58	611.63	-
		CAT 16M (Grader)		Number of Units	#	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	101,863	113,048	102,212	103,719	105,448	111,468	108,623	108,033	74,479	109,118	59,818	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	14,403.89	36,290.27	34,070.52	34,573.01	35,149.21	37,155.98	36,207.76	36,010.98	24,826.36	36,372.64	19,939.28	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	-	-	-	-	18	20	18	18	19	20	20	19	15	20	11	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	1,877	431	697	2,272	1,580	1,538	1,790	727	549	2,217	458	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	265.35	138.20	232.39	757.34	526.51	512.55	596.74	242.31	183.16	738.86	152.68	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	18,282	17,309	19,031	17,425	17,211	18,079	17,691	17,446	17,277	20,096	7,893	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	-	-	-	-	2,018.84	3,458.48	3,980.91	3,844.36	4,510.22	4,500.85	4,436.93	4,949.67	5,584.31	4,294.65	1,831.41	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	-	-	-	-	4	4	4	4	4	4	4	4	4	4	4	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	8,741.37	19,415.12	21,309.28	21,833.80	21,408.53	23,596.12	23,534.31	23,435.18	21,555.92	22,254.55	12,634.24	-
		CAT 390D (Backhoe)		Number of Hours		-	-	-	-	-	-	8,741.37	19,415.12	21,309.28	21,833.80	21,408.53	23,596.12	23,534.31	23,435.18	21,555.92	22,254.55	12,634.24	-
		CAT 390D (Backhoe)		Number of Units	#	-	-	-	-	-	-	4	4	4	4	4	4	4	4	4	4	2	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	Number of Annual Operating Hours in East Pi	hr/year	-	-	-	-	1,721.32	8,244.62	7,497.29	489.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	-	-	1,721.32	8,244.62	7,497.29	489.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-	-	-	2	2	2	2	0	0	0	0	0	0	0	0	0	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	-	-	135.92	772.27	684.63	82.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)		Number of Units	#	-	-	-	-	1	1	1	1	0	0	0	0	0	0	0	0	0	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	2,754	3,762	3,771	6,691	3,951	4,725	4,472	3,949	3,336	3,516	4,244	4,871	2,800	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	-	-	135.92	772.27	684.63	82.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)		Number of Units	#	-	-	-	-	1	1	1	1	0	0	0	0	0	0	0	0	0	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	2,102	2,648	3,026	3,332	3,033	3,096	3,138	3,359	3,282	3,266	2,270	3,262	1,789	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	-	-	103.77	543.64	549.33	41.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	-	-	2	2	2	2	0	0	0	0	0	0	0	0	0	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	Number of Annual Operating Hours	hr/year	-	-	-	-	1,468.24	7,333.66	6,653.48	452.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	-	-	1,468.24	7,333.66	6,653.48	452.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-	-	-	2	3	3	3	0	0	0	0	0	0	0	0	0	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	25,634	29,014	29,147	31,021	28,672	29,119	29,234	34,352	35,168	35,518	29,211	30,391	16,521	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	-	-	1,265.35	5,955.65	5,291.72	382.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	-	-	6	6	6	6	0	0	0	0	0	0	0	0	0	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	3,340	3,594	3,464	4,025	3,168	3,631	3,529	4,450	4,485	4,584	3,995	3,995	2,048	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	-	-	164.88	737.69	628.86	49.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	-	-	1	1	1	1	0	0	0	0	0	0	0	0	0	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	6,298	8,514	9,859	10,750	9,198	9,908	9,954	10,687	10,332	10,313	6,676	10,711	5,600	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	-	-	310.88	1,747.65	1,789.88	132.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)		Number of Units	#	-	-	-	-	2	2	2	2	0	0	0	0	0	0	0	0	0	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	3,999	4,103	3,548	3,245	3,533	3,462	3,355	3,481	3,450	3,298	3,253	3,857	1,835	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	-	-	197.41	842.29	644.07	39.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)		Number of Units	#	-	-	-	-	1	1	1	1	0	0	0	0	0	0	0	0	0	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	67,089	87,897	101,863	113,048	102,212	103,719	105,448	111,468	108,623	108,033	74,479	109,118	59,818	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	-	-	3,311.63	18,042.05	18,493.31	1,392.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	-	-	15	16	18	20	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	968	2,453	1,877	431	697	2,272	1,580	1,538	1,790	727	549	2,217	458	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	47.80	503.42	340.68	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	-	-	2	2	2	2	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	21,943	21,570	18,282	17,309	19,031	17,425	17,211	18,079	17,691	17,446	17,277	20,096	7,893	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	-	-	1,002.36	3,490.24	2,592.01	132.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	-	-	4	4	4	4	0	0	0	0	0	0	0	0	0	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	3,417	13,412	11,223	745	0	0	0	0	0	0	0	0	0	-
		CAT 390D (Backhoe)		Number of Hours		-	-	-	-	3,417	13,412	11,223	745	0	0	0	0	0	0	0	0	0	-
		CAT 390D (Backhoe)		Number of Units	#	-	-	-	-	4	4	4	4	0	0	0	0	0	0	0	0	0	-

M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	Number of Annual Operating Hours	hr/year	-	-						-	-	-	-	-	-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-						-	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	3,271	3,083	2,754	3,762	3,771	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	1,090.17	1,027.81	917.87	1,254.11	1,257.00	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)		Number of Units	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	3,271	3,083	2,754	3,762	3,771	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	1,090.17	1,027.81	917.87	1,254.11	1,257.00	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)		Number of Units	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	2,238	2,463	2,102	2,648	3,026	-	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	745.93	821.11	700.73	882.83	1,008.59	-	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	Number of Annual Operating Hours	hr/year	-	-						-	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-						-	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	24,458	28,307	25,634	29,014	29,147	-	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	8,152.79	9,435.56	8,544.69	9,671.50	9,715.78	-	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	5	6	6	6	6	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	3,024	3,586	3,340	3,594	3,464	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	1,007.90	1,195.30	1,113.39	1,197.95	1,154.62	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	7,149	7,765	6,298	8,514	9,859	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	2,383.03	2,588.40	2,099.29	2,838.05	3,286.29	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)		Number of Units	#	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	4,330	4,283	3,999	4,103	3,548	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	1,443.48	1,427.54	1,333.05	1,367.81	1,182.53	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)		Number of Units	#	-	-	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	73,715	79,972	67,089	87,897	101,863	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	24,571.69	26,657.47	22,362.91	29,298.86	33,954.38	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	17	17	15	16	18	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	924	1,730	968	2,453	1,877	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	308.09	576.51	322.78	817.51	625.51	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	24,182	23,284	21,943	21,570	18,282	-	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	2,352.84	2,928.95	2,984.93	2,457.58	2,081.17	-	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	5	5	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-						-	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)		Number of Hours		-	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)		Number of Units	#	-	-						-	-	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-						-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-	-	-	-	-	-						-	-	-	-	-	-	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	6,691	3,951	4,725	4,472	3,949	-	-	-	-	-	-	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	2,230.37	1,317.16	1,575.13	1,490.54	1,316.47	-	-	-	-	-	-	-
		CAT 994K (Loader)		Number of Units	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	6,691	3,951	4,725	4,472	3,949	-	-	-	-	-	-	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	2,230.37	1,317.16	1,575.13	1,490.54	1,316.47	-	-	-	-	-	-	-
		CAT 992K (Loader)		Number of Units	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	3,332	3,033	3,096	3,138	3,359	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	1,110.53	1,011.15	1,032.16	1,045.83	1,119.82	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-						-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-	-	-	-	-	-						-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	31,021	28,672	29,119	29,234	34,352	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	10,340.22	9,557.42	9,706.30	9,744.74	11,450.72	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	-	-	-	-	-	6	6	6	6	7	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	4,025	3,168	3,631	3,529	4,450	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	1,341.64	1,056.15	1,210.48	1,176.31	1,483.50	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	10,750	9,198	9,908	9,954	10,687	-	-	-	-	-	-	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	3,583.31	3,066.16	3,302.71	3,317.86	3,562.28	-	-	-	-	-	-	-
		CAT 24M (Grader)		Number of Units	#	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	3,245	3,533	3,462	3,355	3,481	-	-	-	-	-	-	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	1,081.79	1,177.53	1,153.94	1,118.28	1,160.17	-	-	-	-	-	-	-
		CAT 16M (Grader)		Number of Units	#	-	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	113,048	102,212	103,719	105,448	111,468	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	37,683	34,071	34,573	35,149	37,156	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	20	18	18	19	20	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	431	697	2,272	1,580	1,538	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	143.501226	232.3917931	757.3416998	526.5088491	512.5460502	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	17,309	19,031	17,425	17,211	18,079	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	1,520.51	1,831.45	1,674.82	1,956.56	2,101.37	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	-	-	-	-	-	4	4	4	4	4	-	-	-	-	-	-	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-						-	-	-	-	-	-	-
		CAT 390D (Backhoe)		Number of Hours		-	-	-	-	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
		CAT 390D (Backhoe)		Number of Units	#	-	-	-	-	-	-	-						-	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	3,336	3,516	4,244	4,871	-	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,111.97	1,171.99	1,414.76	1,623.60	-	-
		CAT 994K (Loader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	3,336	3,516	4,244	4,871	-	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,111.97	1,171.99	1,414.76	1,623.60	-	-
		CAT 992K (Loader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	3,282	3,266	2,270	3,262	-	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,094.10	1,088.66	756.64	1,087.44	-	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	35,168	35,518	29,211	30,391	-	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	11,722.66	11,839.45	9,737.08	10,130.25	-	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	7	7	6	6	-	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	4,485	4,584	3,995	3,995	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,495.01	1,527.86	1,331.56	1,331.56	-	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	10,332	10,313	6,676	10,711	-	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	3,444.11	3,437.70	2,225.31	3,570.34	-	-
		CAT 24M (Grader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	3,450	3,298	3,253	3,857	-	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,149.89	1,099.33	1,084.44	1,285.58	-	-
		CAT 16M (Grader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	108,623	108,033	74,479	109,118	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	36,207.8	36,011.0	24,826.4	36,372.6	-	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	20	19	15	20	-	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	1,790	727	549	2,217	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	596.74	242.31	183.16	738.86	-	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	2	-	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	17,691	17,446	17,277	20,096	-	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	2,104.18	2,305.29	2,443.11	1,867.00	-	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4	4	4	-	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 390D (Backhoe)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-	-
		CAT 390D (Backhoe)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-					-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	Mining Excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		CAT 6050/Komatsu PC5500 (Excavator)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,800	-
		CAT 994K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	933.45	-
		CAT 994K (Loader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CAT 992K (Loader)	Loader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,800	-
		CAT 992K (Loader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	933.45	-
		CAT 992K (Loader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		Komatsu HD1500 (Water Truck)	Water Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,789	-
		Komatsu HD1500 (Water Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	596.24	-
		Komatsu HD1500 (Water Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CAT MD6250/Pit Viper PV-275 (Drill)	Drill	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		CAT MD6250/Pit Viper PV-275 (Drill)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16,521	-
		CAT D11/D10T (Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,506.93	-
		CAT D11/D10T (Dozer)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
		CAT 834 (Rubber Tire Dozer)	Dozer	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,048	-
		CAT 834 (Rubber Tire Dozer)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	682.78	-
		CAT 834 (Rubber Tire Dozer)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CAT 24M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,600	-
		CAT 24M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,866.63	-
		CAT 24M (Grader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CAT 16M (Grader)	Grader	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,835	-
		CAT 16M (Grader)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	611.63	-
		CAT 16M (Grader)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
		CAT 793F/Komatsu 830E (Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59,818	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19,939.28	-
		CAT 793F/Komatsu 830E (Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-
		CAT 740 - Buy (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	458	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152.68	-
		CAT 740 - Buy (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
		CAT 740 - Rent (Articulated Dump Truck)	Dump Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		CAT 740 - Rent (Articulated Dump Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		Western Star 6900XD (Haul Truck)	Haul Truck	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,893	-
		Western Star 6900XD (Haul Truck)		Number of Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803.29	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-
		CAT 390D (Backhoe)	Backhoe/excavator	Number of Annual Operating Hours	hr/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)		Number of Hours		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-
		CAT 390D (Backhoe)		Number of Units	#	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	Haul Truck	Number of Hours	hr/year	0	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760	-
		Western Star 6900XD (Haul Truck)		Number of Units	#	0	3	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	Loader	Number of Hours	hr/year	0	0	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	-
		CAT 994K (Loader)		Number of Units	#	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-

Table M.1.1b - Fixed Inputs

Equipment Model	Parameter	Unit	Value	Match Function	Reference
CAT 6050/Komatsu PC5500 (Excavator)	Engine Horse Power	hp	2520	CAT 6050/Komatsu PC5500 (Excavator)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/hydraulic-mining-shovels/hydraulic-mining-shovels/18560111.html#
	Tier Category	-	2		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 994K (Loader)	Engine Horse Power	hp	1870	CAT 994K (Loader)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/wheel-loaders/large-wheel-loaders/1000001147.html#
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 992K (Loader)	Engine Horse Power	hp	900	CAT 992K (Loader)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/wheel-loaders/large-wheel-loaders/1000028683.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
Komatsu HD1500 (Water Truck)	Engine Horse Power	hp	1487	Komatsu HD1500 (Water Truck)Engine Horse Power	Equipment specifications, accessed from: https://www.komatsuamerica.com/equipment/trucks/mechanical/hd1500-7
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT MD6250/Pit Viper PV-275 (Drill)	Engine Horse Power	hp	1050	CAT MD6250/Pit Viper PV-275 (Drill)Engine Horse Power	Equipment specifications, accessed from: https://www.epiroc.com/en-za/products/drill-rigs/surface-blasthole-drill-rigs/pv-275
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT D11/D10T (Dozer)	Engine Horse Power	hp	955	CAT D11/D10T (Dozer)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/dozers/large-dozers/2729752240046872.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 834 (Rubber Tire Dozer)	Engine Horse Power	hp	562	CAT 834 (Rubber Tire Dozer)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/wheel-dozers/wheel-dozers/18483684.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 24M (Grader)	Engine Horse Power	hp	535	CAT 24M (Grader)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/motor-graders/motor-graders/1000034758.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 16M (Grader)	Engine Horse Power	hp	301	CAT 16M (Grader)Engine Horse Power	Equipment specifications, accessed from: https://www.finning.com/en_IE/products/new/equipment/motor-graders/m-series-motor-graders/18506722.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 793F/Komatsu 830E (Dump Truck)	Engine Horse Power	hp	2650	CAT 793F/Komatsu 830E (Dump Truck)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/off-highway-trucks/mining-trucks/18092621.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 740 (Articulated Dump Truck)	Engine Horse Power	hp	452	CAT 740 (Articulated Dump Truck)Engine Horse Power	Equipment specifications, accessed from: https://www.cat.com/en_US/products/new/equipment/articulated-trucks/three-axle-articulated-trucks/302717362097310.html
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
Western Star 6900XD (Haul Truck)	Engine Horse Power	hp	600	Western Star 6900XD (Haul Truck)Engine Horse Power	Equipment specifications, accessed from: https://www.westernstartrucks.com/Trucks/6900/
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
Pick-up Trucks	Engine Horse Power	hp	430	Pick-up TrucksEngine Horse Power	https://media.ford.com/content/dam/fordmedia/North%20America/US/product/2020/f-series-super-duty/2020-Super-Duty-Tech-Specs.pdf
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
CAT 390D (Backhoe)	Engine Horse Power	hp	523	CAT 390D (Backhoe)Engine Horse Power	Equipment specifications, accessed from: https://www.ritchiespecs.com/model/caterpillar-390d-l-hydraulic-excavator
	Tier Category	-	4		
	Brake Specific Fuel Consumption (BSFC)	lb/hp-hr	0.367		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
n/a	Fraction of fuel sulfur converted to PM (soxcnv)	-	0.02247		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", pg. 22
n/a	Diesel fuel sulfur content	%	0.0011		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table 2
n/a	Maximum # of operating hours per day	hr/day	24		See 06.24.2020 information Requests
n/a	HC to VOC ratio	-	1		conservative assumption
Heavy Duty Diesel Vehicle Moderate Control	CO2 Emission Factor	g CO2e/L fuel	2690		2016 National Inventory Report (1990-2014), Environment Canada, Table A6-12
	CH4 Emission Factor	g CH4/L fuel	0.14		
	N2O Emission Factor	g N2O/L fuel	0.082		

Table M.1.2a - Emission Factors (Criteria Air Contaminants)

Equipment Model	Match Function	Contaminant	Emission Factor	Unit	Reference
CAT 6050/Komatsu PC5500 (Excavator)	CAT 6050/Komatsu PC5500 (Excavator)	Nitrogen Oxides (as NO2)	4.1	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Table A.4
	CAT 6050/Komatsu PC5500 (Excavator)	Sulphur Dioxide (SO2)	0.00358		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 7
	CAT 6050/Komatsu PC5500 (Excavator)	TSP (≤ 30 µm)	0.1316		
	CAT 6050/Komatsu PC5500 (Excavator)	PM10	0.1316		
	CAT 6050/Komatsu PC5500 (Excavator)	PM2.5	0.127652		
	CAT 6050/Komatsu PC5500 (Excavator)	Carbon Monoxide (CO)	0.7642		
	CAT 6050/Komatsu PC5500 (Excavator)	HC (for reference only)	0.1669		
	CAT 6050/Komatsu PC5500 (Excavator)	VOC	0.1669		
	CAT 6050/Komatsu PC5500 (Excavator)	CO2	530.511		US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 6
CAT 994K (Loader)	CAT 994K (Loader)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	CAT 994K (Loader)	Sulphur Dioxide (SO2)	0.00357		
	CAT 994K (Loader)	TSP (≤ 30 µm)	0.069		
	CAT 994K (Loader)	PM10	0.0414		
	CAT 994K (Loader)	PM2.5	0.0207		
	CAT 994K (Loader)	Carbon Monoxide (CO)	0.7642		
	CAT 994K (Loader)	HC (for reference only)	0.2815		
	CAT 994K (Loader)	VOC	0.2815		
	CAT 994K (Loader)	CO2	530.145		
CAT 992K (Loader)	CAT 992K (Loader)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	CAT 992K (Loader)	Sulphur Dioxide (SO2)	0.00357		
	CAT 992K (Loader)	TSP (≤ 30 µm)	0.069		
	CAT 992K (Loader)	PM10	0.069		
	CAT 992K (Loader)	PM2.5	0.06693		
	CAT 992K (Loader)	Carbon Monoxide (CO)	0.7642		
	CAT 992K (Loader)	HC	0.2815		
	CAT 992K (Loader)	VOC	0.2815		
	CAT 992K (Loader)	CO2	530.145		
Komatsu HD1500 (Water Truck)	Komatsu HD1500 (Water Truck)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	Komatsu HD1500 (Water Truck)	Sulphur Dioxide (SO2)	0.00357		
	Komatsu HD1500 (Water Truck)	TSP (≤ 30 µm)	0.069		
	Komatsu HD1500 (Water Truck)	PM10	0.069		
	Komatsu HD1500 (Water Truck)	PM2.5	0.06693		
	Komatsu HD1500 (Water Truck)	Carbon Monoxide (CO)	0.7642		
	Komatsu HD1500 (Water Truck)	HC	0.2815		
	Komatsu HD1500 (Water Truck)	VOC	0.2815		
	Komatsu HD1500 (Water Truck)	CO2	530.145		
CAT MD6250/Pit Viper PV-275 (Drill)	CAT MD6250/Pit Viper PV-275 (Drill)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	CAT MD6250/Pit Viper PV-275 (Drill)	Sulphur Dioxide (SO2)	0.00357		
	CAT MD6250/Pit Viper PV-275 (Drill)	TSP (≤ 30 µm)	0.069		
	CAT MD6250/Pit Viper PV-275 (Drill)	PM10	0.069		
	CAT MD6250/Pit Viper PV-275 (Drill)	PM2.5	0.06693		
	CAT MD6250/Pit Viper PV-275 (Drill)	Carbon Monoxide (CO)	0.7642		
	CAT MD6250/Pit Viper PV-275 (Drill)	HC	0.2815		
	CAT MD6250/Pit Viper PV-275 (Drill)	VOC	0.2815		
	CAT MD6250/Pit Viper PV-275 (Drill)	CO2	530.145		
CAT D11/D10T (Dozer)	CAT D11/D10T (Dozer)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	CAT D11/D10T (Dozer)	Sulphur Dioxide (SO2)	0.00357		
	CAT D11/D10T (Dozer)	TSP (≤ 30 µm)	0.069		
	CAT D11/D10T (Dozer)	PM10	0.069		
	CAT D11/D10T (Dozer)	PM2.5	0.06693		
	CAT D11/D10T (Dozer)	Carbon Monoxide (CO)	0.7642		
	CAT D11/D10T (Dozer)	HC	0.2815		
	CAT D11/D10T (Dozer)	VOC	0.2815		
	CAT D11/D10T (Dozer)	CO2	530.145		
	CAT 834 (Rubber Tire Dozer)	Nitrogen Oxides (as NO2)	2.5		
	CAT 834 (Rubber Tire Dozer)	Sulphur Dioxide (SO2)	0.00358		
	CAT 834 (Rubber Tire Dozer)	TSP (≤ 30 µm)	0.0092		

CAT 834 (Rubber Tire Dozer)	CAT 834 (Rubber Tire Dozer)	PM10	0.0092	g/hp-hr	
	CAT 834 (Rubber Tire Dozer)	PM2.5	0.008924		
	CAT 834 (Rubber Tire Dozer)	Carbon Monoxide (CO)	0.084		
	CAT 834 (Rubber Tire Dozer)	HC	0.1314		
	CAT 834 (Rubber Tire Dozer)	VOC	0.1314		
	CAT 834 (Rubber Tire Dozer)	CO2	530.624		
CAT 24M (Grader)	CAT 24M (Grader)	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	CAT 24M (Grader)	Sulphur Dioxide (SO2)	0.00358		
	CAT 24M (Grader)	TSP (≤ 30 µm)	0.0092		
	CAT 24M (Grader)	PM10	0.0092		
	CAT 24M (Grader)	PM2.5	0.008924		
	CAT 24M (Grader)	Carbon Monoxide (CO)	0.084		
	CAT 24M (Grader)	HC	0.1314		
	CAT 24M (Grader)	VOC	0.1314		
	CAT 24M (Grader)	CO2	530.624		
CAT 16M (Grader)	CAT 16M (Grader)	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	CAT 16M (Grader)	Sulphur Dioxide (SO2)	0.00358		
	CAT 16M (Grader)	TSP (≤ 30 µm)	0.0092		
	CAT 16M (Grader)	PM10	0.0092		
	CAT 16M (Grader)	PM2.5	0.008924		
	CAT 16M (Grader)	Carbon Monoxide (CO)	0.084		
	CAT 16M (Grader)	HC	0.1314		
	CAT 16M (Grader)	VOC	0.1314		
	CAT 16M (Grader)	CO2	530.624		
CAT 793F/Komatsu 830E (Dump Truck)	CAT 793F/Komatsu 830E (Dump Truck)	Nitrogen Oxides (as NO2)	2.392	g/hp-hr	
	CAT 793F/Komatsu 830E (Dump Truck)	Sulphur Dioxide (SO2)	0.00357		
	CAT 793F/Komatsu 830E (Dump Truck)	TSP (≤ 30 µm)	0.069		
	CAT 793F/Komatsu 830E (Dump Truck)	PM10	0.069		
	CAT 793F/Komatsu 830E (Dump Truck)	PM2.5	0.06693		
	CAT 793F/Komatsu 830E (Dump Truck)	Carbon Monoxide (CO)	0.7642		
	CAT 793F/Komatsu 830E (Dump Truck)	HC	0.2815		
	CAT 793F/Komatsu 830E (Dump Truck)	VOC	0.2815		
	CAT 793F/Komatsu 830E (Dump Truck)	CO2	530.145		
CAT 740 - Buy/Rent (Articulated Dump Truck)	CAT 740 - Buy/Rent (Articulated Dump Truck)	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	CAT 740 - Buy/Rent (Articulated Dump Truck)	Sulphur Dioxide (SO2)	0.00358		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	TSP (≤ 30 µm)	0.0092		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	PM10	0.0092		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	PM2.5	0.008924		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	Carbon Monoxide (CO)	0.084		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	HC	0.1314		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	VOC	0.1314		
	CAT 740 - Buy/Rent (Articulated Dump Truck)	CO2	530.624		
Western Star 6900XD (Haul Truck)	Western Star 6900XD (Haul Truck)	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	Western Star 6900XD (Haul Truck)	Sulphur Dioxide (SO2)	0.00358		
	Western Star 6900XD (Haul Truck)	TSP (≤ 30 µm)	0.0092		
	Western Star 6900XD (Haul Truck)	PM10	0.0092		
	Western Star 6900XD (Haul Truck)	PM2.5	0.008924		
	Western Star 6900XD (Haul Truck)	Carbon Monoxide (CO)	0.084		
	Western Star 6900XD (Haul Truck)	HC	0.1314		
	Western Star 6900XD (Haul Truck)	VOC	0.1314		
	Western Star 6900XD (Haul Truck)	CO2	530.624		
Pick-up trucks	Pick-up trucks	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	Pick-up trucks	Sulphur Dioxide (SO2)	0.00358		
	Pick-up trucks	TSP (≤ 30 µm)	0.0092		
	Pick-up trucks	PM10	0.0092		
	Pick-up trucks	PM2.5	0.008924		
	Pick-up trucks	Carbon Monoxide (CO)	0.084		
	Pick-up trucks	HC	0.1314		
	Pick-up trucks	VOC	0.1314		
	Pick-up trucks	CO2	530.624		
CAT 390D (Backhoe)	CAT 390D (Backhoe)	Nitrogen Oxides (as NO2)	2.5	g/hp-hr	
	CAT 390D (Backhoe)	Sulphur Dioxide (SO2)	0.00358		
	CAT 390D (Backhoe)	TSP (≤ 30 µm)	0.0092		
	CAT 390D (Backhoe)	PM10	0.0092		
	CAT 390D (Backhoe)	PM2.5	0.008924		
	CAT 390D (Backhoe)	Carbon Monoxide (CO)	0.084		
	CAT 390D (Backhoe)	HC	0.1314		
	CAT 390D (Backhoe)	VOC	0.1314		
	CAT 390D (Backhoe)	CO2	1.173		

Table M.1.2a - GHG Emission Factors

Equipment Model	Match Function	Contaminant	Emission Factor	Unit	Reference
CAT 6050/Komatsu PC5500 (Excavator)	CAT 6050/Komatsu PC5500 (Excavator)	CO2	530.510717	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 6
	CAT 6050/Komatsu PC5500 (Excavator)	CO2	1.3368870	tonnes CO2/hr	
	CAT 6050/Komatsu PC5500 (Excavator)	CH4 *	0.0000696	tonnes CH4/hr	
	CAT 6050/Komatsu PC5500 (Excavator)	N2O *	0.0000408	tonnes N2O/hr	
CAT 994K (Loader)	CAT 994K (Loader)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 7
	CAT 994K (Loader)	CO2	0.9913714	tonnes CO2/hr	
	CAT 994K (Loader)	CH4	0.0000516	tonnes CH4/hr	
	CAT 994K (Loader)	N2O	0.0000302	tonnes N2O/hr	
CAT 992K (Loader)	CAT 992K (Loader)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 8
	CAT 992K (Loader)	CO2	0.4771306	tonnes CO2/hr	
	CAT 992K (Loader)	CH4	0.0000248	tonnes CH4/hr	
	CAT 992K (Loader)	N2O	0.0000145	tonnes N2O/hr	
Komatsu HD1500 (Water Truck)	Komatsu HD1500 (Water Truck)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 9
	Komatsu HD1500 (Water Truck)	CO2	0.7883258	tonnes CO2/hr	
	Komatsu HD1500 (Water Truck)	CH4	0.0000410	tonnes CH4/hr	
	Komatsu HD1500 (Water Truck)	N2O	0.0000240	tonnes N2O/hr	
CAT MD6250/Pit Viper PV-275 (Drill)	CAT MD6250/Pit Viper PV-275 (Drill)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 10
	CAT MD6250/Pit Viper PV-275 (Drill)	CO2	0.5566524	tonnes CO2/hr	
	CAT MD6250/Pit Viper PV-275 (Drill)	CH4	0.0000290	tonnes CH4/hr	
	CAT MD6250/Pit Viper PV-275 (Drill)	N2O	0.0000170	tonnes N2O/hr	
CAT D11/D10T (Dozer)	CAT D11/D10T (Dozer)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 11
	CAT D11/D10T (Dozer)	CO2	0.5062886	tonnes CO2/hr	
	CAT D11/D10T (Dozer)	CH4	0.0000263	tonnes CH4/hr	
	CAT D11/D10T (Dozer)	N2O	0.0000154	tonnes N2O/hr	
CAT 834 (Rubber Tire Dozer)	CAT 834 (Rubber Tire Dozer)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 12
	CAT 834 (Rubber Tire Dozer)	CO2	0.2982107	tonnes CO2/hr	
	CAT 834 (Rubber Tire Dozer)	CH4	0.0000155	tonnes CH4/hr	
	CAT 834 (Rubber Tire Dozer)	N2O	0.0000091	tonnes N2O/hr	
CAT 24M (Grader)	CAT 24M (Grader)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 13
	CAT 24M (Grader)	CO2	0.2838838	tonnes CO2/hr	
	CAT 24M (Grader)	CH4	0.0000148	tonnes CH4/hr	
	CAT 24M (Grader)	N2O	0.0000087	tonnes N2O/hr	
CAT 16M (Grader)	CAT 16M (Grader)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 14
	CAT 16M (Grader)	CO2	0.1597178	tonnes CO2/hr	
	CAT 16M (Grader)	CH4	0.0000083	tonnes CH4/hr	
	CAT 16M (Grader)	N2O	0.0000049	tonnes N2O/hr	
CAT 793F/Komatsu 830E (Dump Truck)	CAT 793F/Komatsu 830E (Dump Truck)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 15
	CAT 793F/Komatsu 830E (Dump Truck)	CO2	1.4048846	tonnes CO2/hr	
	CAT 793F/Komatsu 830E (Dump Truck)	CH4	0.0000731	tonnes CH4/hr	
	CAT 793F/Komatsu 830E (Dump Truck)	N2O	0.0000428	tonnes N2O/hr	
CAT 740 - Buy/Rent (Articulated Dump Truck)	CAT 740 - Buy/Rent (Articulated Dump Truck)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 16
	CAT 740 - Buy/Rent (Articulated Dump Truck)	CO2	0.2398420	tonnes CO2/hr	
	CAT 740 - Buy/Rent (Articulated Dump Truck)	CH4	0.0000125	tonnes CH4/hr	
	CAT 740 - Buy/Rent (Articulated Dump Truck)	N2O	0.0000073	tonnes N2O/hr	
Western Star 6900XD (Haul Truck)	Western Star 6900XD (Haul Truck)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 17
	Western Star 6900XD (Haul Truck)	CO2	0.3183744	tonnes CO2/hr	
	Western Star 6900XD (Haul Truck)	CH4	0.0000166	tonnes CH4/hr	
	Western Star 6900XD (Haul Truck)	N2O	0.0000097	tonnes N2O/hr	
Pick-up trucks	Pick-up trucks	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 18
	Pick-up trucks	CO2	0.2281683	tonnes CO2/hr	
	Pick-up trucks	CH4	0.0000119	tonnes CH4/hr	
	Pick-up trucks	N2O	0.0000070	tonnes N2O/hr	
CAT 390D (Backhoe)	CAT 390D (Backhoe)	CO2	1.173	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 19
	CAT 390D (Backhoe)	CO2	0.0006132	tonnes CO2/hr	
	CAT 390D (Backhoe)	CH4	0.00000003	tonnes CH4/hr	
	CAT 390D (Backhoe)	N2O	0.00000002	tonnes N2O/hr	

** CH4 and N2O emission factors are based on the ratio of CO2:CH4 and CO2:N20 from 2016 National Inventory Report (1990-2014), Environment Canada, Table A6-12 for Heavy Duty Diesel Vehicles with Moderate Control*

Table M.1.3a - GHG Emission Factors

Equipment Model	Match Function	Contaminant	Emission Factor	Unit	Reference
CAT 6050/Komatsu PC5500 (Excavator)	CAT 6050/Komatsu PC5500 (Excavator)	CO2	530.510717	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 6
	CAT 6050/Komatsu PC5500 (Excavator)	CO2	1.3368870	tonnes CO2/hr	
	CAT 6050/Komatsu PC5500 (Excavator)	CH4 *	0.0000696	tonnes CH4/hr	
	CAT 6050/Komatsu PC5500 (Excavator)	N2O *	0.0000408	tonnes N2O/hr	
CAT 994K (Loader)	CAT 994K (Loader)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 7
	CAT 994K (Loader)	CO2	0.9913714	tonnes CO2/hr	
	CAT 994K (Loader)	CH4	0.0000516	tonnes CH4/hr	
	CAT 994K (Loader)	N2O	0.0000302	tonnes N2O/hr	
CAT 992K (Loader)	CAT 992K (Loader)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 8
	CAT 992K (Loader)	CO2	0.4771306	tonnes CO2/hr	
	CAT 992K (Loader)	CH4	0.0000248	tonnes CH4/hr	
	CAT 992K (Loader)	N2O	0.0000145	tonnes N2O/hr	
Komatsu HD1500 (Water Truck)	Komatsu HD1500 (Water Truck)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 9
	Komatsu HD1500 (Water Truck)	CO2	0.7883258	tonnes CO2/hr	
	Komatsu HD1500 (Water Truck)	CH4	0.0000410	tonnes CH4/hr	
	Komatsu HD1500 (Water Truck)	N2O	0.0000240	tonnes N2O/hr	
CAT MD6250/Pit Viper PV-275 (Drill)	CAT MD6250/Pit Viper PV-275 (Drill)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 10
	CAT MD6250/Pit Viper PV-275 (Drill)	CO2	0.5566524	tonnes CO2/hr	
	CAT MD6250/Pit Viper PV-275 (Drill)	CH4	0.0000290	tonnes CH4/hr	
	CAT MD6250/Pit Viper PV-275 (Drill)	N2O	0.0000170	tonnes N2O/hr	
CAT D11/D10T (Dozer)	CAT D11/D10T (Dozer)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 11
	CAT D11/D10T (Dozer)	CO2	0.5062886	tonnes CO2/hr	
	CAT D11/D10T (Dozer)	CH4	0.0000263	tonnes CH4/hr	
	CAT D11/D10T (Dozer)	N2O	0.0000154	tonnes N2O/hr	
CAT 834 (Rubber Tire Dozer)	CAT 834 (Rubber Tire Dozer)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 12
	CAT 834 (Rubber Tire Dozer)	CO2	0.2982107	tonnes CO2/hr	
	CAT 834 (Rubber Tire Dozer)	CH4	0.0000155	tonnes CH4/hr	
	CAT 834 (Rubber Tire Dozer)	N2O	0.0000091	tonnes N2O/hr	
CAT 24M (Grader)	CAT 24M (Grader)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 13
	CAT 24M (Grader)	CO2	0.2838838	tonnes CO2/hr	
	CAT 24M (Grader)	CH4	0.0000148	tonnes CH4/hr	
	CAT 24M (Grader)	N2O	0.0000087	tonnes N2O/hr	
CAT 16M (Grader)	CAT 16M (Grader)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 14
	CAT 16M (Grader)	CO2	0.1597178	tonnes CO2/hr	
	CAT 16M (Grader)	CH4	0.0000083	tonnes CH4/hr	
	CAT 16M (Grader)	N2O	0.0000049	tonnes N2O/hr	
CAT 793F/Komatsu 830E (Dump Truck)	CAT 793F/Komatsu 830E (Dump Truck)	CO2	530.145143	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 15
	CAT 793F/Komatsu 830E (Dump Truck)	CO2	1.4048846	tonnes CO2/hr	
	CAT 793F/Komatsu 830E (Dump Truck)	CH4	0.0000731	tonnes CH4/hr	
	CAT 793F/Komatsu 830E (Dump Truck)	N2O	0.0000428	tonnes N2O/hr	
CAT 740 - Buy/Rent (Articulated Dump Truck)	CAT 740 - Buy/Rent (Articulated Dump Truck)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 16
	CAT 740 - Buy/Rent (Articulated Dump Truck)	CO2	0.2398420	tonnes CO2/hr	
	CAT 740 - Buy/Rent (Articulated Dump Truck)	CH4	0.0000125	tonnes CH4/hr	
	CAT 740 - Buy/Rent (Articulated Dump Truck)	N2O	0.0000073	tonnes N2O/hr	
Western Star 6900XD (Haul Truck)	Western Star 6900XD (Haul Truck)	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 17
	Western Star 6900XD (Haul Truck)	CO2	0.3183744	tonnes CO2/hr	
	Western Star 6900XD (Haul Truck)	CH4	0.0000166	tonnes CH4/hr	
	Western Star 6900XD (Haul Truck)	N2O	0.0000097	tonnes N2O/hr	
Pick-up trucks	Pick-up trucks	CO2	530.624	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 18
	Pick-up trucks	CO2	0.2281683	tonnes CO2/hr	
	Pick-up trucks	CH4	0.0000119	tonnes CH4/hr	
	Pick-up trucks	N2O	0.0000070	tonnes N2O/hr	
CAT 390D (Backhoe)	CAT 390D (Backhoe)	CO2	1.173	g/hp-hr	US EPA document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition NR-009d", Equation 19
	CAT 390D (Backhoe)	CO2	0.0006132	tonnes CO2/hr	
	CAT 390D (Backhoe)	CH4	0.00000003	tonnes CH4/hr	
	CAT 390D (Backhoe)	N2O	0.00000002	tonnes N2O/hr	

** CH4 and N2O emission factors are based on the ratio of CO2:CH4 and CO2:N2O from 2016 National Inventory Report (1990-2014), Environment Canada, Table A6-12 for Heavy Duty Diesel Vehicles with Moderate Control*

Table M.1.4a - Maximum 24-hr Emission Rates (TSP)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s																		-
		CAT 994K (Loader)			0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
		CAT 992K (Loader)			0.00	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	0.02	0.02	-
		Komatsu HD1500 (Water Truck)			0.00	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.02	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.13	0.13	0.11	0.11	0.07	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 24M (Grader)			0.000	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	-
		CAT 16M (Grader)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.51	0.86	0.86	0.76	0.81	0.91	1.02	0.91	0.91	0.97	1.02	1.02	0.97	0.76	1.02	0.56	-
		CAT 740 - Buy (Articulated Dump Truck)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Rent (Articulated Dump Truck)			0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		pick-up trucks			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	0.00	0.00	0.18	0.18	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)			0.00	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			0.00	0.03	0.06	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.00	0.02	0.04	0.04	0.04	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			0.00	0.02	0.09	0.11	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.001	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.51	0.86	0.86	0.76	0.81	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy (Articulated Dump Truck)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Rent (Articulated Dump Truck)			0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)			0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	0.18424	0.18424	0.18424	0.18424	0.18424	0.27636	0.27636	0.27636	0.18424	0.18424	0.09212	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	0.03584	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.04025	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.10983	0.10983	0.10983	0.10983	0.10983	0.12813	0.12813	0.12813	0.10983	0.10983	0.07322	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.91425	1.01583	0.91425	0.91425	0.96504	1.01583	1.01583	0.96504	0.76188	1.01583	0.55871	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00267	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	0.18424	0.18424	0.18424	0.18424	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-
		CAT 994K (Loader)			-	-	-	-	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			-	-	-	-	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.06	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.04	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.11	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.762	0.813	0.914	1.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	0.00000	0.00000	0.00000	0.00000	0.00000	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.04	0.04	0.04	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.02	0.02	0.02	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.06	0.06	0.06	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.09	0.11	0.11	0.11	0.11	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.86	0.86	0.76	0.81	0.91	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-

M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.036	0.036	0.036	0.036	0.036	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	0.017	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.057	0.057	0.057	0.057	0.057	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.110	0.110	0.110	0.110	0.128	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	0.003	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	1.016	0.914	0.914	0.965	1.016	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	0.006	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.036	0.036	0.036	0.036	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.057	0.057	0.057	0.057	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.128	0.128	0.110	0.110	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	1.016	0.965	0.762	1.016	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.036	-	
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.017	-	
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.057	-	
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.073	-	
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	-	
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-	
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.559	-	
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-	
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-	
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-	
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - TSP	g/s	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - TSP	g/s	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-

Table M.1.4b - Maximum 24-hr Emission Rates (PM10)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s																		
		CAT 994K (Loader)			0.00	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	0.02	0.02	-
		CAT 992K (Loader)			0.00	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	0.02	0.02	-
		Komatsu HD1500 (Water Truck)			0.00	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.02	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.13	0.13	0.11	0.11	0.07	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 24M (Grader)			0.000	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	-
		CAT 16M (Grader)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.508	0.863	0.863	0.762	0.813	0.914	1.016	0.914	0.914	0.965	1.016	1.016	0.965	0.762	1.016	0.559	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.005	0.008	0.008	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	-
		pick-up trucks			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 390D (Backhoe)																				
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	0.000	0.000	0.184	0.184	0.184	0.184	0.184	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.022	0.022	0.022	0.022	0.022	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.017	0.017	0.017	0.017	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.029	0.057	0.057	0.057	0.057	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.020	0.040	0.040	0.040	0.060	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.018	0.092	0.110	0.110	0.110	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.001	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.508	0.863	0.863	0.762	0.813	0.914	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.005	0.008	0.008	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.003	0.005	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	-	-	-	-	0.18424	0.18424	0.18424	0.18424	0.18424	0.27636	0.27636	0.27636	0.18424	0.18424	0.09212	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	0.02151	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	0.01725	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	0.05700	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.06038	0.04025	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.10983	0.10983	0.10983	0.10983	0.10983	0.12813	0.12813	0.12813	0.10983	0.10983	0.07322	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	0.00144	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	0.00273	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	0.00077	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.91425	1.01583	0.91425	0.91425	0.96504	1.01583	1.01583	0.96504	0.76188	1.01583	0.55871	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	0.00231	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	0.00613	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00535	0.00267	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	-	-	0.184	0.184	0.184	0.184	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.022	0.022	0.022	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.017	0.017	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.057	0.057	0.057	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.040	0.060	0.060	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.110	0.110	0.110	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.762	0.813	0.914	1.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	0.000	0.000	0.000	0.000	0.000											-
		CAT 994K (Loader)			-	-	0.022	0.022	0.022	0.022	0.022											-
		CAT 992K (Loader)			-	-	0.017	0.017	0.017	0.017	0.017											-
		Komatsu HD1500 (Water Truck)			-	-	0.057	0.057	0.057	0.057	0.057											-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000											-
		CAT D11/D10T (Dozer)			-	-	0.092	0.110	0.110	0.110	0.110											-
		CAT 834 (Rubber Tire Dozer)			-	-	0.001	0.001	0.001	0.001	0.001											-
		CAT 24M (Grader)			-	-	0.003	0.003	0.003	0.003	0.003											-
		CAT 16M (Grader)			-	-	0.001	0.001	0.001	0.001	0.001											-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.863	0.863	0.762	0.813	0.914											-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.002	0.002	0.002	0.002	0.002											-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000											-
		Western Star 6900XD (Haul Truck)			-	-	0.008	0.008	0.006	0.006	0.006											-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000											-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.022	0.022	0.022	0.022	0.022	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	0.017	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.057	0.057	0.057	0.057	0.057	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.110	0.110	0.110	0.110	0.128	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	0.003	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	1.016	0.914	0.914	0.965	1.016	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	0.006	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.022	0.022	0.022	0.022	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.057	0.057	0.057	0.057	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.128	0.128	0.110	0.110	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	1.016	0.965	0.762	1.016	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM10	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.017	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.057	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.073	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.559	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - PM10	g/s	0.000	0.005	0.008	0.008	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - PM10	g/s	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	-

Table M.1.4c - Maximum 24-hr Emission Rates (PM2.5)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s																		-
		CAT 994K (Loader)			0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 992K (Loader)			0.00	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	0.02	0.02	-
		Komatsu HD1500 (Water Truck)			0.00	0.03	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.02	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.11	0.11	0.07	-
		CAT 834 (Rubber Tire Dozer)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.49	0.84	0.84	0.74	0.79	0.89	0.99	0.89	0.89	0.94	0.99	0.99	0.94	0.74	0.99	0.54	-
		CAT 740 - Buy (Articulated Dump Truck)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Rent (Articulated Dump Truck)			0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		pick-up trucks			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	0.000	0.000	0.179	0.179	0.179	0.179	0.179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.017	0.017	0.017	0.017	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.028	0.055	0.055	0.055	0.055	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.020	0.039	0.039	0.039	0.059	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.018	0.089	0.107	0.107	0.107	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.001	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.493	0.838	0.838	0.739	0.788	0.887	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.004	0.007	0.007	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.003	0.005	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	-	-	0.179	0.179	0.179	0.179	0.179	0.268	0.268	0.268	0.179	0.179	0.089	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.039	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.107	0.107	0.107	0.107	0.107	0.124	0.124	0.124	0.107	0.107	0.071	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.887	0.985	0.887	0.887	0.936	0.985	0.985	0.936	0.739	0.985	0.542	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.003	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	0.179	0.179	0.179	0.179	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.017	0.017	0.017	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.055	0.055	0.055	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.039	0.059	0.059	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.107	0.107	0.107	0.107	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.739	0.788	0.887	0.985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.006	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.011	0.011	0.011	0.011	0.011	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.017	0.017	0.017	0.017	0.017	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.055	0.055	0.055	0.055	0.055	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.089	0.107	0.107	0.107	0.107	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.003	0.003	0.003	0.003	0.003	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.838	0.838	0.739	0.788	0.887	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.007	0.007	0.006	0.006	0.006	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-

					H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	0.011	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	0.017	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.055	0.055	0.055	0.055	0.055	-	-	-	-	-	-
	Mobile	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
	Equipment	CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.107	0.107	0.107	0.107	0.124	-	-	-	-	-	-
M.1.5b	Combustion	CAT 834 (Rubber Tire Dozer)	N/A - PM2.5	g/s	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
	Emissions from	CAT 24M (Grader)			-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	0.003	-	-	-	-	-	-
	Waste Pit (Years	CAT 16M (Grader)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
	6-10)	CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	0.985	0.887	0.887	0.936	0.985	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	0.006	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.017	0.017	0.017	0.017	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.055	0.055	0.055	0.055	-	-
	Mobile	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
	Equipment	CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.124	0.124	0.107	0.107	-	-
M.1.5c	Combustion	CAT 834 (Rubber Tire Dozer)	N/A - PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
	Emissions from	CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.003	0.003	0.003	0.003	-	-
	Waste Pit (Years	CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
	11-14)	CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.985	0.936	0.739	0.985	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.006	0.006	0.006	0.006	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.017	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.055	-
	Mobile	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
	Equipment	CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.071	-
M.1.5d	Combustion	CAT 834 (Rubber Tire Dozer)	N/A - PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
	Emissions from	CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	-
	Waste Pit (Year	CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
	15)	CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.542	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - PM2.5	g/s	0.000	0.004	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - PM2.5	g/s	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	-

Table M.1.4d - Maximum 24-hr Emission Rates (VOC)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s																		-
		CAT 994K (Loader)			0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-
		CAT 992K (Loader)			0.00	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	-
		Komatsu HD1500 (Water Truck)			0.00	0.12	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.07	0.37	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.52	0.52	0.52	0.45	0.45	0.30	-
		CAT 834 (Rubber Tire Dozer)			0.00	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	0.02	0.02	-
		CAT 24M (Grader)			0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	-
		CAT 16M (Grader)			0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	2.07	3.52	3.52	3.11	3.32	3.73	4.14	3.73	3.73	3.94	4.14	4.14	3.94	3.11	4.14	2.28	-
		CAT 740 - Buy (Articulated Dump Truck)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Rent (Articulated Dump Truck)			0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.07	0.11	0.11	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
		pick-up trucks			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	0.02	0.02	0.02	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	0.000	0.000	0.234	0.234	0.234	0.234	0.234	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.146	0.146	0.146	0.146	0.146	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.070	0.070	0.070	0.070	0.070	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.116	0.233	0.233	0.233	0.233	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.082	0.164	0.164	0.164	0.246	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.075	0.373	0.448	0.448	0.448	0.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.021	0.021	0.021	0.021	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.020	0.039	0.039	0.039	0.039	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	2.072	3.523	3.523	3.108	3.315	3.730	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.038	0.076	0.076	0.076	0.076	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	0.234	0.234	0.234	0.234	0.234	0.350	0.350	0.350	0.234	0.234	0.117	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.164	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.448	0.448	0.448	0.448	0.448	0.523	0.523	0.523	0.448	0.448	0.299	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	3.730	4.144	3.730	3.730	3.937	4.144	4.144	3.937	3.108	4.144	2.279	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.038	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	0.234	0.234	0.234	0.234	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.146	0.146	0.146	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.070	0.070	0.070	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.233	0.233	0.233	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.164	0.246	0.246	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.448	0.448	0.448	0.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.021	0.021	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.039	0.039	0.039	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	3.108	3.315	3.730	4.144	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.088	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.076	0.076	0.076	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.146	0.146	0.146	0.146	0.146	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.070	0.070	0.070	0.070	0.070	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.233	0.233	0.233	0.233	0.233	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.373	0.448	0.448	0.448	0.448	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.021	0.021	0.021	0.021	0.021	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.039	0.039	0.039	0.039	0.039	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.011	0.011	0.011	0.011	0.011	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	3.523	3.523	3.108	3.315	3.730	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.110	0.110	0.088	0.088	0.088	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.146	0.146	0.146	0.146	0.146	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.070	0.070	0.070	0.070	0.070	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.233	0.233	0.233	0.233	0.233	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.448	0.448	0.448	0.448	0.523	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.021	0.021	0.021	0.021	0.021	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.039	0.039	0.039	0.039	0.039	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	0.011	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	4.144	3.730	3.730	3.937	4.144	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.088	0.088	0.088	0.088	0.088	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.146	0.146	0.146	0.146	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.070	0.070	0.070	0.070	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.233	0.233	0.233	0.233	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.523	0.523	0.448	0.448	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.021	0.021	0.021	0.021	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.039	0.039	0.039	0.039	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	4.144	3.937	3.108	4.144	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.088	0.088	0.088	0.088	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.146	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.070	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.233	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.299	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.039	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.279	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.088	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - VOC	g/s	0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - VOC	g/s	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	-

Table M.1.4e - Maximum Annual Emission Rates (TSP)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s																		-
		CAT 994K (Loader)			0.000	0.002	0.004	0.004	0.004	0.005	0.005	0.009	0.005	0.006	0.006	0.005	0.005	0.005	0.006	0.007	0.004	-
		CAT 992K (Loader)			0.000	0.001	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.002	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.002	0.003	0.002	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.004	0.004	0.002	0.004	0.002	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.000	0.002	0.017	0.020	0.018	0.020	0.020	0.022	0.020	0.020	0.020	0.024	0.024	0.025	0.020	0.021	0.012	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.016	0.142	0.155	0.130	0.170	0.197	0.218	0.198	0.200	0.204	0.215	0.210	0.209	0.144	0.211	0.116	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	-
		pick-up trucks			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	0.000	0.000	0.114	0.137	0.104	0.054	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.002	0.004	0.004	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.001	0.002	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.002	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.003	0.019	0.025	0.019	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.002	0.017	0.020	0.015	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.016	0.142	0.155	0.110	0.065	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.001	0.003	0.004	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	0.061	0.134	0.142	0.133	0.139	0.191	0.206	0.208	0.142	0.144	0.074	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.002	0.009	0.005	0.006	0.006	0.005	0.005	0.005	0.006	0.007	0.004	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.001	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.002	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.001	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.002	0.004	0.002	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.012	0.027	0.028	0.028	0.028	0.037	0.037	0.037	0.028	0.029	0.015	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.009	0.021	0.020	0.020	0.020	0.024	0.024	0.025	0.020	0.021	0.012	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.084	0.210	0.198	0.200	0.204	0.215	0.210	0.209	0.144	0.211	0.116	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.001	0.003	0.003	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.002	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	0.104	0.054	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.003	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.019	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.015	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.110	0.065	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.004	0.004	0.004	0.005	0.005	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.002	0.003	0.002	0.003	0.003	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.017	0.020	0.018	0.020	0.020	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.000	0.000	0.000	0.000	0.001	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.142	0.155	0.130	0.170	0.197	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.000	0.001	0.001	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
					H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - TSP	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.009	0.005	0.006	0.006	0.005	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.004	0.003	0.003	0.003	0.003	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.004	0.003	0.003	0.003	0.004	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.022	0.020	0.020	0.020	0.024	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.001	0.000	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	0.218	0.198	0.200	0.204	0.215	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.005	0.005	0.006	0.007	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.003	0.003	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.004	0.004	0.002	0.004	-	-
	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.024	0.025	0.020	0.021	-	-
M.1.5c		CAT 834 (Rubber Tire Dozer)	N/A - TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.000	0.001	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.210	0.209	0.144	0.211	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012	-
M.1.5d		CAT 834 (Rubber Tire Dozer)	N/A - TSP	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.116	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - TSP	g/s	0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - TSP	g/s	0.000	0.000	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	-
																	9.780	9.543				

																68158.57	66528.09					
Table M.1.4f - Maximum Annual Emission Rates (PM2.5)																						
Source	**Source Name**	Equipment	**Contaminant**	**Unit**	**Year -2**	**Year -1**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year +15**
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s																		-
		CAT 994K (Loader)			0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.001	-
		CAT 992K (Loader)			0.000	0.001	0.002	0.002	0.002	0.002	0.002	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.002	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.002	0.003	0.002	0.003	0.003	0.004	0.003	0.003	0.003	0.004	0.003	0.003	0.002	0.003	0.002	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.000	0.002	0.017	0.019	0.017	0.020	0.020	0.021	0.019	0.020	0.020	0.023	0.024	0.024	0.020	0.021	0.011	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.015	0.138	0.150	0.126	0.165	0.191	0.212	0.192	0.194	0.198	0.209	0.204	0.203	0.140	0.205	0.112	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	-
		pick-up trucks			0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	0.000	0.000	0.111	0.133	0.101	0.052	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.001	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.002	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.003	0.018	0.025	0.019	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.002	0.017	0.019	0.015	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.015	0.138	0.150	0.107	0.063	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.001	0.003	0.003	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	-	-	0.060	0.130	0.137	0.129	0.135	0.185	0.200	0.202	0.138	0.140	0.072	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.001	0.003	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.001	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.001	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.003	0.002	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.001	0.003	0.003	0.003	0.003	0.004	0.003	0.003	0.002	0.003	0.002	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.012	0.026	0.027	0.027	0.027	0.036	0.036	0.036	0.028	0.028	0.015	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.008	0.020	0.019	0.020	0.020	0.023	0.024	0.024	0.020	0.021	0.011	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.000	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.081	0.204	0.192	0.194	0.198	0.209	0.204	0.203	0.140	0.205	0.112	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.001	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	0.101	0.052	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.019	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.015	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.107	0.063	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.001	0.001	0.001	0.002	0.002	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.002	0.003	0.002	0.003	0.003	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.017	0.019	0.017	0.020	0.020	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.138	0.150	0.126	0.165	0.191	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.000	0.000	0.001	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
					H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	-	-	-						-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.003	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.004	0.003	0.003	0.003	0.003	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.004	0.003	0.003	0.003	0.004	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.021	0.019	0.020	0.020	0.023	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.001	0.000	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	0.212	0.192	0.194	0.198	0.209	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.002	0.002	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.003	0.003	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.003	0.003	0.002	0.003	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.024	0.024	0.020	0.021	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.000	0.001	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.204	0.203	0.140	0.205	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - PM2.5	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.112	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - PM2.5	g/s	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - PM2.5	g/s	0.000	0.000	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	-

Table M.1.4g - Maximum Annual Emission Rates (NOx)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s																		
		CAT 994K (Loader)			0.000	0.065	0.155	0.146	0.130	0.178	0.178	0.316	0.187	0.223	0.211	0.187	0.158	0.166	0.201	0.230	0.132	
		CAT 992K (Loader)			0.000	0.031	0.074	0.070	0.063	0.086	0.086	0.152	0.090	0.108	0.102	0.090	0.076	0.080	0.097	0.111	0.064	
		Komatsu HD1500 (Water Truck)			0.000	0.016	0.084	0.093	0.079	0.100	0.114	0.125	0.114	0.116	0.118	0.126	0.123	0.123	0.085	0.123	0.067	
		CAT MD6250/Pit Viper PV-275 (Drill)																				
		CAT D11/D10T (Dozer)			0.000	0.056	0.591	0.683	0.619	0.701	0.704	0.749	0.692	0.703	0.706	0.829	0.849	0.858	0.705	0.734	0.399	
		CAT 834 (Rubber Tire Dozer)			0.000	0.021	0.045	0.053	0.050	0.053	0.051	0.060	0.047	0.054	0.052	0.066	0.067	0.068	0.059	0.059	0.030	
		CAT 24M (Grader)			0.000	0.010	0.101	0.110	0.089	0.120	0.139	0.152	0.130	0.140	0.141	0.151	0.146	0.146	0.094	0.151	0.079	
		CAT 16M (Grader)			0.000	0.032	0.034	0.034	0.032	0.033	0.028	0.026	0.028	0.028	0.027	0.028	0.027	0.026	0.026	0.031	0.015	
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.538	4.939	5.358	4.495	5.889	6.825	7.574	6.848	6.949	7.065	7.468	7.278	7.238	4.990	7.311	4.008	
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		Western Star 6900XD (Haul Truck)			0.000	0.088	0.720	0.606	0.580	0.639	0.544	0.580	0.629	0.566	0.511	0.546	0.530	0.485	0.440	0.663	0.250	
		pick-up trucks			0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288	
		CAT 390D (Backhoe)																				
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	0.000	0.000	3.565	4.261	3.244	1.685	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.065	0.155	0.146	0.111	0.068	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.031	0.074	0.070	0.053	0.033	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.016	0.084	0.093	0.067	0.038	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.111	0.644	0.882	0.673	0.364	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.056	0.591	0.683	0.527	0.269	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.021	0.045	0.053	0.042	0.021	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.010	0.101	0.110	0.076	0.046	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.032	0.034	0.034	0.027	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.538	4.939	5.358	3.829	2.263	0.212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.062	0.318	0.363	0.274	0.104	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.374	0.841	0.962	0.815	0.347	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	1.913	4.179	4.413	4.148	4.330	5.951	6.427	6.485	4.432	4.487	2.305	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.076	0.305	0.187	0.223	0.211	0.187	0.158	0.166	0.201	0.230	0.132	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.036	0.147	0.090	0.108	0.102	0.090	0.076	0.080	0.097	0.111	0.064	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.048	0.121	0.114	0.116	0.118	0.126	0.123	0.123	0.085	0.123	0.067	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.413	0.939	0.960	0.967	0.960	1.274	1.298	1.289	0.987	0.988	0.531	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.299	0.721	0.692	0.703	0.706	0.829	0.849	0.858	0.705	0.734	0.399	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.022	0.058	0.047	0.054	0.052	0.066	0.067	0.068	0.059	0.059	0.030	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.059	0.146	0.130	0.140	0.141	0.151	0.146	0.146	0.094	0.151	0.079	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.012	0.025	0.028	0.028	0.027	0.028	0.027	0.026	0.026	0.031	0.015	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	2.895	7.294	6.848	6.949	7.065	7.468	7.278	7.238	4.990	7.311	4.008	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.096	0.165	0.189	0.183	0.215	0.214	0.211	0.235	0.266	0.204	0.087	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.362	0.805	0.883	0.905	0.888	0.978	0.976	0.972	0.894	0.923	0.524	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	3.244	1.685	0.140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.111	0.068	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.053	0.033	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.067	0.038	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.673	0.364	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.527	0.269	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.042	0.021	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.076	0.046	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.027	0.013	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	3.829	2.263	0.212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.274	0.104	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.815	0.347	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.155	0.146	0.130	0.178	0.178	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.074	0.070	0.063	0.086	0.086	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.084	0.093	0.079	0.100	0.114	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.591	0.683	0.619	0.701	0.704	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.045	0.053	0.050	0.053	0.051	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.101	0.110	0.089	0.120	0.139	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.034	0.034	0.032	0.033	0.028	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	4.939	5.358	4.495	5.889	6.825	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.112	0.139	0.142	0.117	0.099	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
					H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-						-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.316	0.187	0.223	0.211	0.187	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.152	0.090	0.108	0.102	0.090	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.125	0.114	0.116	0.118	0.126	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.749	0.692	0.703	0.706	0.829	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.060	0.047	0.054	0.052	0.066	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.152	0.130	0.140	0.141	0.151	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.026	0.028	0.028	0.027	0.028	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	7.574	6.848	6.949	7.065	7.468	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.072	0.087	0.080	0.093	0.100	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.158	0.166	0.201	0.230	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.076	0.080	0.097	0.111	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.123	0.123	0.085	0.123	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.849	0.858	0.705	0.734	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.067	0.068	0.059	0.059	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.146	0.146	0.094	0.151	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.027	0.026	0.026	0.031	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	7.278	7.238	4.990	7.311	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.100	0.110	0.116	0.089	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.132	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.064	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.067	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.399	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.030	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.079	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.015	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.008	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.038	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	10102-44-0 - NOx	g/s	0.000	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	0.417	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	10102-44-0 - NOx	g/s	0.000	0.000	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	0.709	-

Table M.1.4h - Maximum Annual Emission Rates (SO2)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s																		-
		CAT 994K (Loader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.001	0.007	0.008	0.007	0.009	0.010	0.011	0.010	0.010	0.011	0.011	0.011	0.011	0.007	0.011	0.006	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	-
		pick-up trucks			0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	0.000	0.000	0.003	0.004	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.001	0.007	0.008	0.006	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	-	-	-	-	0.002	0.004	0.004	0.004	0.004	0.005	0.006	0.006	0.004	0.004	0.002	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.004	0.011	0.010	0.010	0.011	0.011	0.011	0.011	0.007	0.011	0.006	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	-	-	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.001	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.007	0.008	0.007	0.009	0.010	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	0.011	0.010	0.010	0.011	0.011	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.011	0.011	0.007	0.011	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	7446-09-5 - SO2	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.006	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0001	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	7446-09-5 - SO2	g/s	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	7446-09-5 - SO2	g/s	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-

Table M.1.4i - Maximum Annual Emission Rates (VOC)																					
Source	**Source Name**	Equipment	**Contaminant**	**Unit**	**Year -2**	**Year -1**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year +15**
		CAT 6050/Komatsu PC5500 (Excavator)																			-
		CAT 994K (Loader)			0.000	0.008	0.018	0.017	0.015	0.021	0.021	0.037	0.022	0.026	0.025	0.022	0.019	0.020	0.024	0.027	0.016	-
		CAT 992K (Loader)			0.000	0.004	0.009	0.008	0.007	0.010	0.010	0.018	0.011	0.013	0.012	0.011	0.009	0.009	0.011	0.013	0.007	-
		Komatsu HD1500 (Water Truck)			0.000	0.002	0.010	0.011	0.009	0.012	0.013	0.015	0.013	0.014	0.014	0.015	0.015	0.014	0.010	0.014	0.008	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
	Mobile Equipment Combustion Emissions from Haul Road	CAT D11/D10T (Dozer)			0.000	0.007	0.069	0.080	0.073	0.082	0.083	0.088	0.081	0.083	0.083	0.098	0.100	0.101	0.083	0.086	0.047	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.002	0.003	0.003	0.003	0.003	0.003	0.002	0.003	0.003	0.003	0.004	0.004	0.003	0.003	0.002	-
M.1.1		CAT 24M (Grader)	N/A - VOC	g/s	0.000	0.001	0.005	0.006	0.005	0.006	0.007	0.008	0.007	0.007	0.007	0.008	0.008	0.008	0.005	0.008	0.004	-
		CAT 16M (Grader)			0.000	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.063	0.581	0.631	0.529	0.693	0.803	0.891	0.806	0.818	0.831	0.879	0.856	0.852	0.587	0.860	0.472	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.005	0.038	0.032	0.030	0.034	0.029	0.030	0.033	0.030	0.027	0.029	0.028	0.025	0.023	0.035	0.013	-
		pick-up trucks			0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	-
		CAT 390D (Backhoe)																				-
		CAT 6050/Komatsu PC5500 (Excavator)			0.000	0.000	0.145	0.173	0.132	0.069	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.008	0.018	0.017	0.013	0.008	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.004	0.009	0.008	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.002	0.010	0.011	0.008	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.013	0.076	0.104	0.079	0.043	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.007	0.069	0.080	0.062	0.032	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
	Mobile Equipment Combustion Emissions from North Pit	CAT 834 (Rubber Tire Dozer)			0.000	0.001	0.002	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.2		CAT 24M (Grader)	N/A - VOC	g/s	0.000	0.001	0.005	0.006	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.002	0.002	0.002	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	0.063	0.581	0.631	0.451	0.266	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.003	0.017	0.019	0.014	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.020	0.044	0.051	0.043	0.018	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	0.078	0.170	0.180	0.169	0.176	0.242	0.262	0.264	0.180	0.183	0.094	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.009	0.036	0.022	0.026	0.025	0.022	0.019	0.020	0.024	0.027	0.016	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.004	0.017	0.011	0.013	0.012	0.011	0.009	0.009	0.011	0.013	0.007	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.006	0.014	0.013	0.014	0.014	0.015	0.015	0.014	0.010	0.014	0.008	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.049	0.110	0.113	0.114	0.113	0.150	0.153	0.152	0.116	0.116	0.063	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.035	0.085	0.081	0.083	0.083	0.098	0.100	0.101	0.083	0.086	0.047	-
	Mobile Equipment Combustion Emissions from South Pit	CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.001	0.003	0.002	0.003	0.003	0.003	0.004	0.004	0.003	0.003	0.002	-
M.1.3		CAT 24M (Grader)	N/A - VOC	g/s	-	-	-	-	-	-	0.003	0.008	0.007	0.007	0.007	0.008	0.008	0.008	0.005	0.008	0.004	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.341	0.858	0.806	0.818	0.831	0.879	0.856	0.852	0.587	0.860	0.472	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.005	0.009	0.010	0.010	0.011	0.011	0.011	0.012	0.014	0.011	0.005	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.019	0.042	0.046	0.048	0.047	0.051	0.051	0.051	0.047	0.048	0.028	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	0.023	0.110	0.100	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.002	0.013	0.011	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.001	0.006	0.006	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.001	0.007	0.007	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.014	0.069	0.062	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.011	0.051	0.045	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.001	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.078	0.427	0.437	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.003	0.009	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.007	0.029	0.024	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.018	0.017	0.015	0.021	0.021	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.009	0.008	0.007	0.010	0.010	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.010	0.011	0.009	0.012	0.013	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.069	0.080	0.073	0.082	0.083	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.002	0.003	0.003	0.003	0.003	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.005	0.006	0.005	0.006	0.007	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.002	0.002	0.002	0.002	0.001	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	0.581	0.631	0.529	0.693	0.803	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.006	0.007	0.007	0.006	0.005	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.037	0.022	0.026	0.025	0.022	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.018	0.011	0.013	0.012	0.011	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.015	0.013	0.014	0.014	0.015	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.088	0.081	0.083	0.083	0.098	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.003	0.002	0.003	0.003	0.003	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.008	0.007	0.007	0.007	0.008	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.001	0.001	0.001	0.001	0.001	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	0.891	0.806	0.818	0.831	0.879	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.004	0.005	0.004	0.005	0.005	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.019	0.020	0.024	0.027	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.009	0.009	0.011	0.013	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.015	0.014	0.010	0.014	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.100	0.101	0.083	0.086	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.004	0.004	0.003	0.003	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.008	0.008	0.005	0.008	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.001	0.001	0.002	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.856	0.852	0.587	0.860	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.005	0.006	0.006	0.005	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.016	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.047	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.472	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - VOC	g/s	0.000	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - VOC	g/s	0.000	0.000	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	-

Table M.1.4j - Maximum 1-hr Emission Rates (NOx)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s																		-
		CAT 994K (Loader)			0.000	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	-
		CAT 992K (Loader)			0.000	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	-
		Komatsu HD1500 (Water Truck)			0.000	0.988	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.000	0.635	3.173	3.807	3.807	3.807	3.807	3.807	3.807	3.807	3.807	4.442	4.442	4.442	3.807	3.807	2.538	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	-
		CAT 24M (Grader)			0.000	0.372	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	-
		CAT 16M (Grader)			0.000	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	17.608	29.933	29.933	26.412	28.172	31.694	35.216	31.694	31.694	33.455	35.216	35.216	33.455	26.412	35.216	19.369	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	1.250	2.083	2.083	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	-
		pick-up trucks			0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	0.299	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	0.000	0.000	5.740	5.740	5.740	5.740	5.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	1.243	1.243	1.243	1.243	1.243	1.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.598	0.598	0.598	0.598	0.598	0.598	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.988	1.976	1.976	1.976	1.976	1.976	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.698	1.395	1.395	1.395	2.093	2.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.635	3.173	3.807	3.807	3.807	3.807	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.390	0.390	0.390	0.390	0.390	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.372	0.743	0.743	0.743	0.743	0.743	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.209	0.209	0.209	0.209	0.209	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	17.608	29.933	29.933	26.412	28.172	31.694	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	1.250	2.083	2.083	1.667	1.667	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.726	1.453	1.453	1.453	1.453	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	5.740	5.740	5.740	5.740	5.740	8.610	8.610	8.610	5.740	5.740	2.870	-
		CAT 994K (Loader)			-	-	-	-	-	-	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	0.598	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	1.976	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	2.093	2.093	2.093	2.093	2.093	2.093	2.093	2.093	2.093	2.093	1.395	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	3.807	3.807	3.807	3.807	3.807	4.442	4.442	4.442	3.807	3.807	2.538	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	0.390	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	0.209	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	31.694	35.216	31.694	31.694	33.455	35.216	35.216	33.455	26.412	35.216	19.369	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	1.453	1.453	1.453	1.453	1.453	1.453	1.453	1.453	1.453	1.453	0.726	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	5.740	5.740	5.740	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	1.243	1.243	1.243	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.598	0.598	0.598	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	1.976	1.976	1.976	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	1.395	2.093	2.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	3.807	3.807	3.807	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.390	0.390	0.390	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.743	0.743	0.743	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.209	0.209	0.209	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	26.412	28.172	31.694	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	1.667	1.667	1.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	1.453	1.453	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	1.243	1.243	1.243	1.243	1.243	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.598	0.598	0.598	0.598	0.598	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	1.976	1.976	1.976	1.976	1.976	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	3.173	3.807	3.807	3.807	3.807	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.390	0.390	0.390	0.390	0.390	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.743	0.743	0.743	0.743	0.743	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.209	0.209	0.209	0.209	0.209	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	29.933	29.933	26.412	28.172	31.694	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	2.083	2.083	1.667	1.667	1.667	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	1.243	1.243	1.243	1.243	1.243		-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.598	0.598	0.598	0.598	0.598		-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	1.976	1.976	1.976	1.976	1.976		-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000		-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	3.807	3.807	3.807	3.807	4.442		-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.390	0.390	0.390	0.390	0.390		-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.743	0.743	0.743	0.743	0.743		-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.209	0.209	0.209	0.209	0.209		-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	35.216	31.694	31.694	33.455	35.216		-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002		-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000		-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	1.667	1.667	1.667	1.667	1.667		-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	1.243	1.243	1.243	1.243	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.598	0.598	0.598	0.598	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	1.976	1.976	1.976	1.976	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	4.442	4.442	3.807	3.807	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.390	0.390	0.390	0.390	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.743	0.743	0.743	0.743	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.209	0.209	0.209	0.209	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	35.216	33.455	26.412	35.216	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	1.667	1.667	1.667	1.667	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	10102-44-0 - NOx	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.243	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.598	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.976	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.538	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.390	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.743	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.209	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.369	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.667	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	10102-44-0 - NOx	g/s	0.000	1.250	2.083	2.083	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	10102-44-0 - NOx	g/s	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	1.243	-

Table M.1.4k - Maximum 1-hr Emission Rates (CO)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s																		-
		CAT 994K (Loader)			0.000	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	-
		CAT 992K (Loader)			0.000	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	-
		Komatsu HD1500 (Water Truck)			0.000	0.316	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.000	0.203	1.014	1.216	1.216	1.216	1.216	1.216	1.216	1.216	1.216	1.419	1.419	1.419	1.216	1.216	0.811	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	-
		CAT 24M (Grader)			0.000	0.012	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	-
		CAT 16M (Grader)			0.000	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	5.625	9.563	9.563	8.438	9.001	10.126	11.251	10.126	10.126	10.688	11.251	11.251	10.688	8.438	11.251	6.188	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.042	0.070	0.070	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	-
		pick-up trucks			0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	-
		CAT 390D (Backhoe)																				-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	0.000	0.000	1.070	1.070	1.070	1.070	1.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			0.000	0.397	0.397	0.397	0.397	0.397	0.397	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			0.000	0.191	0.191	0.191	0.191	0.191	0.191	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			0.000	0.316	0.631	0.631	0.631	0.631	0.631	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.223	0.446	0.446	0.446	0.669	0.669	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			0.000	0.203	1.014	1.216	1.216	1.216	1.216	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			0.000	0.013	0.013	0.013	0.013	0.013	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			0.000	0.012	0.025	0.025	0.025	0.025	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			0.000	0.007	0.007	0.007	0.007	0.007	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	5.625	9.563	9.563	8.438	9.001	10.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.042	0.070	0.070	0.056	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			0.000	0.024	0.049	0.049	0.049	0.049	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-	-	-	-	-	1.070	1.070	1.070	1.070	1.070	1.605	1.605	1.605	1.070	1.070	0.535	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	0.631	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.669	0.446	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	1.216	1.216	1.216	1.216	1.216	1.419	1.419	1.419	1.216	1.216	0.811	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	10.126	11.251	10.126	10.126	10.688	11.251	11.251	10.688	8.438	11.251	6.188	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.024	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-	-	-	1.070	1.070	1.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.397	0.397	0.397	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.191	0.191	0.191	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.631	0.631	0.631	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.446	0.669	0.669	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	1.216	1.216	1.216	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.013	0.013	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.025	0.025	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.007	0.007	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	8.438	9.001	10.126	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-

		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.056	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.049	0.049	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.397	0.397	0.397	0.397	0.397	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.191	0.191	0.191	0.191	0.191	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.631	0.631	0.631	0.631	0.631	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	1.014	1.216	1.216	1.216	1.216	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.013	0.013	0.013	0.013	0.013	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.025	0.025	0.025	0.025	0.025	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.007	0.007	0.007	0.007	0.007	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	9.563	9.563	8.438	9.001	10.126	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.070	0.070	0.056	0.056	0.056	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-											-	-	-	-	-
		CAT 994K (Loader)			-	-						0.397	0.397	0.397	0.397	0.397		-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.191	0.191	0.191	0.191	0.191	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.631	0.631	0.631	0.631	0.631	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	1.216	1.216	1.216	1.216	1.419	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.013	0.013	0.013	0.013	0.013	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.025	0.025	0.025	0.025	0.025	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.007	0.007	0.007	0.007	0.007	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	11.251	10.126	10.126	10.688	11.251	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.056	0.056	0.056	0.056	0.056	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.397	0.397	0.397	0.397	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.191	0.191	0.191	0.191	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.631	0.631	0.631	0.631	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	1.419	1.419	1.216	1.216	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.013	0.013	0.013	0.013	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.025	0.025	0.025	0.025	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.007	0.007	0.007	0.007	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	11.251	10.688	8.438	11.251	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.056	0.056	0.056	0.056	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.397	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.191	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.631	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.811	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.013	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.025	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.007	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.188	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.056	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	630-08-0 - CO	g/s	0.000	0.042	0.070	0.070	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	630-08-0 - CO	g/s	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	0.397	-

Table M.1.4l - Maximum 1-hr Emission Rates (VOCs)					H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
Source	**Source Name**	Equipment	**Contaminant**	**Unit**	**Year -2**	**Year -1**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year +15**
		CAT 6050/Komatsu PC5500 (Excavator)																				-
		CAT 994K (Loader)			0.000	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	-
		CAT 992K (Loader)			0.000	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	-
		Komatsu HD1500 (Water Truck)			0.000	0.116	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				
		CAT D11/D10T (Dozer)			0.000	0.075	0.373	0.448	0.448	0.448	0.448	0.448	0.448	0.448	0.448	0.523	0.523	0.523	0.448	0.448	0.299	-
	Mobile Equipment Combustion Emissions from Haul Road	CAT 834 (Rubber Tire Dozer)			0.000	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	-
M.1.1		CAT 24M (Grader)	N/A - VOC	g/s	0.000	0.020	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	-
		CAT 16M (Grader)			0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	2.072	3.523	3.523	3.108	3.315	3.730	4.144	3.730	3.730	3.937	4.144	4.144	3.937	3.108	4.144	2.279	-
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	-
		pick-up trucks			0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	-
		CAT 390D (Backhoe)																				
		CAT 6050/Komatsu PC5500 (Excavator)			0.000	0.000	0.234	0.234	0.234	0.234	0.234	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 994K (Loader)			0.000	0.146	0.146	0.146	0.146	0.146	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 992K (Loader)			0.000	0.070	0.070	0.070	0.070	0.070	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		Komatsu HD1500 (Water Truck)			0.000	0.116	0.233	0.233	0.233	0.233	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT MD6250/Pit Viper PV-275 (Drill)			0.000	0.082	0.164	0.164	0.164	0.246	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT D11/D10T (Dozer)			0.000	0.075	0.373	0.448	0.448	0.448	0.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	Mobile Equipment Combustion Emissions from North Pit	CAT 834 (Rubber Tire Dozer)			0.000	0.021	0.021	0.021	0.021	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
M.1.2		CAT 24M (Grader)	N/A - VOC	g/s	0.000	0.020	0.039	0.039	0.039	0.039	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 16M (Grader)			0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 793F/Komatsu 830E (Dump Truck)			0.000	2.072	3.523	3.523	3.108	3.315	3.730	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 740 - Buy (Articulated Dump Truck)			0.000	0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 740 - Rent (Articulated Dump Truck)			0.000	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		Western Star 6900XD (Haul Truck)			0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 390D (Backhoe)			0.000	0.038	0.076	0.076	0.076	0.076	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		CAT 6050/Komatsu PC5500 (Excavator)										0.234	0.234	0.234	0.234	0.350	0.350	0.350	0.234	0.234	0.117	
		CAT 994K (Loader)										0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	
		CAT 992K (Loader)										0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	
		Komatsu HD1500 (Water Truck)										0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	0.233	
		CAT MD6250/Pit Viper PV-275 (Drill)										0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.246	0.164	
		CAT D11/D10T (Dozer)										0.448	0.448	0.448	0.448	0.523	0.523	0.523	0.448	0.448	0.299	
	Mobile Equipment Combustion Emissions from South Pit	CAT 834 (Rubber Tire Dozer)										0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	
M.1.3		CAT 24M (Grader)	N/A - VOC	g/s								0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039	
		CAT 16M (Grader)										0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	
		CAT 793F/Komatsu 830E (Dump Truck)										4.144	3.730	3.730	3.937	4.144	4.144	3.937	3.108	4.144	2.279	
		CAT 740 - Buy (Articulated Dump Truck)										0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
		CAT 740 - Rent (Articulated Dump Truck)										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		Western Star 6900XD (Haul Truck)										0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	
		CAT 390D (Backhoe)										0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.038	

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	0.234	0.234	0.234	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 994K (Loader)			-	-	-	-	0.146	0.146	0.146	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 992K (Loader)			-	-	-	-	0.070	0.070	0.070	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.233	0.233	0.233	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.164	0.246	0.246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.448	0.448	0.448	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.021	0.021	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 24M (Grader)			-	-	-	-	0.039	0.039	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 16M (Grader)			-	-	-	-	0.011	0.011	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	3.108	3.315	3.730	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.088	0.088	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
		CAT 390D (Backhoe)			-	-	-	-	0.076	0.076	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	630-08-0 - CO	g/s			0.000	0.000	0.000	0.000	0.000											
		CAT 994K (Loader)					0.397	0.397	0.397	0.397	0.397											
		CAT 992K (Loader)					0.191	0.191	0.191	0.191	0.191											
		Komatsu HD1500 (Water Truck)					0.631	0.631	0.631	0.631	0.631											
		CAT MD6250/Pit Viper PV-275 (Drill)					0.000	0.000	0.000	0.000	0.000											
		CAT D11/D10T (Dozer)					1.014	1.216	1.216	1.216	1.216											
		CAT 834 (Rubber Tire Dozer)					0.013	0.013	0.013	0.013	0.013											
		CAT 24M (Grader)					0.025	0.025	0.025	0.025	0.025											
		CAT 16M (Grader)					0.007	0.007	0.007	0.007	0.007											
		CAT 793F/Komatsu 830E (Dump Truck)					9.563	9.563	8.438	9.001	10.126											
		CAT 740 - Buy (Articulated Dump Truck)					0.002	0.002	0.002	0.002	0.002											
		CAT 740 - Rent (Articulated Dump Truck)					0.000	0.000	0.000	0.000	0.000											
		Western Star 6900XD (Haul Truck)					0.070	0.070	0.056	0.056	0.056											
		CAT 390D (Backhoe)					0.000	0.000	0.000	0.000	0.000											
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-						-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.146	0.146	0.146	0.146	0.146	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.070	0.070	0.070	0.070	0.070	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.233	0.233	0.233	0.233	0.233	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.448	0.448	0.448	0.448	0.523	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.021	0.021	0.021	0.021	0.021	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.039	0.039	0.039	0.039	0.039	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	0.011	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	4.144	3.730	3.730	3.937	4.144	-	-	-	-	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	0.002	-	-	-	-	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.088	0.088	0.088	0.088	0.088	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	0.000	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-					-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.146	0.146	0.146	0.146	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.070	0.070	0.070	0.070	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.233	0.233	0.233	0.233	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.523	0.523	0.448	0.448	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.021	0.021	0.021	0.021	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.039	0.039	0.039	0.039	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.011	0.011	0.011	0.011	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	4.144	3.937	3.108	4.144	-	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.002	0.002	0.002	0.002	-	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.088	0.088	0.088	0.088	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	N/A - VOC	g/s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.146	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.070	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.233	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.299	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.021	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.039	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.011	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.279	-
		CAT 740 - Buy (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.002	-
		CAT 740 - Rent (Articulated Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.088	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	N/A - VOC	g/s	0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	N/A - VOC	g/s	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	-

Table M.1.4m - Maximum Annual Emission Rates (CO2)																					
Source	**Source Name**	Equipment	**Contaminant**	**Unit**	**Year -2**	**Year -1**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	**Year 11**	**Year 12**	**Year 13**	**Year 14**	**Year 15**	**Year +15**
		CAT 6050/Komatsu PC5500 (Excavator)																				
		CAT 994K (Loader)			0.00	457.34	1080.77	1018.94	909.95	1243.29	1246.15	2211.13	1305.79	1561.54	1477.68	1305.11	1102.38	1161.88	1402.55	1609.59	925.40	-
		CAT 992K (Loader)			0.00	220.11	520.16	490.40	437.94	598.37	599.75	1064.18	628.46	751.54	711.18	628.13	530.56	559.19	675.03	774.67	445.38	-
		Komatsu HD1500 (Water Truck)			0.00	114.24	588.04	647.30	552.40	695.96	795.09	875.46	797.12	813.68	824.46	882.78	862.51	858.22	596.48	857.26	470.03	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	391.97	4127.66	4777.12	4326.08	4896.57	4918.99	5235.14	4838.81	4914.19	4933.65	5797.37	5935.05	5994.18	4929.77	5128.83	2788.10	-
		CAT 834 (Rubber Tire Dozer)			0.00	137.68	300.57	356.45	332.03	357.24	344.32	400.09	314.95	360.98	350.79	442.39	445.83	455.62	397.09	397.09	203.61	-
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 24M (Grader)	124-38-9 - CO2	tonnes /year	0.00	68.36	676.50	734.81	595.96	805.68	932.92	1017.24	870.43	937.59	941.89	1011.27	977.73	975.91	631.73	1013.56	529.91	-
		CAT 16M (Grader)			0.00	216.63	230.55	228.00	212.91	218.46	188.87	172.78	188.07	184.30	178.61	185.30	183.66	175.58	173.20	205.33	97.69	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	3762.72	34520.39	37450.68	31417.30	41161.51	47701.98	52939.72	47865.15	48571.09	49380.58	52199.86	50867.72	50591.28	34878.17	51099.36	28012.39	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	435.48	73.89	138.27	77.42	196.07	150.02	34.42	55.74	181.64	126.28	122.93	143.12	58.11	43.93	177.21	36.62	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	1741.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	586.99	4822.45	4053.93	3880.90	4280.28	3642.64	3883.41	4208.40	3790.60	3420.77	3653.83	3549.94	3244.70	2944.72	4436.37	1674.24	-
		pick-up trucks			1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	1929.60	-
		CAT 390D (Backhoe)																				
		CAT 6050/Komatsu PC5500 (Excavator)			0.00	0.00	14545.91	17386.89	13238.53	6876.93	572.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)			0.00	457.34	1080.77	1018.94	775.20	477.68	38.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			0.00	220.11	520.16	490.40	373.09	229.90	18.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			0.00	114.24	588.04	647.30	470.60	267.39	24.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.00	775.18	4503.49	6161.39	4701.80	2547.03	211.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			0.00	391.97	4127.66	4777.12	3685.45	1881.29	153.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 834 (Rubber Tire Dozer)	124-38-9 - CO2	tonnes /year	0.00	137.68	300.57	356.45	282.86	137.25	10.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)			0.00	68.36	676.50	734.81	507.70	309.55	29.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)			0.00	216.63	230.55	228.00	181.38	83.94	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	3762.72	34520.39	37450.68	26764.85	15814.51	1485.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	435.48	73.89	138.27	65.95	75.33	4.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	1741.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	416.27	2127.46	2426.52	1835.87	693.30	47.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)			0.00	5.53	12.44	14.22	12.06	5.13	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	7806.64	17053.44	18006.70	16925.51	17669.29	24285.02	26224.49	26463.30	18086.56	18307.36	9404.64	-
		CAT 994K (Loader)			-	-	-	-	-	-	528.63	2129.43	1305.79	1561.54	1477.68	1305.11	1102.38	1161.88	1402.55	1609.59	925.40	-
		CAT 992K (Loader)			-	-	-	-	-	-	254.42	1024.86	628.46	751.54	711.18	628.13	530.56	559.19	675.03	774.67	445.38	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	337.29	843.11	797.12	813.68	824.46	882.78	862.51	858.22	596.48	857.26	470.03	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	2884.68	6561.45	6710.43	6756.69	6711.05	8906.01	9075.15	9008.32	6897.74	6907.55	3712.10	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	2086.70	5041.70	4838.81	4914.19	4933.65	5797.37	5935.05	5994.18	4929.77	5128.83	2788.10	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 834 (Rubber Tire Dozer)	124-38-9 - CO2	tonnes /year	-	-	-	-	-	-	146.06	385.31	314.95	360.98	350.79	442.39	445.83	455.62	397.09	397.09	203.61	-
		CAT 24M (Grader)			-	-	-	-	-	-	395.76	979.66	870.43	937.59	941.89	1011.27	977.73	975.91	631.73	1013.56	529.91	-
		CAT 16M (Grader)			-	-	-	-	-	-	80.12	166.40	188.07	184.30	178.61	185.30	183.66	175.58	173.20	205.33	97.69	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	20235.80	50983.64	47865.15	48571.09	49380.58	52199.86	50867.72	50591.28	34878.17	51099.36	28012.39	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	63.64	33.15	55.74	181.64	126.28	122.93	143.12	58.11	43.93	177.21	36.62	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	642.75	1101.09	1267.42	1223.94	1435.94	1432.95	1412.60	1575.85	1777.90	1367.31	583.07	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	5.36	11.91	13.07	13.39	13.13	14.47	14.43	14.37	13.22	13.65	7.75	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	124-38-9 - CO2	tonnes /year	-	-	-	-	2301.21	11022.13	10023.03	654.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)			-	-	-	-	134.75	765.61	678.72	81.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			-	-	-	-	64.85	368.47	326.66	39.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	81.80	428.56	433.05	32.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	817.30	4082.30	3703.68	251.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			-	-	-	-	640.63	3015.28	2679.14	193.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	49.17	219.99	187.53	14.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)			-	-	-	-	88.25	496.13	508.12	37.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)			-	-	-	-	31.53	134.53	102.87	6.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	4652.46	25347.00	25980.97	1956.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	11.46	120.74	81.71	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	319.12	1111.20	825.23	42.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)			-	-	-	-	2.10	8.22	6.88	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	124-38-9 - CO2	tonnes /year	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	1080.77	1018.94	909.95	1243.29	1246.15	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	520.16	490.40	437.94	598.37	599.75	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	588.04	647.30	552.40	695.96	795.09	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	4127.66	4777.12	4326.08	4896.57	4918.99	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	300.57	356.45	332.03	357.24	344.32	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	676.50	734.81	595.96	805.68	932.92	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	230.55	228.00	212.91	218.46	188.87	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	34520.39	37450.68	31417.30	41161.51	47701.98	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	73.89	138.27	77.42	196.07	150.02	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	749.08	932.50	950.32	782.43	662.59	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	124-38-9 - CO2	tonnes /year	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	2211.13	1305.79	1561.54	1477.68	1305.11	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	1064.18	628.46	751.54	711.18	628.13	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	875.46	797.12	813.68	824.46	882.78	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	5235.14	4838.81	4914.19	4933.65	5797.37	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	400.09	314.95	360.98	350.79	442.39	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	1017.24	870.43	937.59	941.89	1011.27	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	172.78	188.07	184.30	178.61	185.30	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	52939.72	47865.15	48571.09	49380.58	52199.86	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	34.42	55.74	181.64	126.28	122.93	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	484.09	583.09	533.22	622.92	669.02	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-

		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	1102.38	1161.88	1402.55	1609.59	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	530.56	559.19	675.03	774.67	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	862.51	858.22	596.48	857.26	-	-
	Mobile	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
	Equipment	CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	5935.05	5994.18	4929.77	5128.83	-	-
M.1.5c	Combustion	CAT 834 (Rubber Tire Dozer)	124-38-9 -	tonnes	-	-	-	-	-	-	-	-	-	-	-	-	445.83	455.62	397.09	397.09	-	-
	Emissions from	CAT 24M (Grader)	CO2	/year	-	-	-	-	-	-	-	-	-	-	-	-	977.73	975.91	631.73	1013.56	-	-
	Waste Pit (Years	CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	183.66	175.58	173.20	205.33	-	-
	11-14)	CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	50867.72	50591.28	34878.17	51099.36	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	143.12	58.11	43.93	177.21	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	669.92	733.95	777.82	594.41	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	925.40	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	445.38	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	470.03	-
	Mobile	CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
	Equipment	CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2788.10	-
M.1.5d	Combustion	CAT 834 (Rubber Tire Dozer)	124-38-9 -	tonnes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	203.61	-
	Emissions from	CAT 24M (Grader)	CO2	/year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	529.91	-
	Waste Pit (Year	CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97.69	-
	15)	CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28012.39	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.62	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	255.75	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	124-38-9 - CO2	tonnes/ year	0.00	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	124-38-9 - CO2	tonnes/ year	0.00	0.00	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	-

Table M.1.4n - Maximum Annual Emission Rates (CH4)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year																		
		CAT 994K (Loader)			0.00	0.02	0.06	0.05	0.05	0.06	0.06	0.12	0.07	0.08	0.08	0.07	0.06	0.06	0.07	0.08	0.05	-
		CAT 992K (Loader)			0.00	0.01	0.03	0.03	0.02	0.03	0.03	0.06	0.03	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.02	-
		Komatsu HD1500 (Water Truck)			0.00	0.01	0.03	0.03	0.03	0.04	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.04	0.03	0.04	0.02	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.02	0.21	0.25	0.23	0.25	0.26	0.27	0.25	0.26	0.26	0.30	0.31	0.31	0.26	0.27	0.15	-
		CAT 834 (Rubber Tire Dozer)			0.00	0.01	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	0.01	-
		CAT 24M (Grader)			0.00	0.00	0.04	0.04	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.05	0.03	-
		CAT 16M (Grader)			0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.20	1.80	1.95	1.64	2.14	2.48	2.76	2.49	2.53	2.57	2.72	2.65	2.63	1.82	2.66	1.46	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.02	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.03	0.25	0.21	0.20	0.22	0.19	0.20	0.22	0.20	0.18	0.19	0.18	0.17	0.15	0.23	0.09	-
		pick-up trucks			0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	-
		CAT 390D (Backhoe)																				
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	0.00	0.00	0.76	0.90	0.69	0.36	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)			0.00	0.02	0.06	0.05	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			0.00	0.01	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			0.00	0.01	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.00	0.04	0.23	0.32	0.24	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			0.00	0.02	0.21	0.25	0.19	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)			0.00	0.01	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)			0.00	0.00	0.04	0.04	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)			0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.20	1.80	1.95	1.39	0.82	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.02	0.11	0.13	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	-	-	-	-	0.41	0.89	0.94	0.88	0.92	1.26	1.36	1.38	0.94	0.95	0.49	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.03	0.11	0.07	0.08	0.08	0.07	0.06	0.06	0.07	0.08	0.05	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.01	0.05	0.03	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.02	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.02	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.03	0.04	0.02	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.15	0.34	0.35	0.35	0.35	0.46	0.47	0.47	0.36	0.36	0.19	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.11	0.26	0.25	0.26	0.26	0.30	0.31	0.31	0.26	0.27	0.15	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.03	0.05	0.03	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	1.05	2.65	2.49	2.53	2.57	2.72	2.65	2.63	1.82	2.66	1.46	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.03	0.06	0.07	0.06	0.07	0.07	0.07	0.08	0.09	0.07	0.03	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	-	-	0.1198	0.5736	0.5216	0.0341	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 994K (Loader)			-	-	-	-	0.0070	0.0398	0.0353	0.0043	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 992K (Loader)			-	-	-	-	0.0034	0.0192	0.0170	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.0043	0.0223	0.0225	0.0017	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.0425	0.2125	0.1928	0.0131	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.0333	0.1569	0.1394	0.0101	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	0.0026	0.0114	0.0098	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 24M (Grader)			-	-	-	-	0.0046	0.0258	0.0264	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 16M (Grader)			-	-	-	-	0.0016	0.0070	0.0054	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.2421	1.3192	1.3522	0.1018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	0.0006	0.0063	0.0043	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.0166	0.0578	0.0429	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 390D (Backhoe)			-	-	-	-	0.0001	0.0004	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.06	0.05	0.05	0.06	0.06	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.03	0.03	0.02	0.03	0.03	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.03	0.03	0.03	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.21	0.25	0.23	0.25	0.26	-	-	-	-	-	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	0.02	0.02	0.02	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.04	0.04	0.03	0.04	0.05	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	1.80	1.95	1.64	2.14	2.48	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	0.00	0.01	0.00	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.04	0.05	0.05	0.04	0.03	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.12	0.07	0.08	0.08	0.07	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.06	0.03	0.04	0.04	0.03	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.05	0.04	0.04	0.04	0.05	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.27	0.25	0.26	0.26	0.30	-	-	-	-	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	0.02	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.05	0.05	0.05	0.05	0.05	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	2.76	2.49	2.53	2.57	2.72	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	0.00	0.00	0.01	0.01	0.01	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.03	0.03	0.03	0.03	0.03	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.06	0.06	0.07	0.08	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03	0.04	0.04	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.04	0.03	0.04	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.31	0.31	0.26	0.27	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.05	0.05	0.03	0.05	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	2.65	2.63	1.82	2.66	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.00	0.00	0.01	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.04	0.04	0.03	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	74-82-8 - CH4	tonnes /year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.05	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.46	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	74-82-8 - CH4	tonnes/ year	0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	74-82-8 - CH4	tonnes/ year	0.00	0.00	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	-

Table M.1.4o- Maximum Annual Emission Rates (N2O)

Source	Source Name	Equipment	Contaminant	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CAT 6050/Komatsu PC5500 (Excavator)	10024-97-2 - N2O	tonnes /year																		
		CAT 994K (Loader)			0.00	0.01	0.03	0.03	0.03	0.04	0.04	0.07	0.04	0.05	0.05	0.04	0.03	0.04	0.04	0.05	0.03	-
		CAT 992K (Loader)			0.00	0.01	0.02	0.01	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	-
		Komatsu HD1500 (Water Truck)			0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.03	0.01	-
		CAT MD6250/Pit Viper PV-275 (Drill)																				-
		CAT D11/D10T (Dozer)			0.00	0.01	0.13	0.15	0.13	0.15	0.15	0.16	0.15	0.15	0.15	0.18	0.18	0.18	0.15	0.16	0.08	-
		CAT 834 (Rubber Tire Dozer)			0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 24M (Grader)			0.00	0.00	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.02	-
		CAT 16M (Grader)			0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.11	1.05	1.14	0.96	1.25	1.45	1.61	1.46	1.48	1.51	1.59	1.55	1.54	1.06	1.56	0.85	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.02	0.15	0.12	0.12	0.13	0.11	0.12	0.13	0.12	0.10	0.11	0.11	0.10	0.09	0.14	0.05	-
		pick-up trucks			0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	-
		CAT 390D (Backhoe)																				
M.1.2	Mobile Equipment Combustion Emissions from North Pit	CAT 6050/Komatsu PC5500 (Excavator)	10024-97-2 - N2O	tonnes /year	0.00	0.00	0.44	0.53	0.40	0.21	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 994K (Loader)			0.00	0.01	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 992K (Loader)			0.00	0.01	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Komatsu HD1500 (Water Truck)			0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT MD6250/Pit Viper PV-275 (Drill)			0.00	0.02	0.14	0.19	0.14	0.08	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT D11/D10T (Dozer)			0.00	0.01	0.13	0.15	0.11	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 834 (Rubber Tire Dozer)			0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 24M (Grader)			0.00	0.00	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 16M (Grader)			0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			0.00	0.11	1.05	1.14	0.82	0.48	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			0.00	0.01	0.06	0.07	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		CAT 390D (Backhoe)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
M.1.3	Mobile Equipment Combustion Emissions from South Pit	CAT 6050/Komatsu PC5500 (Excavator)	10024-97-2 - N2O	tonnes /year	-	-	-	-	-	-	0.24	0.52	0.55	0.52	0.54	0.74	0.80	0.81	0.55	0.56	0.29	-
		CAT 994K (Loader)			-	-	-	-	-	-	0.02	0.06	0.04	0.05	0.05	0.04	0.03	0.04	0.04	0.05	0.03	-
		CAT 992K (Loader)			-	-	-	-	-	-	0.01	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	0.01	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.03	0.01	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	0.09	0.20	0.20	0.21	0.20	0.27	0.28	0.27	0.21	0.21	0.11	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	0.06	0.15	0.15	0.15	0.15	0.18	0.18	0.18	0.15	0.16	0.08	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
		CAT 24M (Grader)			-	-	-	-	-	-	0.01	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.02	-
		CAT 16M (Grader)			-	-	-	-	-	-	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	0.62	1.55	1.46	1.48	1.51	1.59	1.55	1.54	1.06	1.56	0.85	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.02	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-

		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	0.0701	0.3360	0.3055	0.0199	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 994K (Loader)			-	-	-	-	0.0041	0.0233	0.0207	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 992K (Loader)			-	-	-	-	0.0020	0.0112	0.0100	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	0.0025	0.0131	0.0132	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	0.0249	0.1244	0.1129	0.0077	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT D11/D10T (Dozer)			-	-	-	-	0.0195	0.0919	0.0817	0.0059	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
M.1.4	Mobile Equipment Combustion Emissions from East Pit	CAT 834 (Rubber Tire Dozer)	10024-97-2 - N2O	tonnes /year	-	-	-	-	0.0015	0.0067	0.0057	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 24M (Grader)			-	-	-	-	0.0027	0.0151	0.0155	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 16M (Grader)			-	-	-	-	0.0010	0.0041	0.0031	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	0.1418	0.7727	0.7920	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	0.0003	0.0037	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	0.0097	0.0339	0.0252	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 390D (Backhoe)			-	-	-	-	0.0001	0.0003	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	0.03	0.03	0.03	0.04	0.04	-	-	-	-	-	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	0.02	0.01	0.01	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	0.02	0.02	0.02	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	0.13	0.15	0.13	0.15	0.15	-	-	-	-	-	-	-	-	-	-	-
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)	CAT 834 (Rubber Tire Dozer)	10024-97-2 - N2O	tonnes /year	-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	0.02	0.02	0.02	0.02	0.03	-	-	-	-	-	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	1.05	1.14	0.96	1.25	1.45	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	0.00	0.00	0.00	0.01	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	0.02	0.03	0.03	0.02	0.02	-	-	-	-	-	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-	-	-
		CAT 6050/Komatsu PC5500 (Excavator)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	0.07	0.04	0.05	0.05	0.04	-	-	-	-	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	0.03	0.02	0.02	0.02	0.02	-	-	-	-	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	0.03	0.02	0.02	0.03	0.03	-	-	-	-	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	0.16	0.15	0.15	0.15	0.18	-	-	-	-	-	-
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)	CAT 834 (Rubber Tire Dozer)	10024-97-2 - N2O	tonnes /year	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	0.03	0.03	0.03	0.03	0.03	-	-	-	-	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	1.61	1.46	1.48	1.51	1.59	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	0.00	0.00	0.01	0.00	0.00	-	-	-	-	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	0.01	0.02	0.02	0.02	0.02	-	-	-	-	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	0.00	-	-	-	-	-	-

M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)	CAT 6050/Komatsu PC5500 (Excavator)	10024-97-2 - N2O	tonnes /year	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.04	0.04	0.05	-	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	-	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03	0.02	0.03	-	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.18	0.18	0.15	0.16	-	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	-	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.03	0.03	0.02	0.03	-	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.01	0.01	0.01	-	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	1.55	1.54	1.06	1.56	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.01	-	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	-	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.00	0.00	0.00	-	-
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)	CAT 6050/Komatsu PC5500 (Excavator)	10024-97-2 - N2O	tonnes /year	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 994K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.03	-
		CAT 992K (Loader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		Komatsu HD1500 (Water Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT MD6250/Pit Viper PV-275 (Drill)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT D11/D10T (Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	-
		CAT 834 (Rubber Tire Dozer)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT 24M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	-
		CAT 16M (Grader)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 793F/Komatsu 830E (Dump Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.85	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		CAT 740 - Buy/Rent (Articulated Dump Truck			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
		Western Star 6900XD (Haul Truck)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-
		CAT 390D (Backhoe)			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out	Western Star 6900XD (Haul Truck)	10024-97-2 - N2O	tonnes/ year	0.00	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	-
M.1.7	Mobile Equipment Combustion Emissions from CPP Area	CAT 994K (Loader)	10024-97-2 - N2O	tonnes/ year	0.00	0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	-

Table M.1.5 - Emission Summary

Source	Source Name	Contaminant	CAS	Averaging Period	Unit	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year +15
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	TSP	N/A - TSP	24-hr	g/s	0.00	0.63	1.08	1.10	1.00	1.05	1.15	1.25	1.15	1.15	1.20	1.27	1.27	1.22	1.00	1.25	0.76	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	0.65	1.31	1.33	1.23	1.30	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.00	0.00	0.00	0.00	0.00	0.00	1.40	1.50	1.40	1.40	1.45	1.61	1.61	1.56	1.25	1.50	0.89	0.00
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.00	0.00	0.00	0.00	1.23	1.30	1.40	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.00	0.00	1.08	1.10	1.00	1.05	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.15	1.15	1.20	1.27	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	1.22	1.00	1.25	0.00	0.00
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.00
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	PM10	N/A - PM10	24-hr	g/s	0.00	0.61	1.07	1.09	0.98	1.03	1.13	1.24	1.13	1.13	1.19	1.25	1.25	1.20	0.98	1.24	0.74	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	0.64	1.30	1.31	1.21	1.28	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.00	0.00	0.00	0.00	0.00	0.00	1.38	1.48	1.38	1.38	1.43	1.60	1.60	1.54	1.23	1.48	0.88	0.00
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.00	0.00	0.00	0.00	1.21	1.28	1.38	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.00	0.00	1.07	1.08	0.98	1.03	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	1.13	1.13	1.18	1.25	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.20	0.98	1.23	0.00	0.00
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					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	0.02	0.02	0.02	0.00

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	PM2.5	N/A - PM2.5	24-hr	g/s	0.00	0.59	1.02	1.04	0.94	0.99	1.09	1.19	1.09	1.09	1.14	1.21	1.21	1.16	0.94	1.19	0.71	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	0.61	1.25	1.26	1.16	1.23	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0	0	0	0	0	0	1.332	1.430	1.332	1.332	1.381	1.537	1.537	1.488	1.184	1.430	0.840	0
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0	0	0	0	1.164	1.233	1.332	1.430	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0	0	1.024	1.041	0.941	0.991	1.089	0	0	0	0	0	0	0	0	0	0	0
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0	0	0	0	0	0	0	1.188	1.089	1.089	1.138	1.205	0	0	0	0	0	0
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0	0	0	0	0	0	0	0	0	0	0	0	1.205	1.156	0.941	1.188	0	0
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.709	0
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.000	0.004	0.007	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	VOC	N/A - VOC	24-hr	g/s	0.015	2.623	4.543	4.617	4.181	4.388	4.803	5.217	4.803	4.803	5.010	5.292	5.292	5.085	4.181	5.217	3.203	0.000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.000	2.728	5.002	5.076	4.640	4.929	5.344	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.000	0.000	0.000	0.000	0.000	0.000	5.344	5.758	5.344	5.344	5.551	5.950	5.950	5.743	4.722	5.758	3.507	0.000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.000	0.000	0.000	0.000	4.640	4.929	5.344	5.758	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.000	0.000	4.528	4.602	4.166	4.373	4.788	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.202	4.788	4.788	4.995	5.277	0.000	0.000	0.000	0.000	0.000	0.000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.277	5.069	4.166	5.202	0.000	0.000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.188	0.000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.000	0.066	0.110	0.110	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.146	0.000

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	TSP	N/A - TSP	Annual	g/s	0.0011	0.0232	0.1730	0.1873	0.1592	0.2048	0.2320	0.2613	0.2329	0.2377	0.2404	0.2550	0.2487	0.2479	0.1787	0.2499	0.1372	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	0.0266	0.3065	0.3510	0.2605	0.1437	0.0126	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1721	0.4134	0.4029	0.3996	0.4082	0.4841	0.4938	0.4949	0.3510	0.4231	0.2267	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	0.2605	0.1437	0.0126	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	0.1697	0.1845	0.1566	0.2019	0.2293	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2584	0.2299	0.2349	0.2378	0.2523	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2461	0.2455	0.1764	0.2468	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1353	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.0000	0.0000	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0205	0.0000
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	PM2.5	N/A - PM2.5	Annual	g/s	0.0010	0.0213	0.1648	0.1788	0.1519	0.1953	0.2216	0.2474	0.2224	0.2263	0.2291	0.2438	0.2382	0.2373	0.1695	0.2380	0.1305	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	0.0246	0.2943	0.3377	0.2505	0.1380	0.0121	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1655	0.3951	0.3872	0.3833	0.3919	0.4660	0.4759	0.4768	0.3366	0.4059	0.2174	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	0.2505	0.1380	0.0121	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	0.1616	0.1761	0.1493	0.1924	0.2190	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2445	0.2194	0.2235	0.2266	0.2411	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2356	0.2349	0.1673	0.2349	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1287	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.0000	0.0000	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0061	0.0000

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	NOx	10102-44-0	Annual	g/s	0.2883	1.1480	7.0319	7.4413	6.4244	8.0870	8.9581	10.0232	9.0536	9.1759	9.2213	9.7799	9.5428	9.4781	6.9859	9.7011	5.3327	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	1.3192	11.3909	13.0141	9.7399	5.2509	0.4574	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	6.2313	14.9039	14.5823	14.5240	14.8144	17.3637	17.6361	17.6862	12.8363	15.3518	8.2411	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	9.7399	5.2509	0.4574	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	6.1351	6.6867	5.6983	7.2761	8.2246	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	9.2271	8.2237	8.4010	8.5150	9.0457	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.8243	8.8147	6.3739	8.8389	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	4.8325	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.4167	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.0000	0.0000	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.7092	0.0000
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	SO2	SO2 - NA	Annual	g/s	0.0004	0.0029	0.0105	0.0111	0.0096	0.0121	0.0134	0.0149	0.0135	0.0137	0.0138	0.0146	0.0143	0.0141	0.0104	0.0145	0.0079	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	0.0031	0.0148	0.0168	0.0125	0.0068	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0081	0.0196	0.0190	0.0191	0.0194	0.0222	0.0223	0.0223	0.0164	0.0202	0.0109	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	0.0022	0.0109	0.0104	0.0008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	0.0092	0.0100	0.0085	0.0110	0.0124	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0138	0.0123	0.0126	0.0128	0.0136	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0132	0.0132	0.0095	0.0133	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0072	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.0000	0.0000	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0000

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	VOC	N/A - VOC	Annual	g/s	0.0152	0.1076	0.7501	0.8047	0.6885	0.8779	0.9858	1.1076	0.9924	1.0099	1.0189	1.0807	1.0542	1.0495	0.7630	1.0641	0.5844	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	0.1238	0.9790	1.1046	0.8161	0.4537	0.0404	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5502	1.3542	1.2932	1.3048	1.3241	1.4918	1.4879	1.4880	1.0823	1.3723	0.7446	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	0.1419	0.7273	0.7064	0.0520	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	0.7030	0.7651	0.6503	0.8353	0.9473	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0657	0.9488	0.9691	0.9818	1.0421	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.0164	1.0146	0.7309	1.0188	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5582	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0219	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.0000	0.0000	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0835	0.0000
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	NOx	10102-44-0	1-hr	g/s	0.2986	23.6019	40.6491	41.2837	37.3455	39.1062	42.6278	46.1493	42.6278	42.6278	44.3886	46.7839	46.7839	45.0231	37.3455	46.1493	29.0333	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	24.7273	48.9386	49.5732	45.6350	48.0934	51.6150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	51.6150	55.1365	51.6150	51.6150	53.3757	58.6411	58.6411	56.8803	46.3326	55.1365	33.7264	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	45.6350	48.0934	51.6150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	40.3505	40.9851	37.0468	38.8076	42.3292	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	45.8507	42.3292	42.3292	44.0900	46.4853	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	46.4853	44.7245	37.0468	45.8507	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	28.7346	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	1.2500	2.0833	2.0833	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	1.6667	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	1.2425	0.0000

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CO	630-08-0	1-hr	g/s	0.0100	6.8280	11.9235	12.1262	10.9872	11.5497	12.6748	13.7998	12.6748	12.6748	13.2373	14.0026	14.0026	13.4400	10.9872	13.7998	8.3316	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	7.0652	13.4780	13.6807	12.5416	13.3270	14.4521	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	14.4521	15.5772	14.4521	14.4521	15.0146	16.3148	16.3148	15.7523	12.7645	15.5772	9.3267	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	12.5416	13.3270	14.4521	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	11.9135	12.1162	10.9771	11.5397	12.6647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	13.7898	12.6647	12.6647	13.2273	13.9925	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	13.9925	13.4300	10.9771	13.7898	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	8.3215	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0420	0.0700	0.0700	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0560	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.3970	0.0000
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	VOC	N/A - VOC	1-hr	g/s	0.0157	2.6237	4.5432	4.6179	4.1816	4.3888	4.8032	5.2177	4.8032	4.8032	5.0105	5.2923	5.2923	5.0851	4.1816	5.2177	3.2034	0.0000
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.0000	2.7283	5.0018	5.0765	4.6401	4.9294	5.3439	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.7583	5.3439	5.3439	5.5511	5.9498	5.9498	5.7426	4.7222	5.7583	3.5069	0.0000
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.0000	0.0000	0.0000	0.0000	4.6401	4.9294	5.3439	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.0000	0.0000	11.9135	12.1162	10.9771	11.5397	12.6647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.2020	4.7875	4.7875	4.9948	5.2766	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.2766	5.0694	4.1659	5.2020	0.0000	0.0000
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	3.1877	0.0000
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.0000	0.0657	0.1095	0.1095	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0876	0.0000
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.1462	0.0000

M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CO2	124-38-9 - CO2	Annual	tonnes/year	1929.60	10063.01	48870.58	51825.49	44672.49	56383.03	62450.35	69763.17	63002.53	63996.75	64275.49	68158.57	66528.09	66004.27	48602.27	67628.86	37112.96	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	8743.41	63307.82	71830.99	52895.34	29399.24	2603.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.00	0.00	0.00	0.00	0.00	0.00	35467.86	86315.14	82862.14	83196.09	84754.52	97213.60	97775.23	97891.81	70503.38	87858.75	47216.68	0.00
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.00	0.00	0.00	0.00	9194.64	47120.17	45537.58	3311.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.00	0.00	42867.61	46774.47	39812.31	50955.58	57540.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	64434.26	57447.61	58809.77	59548.03	63244.17	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61718.47	61563.92	44505.78	61857.30	0.00	0.00
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33764.87	0.00
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.00	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	2788.96	0.00
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.00	0.00	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	4956.86	0.00
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	CH4	74-82-8 - CH4	Annual	tonnes/year	0.10	0.52	2.54	2.70	2.32	2.93	3.25	3.63	3.28	3.33	3.35	3.55	3.46	3.44	2.53	3.52	1.93	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	0.46	3.29	3.74	2.75	1.53	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.00	0.00	0.00	0.00	0.00	0.00	1.85	4.49	4.31	4.33	4.41	5.06	5.09	5.09	3.67	4.57	2.46	0.00
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.00	0.00	0.00	0.00	0.48	2.45	2.37	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.00	0.00	2.23	2.43	2.07	2.65	2.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.35	2.99	3.06	3.10	3.29	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.21	3.20	2.32	3.22	0.00	0.00
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	0.00
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.00
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.00	0.00	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.00
M.1.1	Mobile Equipment Combustion Emissions from Haul Road	N2O	10024-97-2 - N2O	Annual	tonnes/year	0.06	0.31	1.49	1.58	1.36	1.72	1.90	2.13	1.92	1.95	1.96	2.08	2.03	2.01	1.48	2.06	1.13	0.00
M.1.2	Mobile Equipment Combustion Emissions from North Pit					0.00	0.27	1.93	2.19	1.61	0.90	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.3	Mobile Equipment Combustion Emissions from South Pit					0.00	0.00	0.00	0.00	0.00	0.00	1.08	2.63	2.53	2.54	2.58	2.96	2.98	2.98	2.15	2.68	1.44	0.00
M.1.4	Mobile Equipment Combustion Emissions from East Pit					0.00	0.00	0.00	0.00	0.28	1.44	1.39	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5a	Mobile Equipment Combustion Emissions from Waste Pit (Years 1-5)					0.00	0.00	1.31	1.43	1.21	1.55	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5b	Mobile Equipment Combustion Emissions from Waste Pit (Years 6-10)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.96	1.75	1.79	1.82	1.93	0.00	0.00	0.00	0.00	0.00	0.00
M.1.5c	Mobile Equipment Combustion Emissions from Waste Pit (Years 11-14)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	1.88	1.36	1.89	0.00	0.00
M.1.5d	Mobile Equipment Combustion Emissions from Waste Pit (Year 15)					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00
M.1.6	Mobile Equipment Combustion Emissions from Rail Load Out					0.00	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.00
M.1.7	Mobile Equipment Combustion Emissions from CPP Area					0.00	0.00	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.00

Appendix C

CALMET/CALPUFF Quality Control

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1.0 Introduction

The BC Ministry of Environment and Climate Change Strategy requires that quality assurance and quality control (QA/ QC) procedures be undertaken for CALMET models to confirm the accuracy of the model inputs and behaviour of the model. The guidance and recommendations for QA/QC procedures on the CALMET input and output files are detailed in Section 9.1 of the BC Air Quality Dispersion Modelling Guideline (hereafter called the Guideline, or the BC AQDMG).

Following the Guideline, the following supporting documentation has been provided to verify the quality of the various datasets such as topography, land cover, surface meteorological data, and the Weather Research and Forecasting (WRF) model output used for the CALMET model inputs. The report is structured based on the required QA/QC procedure for the CALMET input data and output files in accordance with Section 9.1 of BC ADQMG.

2.0 CALMET Quality Assurance

2.1 Meteorological Data Comparison

Wind data and temperature data from the meteorological surface station, WRF data, and the CALMET model were analyzed for QA/QC purposes. The meteorological parameters from the WRF and CALMET model were compared to the meteorological data measured at the Sparwood surface station for the modelling period from 2013 to 2015 to determine the suitability of the WRF and CALMET dataset for the dispersion modelling.

In CALMET, meteorological parameters for a particular location (e.g., surface MET station and Project site) were determined by the nearest CALMET grid cell. Meteorological parameters from the WRF dataset were extracted using a CALPUFF post-processor –METSERIES v7.0.0. The METSERIES extracts the meteorological parameters from the WRF dataset for specified locations using a bilinear interpolation method. Note that the latest version of METSERIES is programmed to directly extract wind field at 10 m above ground (AG) and temperature and humidity at 2 m AG.

For clarity, wind plots (10 m AG) are presented the following datasets:

1. surface meteorological station (Sparwood Station);
2. the WRF model output data; and
3. the CALMET model output data.

For the Project site (mine center X=662.93 km, Y=5519.344 km), wind plots from WRF data are compared with the CALMET output due to the lack of representative meteorological observation data. Where seasonal variations are presented, as per Section 4.4 of the Guideline, meteorological seasons in the CALMET were defined as follows:

- Season 1 (midsummer): June, July

- Season 2 (Autumn): August, September
- Season 3 (Winter 1): October, November
- Season 4 (Winter 2): December, January, February, March, April
- Season 5 (Spring): May

2.1.1 Wind Rose and Frequency Distribution

The annual and seasonal wind plots, including wind roses and frequency distribution of wind speeds are compared below and checked for reasonableness. As shown in the wind plots for the surface meteorological station, the WRF, and CALMET predicted prevailing annual and seasonal wind directions blowing from the south, which is in line with the wind rose from the surface meteorological station.

At the surface station, a higher percentage of wind blows from the north direction in the spring season. Among the three data sources, the WRF model generally predicted a wider range of wind directions than the surface meteorological data and CALMET output.

At the Project site, the WRF model predicts that the prevailing wind generally blows from the southwest direction in all seasons except spring. Among the five seasons, the midsummer, autumn, and spring wind roses from the WRF data and CALMET Output are similar. During winter seasons (winter 1 and winter 2), the WRF predicted a prevailing direction from the southwest at the Project site while the CALMET predicted a prevailing direction from the southeast.

The selected project site is located beyond the maximum radius of influence (RMAX1= 12 km) from the surface meteorological station, and therefore the meteorological conditions at the project site are determined based on the WRF model output. The WRF predictions are averaged meteorological conditions for a 4 km grid spacing, which are downscaled by CALMET to the model grid spacing (i.e., 0.2 km). The CALMET predictions for a particular location are downscaled based on a number of physical factors such as topography, and therefore may not align with the WRF model output.

2.1.1.1 Annual Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

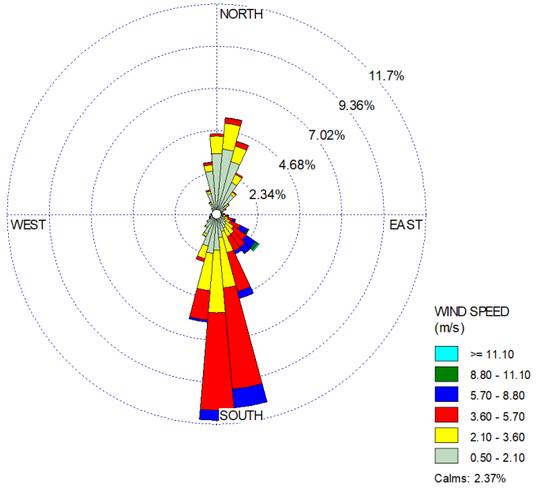


Figure 1 Surface Station Annual Wind Rose at the Sparwood Surface Station From 2013 to 2015

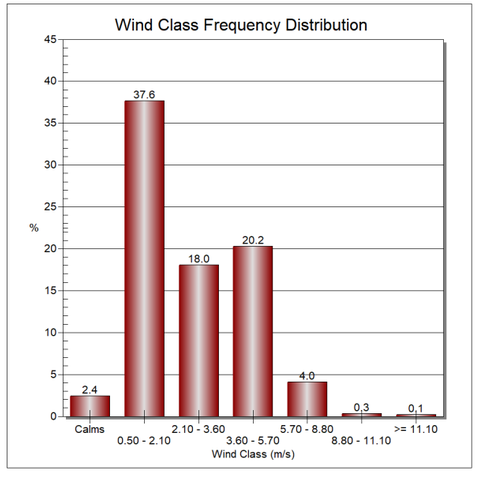


Figure 2 Surface Station Annual Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

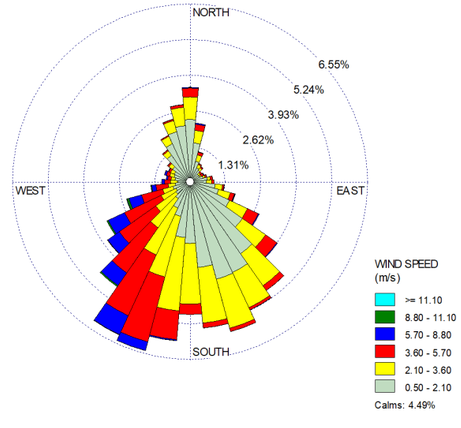


Figure 3 WRF Annual Wind Rose at Sparwood Meteorological Station from 2013 to 2015

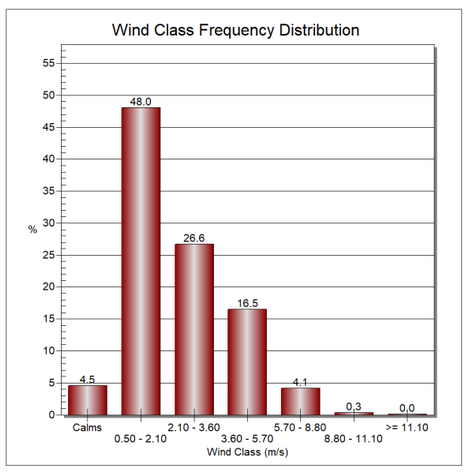


Figure 4 WRF Annual Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

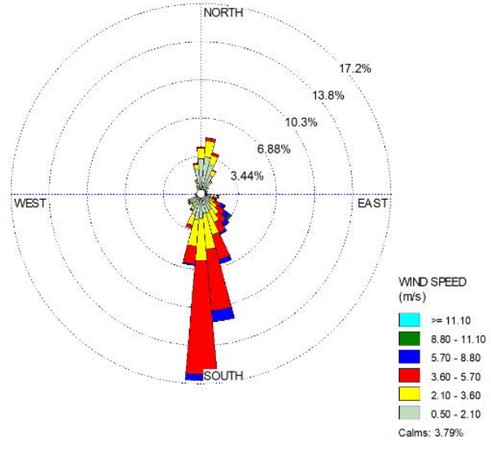


Figure 5 CALMET Annual Wind Rose (Blowing From) at the Surface **Meteorological Station for 2013-2015**

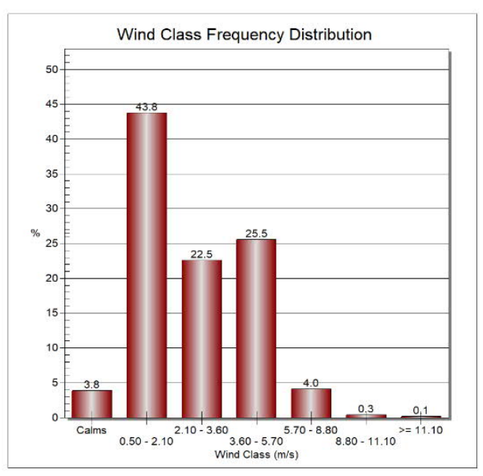


Figure 6 CALMET Annual Wind Class Frequency Distribution at the Surface Meteorological Station for 2013-201

2.1.1.2 Season 1 Midsummer Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

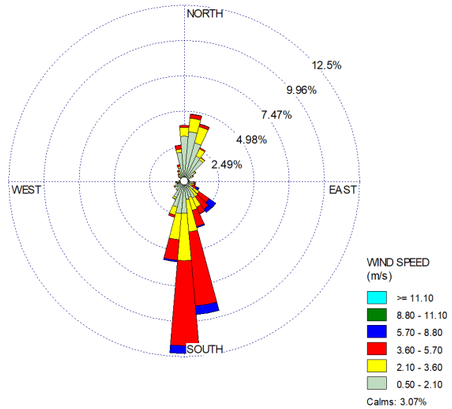


Figure 7 Surface Station Midsummer (June-July) Wind Rose at the Sparwood Surface Station from 2013 to 2015

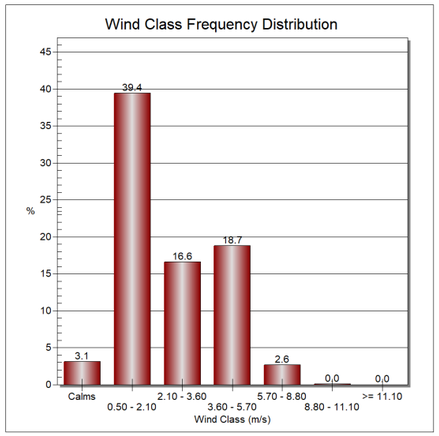


Figure 8 Surface Station Midsummer (June-July) Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

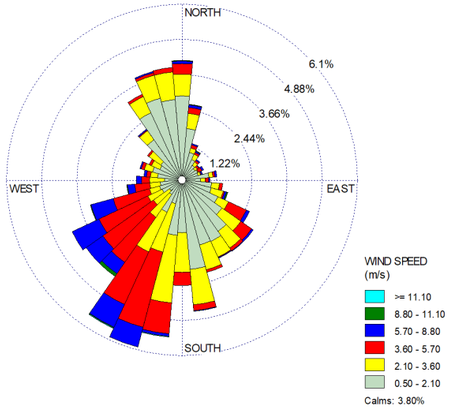


Figure 9 WRF Midsummer (June-July) Wind Rose at Sparwood **Meteorological Station from 2013 to 2015**

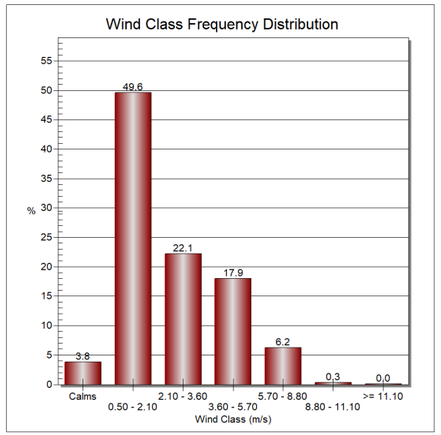


Figure 10 WRF Midsummer (June-July) Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

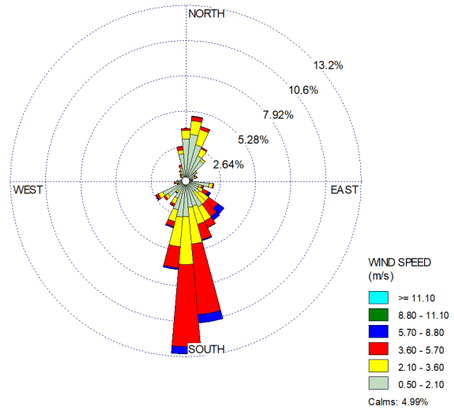


Figure 11 CALMET Midsummer (June-July) Wind Rose (Blowing From) at the **Surface Meteorological Station for 2013-2015**

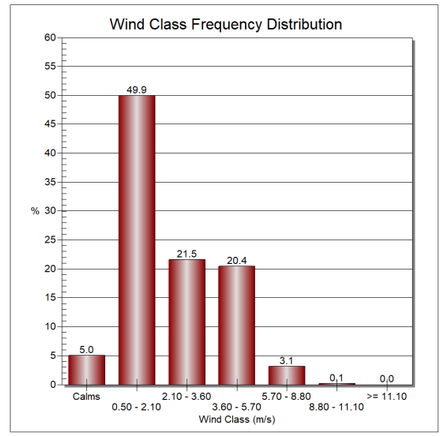


Figure 12 CALMET Midsummer (June-July) Wind Class Frequency **Distribution at the Surface Meteorological Station for 2013-2015**

2.1.1.3 Season 2 Autumn Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

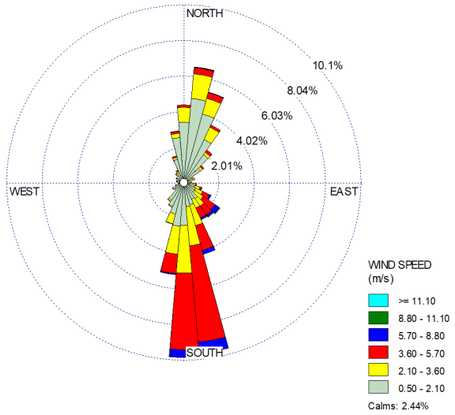


Figure 13 Surface Station Autumn (Aug-Sep) Wind Rose at the Sparwood Surface Station from 2013 to 2015

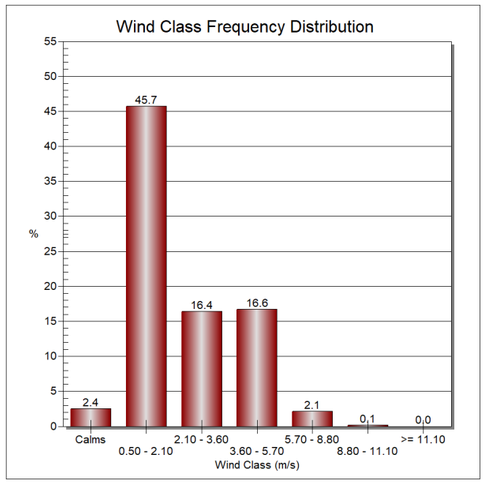


Figure 14 Surface Station Autumn (Aug-Sep) Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

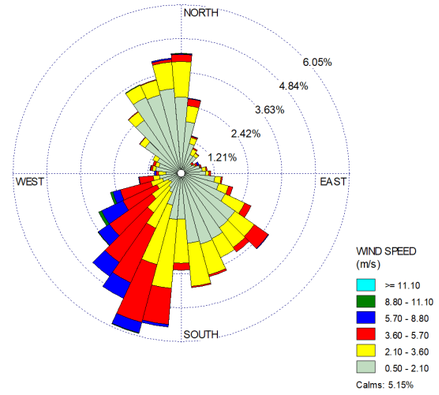


Figure 15 WRF Autumn Wind Rose (Aug-Sep) at the Sparwood **Meteorological Station from 2013 to 2015**

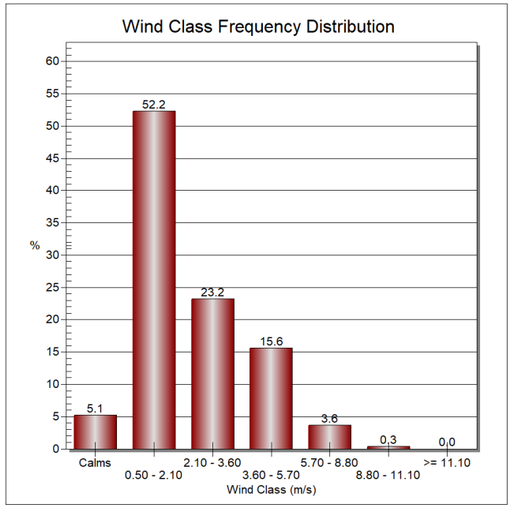


Figure 16 WRF Autumn (Aug-Sep) Wind Class Frequency Distribution at the Sparwood Meteorological Station from 2013 to 2015

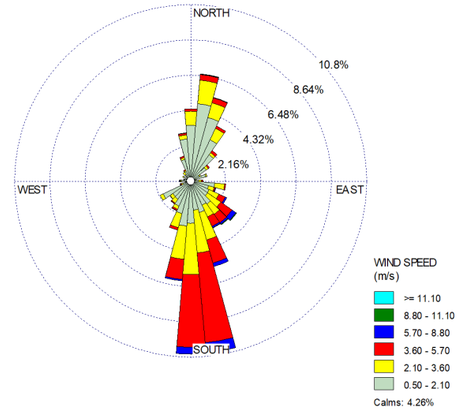


Figure 17 CALMET Autumn (Aug-Sep) Windrose (Blowing From) at the **Surface Meteorological Station for 2013-2015**

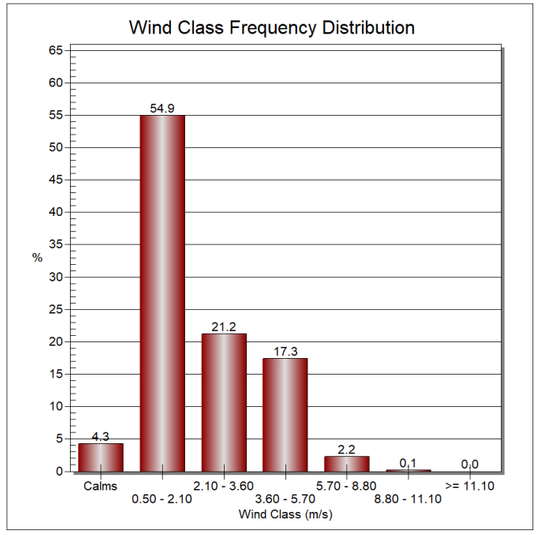


Figure 18 CALMET Autumn (Aug-Sep) Wind Class Frequency Distribution at the Surface Meteorological Station for 2013-2015

2.1.1.4 Season 3 Winter 1 Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

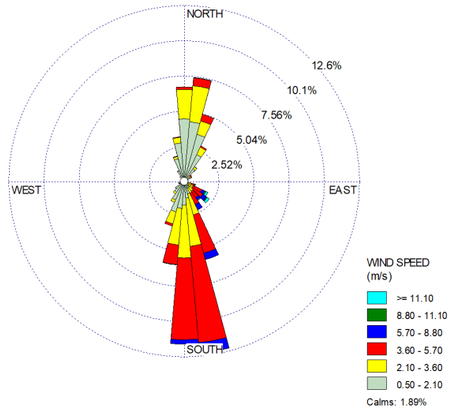


Figure 19 Surface Station Winter 1 (Oct-Nov) Wind Rose at the Sparwood Surface Station from 2013 to 2015

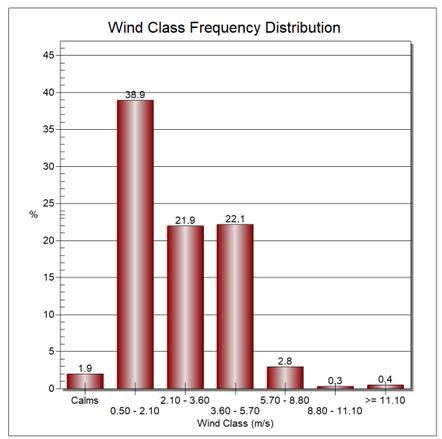


Figure 20 Surface Station Winter 1 (Oct-Nov) Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

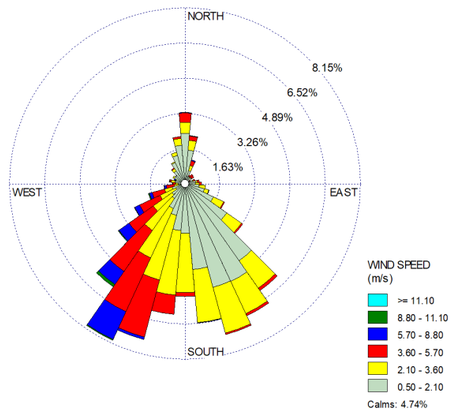


Figure 21 WRF Winter 1 (Oct-Nov) Wind Rose at Sparwood Meteorological **Station from 2013 to 2015**

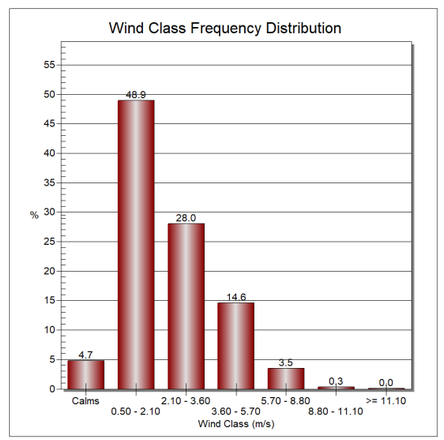


Figure 22 WRF Winter 1 Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

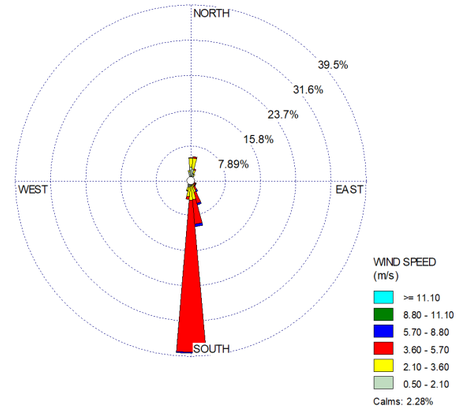


Figure 23 CALMET Winter 1 (Oct-Nov) Windrose (Blowing From) at the **Surface Meteorological Station for 2013-2015**

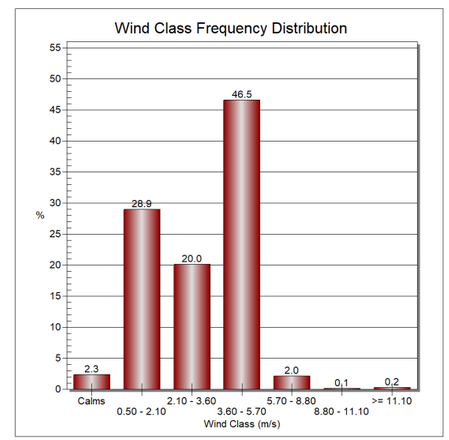


Figure 24 CALMET Winter 1 (Oct-Nov) Wind Class Frequency Distribution at the Surface Meteorological Station for 2013-2015

2.1.1.5 Season 4 Winter 2 Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

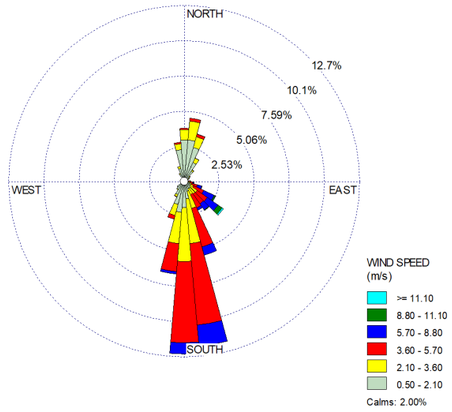


Figure 25 Surface Station Winter 2 (Dec-April) Wind Rose at the Sparwood Surface Station from 2013 to 2015

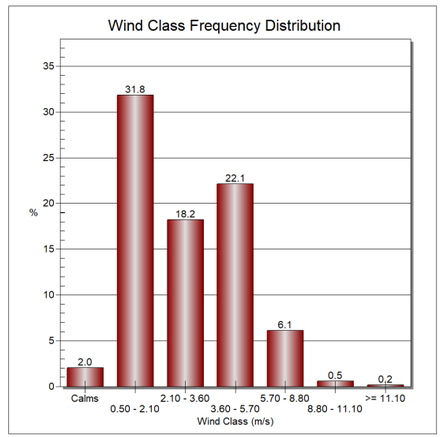


Figure 26 Surface Station Winter 2 (Dec-April) Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

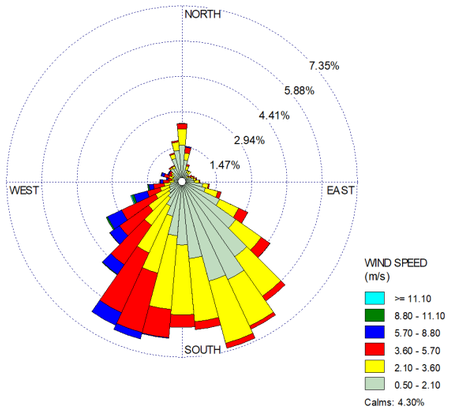


Figure 27 WRF Winter 2 (Dec-April) Wind Rose at Sparwood Meteorological **Station from 2013 to 2015**

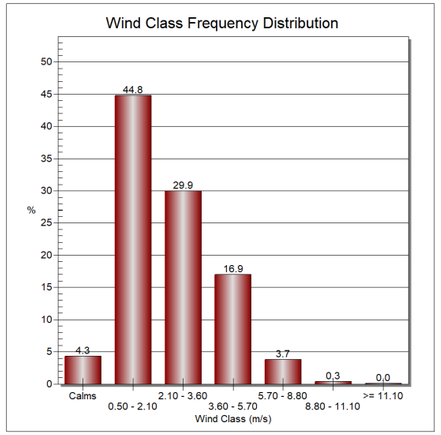


Figure 28 WRF Winter 2 (Dec-April) Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

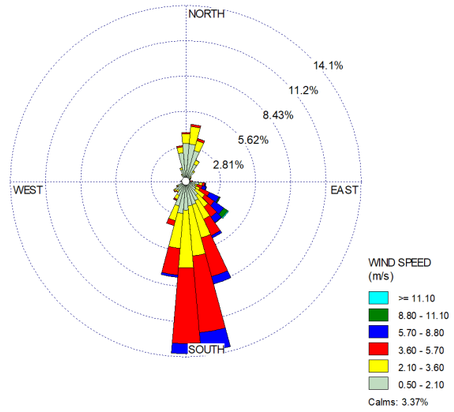


Figure 29 CALMET Winter 2 (Dec-April) Windrose (Blowing From) at the **Surface Meteorological Station for 2013-2015**

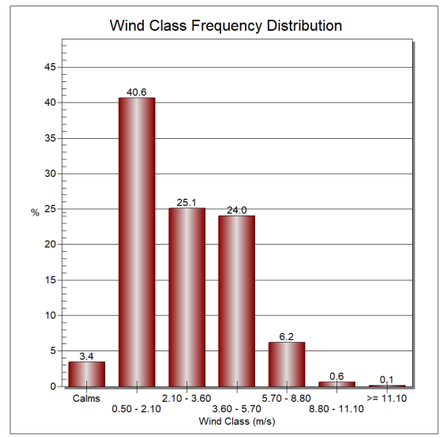


Figure 30 CALMET Winter 2 (Dec-April) Wind Class Frequency Distribution at the Surface Meteorological Station for 2013-2015

2.1.1.6 Season 5 Spring Wind Rose and Distribution at Surface Meteorological Station (10 m AG)

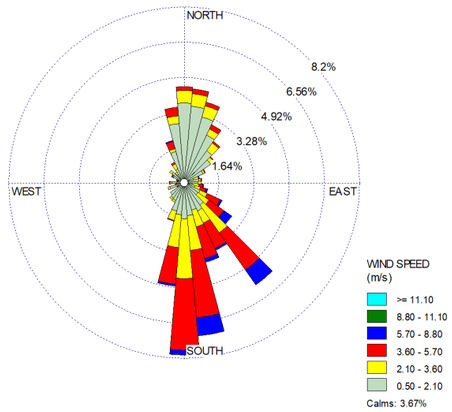


Figure 31 Surface Station Spring (May) Wind Rose at the Sparwood Surface Station from 2013 to 2015

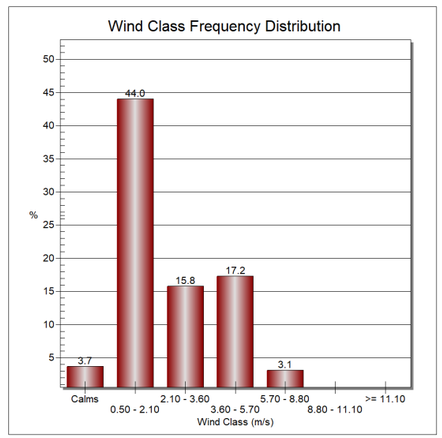


Figure 32 Surface Station Spring (May) Wind Class Frequency Distribution at the Sparwood Surface Station from 2013 to 2015

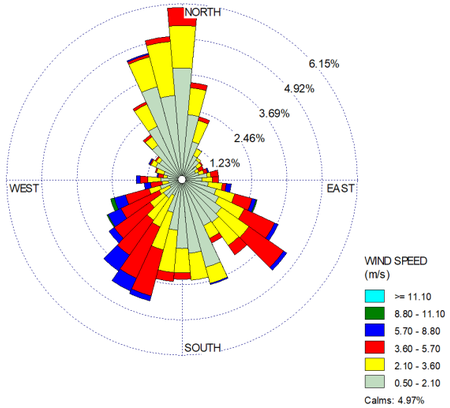


Figure 33 WRF Spring (May) Wind Rose at Sparwood Meteorological Station from 2013 to 2015

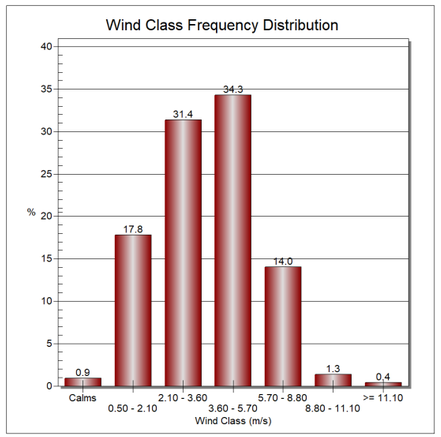


Figure 34 WRF Spring (May) Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

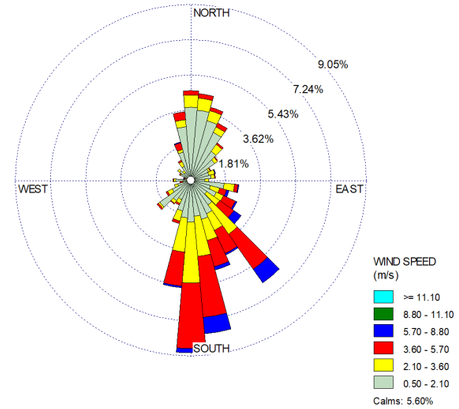


Figure 35 CALMET Spring (May) Windrose (Blowing From) at the Surface **Meteorological Station for 2013-2015**

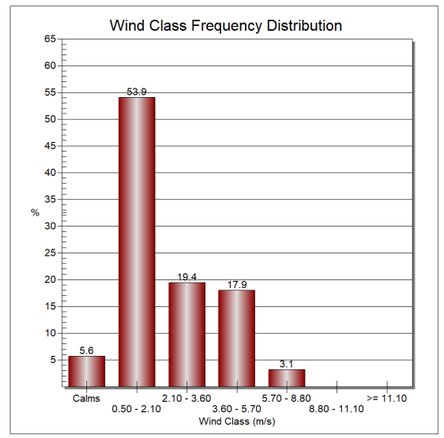


Figure 36 CALMET Spring (May) Wind Class Frequency Distribution at the Surface Meteorological Station for 2013-2015

2.1.1.7 Annual Wind Rose and Distribution at the Project site (10 m AG)

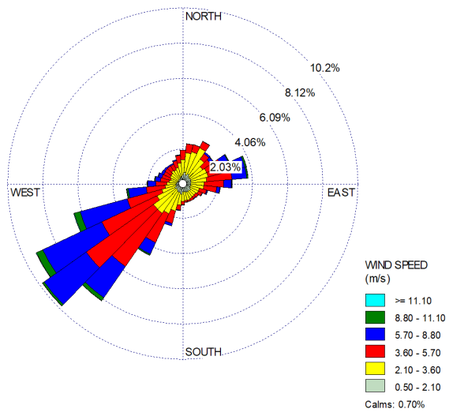


Figure 37 WRF Annual Wind Rose at the Project Site (Mine Center) from 2013 to 2015

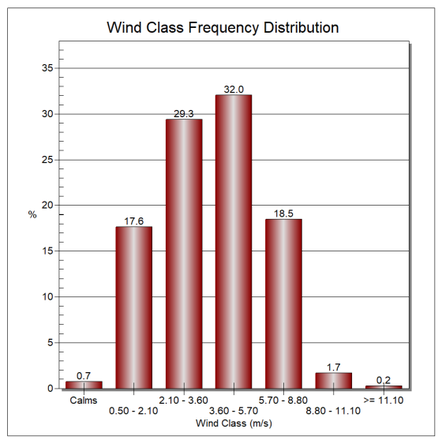


Figure 38 WRF Annual Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

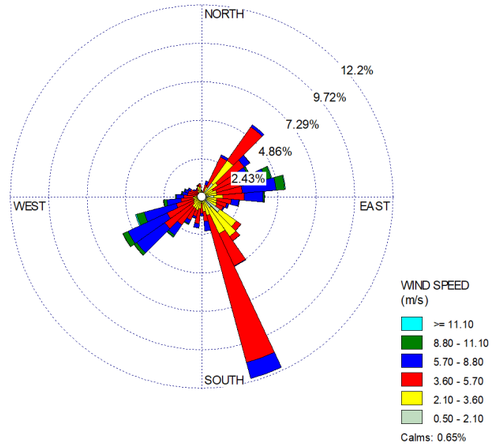


Figure 39 CALMET Annual Windrose (Blowing From) at the Project Site (Mine Centre) for 2013-2015

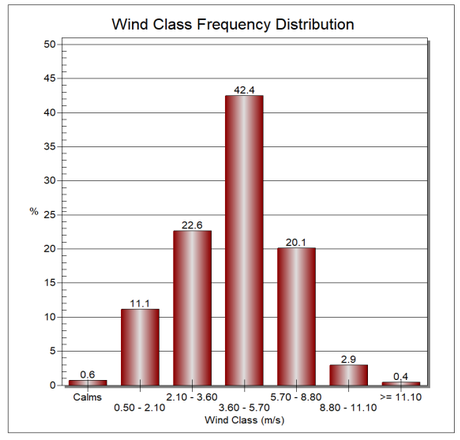


Figure 40 CALMET Annual Wind Class Frequency Distribution at the Project Site (Mine center) for 2013-2015

2.1.1.8 Season 1 Midsummer Wind Rose and Distribution at the Project site (10 m AG)

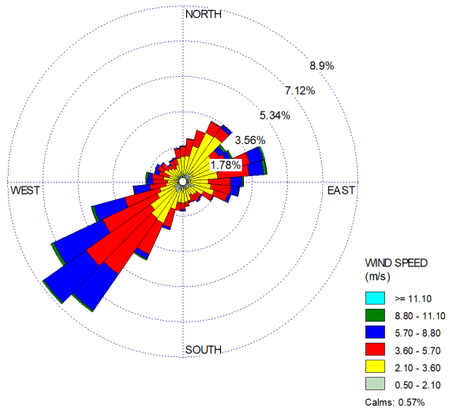


Figure 41 WRF Midsummer (June –July) Wind Rose at the Project Site (Mine Center) from 2013 to 2015

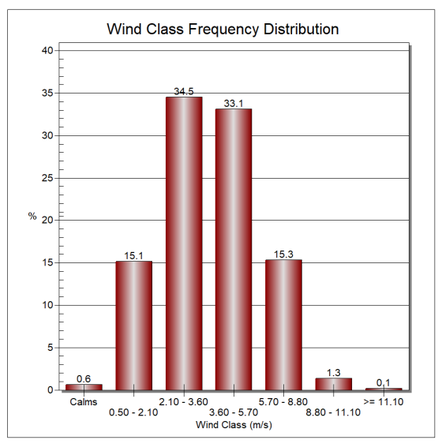


Figure 42 WRF Midsummer (June –July) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

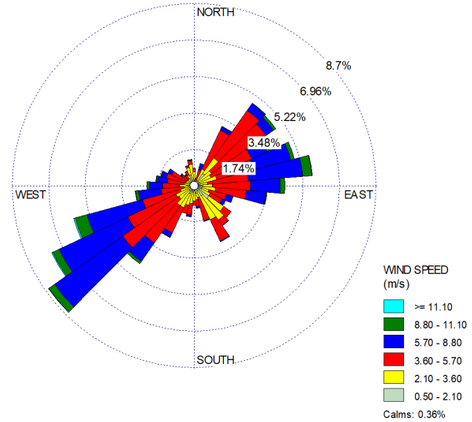


Figure 43 CALMET Midsummer (June –July) Wind Rose at the Project Site (Mine Center) from 2013 to 2015

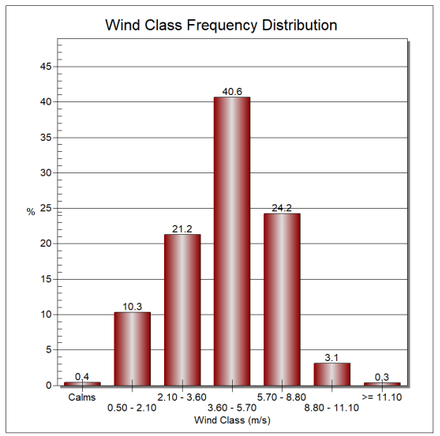


Figure 44 CALMET Midsummer Wind Class Frequency Distribution at the Project Site (Mine Center) for 2013-2015

2.1.1.9 Season 2 Autumn Wind Rose and Distribution at the Project site (10 m AG)

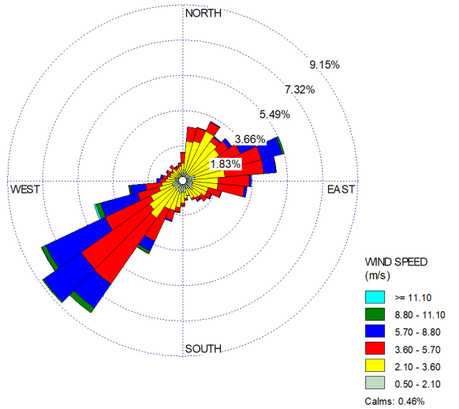


Figure 45 WRF Autumn (Aug- Sep) Windrose at the Project Site (Mine Center) from 2013 to 2015

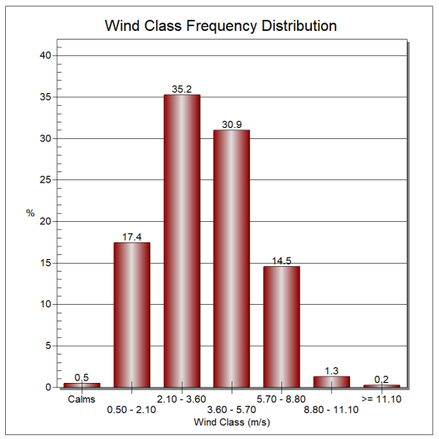


Figure 46 WRF Autumn (Aug- Sep) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

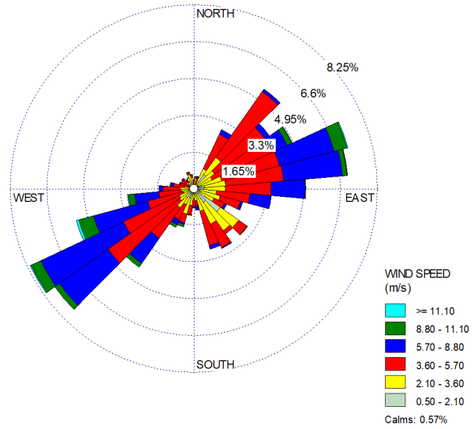


Figure 47 CALMET Autumn (Aug- Sep) Windrose at the Project Site (Mine Center) from 2013 to 2015

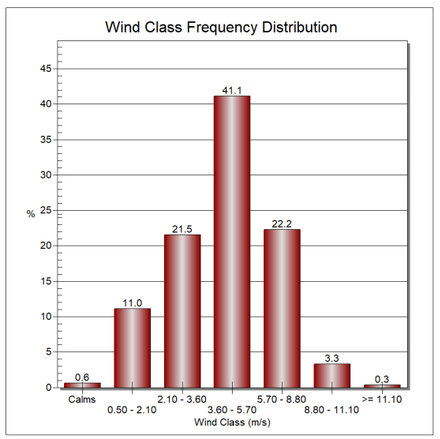


Figure 48 CALMET Autumn (Aug- Sep) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

2.1.1.10 Season 3 Winter 1 Wind Rose and Distribution at the Project site (10 m AG)

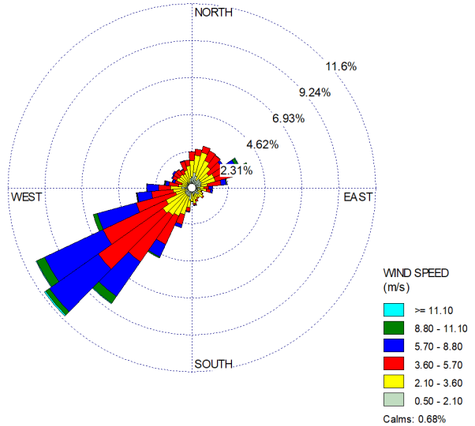


Figure 49 WRF Winter 1 (Oct-Nov) Windrose at the Project Site (Mine Center) from 2013 to 2015

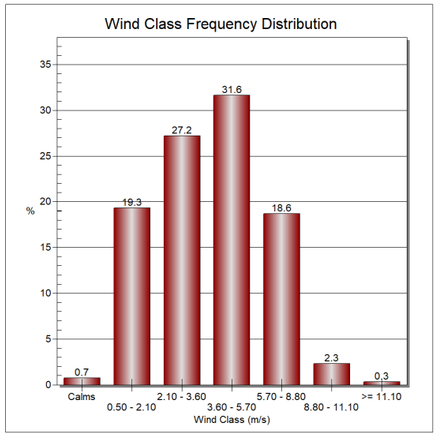


Figure 50 WRF Winter 1 (Oct-Nov) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

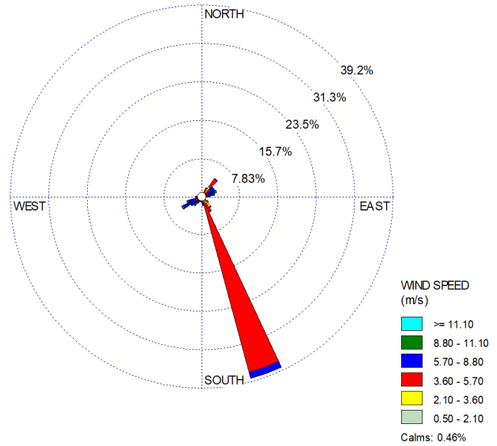


Figure 51 CALMET Winter 1 (Oct-Nov) Windrose at the Project Site (Mine Center) from 2013 to 2015

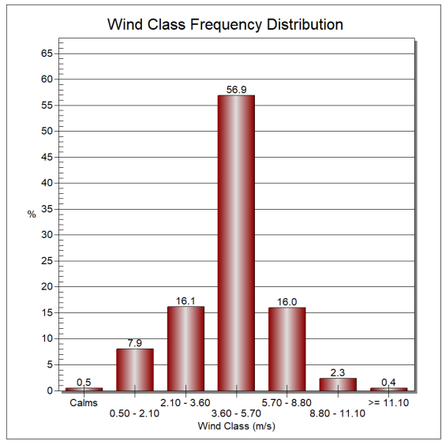


Figure 52 CALMET Winter 1 (Oct-Nov) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

2.1.1.11 Season 4 Winter 2 Wind Rose and Distribution at the Project site (10 m AG)

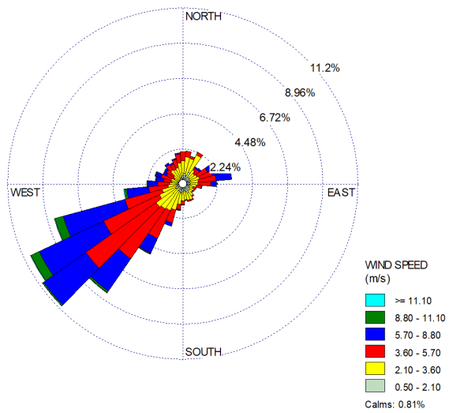


Figure 53 WRF Winter 2 (Dec-April) Windrose at the Project Site (Mine Center) from 2013 to 2015

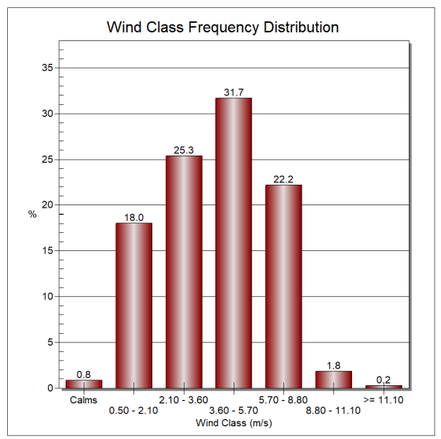


Figure 54 WRF Winter 2 (Dec-April) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

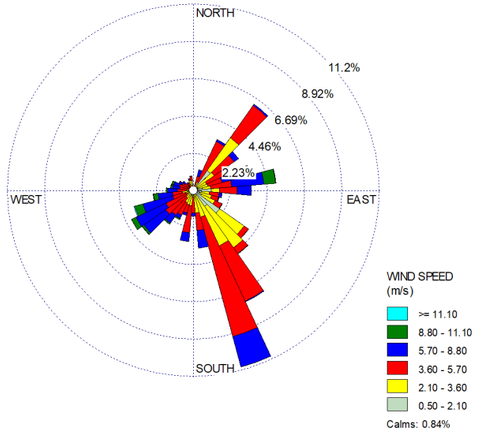


Figure 55 CALMET Winter 2 (Dec-April) Windrose at the Project Site (Mine Center) from 2013 to 2015

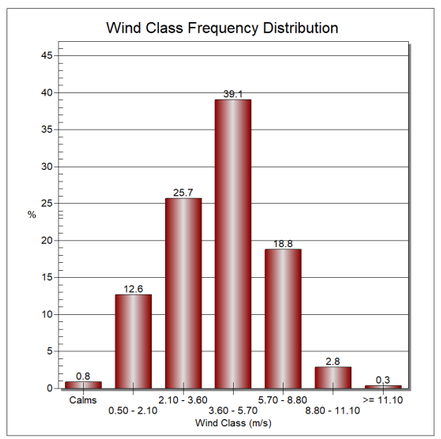


Figure 56 CALMET Winter 2 (Dec-April) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

2.1.1.12 Season 5 Spring Wind Rose and Distribution at the Project site (10 m AG)

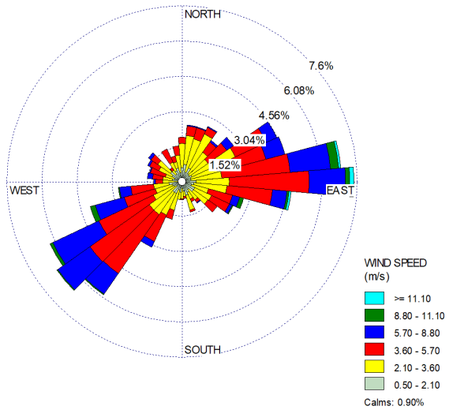


Figure 57 WRF Spring (May) Windrose at the Project Site (Mine Center) from 2013 to 2015

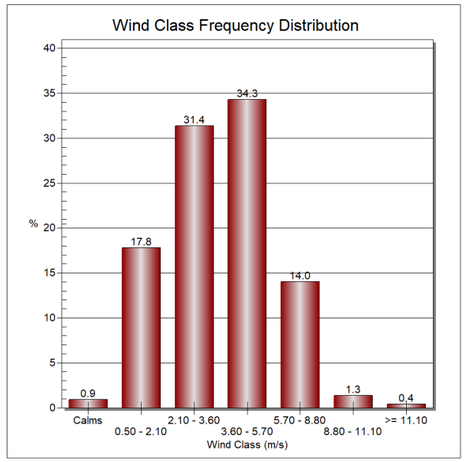


Figure 58 WRF Spring Wind Class Frequency Distribution at the Project Site

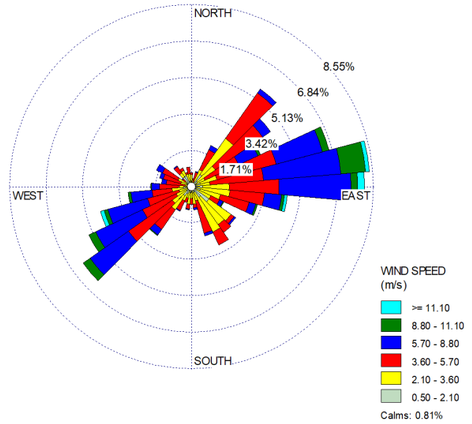


Figure 59 CALMET Spring (May) Windrose at the Project Site (Mine Center) from 2013 to 2015

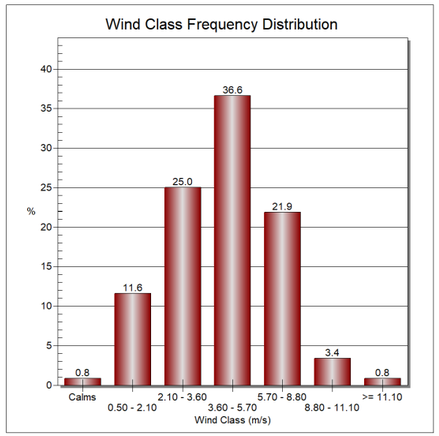


Figure 60 CALMET Spring (May) Wind Class Frequency Distribution at the Project Site (Mine Center) from 2013 to 2015

2.1.2 Wind Class Frequency Distribution Comparison

The wind class frequency distribution figures at the Sparwood station demonstrate that low wind speeds (i.e., 0.5m/s - 2.1 m/s) are most typical at the surface station during all five meteorological seasons. This is consistent with the annual and seasonal wind class frequency distributions from the WRF and CALMET models for the surface station. The wind speeds at the surface station are relatively consistent for all seasons.

Figure 61 provides a comparison of the annual wind class frequency distribution at the surface station from 2013 to 2015. The wind speed predictions from WRF and CALMET models are in good agreement with the wind observation data. The CALMET model typically predicts slightly higher wind speeds than the wind speeds from the surface station and WRF data, expect under lower wind conditions (< 2.1 m/s).

It should be noted that 17% of observed data from the Sparwood surface station is missing and not plotted. Therefore the percentages presented in Figure 61 for station observations are lower than the WRF and CALMET data as both models have 100% data completeness.

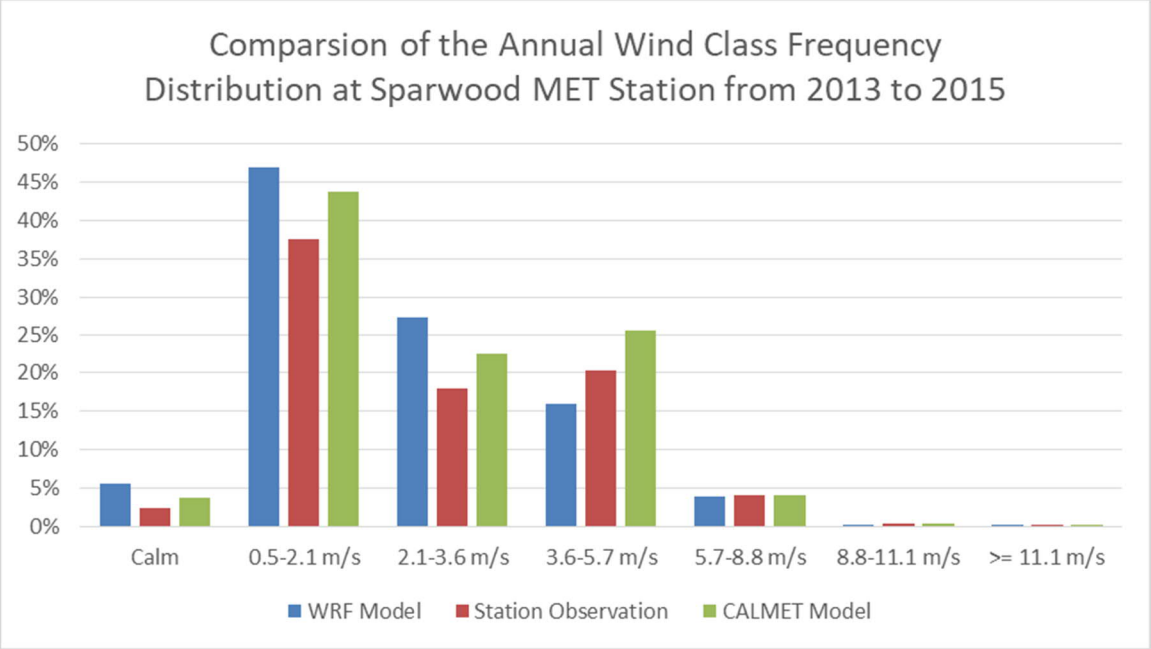


Figure 61 Comparison of the Annual Wind Class Frequency Distribution at Sparwood Meteorological Station from 2013 to 2015

At the Project site, both WRF and CALMET models predict larger distributions of higher wind speeds than the surface station. Figure 62 presents the predicted wind speeds from the WRF and CALMET models for the Project site. The CALMET model predicts higher wind speeds than the WRF model for the Project site, except under lower wind conditions (<3.6 m/s).

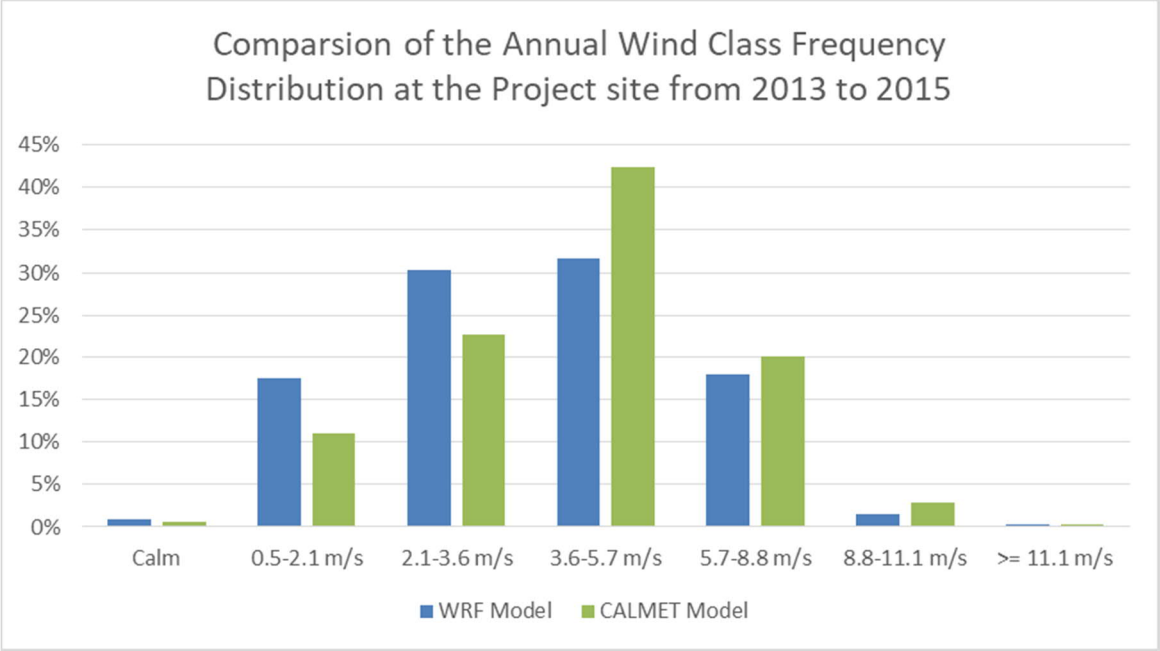


Figure 62 Comparison of the Annual Wind Class Frequency Distribution at the Project Site from 2013 to 2015

2.1.3 Wind Field Comparison

Figure 63 through Figure 66 present wind fields (10 m AG) at the LSA during the clear sky and low wind speed conditions over daytime and nighttime periods. The wind field plots illustrate the expected thermally driven flows during calm wind and clear weather conditions. The wind fields at the Project site are different from the coal processing area located approximately 11 km northwest of the mine site (see Figure 64), which is likely caused by the geophysical conditions in the area.

At the coal processing facility, the wind mainly blows from the south in the daytime; in the nighttime, wind blows both from the south and northeast. The winds predominant direction is from the northwest in the daytime and from the north in the nighttime at the Project site. Note that the wind field plots extracted from the CALMET output are example hourly periods with light wind and clear sky conditions, which may not represent the prevailing wind conditions in the area.

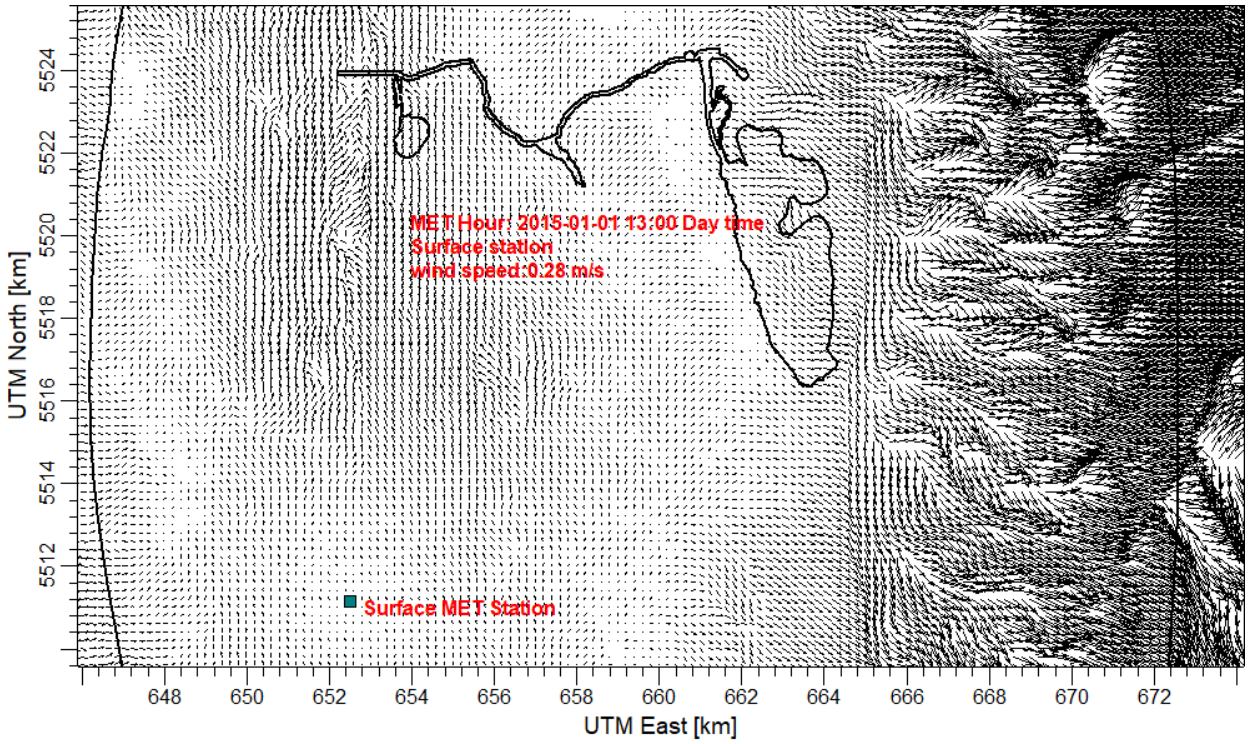


Figure 63 Wind Field during Low Wind and Clear Sky Condition at Daytime

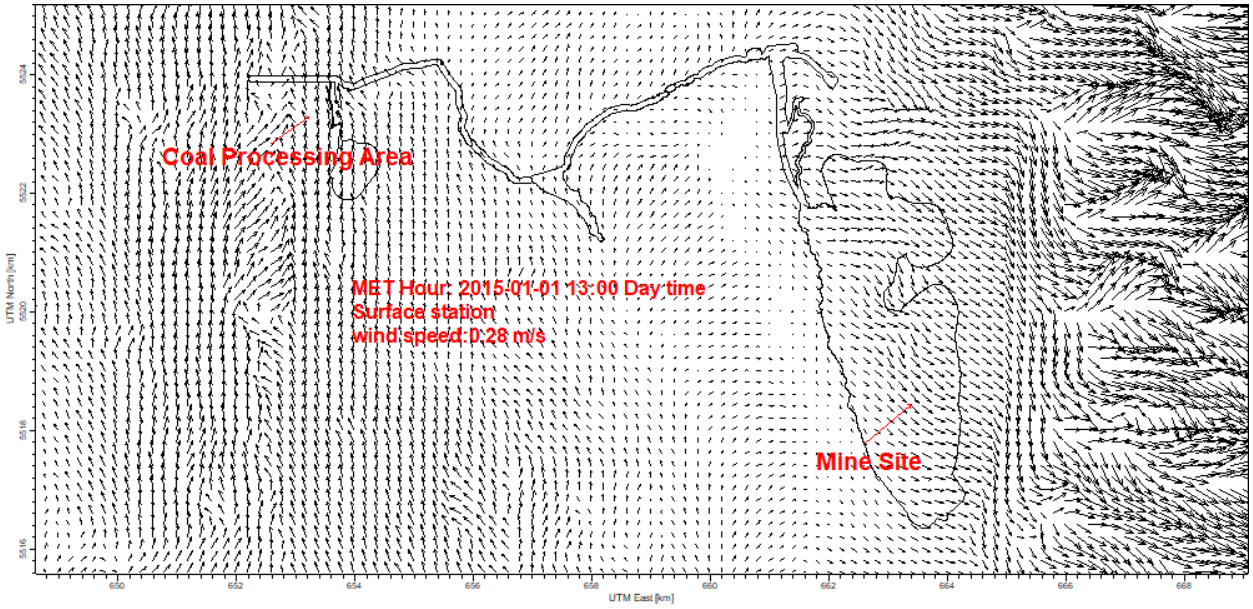


Figure 64 Wind Field during Low Wind and Clear Sky Condition at Daytime (Zoomed In For the Project Footprint)

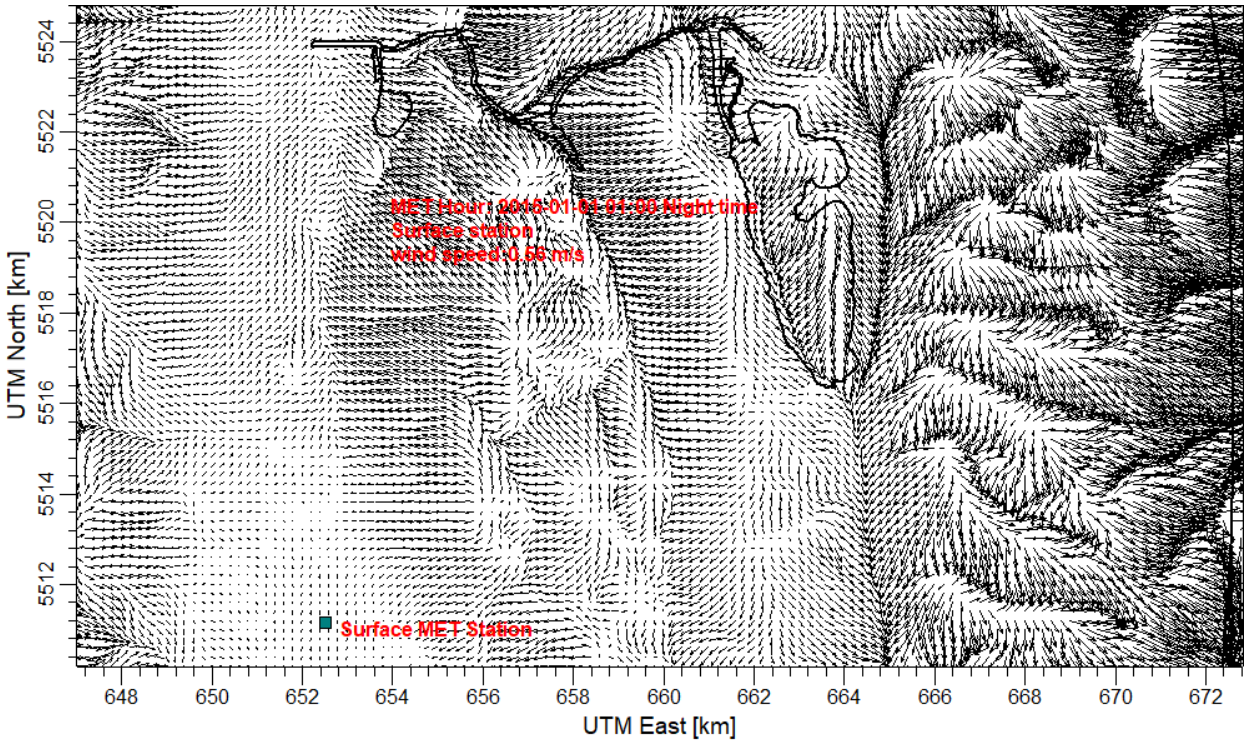


Figure 65 Wind Field during Low Wind and Clear Sky Condition at Night Time

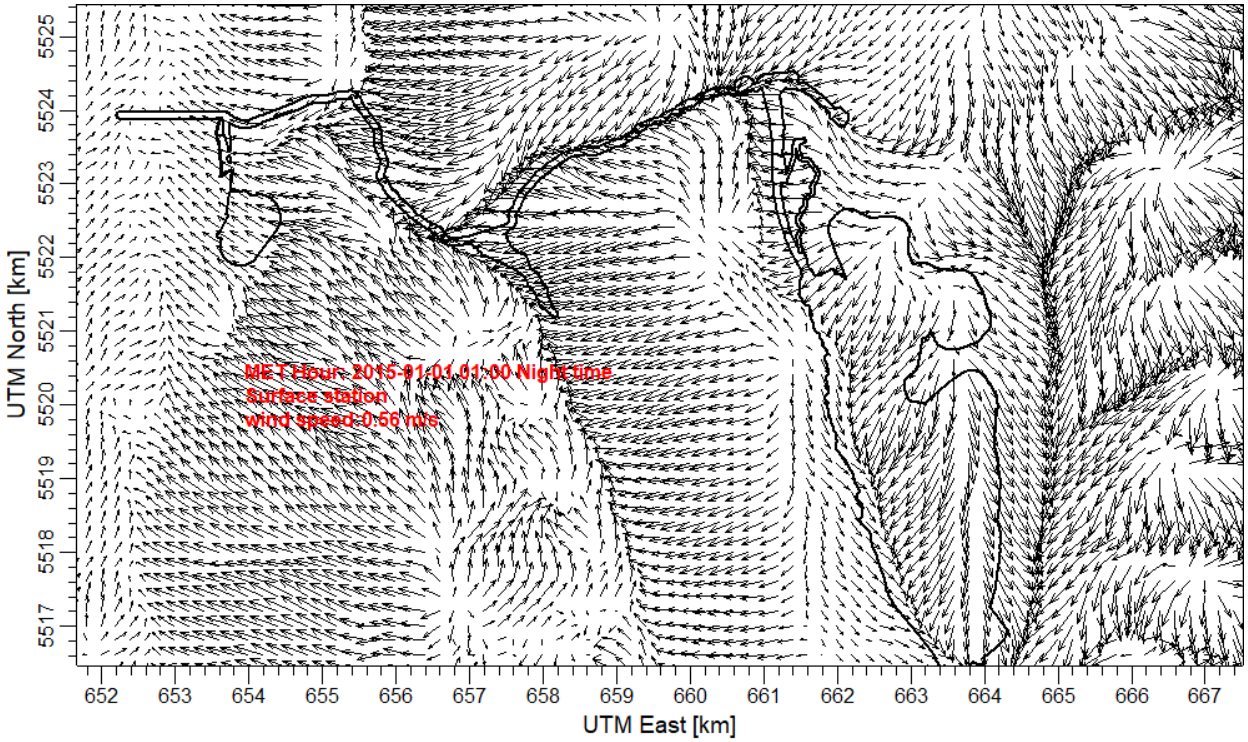


Figure 66 Wind Field during Low Wind and Clear Sky Condition at Night Time (Zoomed In For the Project Footprint)

2.2 Temperature Data Comparison

Figure 67 and Figure 68 compare time-series average temperature extracted from the WRF model, station observation, and the CALMET model at the surface station. The average temperature by hour-of-day and month from all meteorological sources followed a similar trend.

The WRF model predicts temperatures approximately 2°C below the observed temperature, while the CALMET model predicts average hourly temperatures similar to the observed temperature. This is expected as CALMET refines the meteorological parameters (e.g., temperature) based on the station observation data.

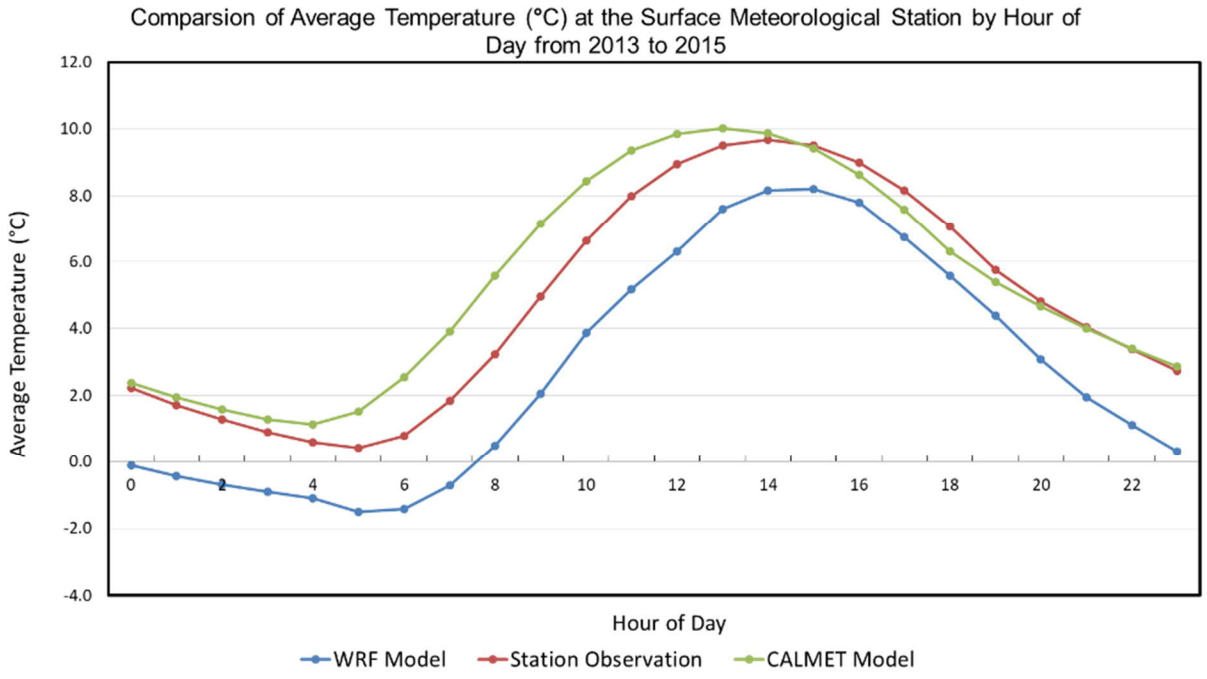


Figure 67 Comparison of Average Temperature (°C) at the Surface Meteorological Station by Hour-of-Day from 2013 to 2015

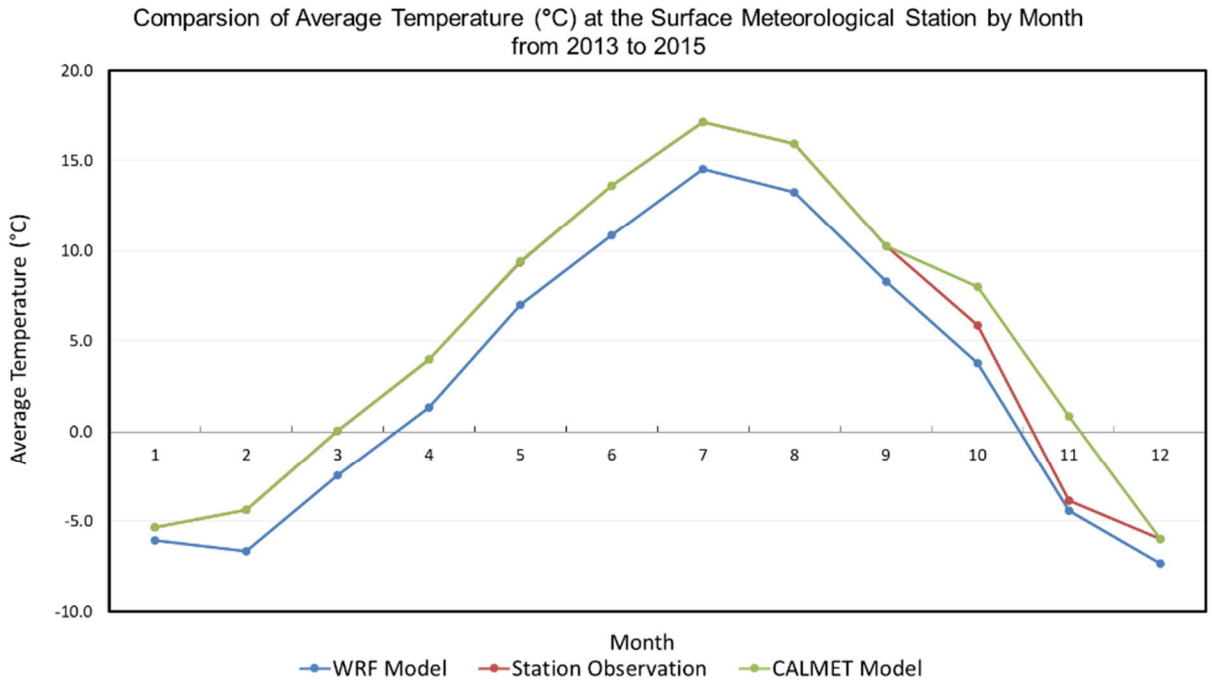


Figure 68 Comparison of Average Temperature (°C) at the Surface Meteorological Station by Month from 2013 to 2015

As meteorological observation data are not available at the Project site, time-series average temperature from CALMET is compared with the WRF output to confirm the stability of the CALMET model. The time-series average temperature from the WRF and CALMET models followed a similar trend by hour-of-day and month. The CALMET model predicts the project site has the same temperature as the surface station, which is approximately 4.5°C above the temperature predicted by the WRF model.

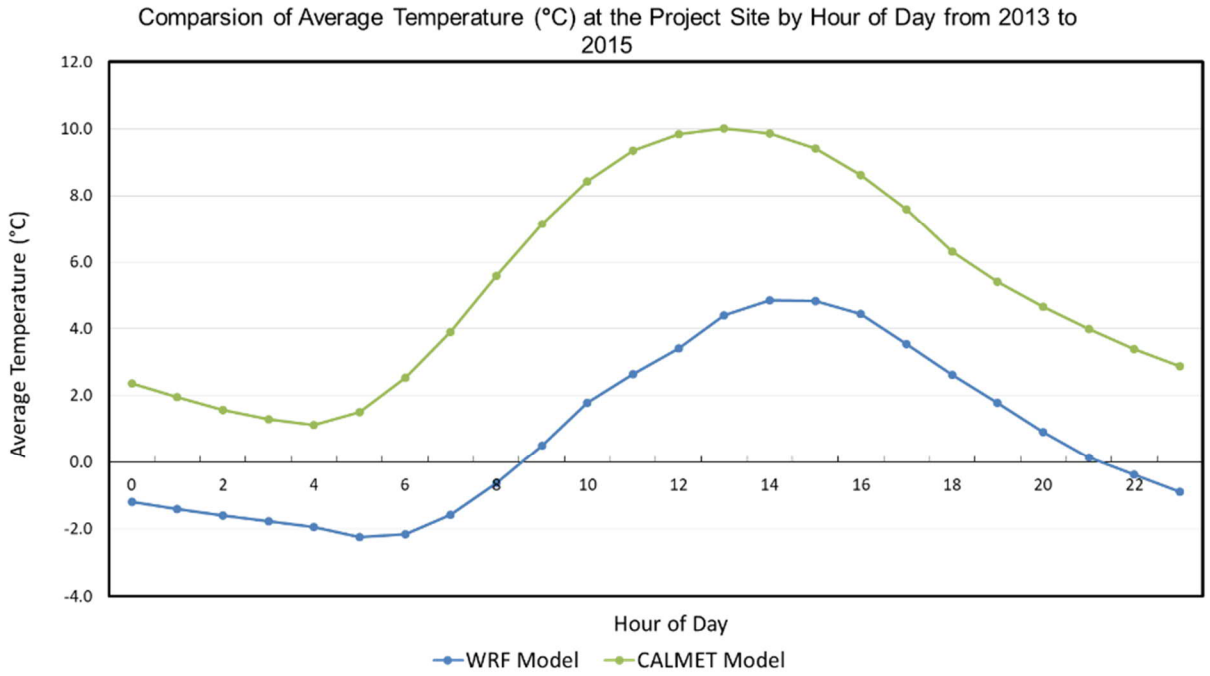


Figure 69 Comparison of Average Temperature at the Project Site by Hour of Day from 2013 to 2015

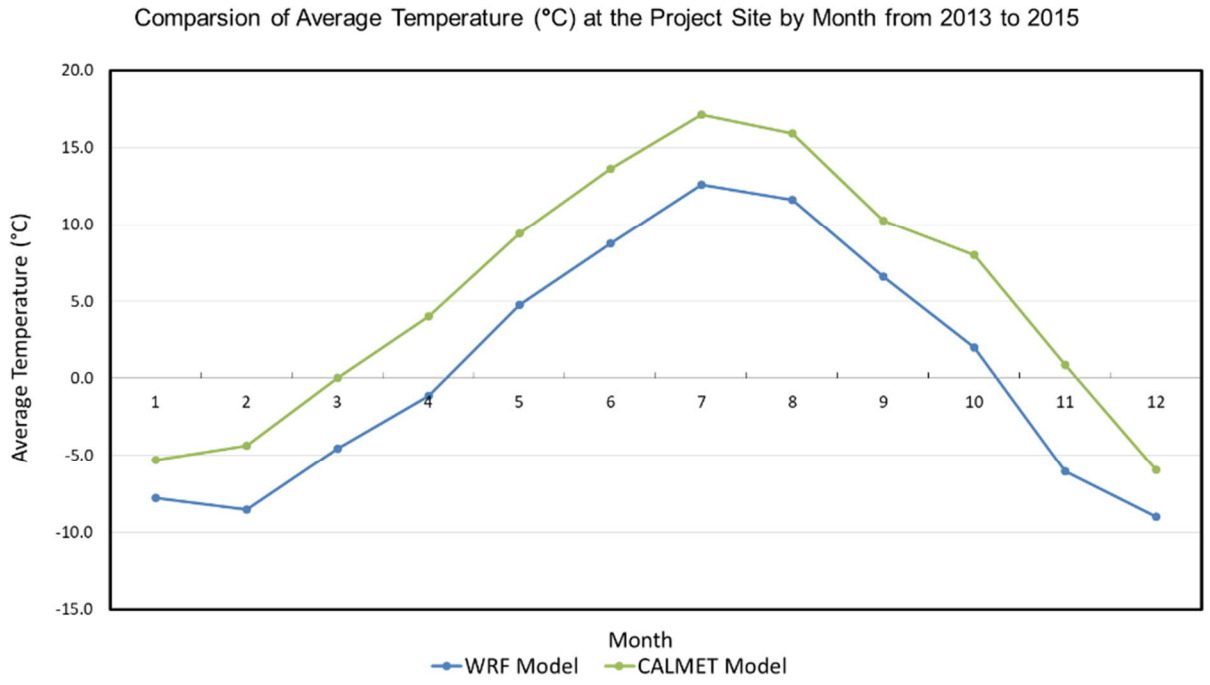


Figure 70 Comparison of Average Temperature at the Project Site by Month from 2013 to 2015

2.3 Other Meteorological Parameters

Meteorological parameters including precipitation rate, ceiling height, and cloud cover are not monitored at the surface station, and therefore the CALMET predictions are based on the WRF data. The time-series of precipitation rate and mixing height at the surface station are presented below and checked for reasonableness. As shown in Figure 71, the average hourly precipitation rate by month at the surface station varies between 0.05 mm/hr and 0.15 mm/hr and the maximum precipitation occurs in June.

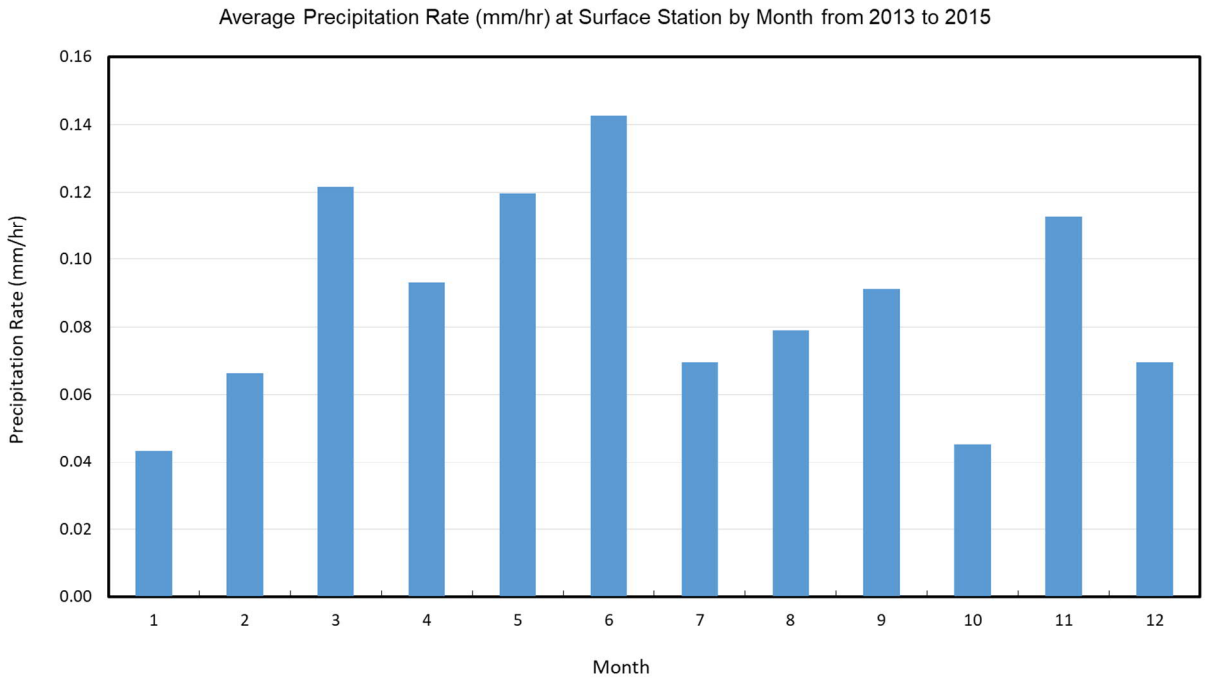


Figure 71 Average Precipitation Rate at the Surface Station by Month from 2013 to 2015

Figure 71 presents the average mixing height at the surface station by the hour of day, which starts to increase from approximately 200m in the morning (around 6 A.M.) to a maximum of 1200m in the afternoon (around 3 P.M.) and then fall back to 200m in the evening (around 8 P.M.). The average mixing height by month at the surface station ranges from approximately 350m to 850m (see Figure 73). The average mixing height in spring and mid-summer seasons is higher than winter seasons.

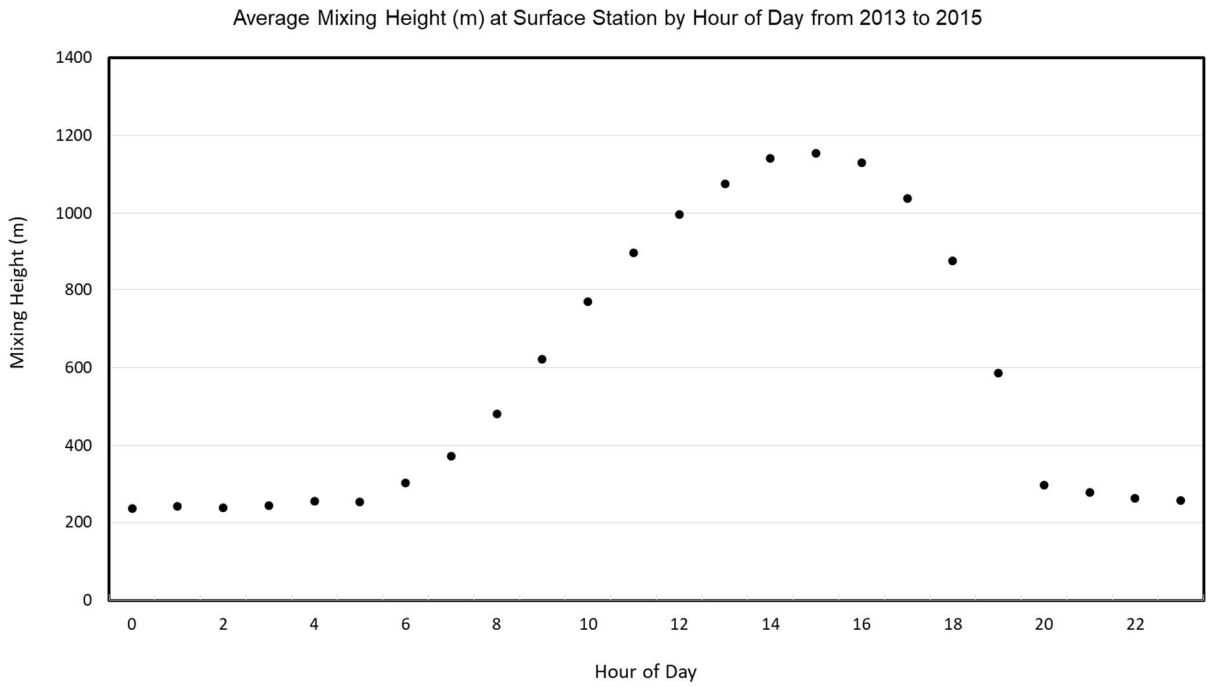


Figure 72 Average Mixing Height at Surface Station by Hour-of-Day

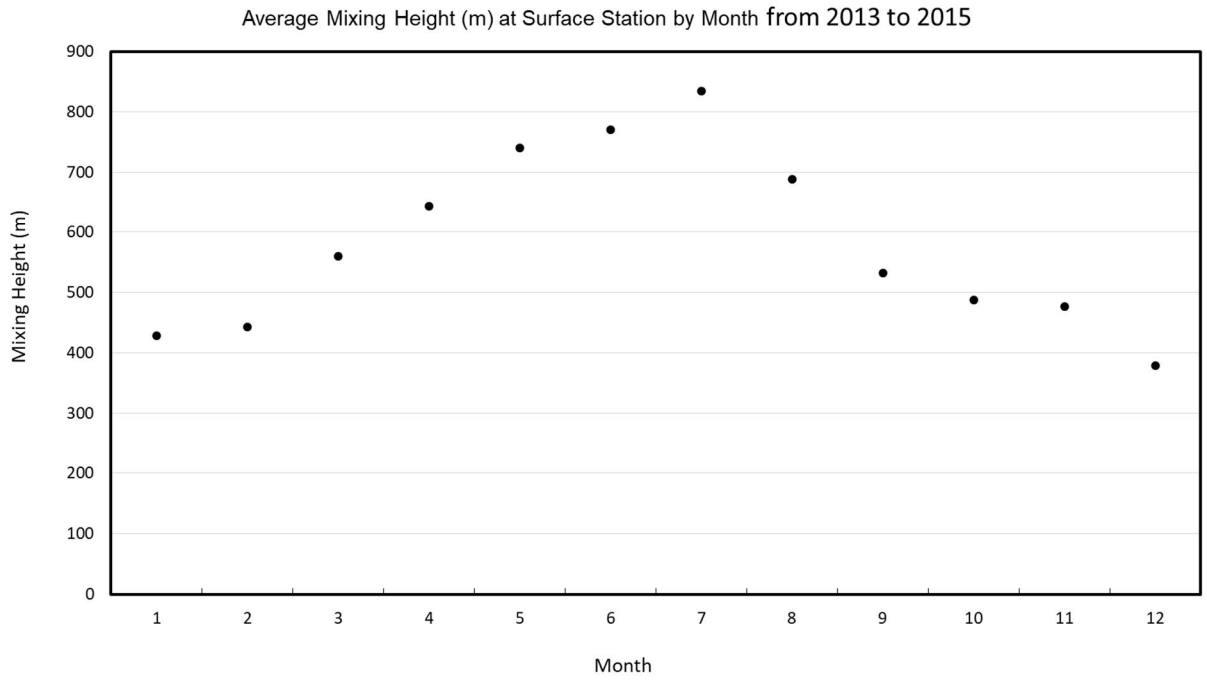


Figure 73 Average Mixing Height at the Surface Station by Month

2.4 Topography and Land Cover

Topography and land cover data were also reviewed for the QA/QC of geophysical inputs to the CALMET model. The contour plot of topography (Figure 74) within the LSA has been validated against elevation and other terrain maps for reasonableness. The land cover (Figure 75) has been validated using other publicly available land cover maps.

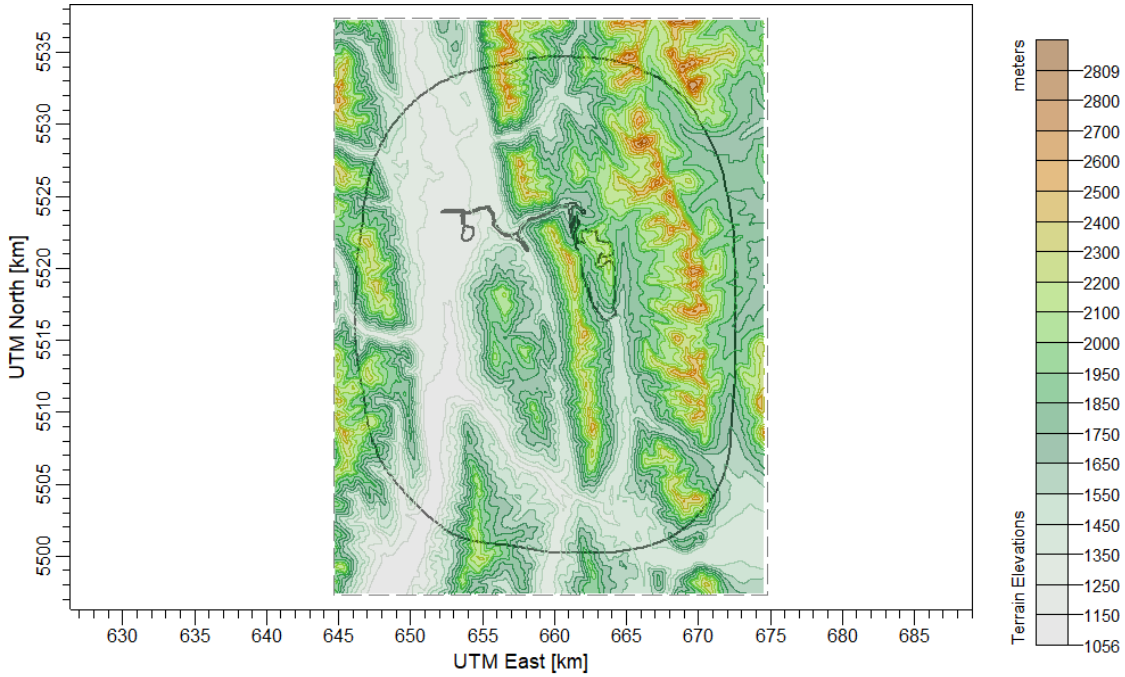


Figure 74 Terrain Elevation in the LSA

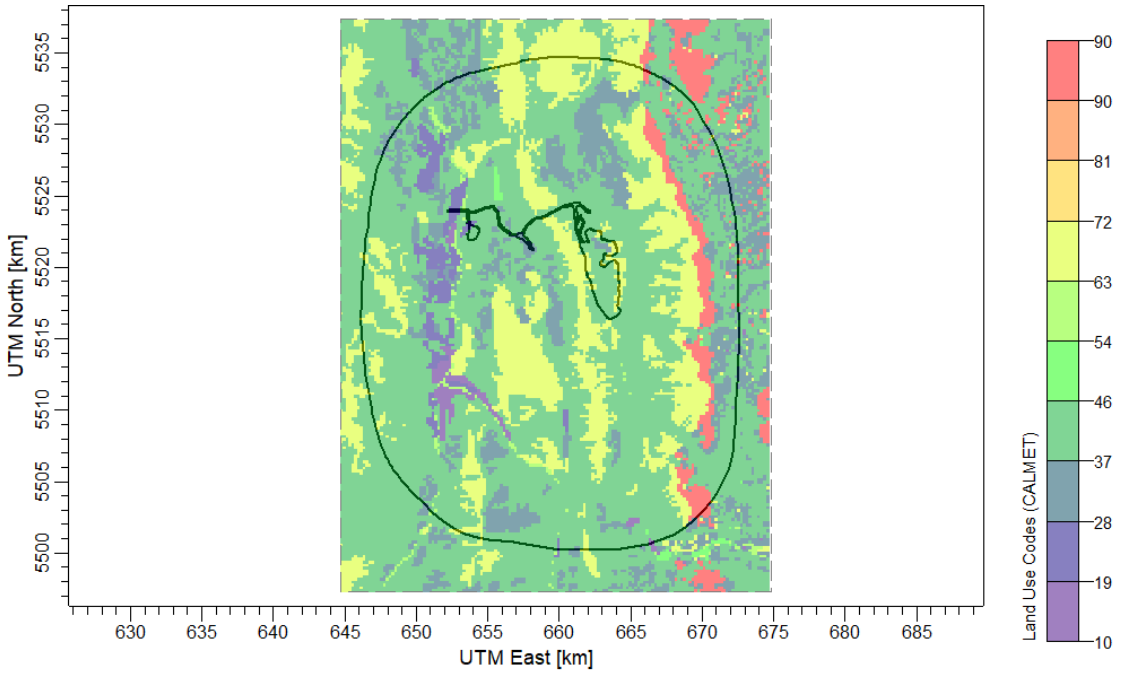


Figure 75 Land Use Cover Map in the LSA

3.0 CALMET QA/QC Conclusion

CALMET QA/QC analysis was performed for the surface meteorological observations, WRF output, and CALMET output data following the recommended QA/QC procedure in the BC AQDMG. All CALMET input and output data files were checked for reasonableness. The QA/QC procedure shows that the meteorological, topography, and land cover parameters in the CALMET model are in relatively good agreement with the observed meteorological conditions, topography, and land cover at the Sparwood surface station.

Appendix D

Modelled Concentrations and Frequency of Exceedance

Table A1. Project Case Maximum Predicted Particulate Matter Concentrations and Dustfall without Background

Contaminant	Dustfall	TSP		PM10	PM2.5	
Averaging Period	**30-day**	**24-hour**	**Annual**	**24-hour**	**24-hour**	**Annual**
BC Objective (µg/m^3)	-	120	60	50	25	8
Receptor ID	Deposition without Background [mg/dm^2/d]	Concentration without Background [µg/m3]				
LSA and RSA Sensitive Receptors						
S 1	0.00	0.85	0.03	0.80	0.27	0.01
S 2	0.00	1.25	0.05	1.19	0.33	0.01
S 3	0.00	0.21	0.01	0.19	0.06	0.00
S 4	0.00	0.21	0.01	0.20	0.06	0.00
S 5	0.11	26.74	1.43	21.09	5.04	0.32
S 6	0.81	68.74	5.39	52.20	8.58	0.91
S 7	5.55	453.50	240.11	257.41	34.14	8.36
S 8	0.11	22.85	3.08	15.93	3.36	0.24
S 9	0.04	7.48	0.66	6.59	1.73	0.09
S 10	0.04	34.39	1.15	25.27	5.00	0.18
S 11	0.07	31.58	2.04	24.61	6.25	0.27
S 12	0.02	16.24	0.45	13.98	3.47	0.08
S 13	0.02	11.78	0.36	10.28	2.07	0.06
S 14	0.01	8.99	0.19	8.28	1.90	0.04
S 15	0.01	3.41	0.09	3.22	0.84	0.02
S 16	0.01	4.43	0.15	3.98	1.31	0.03
S 17	0.01	4.84	0.16	4.42	1.27	0.03
S 18	0.00	1.69	0.06	1.56	0.43	0.01
S 19	0.02	13.71	0.51	11.45	2.03	0.07
S 20	0.01	1.52	0.08	1.41	0.46	0.02
S 21	0.12	35.55	4.49	21.91	4.34	0.46
S 22	0.01	3.81	0.17	3.47	0.83	0.04
S 23	0.00	1.66	0.07	1.57	0.42	0.02
S 24	0.07	7.10	0.38	6.54	1.35	0.09
S 25	0.45	157.10	25.75	64.90	10.29	1.77
S 26	0.02	2.22	0.16	1.98	0.61	0.04
S 27	0.02	7.36	0.34	6.85	2.15	0.08
S 28	0.03	11.02	1.08	9.46	2.57	0.16
S 29	0.02	12.25	0.60	10.23	2.71	0.10
S 30	0.09	25.17	2.87	17.72	3.31	0.32
S 31	0.04	12.57	1.29	10.49	2.89	0.19
S 32	0.01	5.82	0.30	5.23	1.16	0.06
S 33	0.02	9.48	0.63	7.84	1.99	0.10
S 34	0.04	17.52	1.12	14.14	2.96	0.17
S 35	0.00	1.47	0.06	1.39	0.42	0.02
S 36	0.01	2.19	0.09	2.03	0.55	0.02
S 37	0.03	4.22	0.21	3.66	0.87	0.05
S 38	0.01	1.59	0.12	1.48	0.43	0.03
S 39	0.01	1.31	0.10	1.12	0.37	0.03
S 40	0.03	21.06	0.99	16.78	3.71	0.16
S 41	0.02	11.99	0.60	10.23	3.11	0.12
S 42	0.03	4.17	0.26	3.87	0.85	0.06
S 43	0.01	2.11	0.09	1.96	0.53	0.02
S 44	0.00	0.68	0.02	0.62	0.26	0.01
S 45	0.02	8.08	0.37	7.59	2.36	0.08
S 46	0.00	1.48	0.06	1.40	0.41	0.02
S 47	0.27	66.06	7.40	42.96	12.61	0.75
S 48	4.69	880.08	147.49	327.11	39.75	5.28
S 49	0.18	51.73	7.19	32.78	6.13	0.65
S 50	0.14	31.30	1.61	24.25	5.61	0.36
S 51	0.12	25.89	1.46	19.51	4.54	0.33
S 52	0.02	14.75	0.72	12.56	3.72	0.15
S 53	0.35	122.64	4.64	90.83	16.14	1.08
S 54	0.50	174.76	6.70	119.85	21.04	1.50
S 55	0.10	26.65	1.34	21.21	5.13	0.29
S 56	0.72	531.60	30.83	235.41	29.75	1.70
S 57	0.00	0.81	0.02	0.76	0.28	0.01
S 58	0.02	13.82	0.60	11.44	2.99	0.11
S 59	0.00	1.46	0.06	1.38	0.42	0.02
S 61	0.42	183.91	14.95	108.45	21.64	1.21
S 62	0.51	155.93	14.97	85.44	13.02	1.11
S 63	0.53	183.04	16.03	96.73	14.30	1.18
S 64	0.96	201.23	21.42	88.74	11.66	1.32
S 65	0.98	611.04	42.45	259.70	32.46	2.13
S 66	0.74	543.00	31.40	239.40	30.21	1.72
S 67	0.02	12.43	0.62	10.36	2.73	0.11
S 68	0.02	12.17	0.61	10.15	2.67	0.10

S 69	3.59	610.01	66.04	232.84	27.99	2.79
S 70	0.02	12.36	0.62	10.31	2.71	0.11
S 71	0.02	12.08	0.61	10.08	2.66	0.10
S 72	0.02	12.07	0.61	10.07	2.66	0.10
S 74	0.00	1.17	0.07	1.06	0.41	0.02
S 75	0.00	1.42	0.08	1.24	0.43	0.02
S 76	0.01	1.59	0.09	1.40	0.45	0.02
S 77	0.01	1.89	0.09	1.65	0.46	0.02
S 78	0.01	1.79	0.09	1.57	0.47	0.02
S 79	0.01	1.82	0.09	1.60	0.48	0.02
S 80	0.01	1.66	0.09	1.46	0.48	0.02
S 81	0.01	2.38	0.11	2.09	0.58	0.03
S 82	0.02	3.20	0.15	2.78	0.68	0.04
S 83	0.02	2.84	0.19	2.63	0.67	0.05
S 84	0.02	3.48	0.21	3.04	0.81	0.05
S 85	0.03	3.56	0.24	3.27	0.76	0.06
S 86	0.05	6.17	0.33	5.70	1.19	0.08
S 87	0.07	8.49	0.42	7.76	1.54	0.10
S 88	0.06	14.16	0.87	11.50	2.55	0.20
S 89	0.11	28.33	1.41	22.28	5.32	0.31
S 90	0.53	190.32	7.29	130.35	23.31	1.67
S 91	0.81	76.05	5.96	57.30	9.41	0.99
S 92	0.96	76.62	9.90	55.62	9.17	1.04
S 93	0.48	51.43	8.76	38.18	6.81	0.80
S 94	0.49	38.17	13.91	27.74	5.25	0.81
S 95	0.08	19.69	1.75	15.80	3.64	0.17
S 96	0.09	10.36	1.59	7.89	1.57	0.15
S 97	0.10	7.51	1.32	5.88	1.17	0.13
S 98	0.06	5.98	0.90	4.66	1.17	0.09
S 99	0.04	4.83	0.62	3.84	1.00	0.07
S 100	0.05	5.02	0.65	3.81	0.95	0.07
S 101	0.07	3.59	0.50	3.08	0.80	0.06
S 102	0.04	3.04	0.37	2.64	0.71	0.05
S 103	0.04	3.40	0.35	2.72	0.72	0.05
S 104	0.03	2.67	0.22	2.22	0.54	0.03
S 105	0.02	2.49	0.21	2.22	0.60	0.03
S 106	0.02	2.96	0.18	2.78	0.69	0.03
S 107	0.02	4.94	0.17	4.61	1.11	0.03
S 108	0.01	4.89	0.14	4.59	1.14	0.02
S 109	0.01	3.05	0.10	2.89	0.75	0.02
S 110	0.01	2.15	0.08	2.05	0.55	0.02
S 111	0.01	1.90	0.06	1.81	0.49	0.01
S 112	0.01	1.66	0.09	1.46	0.48	0.02
S 113	0.02	3.48	0.21	3.04	0.81	0.05
S 114	0.07	8.49	0.42	7.76	1.54	0.10
S 115	0.13	32.84	1.60	25.44	5.86	0.35
S 116	0.03	2.67	0.22	2.22	0.54	0.03
S 117	0.01	1.90	0.06	1.81	0.49	0.01
S 118	0.07	7.13	0.37	6.56	1.35	0.09
S 119	0.06	5.98	0.90	4.66	1.17	0.09
S 120	0.04	3.19	0.34	2.57	0.70	0.05
S 121	0.01	4.79	0.14	4.50	1.12	0.02
S 122	0.01	2.04	0.08	1.94	0.52	0.02
S 123	0.02	2.96	0.18	2.77	0.69	0.03
S 124	0.03	3.57	0.24	3.28	0.76	0.06
S 125	0.02	2.33	0.19	2.09	0.57	0.03
S 126	0.07	3.58	0.50	3.08	0.80	0.06
S 127	0.00	1.17	0.07	1.06	0.41	0.02
S 128	0.01	1.95	0.14	1.81	0.55	0.04
S 129	0.02	2.84	0.19	2.62	0.67	0.05
S 130	0.02	2.83	0.19	2.62	0.68	0.05
S 131	0.02	2.16	0.16	2.01	0.60	0.04
S 132	0.05	5.04	0.67	3.95	1.02	0.07
S 133	0.00	1.74	0.08	1.64	0.44	0.02
S 134	0.01	8.74	0.42	7.85	2.11	0.08
S 135	0.00	0.85	0.03	0.80	0.25	0.01
S 137	0.00	1.79	0.08	1.67	0.45	0.02
S 138	0.01	4.21	0.19	3.83	0.90	0.04
S 139	0.01	4.62	0.21	4.19	0.97	0.04
S 140	0.01	4.38	0.20	3.97	0.93	0.04
S 141	0.03	12.20	1.23	10.19	2.74	0.18
S 142	0.06	18.19	2.27	14.03	3.47	0.27
S 143	0.17	47.91	7.15	30.95	6.05	0.64
S 144	0.02	12.25	0.62	10.21	2.68	0.11
S 145	0.00	1.81	0.08	1.69	0.46	0.02
S 146	0.00	1.97	0.08	1.83	0.50	0.02
S 147	0.04	12.49	1.28	10.38	2.84	0.19

S 148	0.03	11.60	1.26	9.59	2.62	0.18
S 149	0.00	1.79	0.08	1.68	0.45	0.02
S 150	0.01	6.03	0.31	5.41	1.20	0.06
S 151	0.02	7.29	0.42	6.51	1.47	0.08
S 152	0.04	12.51	1.29	10.44	2.87	0.19
S 153	0.07	37.42	2.04	28.30	6.73	0.27
S 154	0.00	1.66	0.07	1.57	0.41	0.02
S 155	0.03	11.03	1.07	9.47	2.57	0.16
S 156	0.01	2.10	0.09	1.95	0.52	0.02
S 157	0.00	1.87	0.08	1.74	0.47	0.02
S 158	0.01	2.04	0.09	1.90	0.51	0.02
S 159	0.04	12.45	1.29	10.36	2.85	0.19
S 160	0.02	12.56	0.63	10.46	2.75	0.11
S 161	0.00	0.84	0.03	0.71	0.25	0.01
S 162	0.00	0.71	0.03	0.67	0.25	0.01
S 163	0.00	0.59	0.02	0.54	0.23	0.01
S 164	0.00	0.73	0.02	0.68	0.27	0.01
S 165	0.00	0.34	0.01	0.32	0.13	0.00
S 166	0.00	0.48	0.01	0.44	0.18	0.00
S 167	0.00	0.74	0.02	0.68	0.28	0.01
S 168	0.00	0.30	0.01	0.28	0.11	0.00
S 169	0.01	2.98	0.15	2.74	0.63	0.03
S 170	0.00	1.03	0.03	0.96	0.36	0.01
S 171	0.00	0.43	0.01	0.40	0.13	0.00
S 172	0.00	0.40	0.01	0.37	0.12	0.00
S 173	0.00	0.51	0.02	0.48	0.15	0.00
S 174	0.00	2.28	0.08	2.10	0.62	0.02
S 175	0.01	3.92	0.13	3.52	1.14	0.03
S 176	0.36	109.88	4.81	82.38	16.63	1.13
S 177	0.81	77.59	6.36	58.28	9.60	1.04
S 178	5.50	984.97	186.62	353.37	42.73	6.44
S 179	1.26	253.88	27.67	113.82	14.23	1.63
S 180	0.29	139.66	18.49	61.24	8.51	1.32
S 181	0.13	41.20	5.55	24.51	5.01	0.54
S 182	0.01	4.86	0.16	4.54	1.10	0.03
S 183	0.00	1.86	0.08	1.73	0.47	0.02
S 184	0.03	28.44	1.15	21.44	4.58	0.17
S 185	0.01	13.72	0.51	11.30	3.13	0.09
S 186	0.02	14.11	0.61	11.66	3.03	0.11
S 187	0.02	13.25	0.59	11.01	2.91	0.10
S 188	0.01	8.77	0.42	7.87	2.12	0.08
S 189	0.01	8.77	0.42	7.87	2.12	0.08
S 190	0.01	2.21	0.09	2.05	0.56	0.02
S 191	0.00	1.59	0.08	1.42	0.42	0.02
S 192	0.01	3.18	0.14	2.90	0.72	0.03
S 193	0.01	3.22	0.15	2.94	0.68	0.03
S 194	0.00	1.94	0.08	1.81	0.50	0.02
S 195	0.00	0.58	0.02	0.54	0.17	0.00
S 196	0.00	0.21	0.01	0.20	0.06	0.00
S 197	0.04	12.46	1.42	10.26	2.86	0.20
S 199	3.37	593.01	76.90	238.45	33.00	3.29
S 200	10.66	2306.47	623.04	812.95	96.11	21.95
S 201	0.96	201.92	21.74	87.49	11.50	1.33
S 202	0.25	229.71	13.66	128.55	17.82	0.84
S 203	0.29	63.68	7.38	45.29	12.72	0.75
S 204	0.28	17.14	1.93	12.44	3.15	0.40
S 205	1.21	146.82	7.07	109.90	15.37	1.88
S 206	0.53	171.54	6.90	116.30	20.95	1.52
S 207	0.02	12.69	0.62	10.51	3.18	0.13
S 209	0.04	12.01	1.37	9.84	2.65	0.19
S 210	0.10	28.78	1.38	22.73	5.44	0.30
S 211	0.03	4.66	0.24	4.03	0.97	0.06
S 212	0.01	1.22	0.09	1.01	0.34	0.02
S 213	0.01	1.31	0.10	1.12	0.37	0.03
S 214	0.02	2.04	0.14	1.80	0.57	0.04
S 215	0.01	1.94	0.14	1.78	0.56	0.04
S 216	0.02	2.86	0.20	2.64	0.72	0.05
S 217	0.02	2.87	0.20	2.58	0.72	0.05
S 218	0.01	1.59	0.12	1.48	0.43	0.03
S 219	0.01	1.43	0.11	1.33	0.42	0.03
S 220	0.02	2.88	0.20	2.64	0.72	0.05
S 221	0.01	1.91	0.14	1.77	0.55	0.04
S 222	0.02	2.73	0.18	2.53	0.64	0.05
S 223	0.04	12.14	1.34	10.01	2.77	0.19
S 224	0.01	1.29	0.10	1.10	0.36	0.03
S 225	0.04	12.27	1.34	10.12	2.81	0.19
S 226	0.01	2.00	0.09	1.87	0.50	0.02

S 227	0.00	1.96	0.08	1.83	0.49	0.02
S 228	0.00	1.46	0.06	1.38	0.42	0.02
S 229	0.04	12.43	1.30	10.33	2.85	0.19
S 230	0.02	3.05	0.20	2.68	0.74	0.05
S 231	0.02	2.93	0.20	2.58	0.72	0.05
S 232	0.01	1.28	0.10	1.10	0.37	0.03
S 233	0.02	2.92	0.19	2.69	0.65	0.05
S 234	0.01	6.61	0.29	5.93	1.88	0.07
S 235	0.09	25.28	2.88	17.79	3.32	0.32
S 236	0.01	1.93	0.14	1.79	0.53	0.04
S 237	0.01	1.91	0.14	1.77	0.53	0.04
S 238	0.01	1.94	0.14	1.80	0.54	0.04
S 239	0.02	2.01	0.15	1.86	0.57	0.04
S 240	0.01	1.71	0.13	1.59	0.46	0.03
S 242	0.03	4.17	0.26	3.87	0.85	0.06
S 243	0.02	2.90	0.19	2.68	0.65	0.05
S 244	0.01	1.28	0.10	1.08	0.36	0.03
S 245	0.01	1.99	0.14	1.85	0.55	0.04
S 246	0.02	2.29	0.16	2.12	0.60	0.04
S 247	0.03	5.78	0.25	5.00	1.19	0.06
S 248	0.01	1.97	0.14	1.83	0.55	0.04
S 249	0.03	5.36	0.23	4.65	1.08	0.06
S 250	0.02	2.82	0.19	2.50	0.71	0.05
S 251	0.02	2.22	0.16	1.98	0.61	0.04
S 252	0.01	1.23	0.09	0.99	0.32	0.02
S 253	0.01	1.30	0.10	1.15	0.38	0.03
S 254	0.02	2.19	0.16	1.98	0.60	0.04
S 255	0.00	0.71	0.03	0.62	0.22	0.01
S 256	0.01	1.98	0.09	1.84	0.50	0.02
S 257	0.00	1.70	0.07	1.60	0.43	0.02
S 258	0.00	1.70	0.07	1.60	0.43	0.02
S 259	0.00	1.83	0.08	1.71	0.46	0.02
S 260	0.02	12.67	0.61	10.56	2.79	0.10
S 261	0.02	15.46	0.70	12.66	3.19	0.12
S 262	0.02	15.50	0.68	12.69	3.21	0.12
S 263	0.28	141.74	16.44	63.27	8.66	1.21
S 264	0.02	2.19	0.16	2.03	0.59	0.04
S 265	0.01	2.01	0.09	1.87	0.50	0.02
S 266	0.03	11.02	1.09	9.35	2.54	0.16
S 269	0.00	1.91	0.08	1.78	0.48	0.02
S 270	0.02	12.67	0.63	10.55	2.77	0.11
S 271	0.00	1.83	0.08	1.70	0.46	0.02
S 272	0.02	2.18	0.16	2.02	0.60	0.04
S 273	0.02	2.19	0.16	2.03	0.59	0.04
S 274	0.03	11.57	1.21	9.64	2.62	0.17
S 276	0.04	12.71	1.35	10.54	2.94	0.19
S 277	0.00	1.85	0.08	1.73	0.47	0.02
S 278	0.01	1.30	0.10	1.13	0.38	0.03
S 279	0.00	1.74	0.07	1.64	0.44	0.02
S 280	0.00	1.84	0.08	1.72	0.47	0.02
S 281	0.04	12.34	1.30	10.25	2.83	0.19
S 282	0.01	1.88	0.14	1.74	0.51	0.03
S 283	0.01	1.32	0.10	1.15	0.38	0.03
S 284	0.03	10.69	1.10	8.87	2.40	0.16
S 285	0.04	11.86	1.34	9.77	2.67	0.19
S 286	0.03	11.32	1.18	9.39	2.54	0.17
S 287	0.03	11.52	1.23	9.53	2.59	0.18
S 288	0.03	11.48	1.23	9.50	2.58	0.18
S 289	0.03	11.60	1.28	9.58	2.60	0.18
S 290	0.03	11.50	1.24	9.51	2.59	0.18
S 291	0.00	1.80	0.08	1.68	0.46	0.02
S 292	0.03	11.63	1.25	9.62	2.63	0.18
S 293	0.00	1.80	0.08	1.68	0.45	0.02
S 294	0.02	12.59	0.61	10.50	2.77	0.10
S 295	0.00	1.85	0.08	1.73	0.47	0.02
S 296	0.03	12.21	1.21	10.24	2.75	0.18
S 297	0.00	1.82	0.08	1.70	0.46	0.02
S 298	0.01	2.11	0.09	1.96	0.52	0.02
S 299	0.00	1.78	0.08	1.66	0.45	0.02
S 300	0.00	1.70	0.07	1.60	0.43	0.02
S 301	0.00	1.82	0.08	1.70	0.46	0.02
S 302	0.00	1.70	0.07	1.60	0.44	0.02
S 303	0.00	1.80	0.08	1.68	0.46	0.02
S 304	0.00	1.86	0.08	1.73	0.47	0.02
S 305	0.00	1.85	0.08	1.73	0.47	0.02
S 306	0.05	15.00	1.78	11.77	3.04	0.23
S 307	0.00	1.71	0.07	1.61	0.43	0.02

S 308	0.00	1.95	0.08	1.81	0.49	0.02
S 309	0.02	15.39	0.68	12.61	3.20	0.12
S 310	0.02	15.13	0.71	12.42	3.13	0.12
S 311	0.02	13.19	0.62	10.96	2.87	0.11
S 312	0.02	13.52	0.60	11.22	2.95	0.11
S 313	0.02	13.66	0.68	11.31	2.91	0.11
S 314	0.02	12.92	0.61	10.75	2.83	0.11
S 315	0.03	11.48	1.18	9.60	2.59	0.17
S 316	0.04	12.23	1.29	10.16	2.80	0.18
S 317	0.04	14.24	1.68	11.24	2.97	0.22
S 318	0.00	1.87	0.08	1.75	0.48	0.02
S 319	0.00	1.86	0.08	1.74	0.47	0.02
S 320	0.00	1.80	0.08	1.68	0.46	0.02
S 321	0.00	1.87	0.08	1.75	0.47	0.02
S 322	0.01	1.99	0.08	1.86	0.50	0.02
S 323	0.01	2.04	0.09	1.90	0.51	0.02
S 324	0.00	1.86	0.08	1.73	0.47	0.02
S 325	0.01	1.99	0.08	1.85	0.50	0.02
S 326	0.03	9.97	0.94	8.71	2.39	0.15
S 327	0.02	9.58	0.71	8.38	2.14	0.12
S 328	0.02	11.81	0.53	10.17	3.08	0.11
S 329	0.02	11.32	0.50	9.76	2.98	0.11
S 330	0.02	9.10	0.42	8.47	2.62	0.09
S 331	0.03	12.32	1.27	10.26	2.79	0.18
S 332	0.04	13.13	1.38	11.01	3.11	0.20
S 333	0.04	13.17	1.32	11.15	3.10	0.19
S 334	0.02	13.28	0.62	11.03	2.89	0.11
S 335	0.02	11.92	0.61	9.95	2.62	0.10
S 336	0.00	0.94	0.03	0.88	0.32	0.01
S 337	0.00	0.94	0.03	0.88	0.32	0.01
S 338	0.00	0.87	0.03	0.80	0.32	0.01
S 339	0.00	0.27	0.01	0.25	0.08	0.00
S 340	0.02	2.84	0.19	2.62	0.67	0.05
S 341	0.06	6.87	0.35	6.32	1.30	0.08
S 342	0.01	2.62	0.12	2.29	0.58	0.03
S 343	0.01	2.19	0.08	2.09	0.56	0.02
S 344	0.02	2.22	0.16	1.98	0.61	0.04
S 345	0.38	11.31	1.65	8.28	2.03	0.27
S 346	0.06	11.97	0.75	9.29	1.98	0.14
S 416	0.32	44.75	8.37	26.16	5.74	0.69
N 348	0.01	2.20	0.09	2.04	0.55	0.02
N 349	0.01	2.56	0.11	2.36	0.61	0.03
N 350	0.01	2.70	0.12	2.49	0.64	0.03
N 351	0.01	3.44	0.15	3.14	0.77	0.03
N 352	0.01	4.23	0.19	3.84	0.91	0.04
N 353	0.01	5.85	0.30	5.26	1.17	0.06
N 354	0.01	6.80	0.38	6.09	1.36	0.07
N 355	0.02	8.24	0.52	7.33	1.76	0.09
N 356	0.03	14.73	0.89	12.53	3.03	0.16
N 357	0.03	14.60	0.80	12.58	2.90	0.15
N 358	0.02	14.05	0.76	12.27	3.79	0.15
N 359	0.02	12.93	0.71	11.73	3.31	0.14
N 360	0.02	13.81	0.73	12.44	3.67	0.14
N 361	0.02	11.96	0.60	10.30	3.13	0.12
N 362	0.00	1.65	0.07	1.56	0.42	0.02
N 363	0.00	1.54	0.07	1.45	0.43	0.02
N 364	0.07	54.60	3.50	33.86	6.56	0.39
N 365	0.08	40.15	3.32	24.46	5.94	0.38
N 366	0.08	44.10	3.61	28.69	5.58	0.40
N 367	0.10	57.11	3.96	35.95	6.83	0.42
N 368	0.09	46.29	4.23	31.05	5.63	0.43
N 369	0.10	25.72	3.01	17.98	3.48	0.33
N 370	0.07	18.28	2.21	13.64	3.14	0.26
N 371	0.05	15.12	1.82	11.92	3.23	0.23
N 372	0.04	13.34	1.50	10.97	3.16	0.21
N 373	0.04	14.31	1.20	12.45	3.31	0.19
N 374	0.02	9.91	0.53	8.61	2.27	0.09
N 375	0.04	24.77	1.36	19.44	4.53	0.20
N 376	0.06	31.80	1.68	24.02	5.92	0.24
N 377	0.07	39.10	2.07	29.20	6.87	0.27
N 378	0.00	0.57	0.02	0.53	0.21	0.00
N 379	0.00	0.63	0.02	0.58	0.23	0.00
N 380	0.00	0.56	0.02	0.53	0.21	0.00
N 381	0.00	0.55	0.02	0.52	0.20	0.00
N 382	0.00	0.68	0.02	0.63	0.25	0.01
N 383	0.00	0.87	0.03	0.79	0.31	0.01
N 384	0.00	0.85	0.03	0.79	0.30	0.01

N 385	0.00	0.82	0.02	0.75	0.29	0.01
N 386	0.00	0.73	0.02	0.68	0.26	0.01
N 387	0.00	0.88	0.03	0.82	0.31	0.01
N 388	0.00	0.87	0.03	0.81	0.31	0.01
N 389	0.00	1.30	0.06	1.21	0.43	0.01
N 390	0.00	0.54	0.01	0.50	0.18	0.00
N 391	0.00	1.29	0.05	1.19	0.43	0.01
N 392	0.00	0.92	0.03	0.86	0.32	0.01
N 393	0.00	0.50	0.01	0.47	0.16	0.00
N 394	0.00	1.22	0.05	1.12	0.41	0.01
N 395	0.00	0.47	0.01	0.44	0.14	0.00
N 396	0.00	0.44	0.01	0.41	0.13	0.00
N 397	0.00	1.16	0.04	1.08	0.40	0.01
N 398	0.00	0.94	0.03	0.88	0.31	0.01
N 399	0.00	1.10	0.04	1.03	0.37	0.01
N 400	0.00	1.07	0.04	1.00	0.36	0.01
N 401	0.00	1.03	0.04	0.97	0.35	0.01
N 402	0.00	1.01	0.03	0.94	0.34	0.01
N 403	0.00	1.00	0.03	0.93	0.33	0.01
N 404	0.00	0.73	0.03	0.62	0.23	0.01
N 405	0.00	0.71	0.03	0.67	0.22	0.01
N 406	0.00	0.75	0.03	0.70	0.25	0.01
N 407	0.00	0.84	0.03	0.79	0.28	0.01
N 408	0.00	0.86	0.03	0.81	0.31	0.01
N 409	0.00	0.86	0.03	0.78	0.31	0.01
N 410	0.00	0.39	0.01	0.36	0.11	0.00
N 411	0.00	0.34	0.01	0.32	0.10	0.00
N 412	0.00	0.30	0.01	0.28	0.09	0.00
N 413	0.00	0.27	0.01	0.25	0.08	0.00
N 414	0.00	0.27	0.01	0.25	0.08	0.00

Notes:

Receptors S3, S4, S196, N413, N414 are located on the edge of CALPUFF computational domain so their locations have been slightly adjusted.

Receptors S198, S208, S347, N415 are located within the Project footprint and thus excluded from reporting

Receptors S60, S73,S136, S241, S267, S268, S275 are duplicate receptors and thus excluded from reporting.

Table A2. Project Case Maximum Predicted Particulate Matter Concentrations and dustfall with Background

Contaminant	Dustfall	TSP		PM10	PM2.5	
Averaging Period	**30-day**	**24-hour**	**Annual**	**24-hour**	**24-hour**	**Annual**
BC Objective (µg/m^3)	-	120	60	50	25	8
Ambient Concentration (µg/m^3)	1.08 mg/dm^2/d	59.9	15.2	28.7	19.7	5.2
Receptor ID	Deposition with Background [mg/dm2/d]	Concentration with Background [µg/m^3]				
LSA and RSA Sensitive Receptors						
S 1	1.08	60.75	15.23	29.50	19.97	5.21
S 2	1.08	61.15	15.25	29.89	20.03	5.21
S 3	1.08	60.11	15.21	28.89	19.76	5.20
S 4	1.08	60.11	15.21	28.90	19.76	5.20
S 5	1.19	86.64	16.63	49.79	24.74	5.52
S 6	1.89	128.64	20.59	80.90	28.28	6.11
S 7	6.63	513.40	255.31	286.11	53.84	13.56
S 8	1.19	82.75	18.28	44.63	23.06	5.44
S 9	1.12	67.38	15.86	35.29	21.43	5.29
S 10	1.12	94.29	16.35	53.97	24.70	5.38
S 11	1.15	91.48	17.24	53.31	25.95	5.47
S 12	1.10	76.14	15.65	42.68	23.17	5.28
S 13	1.10	71.68	15.56	38.98	21.77	5.26
S 14	1.09	68.89	15.39	36.98	21.60	5.24
S 15	1.09	63.31	15.29	31.92	20.54	5.22
S 16	1.09	64.33	15.35	32.68	21.01	5.23
S 17	1.09	64.74	15.36	33.12	20.97	5.23
S 18	1.08	61.59	15.26	30.26	20.13	5.21
S 19	1.10	73.61	15.71	40.15	21.73	5.27
S 20	1.09	61.42	15.28	30.11	20.16	5.22
S 21	1.20	95.45	19.69	50.61	24.04	5.66
S 22	1.09	63.71	15.37	32.17	20.53	5.24
S 23	1.08	61.56	15.27	30.27	20.12	5.22
S 24	1.15	67.00	15.58	35.24	21.05	5.29
S 25	1.53	217.00	40.95	93.60	29.99	6.97
S 26	1.10	62.12	15.36	30.68	20.31	5.24
S 27	1.10	67.26	15.54	35.55	21.85	5.28
S 28	1.11	70.92	16.28	38.16	22.27	5.36
S 29	1.10	72.15	15.80	38.93	22.41	5.30
S 30	1.17	85.07	18.07	46.42	23.01	5.52
S 31	1.12	72.47	16.49	39.19	22.59	5.39
S 32	1.09	65.72	15.50	33.93	20.86	5.26
S 33	1.10	69.38	15.83	36.54	21.69	5.30
S 34	1.12	77.42	16.32	42.84	22.66	5.37
S 35	1.08	61.37	15.26	30.09	20.12	5.22
S 36	1.09	62.09	15.29	30.73	20.25	5.22
S 37	1.11	64.12	15.41	32.36	20.57	5.25
S 38	1.09	61.49	15.32	30.18	20.13	5.23
S 39	1.09	61.21	15.30	29.82	20.07	5.23
S 40	1.11	80.96	16.19	45.48	23.41	5.36
S 41	1.10	71.89	15.80	38.93	22.81	5.32
S 42	1.11	64.07	15.46	32.57	20.55	5.26
S 43	1.09	62.01	15.29	30.66	20.23	5.22
S 44	1.08	60.58	15.22	29.32	19.96	5.21
S 45	1.10	67.98	15.57	36.29	22.06	5.28
S 46	1.08	61.38	15.26	30.10	20.11	5.22
S 47	1.35	125.96	22.60	71.66	32.31	5.95
S 48	5.77	939.98	162.69	355.81	59.45	10.48
S 49	1.26	111.63	22.39	61.48	25.83	5.85
S 50	1.22	91.20	16.81	52.95	25.31	5.56
S 51	1.20	85.79	16.66	48.21	24.24	5.53
S 52	1.10	74.65	15.92	41.26	23.42	5.35
S 53	1.43	182.54	19.84	119.53	35.84	6.28
S 54	1.58	234.66	21.90	148.55	40.74	6.70
S 55	1.18	86.55	16.54	49.91	24.83	5.49
S 56	1.80	591.50	46.03	264.11	49.45	6.90
S 57	1.08	60.71	15.22	29.46	19.98	5.21
S 58	1.10	73.72	15.80	40.14	22.69	5.31
S 59	1.08	61.36	15.26	30.08	20.12	5.22
S 61	1.50	243.81	30.15	137.15	41.34	6.41
S 62	1.59	215.83	30.17	114.14	32.72	6.31
S 63	1.61	242.94	31.23	125.43	34.00	6.38
S 64	2.04	261.13	36.62	117.44	31.36	6.52
S 65	2.06	670.94	57.65	288.40	52.16	7.33
S 66	1.82	602.90	46.60	268.10	49.91	6.92
S 67	1.10	72.33	15.82	39.06	22.43	5.31

S 68	1.10	72.07	15.81	38.85	22.37	5.30
S 69	4.67	669.91	81.24	261.54	47.69	7.99
S 70	1.10	72.26	15.82	39.01	22.41	5.31
S 71	1.10	71.98	15.81	38.78	22.36	5.30
S 72	1.10	71.97	15.81	38.77	22.36	5.30
S 74	1.08	61.07	15.27	29.76	20.11	5.22
S 75	1.08	61.32	15.28	29.94	20.13	5.22
S 76	1.09	61.49	15.29	30.10	20.15	5.22
S 77	1.09	61.79	15.29	30.35	20.16	5.22
S 78	1.09	61.69	15.29	30.27	20.17	5.22
S 79	1.09	61.72	15.29	30.30	20.18	5.22
S 80	1.09	61.56	15.29	30.16	20.18	5.22
S 81	1.09	62.28	15.31	30.79	20.28	5.23
S 82	1.10	63.10	15.35	31.48	20.38	5.24
S 83	1.10	62.74	15.39	31.33	20.37	5.25
S 84	1.10	63.38	15.41	31.74	20.51	5.25
S 85	1.11	63.46	15.44	31.97	20.46	5.26
S 86	1.13	66.07	15.53	34.40	20.89	5.28
S 87	1.15	68.39	15.62	36.46	21.24	5.30
S 88	1.14	74.06	16.07	40.20	22.25	5.40
S 89	1.19	88.23	16.61	50.98	25.02	5.51
S 90	1.61	250.22	22.49	159.05	43.01	6.87
S 91	1.89	135.95	21.16	86.00	29.11	6.19
S 92	2.04	136.52	25.10	84.32	28.87	6.24
S 93	1.56	111.33	23.96	66.88	26.51	6.00
S 94	1.57	98.07	29.11	56.44	24.95	6.01
S 95	1.16	79.59	16.95	44.50	23.34	5.37
S 96	1.17	70.26	16.79	36.59	21.27	5.35
S 97	1.18	67.41	16.52	34.58	20.87	5.33
S 98	1.14	65.88	16.10	33.36	20.87	5.29
S 99	1.12	64.73	15.82	32.54	20.70	5.27
S 100	1.13	64.92	15.85	32.51	20.65	5.27
S 101	1.15	63.49	15.70	31.78	20.50	5.26
S 102	1.12	62.94	15.57	31.34	20.41	5.25
S 103	1.12	63.30	15.55	31.42	20.42	5.25
S 104	1.11	62.57	15.42	30.92	20.24	5.23
S 105	1.10	62.39	15.41	30.92	20.30	5.23
S 106	1.10	62.86	15.38	31.48	20.39	5.23
S 107	1.10	64.84	15.37	33.31	20.81	5.23
S 108	1.09	64.79	15.34	33.29	20.84	5.22
S 109	1.09	62.95	15.30	31.59	20.45	5.22
S 110	1.09	62.05	15.28	30.75	20.25	5.22
S 111	1.09	61.80	15.26	30.51	20.19	5.21
S 112	1.09	61.56	15.29	30.16	20.18	5.22
S 113	1.10	63.38	15.41	31.74	20.51	5.25
S 114	1.15	68.39	15.62	36.46	21.24	5.30
S 115	1.21	92.74	16.80	54.14	25.56	5.55
S 116	1.11	62.57	15.42	30.92	20.24	5.23
S 117	1.09	61.80	15.26	30.51	20.19	5.21
S 118	1.15	67.03	15.57	35.26	21.05	5.29
S 119	1.14	65.88	16.10	33.36	20.87	5.29
S 120	1.12	63.09	15.54	31.27	20.40	5.25
S 121	1.09	64.69	15.34	33.20	20.82	5.22
S 122	1.09	61.94	15.28	30.64	20.22	5.22
S 123	1.10	62.86	15.38	31.47	20.39	5.23
S 124	1.11	63.47	15.44	31.98	20.46	5.26
S 125	1.10	62.23	15.39	30.79	20.27	5.23
S 126	1.15	63.48	15.70	31.78	20.50	5.26
S 127	1.08	61.07	15.27	29.76	20.11	5.22
S 128	1.09	61.85	15.34	30.51	20.25	5.24
S 129	1.10	62.74	15.39	31.32	20.37	5.25
S 130	1.10	62.73	15.39	31.32	20.38	5.25
S 131	1.10	62.06	15.36	30.71	20.30	5.24
S 132	1.13	64.94	15.87	32.65	20.72	5.27
S 133	1.08	61.64	15.28	30.34	20.14	5.22
S 134	1.09	68.64	15.62	36.55	21.81	5.28
S 135	1.08	60.75	15.23	29.50	19.95	5.21
S 137	1.08	61.69	15.28	30.37	20.15	5.22
S 138	1.09	64.11	15.39	32.53	20.60	5.24
S 139	1.09	64.52	15.41	32.89	20.67	5.24
S 140	1.09	64.28	15.40	32.67	20.63	5.24
S 141	1.11	72.10	16.43	38.89	22.44	5.38
S 142	1.14	78.09	17.47	42.73	23.17	5.47
S 143	1.25	107.81	22.35	59.65	25.75	5.84
S 144	1.10	72.15	15.82	38.91	22.38	5.31
S 145	1.08	61.71	15.28	30.39	20.16	5.22
S 146	1.08	61.87	15.28	30.53	20.20	5.22

S 147	1.12	72.39	16.48	39.08	22.54	5.39
S 148	1.11	71.50	16.46	38.29	22.32	5.38
S 149	1.08	61.69	15.28	30.38	20.15	5.22
S 150	1.09	65.93	15.51	34.11	20.90	5.26
S 151	1.10	67.19	15.62	35.21	21.17	5.28
S 152	1.12	72.41	16.49	39.14	22.57	5.39
S 153	1.15	97.32	17.24	57.00	26.43	5.47
S 154	1.08	61.56	15.27	30.27	20.11	5.22
S 155	1.11	70.93	16.27	38.17	22.27	5.36
S 156	1.09	62.00	15.29	30.65	20.22	5.22
S 157	1.08	61.77	15.28	30.44	20.17	5.22
S 158	1.09	61.94	15.29	30.60	20.21	5.22
S 159	1.12	72.35	16.49	39.06	22.55	5.39
S 160	1.10	72.46	15.83	39.16	22.45	5.31
S 161	1.08	60.74	15.23	29.41	19.95	5.21
S 162	1.08	60.61	15.23	29.37	19.95	5.21
S 163	1.08	60.49	15.22	29.24	19.93	5.21
S 164	1.08	60.63	15.22	29.38	19.97	5.21
S 165	1.08	60.24	15.21	29.02	19.83	5.20
S 166	1.08	60.38	15.21	29.14	19.88	5.20
S 167	1.08	60.64	15.22	29.38	19.98	5.21
S 168	1.08	60.20	15.21	28.98	19.81	5.20
S 169	1.09	62.88	15.35	31.44	20.33	5.23
S 170	1.08	60.93	15.23	29.66	20.06	5.21
S 171	1.08	60.33	15.21	29.10	19.83	5.20
S 172	1.08	60.30	15.21	29.07	19.82	5.20
S 173	1.08	60.41	15.22	29.18	19.85	5.20
S 174	1.08	62.18	15.28	30.80	20.32	5.22
S 175	1.09	63.82	15.33	32.22	20.84	5.23
S 176	1.44	169.78	20.01	111.08	36.33	6.33
S 177	1.89	137.49	21.56	86.98	29.30	6.24
S 178	6.58	1044.87	201.82	382.07	62.43	11.64
S 179	2.34	313.78	42.87	142.52	33.93	6.83
S 180	1.37	199.56	33.69	89.94	28.21	6.52
S 181	1.21	101.10	20.75	53.21	24.71	5.74
S 182	1.09	64.76	15.36	33.24	20.80	5.23
S 183	1.08	61.76	15.28	30.43	20.17	5.22
S 184	1.11	88.34	16.35	50.14	24.28	5.37
S 185	1.09	73.62	15.71	40.00	22.83	5.29
S 186	1.10	74.01	15.81	40.36	22.73	5.31
S 187	1.10	73.15	15.79	39.71	22.61	5.30
S 188	1.09	68.67	15.62	36.57	21.82	5.28
S 189	1.09	68.67	15.62	36.57	21.82	5.28
S 190	1.09	62.11	15.29	30.75	20.26	5.22
S 191	1.08	61.49	15.28	30.12	20.12	5.22
S 192	1.09	63.08	15.34	31.60	20.42	5.23
S 193	1.09	63.12	15.35	31.64	20.38	5.23
S 194	1.08	61.84	15.28	30.51	20.20	5.22
S 195	1.08	60.48	15.22	29.24	19.87	5.20
S 196	1.08	60.11	15.21	28.90	19.76	5.20
S 197	1.12	72.36	16.62	38.96	22.56	5.40
S 199	4.45	652.91	92.10	267.15	52.70	8.49
S 200	11.74	2366.37	638.24	841.65	115.81	27.15
S 201	2.04	261.82	36.94	116.19	31.20	6.53
S 202	1.33	289.61	28.86	157.25	37.52	6.04
S 203	1.37	123.58	22.58	73.99	32.42	5.95
S 204	1.36	77.04	17.13	41.14	22.85	5.60
S 205	2.29	206.72	22.27	138.60	35.07	7.08
S 206	1.61	231.44	22.10	145.00	40.65	6.72
S 207	1.10	72.59	15.82	39.21	22.88	5.33
S 209	1.12	71.91	16.57	38.54	22.35	5.39
S 210	1.18	88.68	16.58	51.43	25.14	5.50
S 211	1.11	64.56	15.44	32.73	20.67	5.26
S 212	1.09	61.12	15.29	29.71	20.04	5.22
S 213	1.09	61.21	15.30	29.82	20.07	5.23
S 214	1.10	61.94	15.34	30.50	20.27	5.24
S 215	1.09	61.84	15.34	30.48	20.26	5.24
S 216	1.10	62.76	15.40	31.34	20.42	5.25
S 217	1.10	62.77	15.40	31.28	20.42	5.25
S 218	1.09	61.49	15.32	30.18	20.13	5.23
S 219	1.09	61.33	15.31	30.03	20.12	5.23
S 220	1.10	62.78	15.40	31.34	20.42	5.25
S 221	1.09	61.81	15.34	30.47	20.25	5.24
S 222	1.10	62.63	15.38	31.23	20.34	5.25
S 223	1.12	72.04	16.54	38.71	22.47	5.39
S 224	1.09	61.19	15.30	29.80	20.06	5.23
S 225	1.12	72.17	16.54	38.82	22.51	5.39

S 226	1.09	61.90	15.29	30.57	20.20	5.22
S 227	1.08	61.86	15.28	30.53	20.19	5.22
S 228	1.08	61.36	15.26	30.08	20.12	5.22
S 229	1.12	72.33	16.50	39.03	22.55	5.39
S 230	1.10	62.95	15.40	31.38	20.44	5.25
S 231	1.10	62.83	15.40	31.28	20.42	5.25
S 232	1.09	61.18	15.30	29.80	20.07	5.23
S 233	1.10	62.82	15.39	31.39	20.35	5.25
S 234	1.09	66.51	15.49	34.63	21.58	5.27
S 235	1.17	85.18	18.08	46.49	23.02	5.52
S 236	1.09	61.83	15.34	30.49	20.23	5.24
S 237	1.09	61.81	15.34	30.47	20.23	5.24
S 238	1.09	61.84	15.34	30.50	20.24	5.24
S 239	1.10	61.91	15.35	30.56	20.27	5.24
S 240	1.09	61.61	15.33	30.29	20.16	5.23
S 242	1.11	64.07	15.46	32.57	20.55	5.26
S 243	1.10	62.80	15.39	31.38	20.35	5.25
S 244	1.09	61.18	15.30	29.78	20.06	5.23
S 245	1.09	61.89	15.34	30.55	20.25	5.24
S 246	1.10	62.19	15.36	30.82	20.30	5.24
S 247	1.11	65.68	15.45	33.70	20.89	5.26
S 248	1.09	61.87	15.34	30.53	20.25	5.24
S 249	1.11	65.26	15.43	33.35	20.78	5.26
S 250	1.10	62.72	15.39	31.20	20.41	5.25
S 251	1.10	62.12	15.36	30.68	20.31	5.24
S 252	1.09	61.13	15.29	29.69	20.02	5.22
S 253	1.09	61.20	15.30	29.85	20.08	5.23
S 254	1.10	62.09	15.36	30.68	20.30	5.24
S 255	1.08	60.61	15.23	29.32	19.92	5.21
S 256	1.09	61.88	15.29	30.54	20.20	5.22
S 257	1.08	61.60	15.27	30.30	20.13	5.22
S 258	1.08	61.60	15.27	30.30	20.13	5.22
S 259	1.08	61.73	15.28	30.41	20.16	5.22
S 260	1.10	72.57	15.81	39.26	22.49	5.30
S 261	1.10	75.36	15.90	41.36	22.89	5.32
S 262	1.10	75.40	15.88	41.39	22.91	5.32
S 263	1.36	201.64	31.64	91.97	28.36	6.41
S 264	1.10	62.09	15.36	30.73	20.29	5.24
S 265	1.09	61.91	15.29	30.57	20.20	5.22
S 266	1.11	70.92	16.29	38.05	22.24	5.36
S 269	1.08	61.81	15.28	30.48	20.18	5.22
S 270	1.10	72.57	15.83	39.25	22.47	5.31
S 271	1.08	61.73	15.28	30.40	20.16	5.22
S 272	1.10	62.08	15.36	30.72	20.30	5.24
S 273	1.10	62.09	15.36	30.73	20.29	5.24
S 274	1.11	71.47	16.41	38.34	22.32	5.37
S 276	1.12	72.61	16.55	39.24	22.64	5.39
S 277	1.08	61.75	15.28	30.43	20.17	5.22
S 278	1.09	61.20	15.30	29.83	20.08	5.23
S 279	1.08	61.64	15.27	30.34	20.14	5.22
S 280	1.08	61.74	15.28	30.42	20.17	5.22
S 281	1.12	72.24	16.50	38.95	22.53	5.39
S 282	1.09	61.78	15.34	30.44	20.21	5.23
S 283	1.09	61.22	15.30	29.85	20.08	5.23
S 284	1.11	70.59	16.30	37.57	22.10	5.36
S 285	1.12	71.76	16.54	38.47	22.37	5.39
S 286	1.11	71.22	16.38	38.09	22.24	5.37
S 287	1.11	71.42	16.43	38.23	22.29	5.38
S 288	1.11	71.38	16.43	38.20	22.28	5.38
S 289	1.11	71.50	16.48	38.28	22.30	5.38
S 290	1.11	71.40	16.44	38.21	22.29	5.38
S 291	1.08	61.70	15.28	30.38	20.16	5.22
S 292	1.11	71.53	16.45	38.32	22.33	5.38
S 293	1.08	61.70	15.28	30.38	20.15	5.22
S 294	1.10	72.49	15.81	39.20	22.47	5.30
S 295	1.08	61.75	15.28	30.43	20.17	5.22
S 296	1.11	72.11	16.41	38.94	22.45	5.38
S 297	1.08	61.72	15.28	30.40	20.16	5.22
S 298	1.09	62.01	15.29	30.66	20.22	5.22
S 299	1.08	61.68	15.28	30.36	20.15	5.22
S 300	1.08	61.60	15.27	30.30	20.13	5.22
S 301	1.08	61.72	15.28	30.40	20.16	5.22
S 302	1.08	61.60	15.27	30.30	20.14	5.22
S 303	1.08	61.70	15.28	30.38	20.16	5.22
S 304	1.08	61.76	15.28	30.43	20.17	5.22
S 305	1.08	61.75	15.28	30.43	20.17	5.22
S 306	1.13	74.90	16.98	40.47	22.74	5.43

S 307	1.08	61.61	15.27	30.31	20.13	5.22
S 308	1.08	61.85	15.28	30.51	20.19	5.22
S 309	1.10	75.29	15.88	41.31	22.90	5.32
S 310	1.10	75.03	15.91	41.12	22.83	5.32
S 311	1.10	73.09	15.82	39.66	22.57	5.31
S 312	1.10	73.42	15.80	39.92	22.65	5.31
S 313	1.10	73.56	15.88	40.01	22.61	5.31
S 314	1.10	72.82	15.81	39.45	22.53	5.31
S 315	1.11	71.38	16.38	38.30	22.29	5.37
S 316	1.12	72.13	16.49	38.86	22.50	5.38
S 317	1.12	74.14	16.88	39.94	22.67	5.42
S 318	1.08	61.77	15.28	30.45	20.18	5.22
S 319	1.08	61.76	15.28	30.44	20.17	5.22
S 320	1.08	61.70	15.28	30.38	20.16	5.22
S 321	1.08	61.77	15.28	30.45	20.17	5.22
S 322	1.09	61.89	15.28	30.56	20.20	5.22
S 323	1.09	61.94	15.29	30.60	20.21	5.22
S 324	1.08	61.76	15.28	30.43	20.17	5.22
S 325	1.09	61.89	15.28	30.55	20.20	5.22
S 326	1.11	69.87	16.14	37.41	22.09	5.35
S 327	1.10	69.48	15.91	37.08	21.84	5.32
S 328	1.10	71.71	15.73	38.87	22.78	5.31
S 329	1.10	71.22	15.70	38.46	22.68	5.31
S 330	1.10	69.00	15.62	37.17	22.32	5.29
S 331	1.11	72.22	16.47	38.96	22.49	5.38
S 332	1.12	73.03	16.58	39.71	22.81	5.40
S 333	1.12	73.07	16.52	39.85	22.80	5.39
S 334	1.10	73.18	15.82	39.73	22.59	5.31
S 335	1.10	71.82	15.81	38.65	22.32	5.30
S 336	1.08	60.84	15.23	29.58	20.02	5.21
S 337	1.08	60.84	15.23	29.58	20.02	5.21
S 338	1.08	60.77	15.23	29.50	20.02	5.21
S 339	1.08	60.17	15.21	28.95	19.78	5.20
S 340	1.10	62.74	15.39	31.32	20.37	5.25
S 341	1.14	66.77	15.55	35.02	21.00	5.28
S 342	1.09	62.52	15.32	30.99	20.28	5.23
S 343	1.09	62.09	15.28	30.79	20.26	5.22
S 344	1.10	62.12	15.36	30.68	20.31	5.24
S 345	1.46	71.21	16.85	36.98	21.73	5.47
S 346	1.14	71.87	15.95	37.99	21.68	5.34
S 416	1.40	104.65	23.57	54.86	25.44	5.89
N 348	1.09	62.10	15.29	30.74	20.25	5.22
N 349	1.09	62.46	15.31	31.06	20.31	5.23
N 350	1.09	62.60	15.32	31.19	20.34	5.23
N 351	1.09	63.34	15.35	31.84	20.47	5.23
N 352	1.09	64.13	15.39	32.54	20.61	5.24
N 353	1.09	65.75	15.50	33.96	20.87	5.26
N 354	1.09	66.70	15.58	34.79	21.06	5.27
N 355	1.10	68.14	15.72	36.03	21.46	5.29
N 356	1.11	74.63	16.09	41.23	22.73	5.36
N 357	1.11	74.50	16.00	41.28	22.60	5.35
N 358	1.10	73.95	15.96	40.97	23.49	5.35
N 359	1.10	72.83	15.91	40.43	23.01	5.34
N 360	1.10	73.71	15.93	41.14	23.37	5.34
N 361	1.10	71.86	15.80	39.00	22.83	5.32
N 362	1.08	61.55	15.27	30.26	20.12	5.22
N 363	1.08	61.44	15.27	30.15	20.13	5.22
N 364	1.15	114.50	18.70	62.56	26.26	5.59
N 365	1.16	100.05	18.52	53.16	25.64	5.58
N 366	1.16	104.00	18.81	57.39	25.28	5.60
N 367	1.18	117.01	19.16	64.65	26.53	5.62
N 368	1.17	106.19	19.43	59.75	25.33	5.63
N 369	1.18	85.62	18.21	46.68	23.18	5.53
N 370	1.15	78.18	17.41	42.34	22.84	5.46
N 371	1.13	75.02	17.02	40.62	22.93	5.43
N 372	1.12	73.24	16.70	39.67	22.86	5.41
N 373	1.12	74.21	16.40	41.15	23.01	5.39
N 374	1.10	69.81	15.73	37.31	21.97	5.29
N 375	1.12	84.67	16.56	48.14	24.23	5.40
N 376	1.14	91.70	16.88	52.72	25.62	5.44
N 377	1.15	99.00	17.27	57.90	26.57	5.47
N 378	1.08	60.47	15.22	29.23	19.91	5.20
N 379	1.08	60.53	15.22	29.28	19.93	5.20
N 380	1.08	60.46	15.22	29.23	19.91	5.20
N 381	1.08	60.45	15.22	29.22	19.90	5.20
N 382	1.08	60.58	15.22	29.33	19.95	5.21
N 383	1.08	60.77	15.23	29.49	20.01	5.21

N 384	1.08	60.75	15.23	29.49	20.00	5.21
N 385	1.08	60.72	15.22	29.45	19.99	5.21
N 386	1.08	60.63	15.22	29.38	19.96	5.21
N 387	1.08	60.78	15.23	29.52	20.01	5.21
N 388	1.08	60.77	15.23	29.51	20.01	5.21
N 389	1.08	61.20	15.26	29.91	20.13	5.21
N 390	1.08	60.44	15.21	29.20	19.88	5.20
N 391	1.08	61.19	15.25	29.89	20.13	5.21
N 392	1.08	60.82	15.23	29.56	20.02	5.21
N 393	1.08	60.40	15.21	29.17	19.86	5.20
N 394	1.08	61.12	15.25	29.82	20.11	5.21
N 395	1.08	60.37	15.21	29.14	19.84	5.20
N 396	1.08	60.34	15.21	29.11	19.83	5.20
N 397	1.08	61.06	15.24	29.78	20.10	5.21
N 398	1.08	60.84	15.23	29.58	20.01	5.21
N 399	1.08	61.00	15.24	29.73	20.07	5.21
N 400	1.08	60.97	15.24	29.70	20.06	5.21
N 401	1.08	60.93	15.24	29.67	20.05	5.21
N 402	1.08	60.91	15.23	29.64	20.04	5.21
N 403	1.08	60.90	15.23	29.63	20.03	5.21
N 404	1.08	60.63	15.23	29.32	19.93	5.21
N 405	1.08	60.61	15.23	29.37	19.92	5.21
N 406	1.08	60.65	15.23	29.40	19.95	5.21
N 407	1.08	60.74	15.23	29.49	19.98	5.21
N 408	1.08	60.76	15.23	29.51	20.01	5.21
N 409	1.08	60.76	15.23	29.48	20.01	5.21
N 410	1.08	60.29	15.21	29.06	19.81	5.20
N 411	1.08	60.24	15.21	29.02	19.80	5.20
N 412	1.08	60.20	15.21	28.98	19.79	5.20
N 413	1.08	60.17	15.21	28.95	19.78	5.20
N 414	1.08	60.17	15.21	28.95	19.78	5.20

Table A3. Project Case Maximum Predicted SO2, NO2, CO, and VOCs Concentrations without Background

Contaminant	CO		NO2		SO2		VOCs
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual	24-hr
BC Objective (µg/m^3)	14300	5500	113	32	183	13	N/A
Concentration Without Background [µg/m^3]							
LSA Grid Maximum	10503	6122	744	70	61	0.2	477.4
RSA Grid Maximum	65	23	75	0.2	0.4	0.0	2.36
RSA Sensitive Receptors							
S 1	3	1	5	0.0	0.0	0.0	0.1
S 2	3	2	5	0.0	0.1	0.0	0.2
S 3	1	0	1	0.0	0.0	0.0	0.0
S 4	1	0	1	0.0	0.0	0.0	0.0
S 5	67	26	51	0.1	1.1	0.0	1.7
S 6	108	37	65	0.5	1.8	0.0	2.5
S 7	123	56	62	0.5	1.9	0.0	6.3
S 8	35	11	36	0.1	0.3	0.0	1.2
S 9	14	6	21	0.1	0.2	0.0	0.7
S 10	17	10	15	0.1	0.1	0.0	1.0
S 11	28	16	28	0.2	0.2	0.0	1.8
S 12	32	17	46	0.1	0.2	0.0	1.9
S 13	17	8	23	0.1	0.1	0.0	0.8
S 14	11	7	12	0.0	0.1	0.0	0.8
S 15	6	4	9	0.0	0.0	0.0	0.4
S 16	9	4	16	0.0	0.1	0.0	0.7
S 17	9	4	15	0.0	0.1	0.0	0.8
S 18	4	2	6	0.0	0.0	0.0	0.3
S 19	19	9	24	0.1	0.1	0.0	0.7
S 20	7	3	10	0.0	0.0	0.0	0.2
S 21	69	36	68	0.6	0.4	0.0	3.5
S 22	7	4	11	0.0	0.1	0.0	0.4
S 23	4	2	6	0.0	0.1	0.0	0.2
S 24	15	4	18	0.0	0.2	0.0	0.4
S 25	351	166	138	2.9	0.4	0.0	10.9
S 26	7	3	8	0.0	0.1	0.0	0.3
S 27	16	8	18	0.0	0.3	0.0	0.6
S 28	26	16	36	0.1	0.2	0.0	1.1
S 29	20	10	29	0.1	0.2	0.0	1.7
S 30	49	22	60	0.3	0.3	0.0	2.2
S 31	33	20	40	0.1	0.3	0.0	1.3
S 32	8	3	13	0.0	0.1	0.0	0.3
S 33	15	8	22	0.1	0.2	0.0	1.2
S 34	25	12	36	0.2	0.3	0.0	1.8
S 35	4	2	6	0.0	0.1	0.0	0.2
S 36	5	3	7	0.0	0.1	0.0	0.3
S 37	10	5	11	0.0	0.2	0.0	0.4
S 38	5	2	6	0.0	0.1	0.0	0.2
S 39	4	2	6	0.0	0.1	0.0	0.2
S 40	26	15	40	0.1	0.2	0.0	2.2
S 41	25	10	21	0.0	0.3	0.0	1.0
S 42	9	4	10	0.1	0.1	0.0	0.4
S 43	5	3	7	0.0	0.1	0.0	0.2
S 44	2	1	3	0.0	0.0	0.0	0.1
S 45	19	8	18	0.0	0.3	0.0	0.7
S 46	4	2	6	0.0	0.1	0.0	0.2
S 47	136	42	62	0.4	1.6	0.0	4.6
S 48	301	189	113	7.0	1.2	0.0	45.4
S 49	69	39	54	0.5	0.2	0.0	5.1
S 50	74	28	52	0.2	1.2	0.0	1.8
S 51	75	31	49	0.2	1.0	0.0	1.9
S 52	32	13	34	0.0	0.4	0.0	1.1
S 53	350	89	83	0.7	3.3	0.0	5.0
S 54	557	178	88	1.2	4.1	0.0	8.8
S 55	66	23	51	0.1	1.1	0.0	1.3
S 56	155	83	87	1.1	1.1	0.0	10.9
S 57	2	1	3	0.0	0.0	0.0	0.1
S 58	22	11	28	0.1	0.2	0.0	1.8
S 59	4	2	6	0.0	0.1	0.0	0.2
S 61	920	595	255	2.4	1.3	0.0	34.3
S 62	264	100	137	1.1	0.6	0.0	12.9
S 63	312	98	150	1.4	0.6	0.0	13.8
S 64	136	80	104	2.3	0.6	0.0	11.5
S 65	163	106	91	1.5	1.0	0.0	18.0
S 66	155	84	87	1.2	1.1	0.0	11.1
S 67	20	10	28	0.1	0.2	0.0	1.7
S 68	20	10	28	0.1	0.2	0.0	1.7
S 69	278	163	145	7.0	0.7	0.0	28.8

S 70	20	10	28	0.1	0.2	0.0	1.7
S 71	20	9	28	0.1	0.2	0.0	1.6
S 72	20	9	28	0.1	0.2	0.0	1.6
S 74	5	2	7	0.0	0.1	0.0	0.2
S 75	5	2	7	0.0	0.1	0.0	0.2
S 76	5	2	7	0.0	0.1	0.0	0.2
S 77	5	2	7	0.0	0.1	0.0	0.2
S 78	5	2	7	0.0	0.1	0.0	0.2
S 79	5	3	7	0.0	0.1	0.0	0.2
S 80	6	3	8	0.0	0.1	0.0	0.2
S 81	6	3	7	0.0	0.1	0.0	0.3
S 82	8	4	9	0.0	0.1	0.0	0.3
S 83	8	3	8	0.0	0.1	0.0	0.3
S 84	10	4	9	0.0	0.1	0.0	0.4
S 85	8	4	10	0.1	0.1	0.0	0.3
S 86	14	4	16	0.0	0.2	0.0	0.3
S 87	21	6	24	0.0	0.3	0.0	0.4
S 88	42	12	36	0.1	0.5	0.0	0.8
S 89	68	23	52	0.1	1.2	0.0	1.5
S 90	535	170	91	1.2	3.9	0.0	8.8
S 91	108	39	65	0.5	1.9	0.0	2.7
S 92	82	30	54	0.2	1.0	0.0	2.6
S 93	56	25	44	0.2	0.7	0.0	2.2
S 94	48	18	38	0.2	0.5	0.0	1.9
S 95	27	9	29	0.1	0.3	0.0	0.8
S 96	22	7	18	0.1	0.2	0.0	0.8
S 97	16	5	16	0.0	0.1	0.0	0.6
S 98	12	4	12	0.0	0.1	0.0	0.5
S 99	12	4	14	0.1	0.1	0.0	0.4
S 100	7	3	9	0.0	0.1	0.0	0.3
S 101	6	2	8	0.0	0.1	0.0	0.2
S 102	9	3	12	0.0	0.1	0.0	0.3
S 103	10	3	13	0.0	0.1	0.0	0.3
S 104	7	3	10	0.0	0.1	0.0	0.3
S 105	6	3	9	0.0	0.1	0.0	0.3
S 106	6	4	9	0.0	0.1	0.0	0.3
S 107	7	4	11	0.0	0.1	0.0	0.4
S 108	8	4	13	0.0	0.1	0.0	0.5
S 109	7	3	11	0.0	0.0	0.0	0.3
S 110	6	3	9	0.0	0.0	0.0	0.2
S 111	5	2	8	0.0	0.0	0.0	0.2
S 112	6	3	8	0.0	0.1	0.0	0.2
S 113	10	4	9	0.0	0.1	0.0	0.4
S 114	21	6	24	0.0	0.3	0.0	0.4
S 115	74	25	52	0.2	1.2	0.0	1.7
S 116	7	3	10	0.0	0.1	0.0	0.3
S 117	5	2	8	0.0	0.0	0.0	0.2
S 118	16	4	18	0.0	0.2	0.0	0.3
S 119	12	4	12	0.0	0.1	0.0	0.5
S 120	10	3	12	0.0	0.1	0.0	0.3
S 121	8	4	13	0.0	0.1	0.0	0.5
S 122	6	2	9	0.0	0.0	0.0	0.2
S 123	6	4	9	0.0	0.1	0.0	0.3
S 124	8	4	10	0.1	0.1	0.0	0.3
S 125	5	3	8	0.0	0.1	0.0	0.2
S 126	6	2	8	0.0	0.1	0.0	0.2
S 127	5	3	7	0.0	0.1	0.0	0.2
S 128	7	2	7	0.0	0.1	0.0	0.2
S 129	8	3	8	0.0	0.1	0.0	0.3
S 130	8	3	8	0.0	0.1	0.0	0.3
S 131	7	3	8	0.0	0.1	0.0	0.3
S 132	8	3	9	0.0	0.1	0.0	0.3
S 133	4	2	7	0.0	0.1	0.0	0.2
S 134	18	7	35	0.1	0.2	0.0	1.4
S 135	2	1	4	0.0	0.0	0.0	0.1
S 137	4	2	7	0.0	0.1	0.0	0.2
S 138	9	4	12	0.0	0.1	0.0	0.4
S 139	9	4	13	0.0	0.1	0.0	0.5
S 140	9	4	13	0.0	0.1	0.0	0.4
S 141	29	19	39	0.1	0.3	0.0	1.2
S 142	52	22	43	0.2	0.4	0.0	2.1
S 143	67	37	53	0.5	0.2	0.0	4.8
S 144	20	10	28	0.1	0.2	0.0	1.7
S 145	4	2	6	0.0	0.1	0.0	0.2
S 146	5	2	7	0.0	0.1	0.0	0.2
S 147	32	20	40	0.1	0.3	0.0	1.3

S 148	39	18	39	0.1	0.3	0.0	1.3
S 149	4	2	7	0.0	0.1	0.0	0.2
S 150	9	3	14	0.0	0.1	0.0	0.4
S 151	13	5	18	0.0	0.1	0.0	0.5
S 152	33	20	40	0.1	0.3	0.0	1.3
S 153	29	17	28	0.2	0.1	0.0	1.9
S 154	4	2	6	0.0	0.1	0.0	0.2
S 155	26	16	36	0.1	0.2	0.0	1.1
S 156	5	3	7	0.0	0.1	0.0	0.2
S 157	5	2	7	0.0	0.1	0.0	0.2
S 158	5	2	7	0.0	0.1	0.0	0.2
S 159	34	20	40	0.1	0.3	0.0	1.3
S 160	20	10	28	0.1	0.2	0.0	1.7
S 161	3	1	4	0.0	0.0	0.0	0.1
S 162	3	1	4	0.0	0.0	0.0	0.1
S 163	2	1	3	0.0	0.0	0.0	0.1
S 164	3	1	5	0.0	0.0	0.0	0.1
S 165	1	1	1	0.0	0.0	0.0	0.1
S 166	1	1	2	0.0	0.0	0.0	0.1
S 167	2	1	4	0.0	0.0	0.0	0.1
S 168	1	0	1	0.0	0.0	0.0	0.1
S 169	6	3	14	0.0	0.1	0.0	0.3
S 170	2	1	4	0.0	0.0	0.0	0.2
S 171	1	1	2	0.0	0.0	0.0	0.1
S 172	1	1	2	0.0	0.0	0.0	0.1
S 173	1	1	2	0.0	0.0	0.0	0.1
S 174	5	2	8	0.0	0.0	0.0	0.4
S 175	8	3	14	0.0	0.1	0.0	0.6
S 176	358	86	75	0.7	2.7	0.0	5.1
S 177	111	39	67	0.5	1.8	0.0	2.8
S 178	314	202	118	8.2	1.2	0.0	48.7
S 179	119	61	89	1.5	0.6	0.0	8.0
S 180	246	109	119	1.9	0.4	0.0	10.1
S 181	90	44	83	0.8	0.5	0.0	4.4
S 182	8	4	11	0.0	0.1	0.0	0.4
S 183	4	2	6	0.0	0.1	0.0	0.2
S 184	25	17	35	0.1	0.1	0.0	1.4
S 185	21	13	26	0.1	0.2	0.0	1.9
S 186	22	12	28	0.1	0.2	0.0	1.9
S 187	22	11	28	0.1	0.2	0.0	1.8
S 188	18	7	35	0.1	0.2	0.0	1.4
S 189	18	7	35	0.1	0.2	0.0	1.4
S 190	5	2	7	0.0	0.1	0.0	0.3
S 191	8	3	11	0.0	0.1	0.0	0.2
S 192	6	3	9	0.0	0.1	0.0	0.3
S 193	7	3	12	0.0	0.1	0.0	0.3
S 194	5	2	6	0.0	0.1	0.0	0.2
S 195	2	1	2	0.0	0.0	0.0	0.1
S 196	1	0	1	0.0	0.0	0.0	0.0
S 197	49	19	41	0.1	0.3	0.0	1.4
S 199	212	147	99	3.9	1.0	0.0	27.5
S 200	502	338	187	24.5	0.6	0.1	74.8
S 201	146	93	107	2.1	0.6	0.0	13.1
S 202	62	23	48	0.3	0.7	0.0	2.9
S 203	141	45	63	0.4	1.7	0.0	4.9
S 204	56	15	44	0.4	0.8	0.0	1.2
S 205	282	101	89	1.5	4.6	0.0	4.1
S 206	630	200	92	1.3	4.5	0.0	10.3
S 207	26	11	24	0.0	0.3	0.0	1.0
S 209	46	17	39	0.1	0.3	0.0	1.4
S 210	69	25	52	0.1	1.2	0.0	1.4
S 211	11	6	13	0.0	0.2	0.0	0.4
S 212	4	2	5	0.0	0.1	0.0	0.1
S 213	4	2	6	0.0	0.1	0.0	0.2
S 214	8	2	8	0.0	0.1	0.0	0.2
S 215	7	2	8	0.0	0.1	0.0	0.2
S 216	9	4	8	0.0	0.1	0.0	0.3
S 217	9	4	8	0.0	0.1	0.0	0.3
S 218	5	2	6	0.0	0.1	0.0	0.2
S 219	4	2	5	0.0	0.1	0.0	0.2
S 220	9	4	8	0.0	0.1	0.0	0.3
S 221	7	2	7	0.0	0.1	0.0	0.2
S 222	7	3	7	0.0	0.1	0.0	0.3
S 223	43	19	40	0.1	0.3	0.0	1.4
S 224	4	2	6	0.0	0.1	0.0	0.2
S 225	42	20	40	0.1	0.3	0.0	1.4

S 226	5	2	7	0.0	0.1	0.0	0.2
S 227	5	2	7	0.0	0.1	0.0	0.2
S 228	4	2	6	0.0	0.1	0.0	0.2
S 229	36	20	40	0.1	0.3	0.0	1.3
S 230	9	4	8	0.0	0.1	0.0	0.3
S 231	9	4	8	0.0	0.1	0.0	0.3
S 232	4	2	6	0.0	0.1	0.0	0.2
S 233	8	3	7	0.0	0.1	0.0	0.3
S 234	14	7	16	0.0	0.2	0.0	0.4
S 235	50	22	61	0.3	0.3	0.0	2.2
S 236	6	2	7	0.0	0.1	0.0	0.2
S 237	6	2	7	0.0	0.1	0.0	0.2
S 238	6	2	7	0.0	0.1	0.0	0.2
S 239	7	2	8	0.0	0.1	0.0	0.2
S 240	5	2	6	0.0	0.1	0.0	0.2
S 242	9	4	10	0.1	0.1	0.0	0.4
S 243	8	3	7	0.0	0.1	0.0	0.3
S 244	4	2	6	0.0	0.1	0.0	0.2
S 245	6	2	7	0.0	0.1	0.0	0.2
S 246	6	3	7	0.0	0.1	0.0	0.3
S 247	9	4	10	0.0	0.2	0.0	0.3
S 248	7	2	7	0.0	0.1	0.0	0.2
S 249	7	3	9	0.0	0.1	0.0	0.2
S 250	8	4	8	0.0	0.1	0.0	0.3
S 251	7	3	8	0.0	0.1	0.0	0.3
S 252	4	2	6	0.0	0.1	0.0	0.1
S 253	5	2	5	0.0	0.1	0.0	0.2
S 254	7	3	8	0.0	0.1	0.0	0.3
S 255	2	1	4	0.0	0.0	0.0	0.1
S 256	5	2	7	0.0	0.1	0.0	0.2
S 257	4	2	6	0.0	0.1	0.0	0.2
S 258	4	2	6	0.0	0.1	0.0	0.2
S 259	5	2	7	0.0	0.1	0.0	0.2
S 260	21	10	28	0.1	0.2	0.0	1.7
S 261	22	12	35	0.1	0.2	0.0	1.9
S 262	23	13	34	0.1	0.2	0.0	1.9
S 263	214	101	111	1.7	0.3	0.0	9.6
S 264	7	3	7	0.0	0.1	0.0	0.3
S 265	5	2	7	0.0	0.1	0.0	0.2
S 266	26	16	37	0.1	0.2	0.0	1.1
S 269	5	2	7	0.0	0.1	0.0	0.2
S 270	21	10	29	0.1	0.2	0.0	1.7
S 271	4	2	7	0.0	0.1	0.0	0.2
S 272	7	3	8	0.0	0.1	0.0	0.3
S 273	7	3	7	0.0	0.1	0.0	0.3
S 274	32	18	39	0.1	0.3	0.0	1.2
S 276	39	21	41	0.1	0.4	0.0	1.4
S 277	5	2	7	0.0	0.1	0.0	0.2
S 278	4	2	6	0.0	0.1	0.0	0.2
S 279	4	2	6	0.0	0.1	0.0	0.2
S 280	5	2	7	0.0	0.1	0.0	0.2
S 281	36	20	40	0.1	0.3	0.0	1.3
S 282	6	2	6	0.0	0.1	0.0	0.2
S 283	4	2	6	0.0	0.1	0.0	0.2
S 284	26	16	36	0.1	0.2	0.0	1.1
S 285	45	18	40	0.1	0.3	0.0	1.3
S 286	31	18	38	0.1	0.3	0.0	1.2
S 287	35	18	39	0.1	0.3	0.0	1.3
S 288	36	18	39	0.1	0.3	0.0	1.3
S 289	40	18	39	0.1	0.3	0.0	1.3
S 290	36	18	39	0.1	0.3	0.0	1.3
S 291	4	2	7	0.0	0.1	0.0	0.2
S 292	38	18	39	0.1	0.3	0.0	1.3
S 293	4	2	7	0.0	0.1	0.0	0.2
S 294	21	10	28	0.1	0.2	0.0	1.7
S 295	5	2	7	0.0	0.1	0.0	0.2
S 296	28	18	38	0.1	0.3	0.0	1.2
S 297	4	2	7	0.0	0.1	0.0	0.2
S 298	5	3	7	0.0	0.1	0.0	0.2
S 299	4	2	7	0.0	0.1	0.0	0.2
S 300	4	2	6	0.0	0.1	0.0	0.2
S 301	4	2	7	0.0	0.1	0.0	0.2
S 302	4	2	6	0.0	0.1	0.0	0.2
S 303	4	2	7	0.0	0.1	0.0	0.2
S 304	5	2	7	0.0	0.1	0.0	0.2
S 305	5	2	7	0.0	0.1	0.0	0.2

S 306	60	17	42	0.2	0.3	0.0	1.7
S 307	4	2	6	0.0	0.1	0.0	0.2
S 308	5	2	7	0.0	0.1	0.0	0.2
S 309	23	12	30	0.1	0.2	0.0	1.9
S 310	22	12	34	0.1	0.2	0.0	1.9
S 311	21	11	29	0.1	0.2	0.0	1.8
S 312	22	11	28	0.1	0.2	0.0	1.8
S 313	21	11	30	0.1	0.2	0.0	1.8
S 314	21	10	28	0.1	0.2	0.0	1.7
S 315	30	18	38	0.1	0.3	0.0	1.2
S 316	36	20	40	0.1	0.3	0.0	1.3
S 317	60	16	42	0.2	0.3	0.0	1.6
S 318	5	2	6	0.0	0.1	0.0	0.2
S 319	5	2	7	0.0	0.1	0.0	0.2
S 320	4	2	7	0.0	0.1	0.0	0.2
S 321	5	2	7	0.0	0.1	0.0	0.2
S 322	5	2	7	0.0	0.1	0.0	0.2
S 323	5	2	7	0.0	0.1	0.0	0.2
S 324	5	2	6	0.0	0.1	0.0	0.2
S 325	5	2	7	0.0	0.1	0.0	0.2
S 326	21	13	27	0.1	0.2	0.0	1.0
S 327	18	8	23	0.1	0.2	0.0	0.9
S 328	29	13	25	0.0	0.4	0.0	1.0
S 329	27	13	26	0.0	0.4	0.0	0.9
S 330	22	10	21	0.0	0.3	0.0	0.8
S 331	32	19	40	0.1	0.3	0.0	1.3
S 332	39	21	42	0.1	0.4	0.0	1.4
S 333	31	21	41	0.1	0.4	0.0	1.4
S 334	22	11	29	0.1	0.2	0.0	1.8
S 335	20	9	28	0.1	0.2	0.0	1.6
S 336	2	1	3	0.0	0.0	0.0	0.2
S 337	2	1	3	0.0	0.0	0.0	0.2
S 338	3	1	5	0.0	0.0	0.0	0.1
S 339	1	0	1	0.0	0.0	0.0	0.0
S 340	8	3	8	0.0	0.1	0.0	0.3
S 341	16	4	19	0.0	0.3	0.0	0.3
S 342	6	3	7	0.0	0.1	0.0	0.3
S 343	6	3	9	0.0	0.0	0.0	0.2
S 344	7	3	8	0.0	0.1	0.0	0.3
S 345	27	9	23	0.2	0.3	0.0	0.6
S 346	33	10	36	0.1	0.5	0.0	0.7
S 416	78	49	57	0.6	0.5	0.0	4.7
N 348	5	3	7	0.0	0.1	0.0	0.3
N 349	6	3	9	0.0	0.1	0.0	0.3
N 350	6	3	9	0.0	0.1	0.0	0.3
N 351	7	3	11	0.0	0.1	0.0	0.4
N 352	8	4	12	0.0	0.1	0.0	0.4
N 353	8	3	13	0.0	0.1	0.0	0.3
N 354	11	5	17	0.0	0.1	0.0	0.5
N 355	16	7	21	0.0	0.1	0.0	0.6
N 356	36	16	37	0.1	0.4	0.0	1.3
N 357	44	19	37	0.1	0.4	0.0	1.2
N 358	59	22	38	0.1	0.5	0.0	1.4
N 359	35	15	35	0.0	0.4	0.0	0.9
N 360	30	13	29	0.0	0.4	0.0	0.9
N 361	24	11	21	0.0	0.3	0.0	1.0
N 362	4	2	6	0.0	0.1	0.0	0.2
N 363	4	2	6	0.0	0.1	0.0	0.2
N 364	66	43	65	0.3	0.2	0.0	4.3
N 365	88	46	81	0.3	0.3	0.0	4.0
N 366	121	53	97	0.4	0.3	0.0	4.5
N 367	53	33	51	0.3	0.2	0.0	3.9
N 368	117	58	91	0.5	0.4	0.0	4.2
N 369	49	23	61	0.3	0.3	0.0	2.3
N 370	41	20	44	0.2	0.3	0.0	1.8
N 371	63	18	43	0.2	0.4	0.0	1.8
N 372	51	21	42	0.1	0.4	0.0	1.5
N 373	35	17	38	0.1	0.3	0.0	1.5
N 374	18	8	30	0.1	0.2	0.0	1.4
N 375	18	10	20	0.1	0.1	0.0	1.0
N 376	23	13	24	0.1	0.1	0.0	1.4
N 377	30	18	28	0.2	0.1	0.0	1.9
N 378	2	1	3	0.0	0.0	0.0	0.1
N 379	2	1	3	0.0	0.0	0.0	0.1
N 380	2	1	3	0.0	0.0	0.0	0.1
N 381	2	1	3	0.0	0.0	0.0	0.1

N 382	2	1	3	0.0	0.0	0.0	0.1
N 383	2	1	4	0.0	0.0	0.0	0.1
N 384	2	1	4	0.0	0.0	0.0	0.1
N 385	2	1	4	0.0	0.0	0.0	0.1
N 386	2	1	3	0.0	0.0	0.0	0.1
N 387	2	1	4	0.0	0.0	0.0	0.1
N 388	2	1	4	0.0	0.0	0.0	0.1
N 389	4	2	6	0.0	0.1	0.0	0.2
N 390	1	1	2	0.0	0.0	0.0	0.1
N 391	4	2	6	0.0	0.1	0.0	0.2
N 392	2	1	4	0.0	0.0	0.0	0.2
N 393	1	1	2	0.0	0.0	0.0	0.1
N 394	3	1	5	0.0	0.0	0.0	0.2
N 395	1	1	2	0.0	0.0	0.0	0.1
N 396	1	1	2	0.0	0.0	0.0	0.1
N 397	3	1	4	0.0	0.0	0.0	0.2
N 398	2	1	3	0.0	0.0	0.0	0.2
N 399	3	1	3	0.0	0.0	0.0	0.2
N 400	2	1	3	0.0	0.0	0.0	0.2
N 401	2	1	3	0.0	0.0	0.0	0.2
N 402	2	1	3	0.0	0.0	0.0	0.2
N 403	2	1	3	0.0	0.0	0.0	0.2
N 404	2	1	4	0.0	0.0	0.0	0.1
N 405	2	1	4	0.0	0.0	0.0	0.1
N 406	3	1	5	0.0	0.0	0.0	0.1
N 407	3	1	5	0.0	0.0	0.0	0.1
N 408	3	1	5	0.0	0.0	0.0	0.1
N 409	3	1	4	0.0	0.0	0.0	0.1
N 410	1	0	1	0.0	0.0	0.0	0.1
N 411	1	0	1	0.0	0.0	0.0	0.1
N 412	1	0	1	0.0	0.0	0.0	0.0
N 413	1	0	1	0.0	0.0	0.0	0.0
N 414	1	0	1	0.0	0.0	0.0	0.0

Table A4. Project Case Maximum Predicted SO2, NO2, and CO Concentrations with Background

Contaminant	**CO**		**NO2**		**SO2**	
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual
BC Objective (µg/m^3)	14300	5500	113	32	183	13
Ambient Concentration (µg/m^3)	648	787	29.4	7.4	2.4	0.8
Concentration With Background [µg/m^3]						
LSA Grid Maximum	11151	6909	773	78	62.9	1.0
RSA Grid Maximum	713	810	104	7.6	2.8	0.8
RSA Sensitive Receptors						
S 1	651	788	34	7.4	2.4	0.8
S 2	651	789	35	7.4	2.5	0.8
S 3	648	787	30	7.4	2.4	0.8
S 4	648	787	30	7.4	2.4	0.8
S 5	714	813	80	7.5	3.5	0.8
S 6	756	824	94	7.9	4.2	0.8
S 7	771	842	92	7.9	4.3	0.8
S 8	682	798	65	7.5	2.7	0.8
S 9	661	793	50	7.5	2.6	0.8
S 10	665	797	45	7.5	2.5	0.8
S 11	676	803	58	7.6	2.6	0.8
S 12	679	804	75	7.5	2.6	0.8
S 13	665	795	52	7.5	2.5	0.8
S 14	659	794	41	7.4	2.5	0.8
S 15	653	790	38	7.4	2.4	0.8
S 16	657	791	46	7.4	2.5	0.8
S 17	656	791	44	7.4	2.5	0.8
S 18	651	789	35	7.4	2.4	0.8
S 19	667	796	54	7.5	2.5	0.8
S 20	655	790	40	7.4	2.4	0.8
S 21	717	823	97	8.0	2.8	0.8
S 22	655	791	41	7.4	2.5	0.8
S 23	652	789	35	7.4	2.5	0.8
S 24	663	791	47	7.4	2.6	0.8
S 25	999	953	168	10.3	2.8	0.8
S 26	655	790	37	7.4	2.5	0.8
S 27	663	795	47	7.4	2.7	0.8
S 28	673	803	66	7.5	2.6	0.8
S 29	668	797	58	7.5	2.6	0.8
S 30	697	809	90	7.7	2.7	0.8
S 31	681	807	69	7.5	2.7	0.8
S 32	656	790	42	7.4	2.5	0.8
S 33	663	795	51	7.5	2.6	0.8
S 34	672	799	66	7.6	2.7	0.8
S 35	652	789	36	7.4	2.5	0.8
S 36	653	789	37	7.4	2.5	0.8
S 37	658	792	40	7.4	2.6	0.8
S 38	652	789	35	7.4	2.5	0.8
S 39	652	789	35	7.4	2.5	0.8
S 40	674	802	69	7.5	2.6	0.8
S 41	672	797	50	7.4	2.7	0.8
S 42	656	791	39	7.5	2.5	0.8
S 43	653	789	37	7.4	2.5	0.8
S 44	650	788	33	7.4	2.4	0.8
S 45	667	795	47	7.4	2.7	0.8
S 46	652	789	36	7.4	2.5	0.8
S 47	784	828	91	7.8	4.0	0.8
S 48	949	976	143	14.4	3.6	0.8
S 49	716	826	84	7.9	2.6	0.8
S 50	721	814	81	7.6	3.6	0.8
S 51	723	817	78	7.6	3.4	0.8
S 52	679	800	64	7.4	2.8	0.8
S 53	997	876	112	8.1	5.7	0.8
S 54	1205	965	118	8.6	6.5	0.8
S 55	714	810	80	7.5	3.5	0.8
S 56	802	870	116	8.5	3.5	0.8
S 57	650	788	33	7.4	2.4	0.8
S 58	670	798	57	7.5	2.6	0.8
S 59	652	789	36	7.4	2.5	0.8
S 61	1568	1382	285	9.8	3.7	0.8
S 62	912	887	167	8.5	3.0	0.8
S 63	960	885	179	8.8	3.0	0.8
S 64	783	867	133	9.7	3.0	0.8
S 65	811	893	120	8.9	3.4	0.8
S 66	803	871	116	8.6	3.5	0.8
S 67	668	797	58	7.5	2.6	0.8
S 68	668	796	58	7.5	2.6	0.8

S 69	926	950	175	14.4	3.1	0.8
S 70	668	797	58	7.5	2.6	0.8
S 71	668	796	58	7.5	2.6	0.8
S 72	668	796	58	7.5	2.6	0.8
S 74	653	789	37	7.4	2.5	0.8
S 75	653	789	37	7.4	2.5	0.8
S 76	653	789	37	7.4	2.5	0.8
S 77	652	789	36	7.4	2.5	0.8
S 78	653	789	37	7.4	2.5	0.8
S 79	653	789	37	7.4	2.5	0.8
S 80	653	790	37	7.4	2.5	0.8
S 81	654	790	36	7.4	2.5	0.8
S 82	655	791	38	7.4	2.5	0.8
S 83	655	790	37	7.4	2.5	0.8
S 84	657	791	38	7.4	2.5	0.8
S 85	656	791	40	7.5	2.5	0.8
S 86	661	791	45	7.4	2.6	0.8
S 87	669	793	53	7.4	2.7	0.8
S 88	690	799	65	7.5	2.9	0.8
S 89	716	810	81	7.5	3.6	0.8
S 90	1182	957	121	8.6	6.3	0.8
S 91	755	826	95	7.9	4.3	0.8
S 92	730	817	83	7.6	3.4	0.8
S 93	704	812	74	7.6	3.1	0.8
S 94	696	805	68	7.6	2.9	0.8
S 95	675	796	58	7.5	2.7	0.8
S 96	669	794	47	7.5	2.6	0.8
S 97	663	792	45	7.4	2.5	0.8
S 98	659	791	42	7.4	2.5	0.8
S 99	659	791	43	7.5	2.5	0.8
S 100	654	789	38	7.4	2.5	0.8
S 101	654	789	37	7.4	2.5	0.8
S 102	657	790	42	7.4	2.5	0.8
S 103	658	790	42	7.4	2.5	0.8
S 104	655	790	40	7.4	2.5	0.8
S 105	653	790	38	7.4	2.5	0.8
S 106	654	790	38	7.4	2.5	0.8
S 107	655	791	41	7.4	2.5	0.8
S 108	656	791	42	7.4	2.5	0.8
S 109	655	790	40	7.4	2.4	0.8
S 110	653	789	38	7.4	2.4	0.8
S 111	653	789	38	7.4	2.4	0.8
S 112	653	790	37	7.4	2.5	0.8
S 113	657	791	38	7.4	2.5	0.8
S 114	669	793	53	7.4	2.7	0.8
S 115	721	812	82	7.6	3.6	0.8
S 116	655	790	40	7.4	2.5	0.8
S 117	653	789	38	7.4	2.4	0.8
S 118	664	791	48	7.4	2.6	0.8
S 119	659	791	42	7.4	2.5	0.8
S 120	657	790	41	7.4	2.5	0.8
S 121	656	791	42	7.4	2.5	0.8
S 122	653	789	38	7.4	2.4	0.8
S 123	654	790	38	7.4	2.5	0.8
S 124	656	791	40	7.5	2.5	0.8
S 125	653	790	37	7.4	2.5	0.8
S 126	654	789	37	7.4	2.5	0.8
S 127	653	789	37	7.4	2.5	0.8
S 128	654	789	37	7.4	2.5	0.8
S 129	655	790	37	7.4	2.5	0.8
S 130	656	790	37	7.4	2.5	0.8
S 131	654	790	37	7.4	2.5	0.8
S 132	656	790	38	7.4	2.5	0.8
S 133	652	789	36	7.4	2.5	0.8
S 134	666	794	65	7.5	2.6	0.8
S 135	650	788	33	7.4	2.4	0.8
S 137	652	789	36	7.4	2.5	0.8
S 138	656	791	42	7.4	2.5	0.8
S 139	657	791	42	7.4	2.5	0.8
S 140	656	791	42	7.4	2.5	0.8
S 141	677	806	68	7.5	2.7	0.8
S 142	699	809	72	7.6	2.8	0.8
S 143	714	824	83	7.9	2.6	0.8
S 144	668	796	57	7.5	2.6	0.8
S 145	652	789	36	7.4	2.5	0.8
S 146	652	789	36	7.4	2.5	0.8

S 147	680	807	69	7.5	2.7	0.8
S 148	687	805	68	7.5	2.7	0.8
S 149	652	789	36	7.4	2.5	0.8
S 150	656	790	43	7.4	2.5	0.8
S 151	660	792	48	7.4	2.5	0.8
S 152	681	807	69	7.5	2.7	0.8
S 153	677	804	57	7.6	2.5	0.8
S 154	652	789	35	7.4	2.5	0.8
S 155	673	803	66	7.5	2.6	0.8
S 156	653	789	37	7.4	2.5	0.8
S 157	652	789	36	7.4	2.5	0.8
S 158	652	789	36	7.4	2.5	0.8
S 159	681	807	69	7.5	2.7	0.8
S 160	668	797	58	7.5	2.6	0.8
S 161	650	788	33	7.4	2.4	0.8
S 162	650	788	34	7.4	2.4	0.8
S 163	649	788	32	7.4	2.4	0.8
S 164	650	788	34	7.4	2.4	0.8
S 165	649	787	31	7.4	2.4	0.8
S 166	649	788	31	7.4	2.4	0.8
S 167	650	788	33	7.4	2.4	0.8
S 168	648	787	31	7.4	2.4	0.8
S 169	654	790	43	7.4	2.5	0.8
S 170	650	788	33	7.4	2.4	0.8
S 171	649	787	31	7.4	2.4	0.8
S 172	649	787	31	7.4	2.4	0.8
S 173	649	787	31	7.4	2.4	0.8
S 174	653	789	37	7.4	2.4	0.8
S 175	656	790	44	7.4	2.5	0.8
S 176	1005	873	104	8.1	5.1	0.8
S 177	759	826	96	7.9	4.2	0.8
S 178	961	989	147	15.6	3.6	0.8
S 179	766	848	119	8.9	3.0	0.8
S 180	893	896	148	9.3	2.8	0.8
S 181	738	831	112	8.2	2.9	0.8
S 182	655	791	41	7.4	2.5	0.8
S 183	652	789	36	7.4	2.5	0.8
S 184	673	804	64	7.5	2.5	0.8
S 185	669	800	56	7.5	2.6	0.8
S 186	670	798	58	7.5	2.6	0.8
S 187	669	798	57	7.5	2.6	0.8
S 188	666	794	65	7.5	2.6	0.8
S 189	666	794	65	7.5	2.6	0.8
S 190	653	789	36	7.4	2.5	0.8
S 191	655	790	41	7.4	2.5	0.8
S 192	654	790	39	7.4	2.5	0.8
S 193	654	790	42	7.4	2.5	0.8
S 194	652	789	36	7.4	2.5	0.8
S 195	649	788	31	7.4	2.4	0.8
S 196	648	787	30	7.4	2.4	0.8
S 197	697	806	70	7.5	2.7	0.8
S 199	860	934	128	11.3	3.4	0.8
S 200	1150	1125	216	31.9	3.0	0.9
S 201	793	880	136	9.5	3.0	0.8
S 202	709	810	78	7.7	3.1	0.8
S 203	788	832	93	7.8	4.1	0.8
S 204	704	802	73	7.8	3.2	0.8
S 205	929	888	118	8.9	7.0	0.8
S 206	1278	987	122	8.7	6.9	0.8
S 207	674	798	53	7.4	2.7	0.8
S 209	694	804	69	7.5	2.7	0.8
S 210	716	812	81	7.5	3.6	0.8
S 211	659	793	42	7.4	2.6	0.8
S 212	652	789	35	7.4	2.5	0.8
S 213	652	789	35	7.4	2.5	0.8
S 214	656	789	38	7.4	2.5	0.8
S 215	655	789	37	7.4	2.5	0.8
S 216	656	791	38	7.4	2.5	0.8
S 217	656	791	37	7.4	2.5	0.8
S 218	652	789	35	7.4	2.5	0.8
S 219	652	789	35	7.4	2.5	0.8
S 220	656	791	38	7.4	2.5	0.8
S 221	655	789	37	7.4	2.5	0.8
S 222	655	790	37	7.4	2.5	0.8
S 223	690	806	69	7.5	2.7	0.8
S 224	652	789	35	7.4	2.5	0.8

S 225	689	807	70	7.5	2.7	0.8
S 226	652	789	36	7.4	2.5	0.8
S 227	652	789	36	7.4	2.5	0.8
S 228	652	789	36	7.4	2.5	0.8
S 229	684	807	70	7.5	2.7	0.8
S 230	657	791	38	7.4	2.5	0.8
S 231	656	791	38	7.4	2.5	0.8
S 232	652	789	35	7.4	2.5	0.8
S 233	655	790	37	7.4	2.5	0.8
S 234	662	794	46	7.4	2.6	0.8
S 235	697	809	90	7.7	2.7	0.8
S 236	654	789	36	7.4	2.5	0.8
S 237	654	789	36	7.4	2.5	0.8
S 238	654	789	36	7.4	2.5	0.8
S 239	655	789	37	7.4	2.5	0.8
S 240	652	789	35	7.4	2.5	0.8
S 242	656	791	39	7.5	2.5	0.8
S 243	655	790	37	7.4	2.5	0.8
S 244	652	788	35	7.4	2.5	0.8
S 245	654	789	36	7.4	2.5	0.8
S 246	654	790	36	7.4	2.5	0.8
S 247	656	791	40	7.4	2.6	0.8
S 248	654	789	36	7.4	2.5	0.8
S 249	655	790	38	7.4	2.5	0.8
S 250	656	790	37	7.4	2.5	0.8
S 251	655	790	37	7.4	2.5	0.8
S 252	651	788	35	7.4	2.5	0.8
S 253	652	789	35	7.4	2.5	0.8
S 254	655	790	37	7.4	2.5	0.8
S 255	650	788	33	7.4	2.4	0.8
S 256	652	789	36	7.4	2.5	0.8
S 257	652	789	36	7.4	2.5	0.8
S 258	652	789	36	7.4	2.5	0.8
S 259	652	789	36	7.4	2.5	0.8
S 260	669	797	58	7.5	2.6	0.8
S 261	670	799	64	7.5	2.6	0.8
S 262	670	799	64	7.5	2.6	0.8
S 263	862	887	141	9.1	2.7	0.8
S 264	654	790	37	7.4	2.5	0.8
S 265	652	789	36	7.4	2.5	0.8
S 266	674	803	66	7.5	2.6	0.8
S 269	652	789	36	7.4	2.5	0.8
S 270	668	797	58	7.5	2.6	0.8
S 271	652	789	36	7.4	2.5	0.8
S 272	654	790	37	7.4	2.5	0.8
S 273	654	790	37	7.4	2.5	0.8
S 274	680	805	68	7.5	2.7	0.8
S 276	687	808	70	7.5	2.8	0.8
S 277	652	789	36	7.4	2.5	0.8
S 278	652	789	35	7.4	2.5	0.8
S 279	652	789	36	7.4	2.5	0.8
S 280	652	789	36	7.4	2.5	0.8
S 281	684	807	69	7.5	2.7	0.8
S 282	654	789	35	7.4	2.5	0.8
S 283	652	789	35	7.4	2.5	0.8
S 284	674	803	66	7.5	2.6	0.8
S 285	693	804	69	7.5	2.7	0.8
S 286	679	805	68	7.5	2.7	0.8
S 287	683	805	68	7.5	2.7	0.8
S 288	684	805	68	7.5	2.7	0.8
S 289	688	805	68	7.5	2.7	0.8
S 290	684	805	68	7.5	2.7	0.8
S 291	652	789	36	7.4	2.5	0.8
S 292	685	805	68	7.5	2.7	0.8
S 293	652	789	36	7.4	2.5	0.8
S 294	669	797	58	7.5	2.6	0.8
S 295	652	789	36	7.4	2.5	0.8
S 296	676	805	68	7.5	2.7	0.8
S 297	652	789	36	7.4	2.5	0.8
S 298	653	789	37	7.4	2.5	0.8
S 299	652	789	36	7.4	2.5	0.8
S 300	652	789	36	7.4	2.5	0.8
S 301	652	789	36	7.4	2.5	0.8
S 302	652	789	36	7.4	2.5	0.8
S 303	652	789	36	7.4	2.5	0.8
S 304	652	789	36	7.4	2.5	0.8

S 305	652	789	36	7.4	2.5	0.8
S 306	707	804	72	7.6	2.7	0.8
S 307	652	789	36	7.4	2.5	0.8
S 308	652	789	36	7.4	2.5	0.8
S 309	670	799	59	7.5	2.6	0.8
S 310	670	799	64	7.5	2.6	0.8
S 311	669	797	58	7.5	2.6	0.8
S 312	669	798	58	7.5	2.6	0.8
S 313	669	798	59	7.5	2.6	0.8
S 314	669	797	58	7.5	2.6	0.8
S 315	677	805	68	7.5	2.7	0.8
S 316	684	807	69	7.5	2.7	0.8
S 317	707	803	71	7.6	2.7	0.8
S 318	652	789	36	7.4	2.5	0.8
S 319	652	789	36	7.4	2.5	0.8
S 320	652	789	36	7.4	2.5	0.8
S 321	652	789	36	7.4	2.5	0.8
S 322	652	789	36	7.4	2.5	0.8
S 323	652	789	36	7.4	2.5	0.8
S 324	652	789	36	7.4	2.5	0.8
S 325	652	789	36	7.4	2.5	0.8
S 326	668	800	56	7.5	2.6	0.8
S 327	665	795	53	7.5	2.6	0.8
S 328	676	800	54	7.4	2.8	0.8
S 329	674	800	56	7.4	2.8	0.8
S 330	670	797	50	7.4	2.7	0.8
S 331	679	806	69	7.5	2.7	0.8
S 332	686	808	71	7.5	2.8	0.8
S 333	679	808	70	7.5	2.8	0.8
S 334	669	798	58	7.5	2.6	0.8
S 335	667	796	58	7.5	2.6	0.8
S 336	650	788	33	7.4	2.4	0.8
S 337	650	788	32	7.4	2.4	0.8
S 338	651	788	34	7.4	2.4	0.8
S 339	648	787	30	7.4	2.4	0.8
S 340	655	790	37	7.4	2.5	0.8
S 341	664	791	48	7.4	2.7	0.8
S 342	653	790	36	7.4	2.5	0.8
S 343	653	789	38	7.4	2.4	0.8
S 344	655	790	37	7.4	2.5	0.8
S 345	675	796	52	7.6	2.7	0.8
S 346	680	797	66	7.5	2.9	0.8
S 416	725	836	86	8.0	2.9	0.8
N 348	653	789	37	7.4	2.5	0.8
N 349	653	790	38	7.4	2.5	0.8
N 350	654	790	38	7.4	2.5	0.8
N 351	654	790	40	7.4	2.5	0.8
N 352	656	791	42	7.4	2.5	0.8
N 353	655	790	42	7.4	2.5	0.8
N 354	659	792	46	7.4	2.5	0.8
N 355	664	794	51	7.4	2.5	0.8
N 356	683	803	67	7.5	2.8	0.8
N 357	691	806	66	7.5	2.8	0.8
N 358	707	809	67	7.5	2.9	0.8
N 359	683	802	65	7.4	2.8	0.8
N 360	677	800	58	7.4	2.8	0.8
N 361	672	797	50	7.4	2.7	0.8
N 362	652	789	36	7.4	2.5	0.8
N 363	652	789	36	7.4	2.5	0.8
N 364	714	830	95	7.7	2.6	0.8
N 365	735	833	111	7.7	2.7	0.8
N 366	769	840	126	7.8	2.7	0.8
N 367	700	820	81	7.7	2.6	0.8
N 368	765	845	120	7.9	2.8	0.8
N 369	697	810	91	7.7	2.7	0.8
N 370	689	806	73	7.6	2.7	0.8
N 371	711	805	72	7.6	2.8	0.8
N 372	698	808	72	7.5	2.8	0.8
N 373	683	804	68	7.5	2.7	0.8
N 374	666	795	59	7.5	2.6	0.8
N 375	666	797	49	7.5	2.5	0.8
N 376	671	800	53	7.5	2.5	0.8
N 377	678	804	57	7.6	2.5	0.8
N 378	649	788	32	7.4	2.4	0.8
N 379	649	788	32	7.4	2.4	0.8
N 380	649	788	32	7.4	2.4	0.8

N 381	649	788	32	7.4	2.4	0.8
N 382	649	788	32	7.4	2.4	0.8
N 383	650	788	33	7.4	2.4	0.8
N 384	650	788	33	7.4	2.4	0.8
N 385	650	788	33	7.4	2.4	0.8
N 386	650	788	33	7.4	2.4	0.8
N 387	650	788	33	7.4	2.4	0.8
N 388	650	788	33	7.4	2.4	0.8
N 389	651	789	35	7.4	2.5	0.8
N 390	649	788	32	7.4	2.4	0.8
N 391	651	789	35	7.4	2.5	0.8
N 392	650	788	33	7.4	2.4	0.8
N 393	649	788	31	7.4	2.4	0.8
N 394	651	788	34	7.4	2.4	0.8
N 395	649	788	31	7.4	2.4	0.8
N 396	649	787	31	7.4	2.4	0.8
N 397	650	788	33	7.4	2.4	0.8
N 398	650	788	32	7.4	2.4	0.8
N 399	650	788	33	7.4	2.4	0.8
N 400	650	788	33	7.4	2.4	0.8
N 401	650	788	32	7.4	2.4	0.8
N 402	650	788	32	7.4	2.4	0.8
N 403	650	788	32	7.4	2.4	0.8
N 404	650	788	33	7.4	2.4	0.8
N 405	650	788	33	7.4	2.4	0.8
N 406	650	788	34	7.4	2.4	0.8
N 407	651	788	35	7.4	2.4	0.8
N 408	651	788	35	7.4	2.4	0.8
N 409	650	788	34	7.4	2.4	0.8
N 410	649	787	31	7.4	2.4	0.8
N 411	648	787	31	7.4	2.4	0.8
N 412	648	787	31	7.4	2.4	0.8
N 413	648	787	30	7.4	2.4	0.8
N 414	648	787	30	7.4	2.4	0.8

Table B1 Project Case Maximum Predicted Frequency of Exceedance of PMs without background

Contaminants	PM2.5		PM10	TSP	
Averaging Period	24-hr	Anuual	24-hr	24-hr	Anuual
Sensitive Receptors	Frequency of Exceedance (%) without Background Concentration				
S 1	0.00%	0.00%	0.00%	0.00%	0.00%
S 2	0.00%	0.00%	0.00%	0.00%	0.00%
S 3	0.00%	0.00%	0.00%	0.00%	0.00%
S 4	0.00%	0.00%	0.00%	0.00%	0.00%
S 5	0.00%	0.00%	0.00%	0.00%	0.00%
S 6	0.00%	0.00%	0.09%	0.00%	0.00%
S 7	1.37%	33.33%	44.38%	33.79%	100.00%
S 8	0.00%	0.00%	0.00%	0.00%	0.00%
S 9	0.00%	0.00%	0.00%	0.00%	0.00%
S 10	0.00%	0.00%	0.00%	0.00%	0.00%
S 11	0.00%	0.00%	0.00%	0.00%	0.00%
S 12	0.00%	0.00%	0.00%	0.00%	0.00%
S 13	0.00%	0.00%	0.00%	0.00%	0.00%
S 14	0.00%	0.00%	0.00%	0.00%	0.00%
S 15	0.00%	0.00%	0.00%	0.00%	0.00%
S 16	0.00%	0.00%	0.00%	0.00%	0.00%
S 17	0.00%	0.00%	0.00%	0.00%	0.00%
S 18	0.00%	0.00%	0.00%	0.00%	0.00%
S 19	0.00%	0.00%	0.00%	0.00%	0.00%
S 20	0.00%	0.00%	0.00%	0.00%	0.00%
S 21	0.00%	0.00%	0.00%	0.00%	0.00%
S 22	0.00%	0.00%	0.00%	0.00%	0.00%
S 23	0.00%	0.00%	0.00%	0.00%	0.00%
S 24	0.00%	0.00%	0.00%	0.00%	0.00%
S 25	0.00%	0.00%	1.74%	1.28%	0.00%
S 26	0.00%	0.00%	0.00%	0.00%	0.00%
S 27	0.00%	0.00%	0.00%	0.00%	0.00%
S 28	0.00%	0.00%	0.00%	0.00%	0.00%
S 29	0.00%	0.00%	0.00%	0.00%	0.00%
S 30	0.00%	0.00%	0.00%	0.00%	0.00%
S 31	0.00%	0.00%	0.00%	0.00%	0.00%
S 32	0.00%	0.00%	0.00%	0.00%	0.00%
S 33	0.00%	0.00%	0.00%	0.00%	0.00%
S 34	0.00%	0.00%	0.00%	0.00%	0.00%
S 35	0.00%	0.00%	0.00%	0.00%	0.00%
S 36	0.00%	0.00%	0.00%	0.00%	0.00%
S 37	0.00%	0.00%	0.00%	0.00%	0.00%
S 38	0.00%	0.00%	0.00%	0.00%	0.00%
S 39	0.00%	0.00%	0.00%	0.00%	0.00%
S 40	0.00%	0.00%	0.00%	0.00%	0.00%
S 41	0.00%	0.00%	0.00%	0.00%	0.00%
S 42	0.00%	0.00%	0.00%	0.00%	0.00%
S 43	0.00%	0.00%	0.00%	0.00%	0.00%
S 44	0.00%	0.00%	0.00%	0.00%	0.00%
S 45	0.00%	0.00%	0.00%	0.00%	0.00%
S 46	0.00%	0.00%	0.00%	0.00%	0.00%
S 47	0.00%	0.00%	0.00%	0.00%	0.00%
S 48	1.55%	0.00%	41.28%	48.04%	100.00%
S 49	0.00%	0.00%	0.00%	0.00%	0.00%
S 50	0.00%	0.00%	0.00%	0.00%	0.00%
S 51	0.00%	0.00%	0.00%	0.00%	0.00%
S 52	0.00%	0.00%	0.00%	0.00%	0.00%
S 53	0.00%	0.00%	1.46%	0.09%	0.00%
S 54	0.00%	0.00%	3.65%	0.73%	0.00%
S 55	0.00%	0.00%	0.00%	0.00%	0.00%
S 56	0.09%	0.00%	5.39%	4.84%	0.00%
S 57	0.00%	0.00%	0.00%	0.00%	0.00%
S 58	0.00%	0.00%	0.00%	0.00%	0.00%
S 59	0.00%	0.00%	0.00%	0.00%	0.00%
S 61	0.00%	0.00%	1.46%	0.46%	0.00%
S 62	0.00%	0.00%	0.55%	0.09%	0.00%
S 63	0.00%	0.00%	0.91%	0.27%	0.00%
S 64	0.00%	0.00%	1.28%	0.55%	0.00%
S 65	0.18%	0.00%	9.68%	9.32%	0.00%
S 66	0.09%	0.00%	5.39%	4.84%	0.00%
S 67	0.00%	0.00%	0.00%	0.00%	0.00%
S 68	0.00%	0.00%	0.00%	0.00%	0.00%
S 69	0.18%	0.00%	8.77%	9.41%	100.00%
S 70	0.00%	0.00%	0.00%	0.00%	0.00%
S 71	0.00%	0.00%	0.00%	0.00%	0.00%
S 72	0.00%	0.00%	0.00%	0.00%	0.00%

S 74	0.00%	0.00%	0.00%	0.00%	0.00%
S 75	0.00%	0.00%	0.00%	0.00%	0.00%
S 76	0.00%	0.00%	0.00%	0.00%	0.00%
S 77	0.00%	0.00%	0.00%	0.00%	0.00%
S 78	0.00%	0.00%	0.00%	0.00%	0.00%
S 79	0.00%	0.00%	0.00%	0.00%	0.00%
S 80	0.00%	0.00%	0.00%	0.00%	0.00%
S 81	0.00%	0.00%	0.00%	0.00%	0.00%
S 82	0.00%	0.00%	0.00%	0.00%	0.00%
S 83	0.00%	0.00%	0.00%	0.00%	0.00%
S 84	0.00%	0.00%	0.00%	0.00%	0.00%
S 85	0.00%	0.00%	0.00%	0.00%	0.00%
S 86	0.00%	0.00%	0.00%	0.00%	0.00%
S 87	0.00%	0.00%	0.00%	0.00%	0.00%
S 88	0.00%	0.00%	0.00%	0.00%	0.00%
S 89	0.00%	0.00%	0.00%	0.00%	0.00%
S 90	0.00%	0.00%	4.66%	1.00%	0.00%
S 91	0.00%	0.00%	0.09%	0.00%	0.00%
S 92	0.00%	0.00%	0.09%	0.00%	0.00%
S 93	0.00%	0.00%	0.00%	0.00%	0.00%
S 94	0.00%	0.00%	0.00%	0.00%	0.00%
S 95	0.00%	0.00%	0.00%	0.00%	0.00%
S 96	0.00%	0.00%	0.00%	0.00%	0.00%
S 97	0.00%	0.00%	0.00%	0.00%	0.00%
S 98	0.00%	0.00%	0.00%	0.00%	0.00%
S 99	0.00%	0.00%	0.00%	0.00%	0.00%
S 100	0.00%	0.00%	0.00%	0.00%	0.00%
S 101	0.00%	0.00%	0.00%	0.00%	0.00%
S 102	0.00%	0.00%	0.00%	0.00%	0.00%
S 103	0.00%	0.00%	0.00%	0.00%	0.00%
S 104	0.00%	0.00%	0.00%	0.00%	0.00%
S 105	0.00%	0.00%	0.00%	0.00%	0.00%
S 106	0.00%	0.00%	0.00%	0.00%	0.00%
S 107	0.00%	0.00%	0.00%	0.00%	0.00%
S 108	0.00%	0.00%	0.00%	0.00%	0.00%
S 109	0.00%	0.00%	0.00%	0.00%	0.00%
S 110	0.00%	0.00%	0.00%	0.00%	0.00%
S 111	0.00%	0.00%	0.00%	0.00%	0.00%
S 112	0.00%	0.00%	0.00%	0.00%	0.00%
S 113	0.00%	0.00%	0.00%	0.00%	0.00%
S 114	0.00%	0.00%	0.00%	0.00%	0.00%
S 115	0.00%	0.00%	0.00%	0.00%	0.00%
S 116	0.00%	0.00%	0.00%	0.00%	0.00%
S 117	0.00%	0.00%	0.00%	0.00%	0.00%
S 118	0.00%	0.00%	0.00%	0.00%	0.00%
S 119	0.00%	0.00%	0.00%	0.00%	0.00%
S 120	0.00%	0.00%	0.00%	0.00%	0.00%
S 121	0.00%	0.00%	0.00%	0.00%	0.00%
S 122	0.00%	0.00%	0.00%	0.00%	0.00%
S 123	0.00%	0.00%	0.00%	0.00%	0.00%
S 124	0.00%	0.00%	0.00%	0.00%	0.00%
S 125	0.00%	0.00%	0.00%	0.00%	0.00%
S 126	0.00%	0.00%	0.00%	0.00%	0.00%
S 127	0.00%	0.00%	0.00%	0.00%	0.00%
S 128	0.00%	0.00%	0.00%	0.00%	0.00%
S 129	0.00%	0.00%	0.00%	0.00%	0.00%
S 130	0.00%	0.00%	0.00%	0.00%	0.00%
S 131	0.00%	0.00%	0.00%	0.00%	0.00%
S 132	0.00%	0.00%	0.00%	0.00%	0.00%
S 133	0.00%	0.00%	0.00%	0.00%	0.00%
S 134	0.00%	0.00%	0.00%	0.00%	0.00%
S 135	0.00%	0.00%	0.00%	0.00%	0.00%
S 137	0.00%	0.00%	0.00%	0.00%	0.00%
S 138	0.00%	0.00%	0.00%	0.00%	0.00%
S 139	0.00%	0.00%	0.00%	0.00%	0.00%
S 140	0.00%	0.00%	0.00%	0.00%	0.00%
S 141	0.00%	0.00%	0.00%	0.00%	0.00%
S 142	0.00%	0.00%	0.00%	0.00%	0.00%
S 143	0.00%	0.00%	0.00%	0.00%	0.00%
S 144	0.00%	0.00%	0.00%	0.00%	0.00%
S 145	0.00%	0.00%	0.00%	0.00%	0.00%
S 146	0.00%	0.00%	0.00%	0.00%	0.00%
S 147	0.00%	0.00%	0.00%	0.00%	0.00%
S 148	0.00%	0.00%	0.00%	0.00%	0.00%
S 149	0.00%	0.00%	0.00%	0.00%	0.00%
S 150	0.00%	0.00%	0.00%	0.00%	0.00%

S 151	0.00%	0.00%	0.00%	0.00%	0.00%
S 152	0.00%	0.00%	0.00%	0.00%	0.00%
S 153	0.00%	0.00%	0.00%	0.00%	0.00%
S 154	0.00%	0.00%	0.00%	0.00%	0.00%
S 155	0.00%	0.00%	0.00%	0.00%	0.00%
S 156	0.00%	0.00%	0.00%	0.00%	0.00%
S 157	0.00%	0.00%	0.00%	0.00%	0.00%
S 158	0.00%	0.00%	0.00%	0.00%	0.00%
S 159	0.00%	0.00%	0.00%	0.00%	0.00%
S 160	0.00%	0.00%	0.00%	0.00%	0.00%
S 161	0.00%	0.00%	0.00%	0.00%	0.00%
S 162	0.00%	0.00%	0.00%	0.00%	0.00%
S 163	0.00%	0.00%	0.00%	0.00%	0.00%
S 164	0.00%	0.00%	0.00%	0.00%	0.00%
S 165	0.00%	0.00%	0.00%	0.00%	0.00%
S 166	0.00%	0.00%	0.00%	0.00%	0.00%
S 167	0.00%	0.00%	0.00%	0.00%	0.00%
S 168	0.00%	0.00%	0.00%	0.00%	0.00%
S 169	0.00%	0.00%	0.00%	0.00%	0.00%
S 170	0.00%	0.00%	0.00%	0.00%	0.00%
S 171	0.00%	0.00%	0.00%	0.00%	0.00%
S 172	0.00%	0.00%	0.00%	0.00%	0.00%
S 173	0.00%	0.00%	0.00%	0.00%	0.00%
S 174	0.00%	0.00%	0.00%	0.00%	0.00%
S 175	0.00%	0.00%	0.00%	0.00%	0.00%
S 176	0.00%	0.00%	1.64%	0.00%	0.00%
S 177	0.00%	0.00%	0.09%	0.00%	0.00%
S 178	3.74%	0.00%	52.24%	57.81%	100.00%
S 179	0.00%	0.00%	3.11%	1.74%	0.00%
S 180	0.00%	0.00%	0.64%	0.18%	0.00%
S 181	0.00%	0.00%	0.00%	0.00%	0.00%
S 182	0.00%	0.00%	0.00%	0.00%	0.00%
S 183	0.00%	0.00%	0.00%	0.00%	0.00%
S 184	0.00%	0.00%	0.00%	0.00%	0.00%
S 185	0.00%	0.00%	0.00%	0.00%	0.00%
S 186	0.00%	0.00%	0.00%	0.00%	0.00%
S 187	0.00%	0.00%	0.00%	0.00%	0.00%
S 188	0.00%	0.00%	0.00%	0.00%	0.00%
S 189	0.00%	0.00%	0.00%	0.00%	0.00%
S 190	0.00%	0.00%	0.00%	0.00%	0.00%
S 191	0.00%	0.00%	0.00%	0.00%	0.00%
S 192	0.00%	0.00%	0.00%	0.00%	0.00%
S 193	0.00%	0.00%	0.00%	0.00%	0.00%
S 194	0.00%	0.00%	0.00%	0.00%	0.00%
S 195	0.00%	0.00%	0.00%	0.00%	0.00%
S 196	0.00%	0.00%	0.00%	0.00%	0.00%
S 197	0.00%	0.00%	0.00%	0.00%	0.00%
S 199	0.18%	0.00%	18.81%	19.63%	100.00%
S 200	45.11%	100.00%	100.00%	100.00%	100.00%
S 201	0.00%	0.00%	1.37%	0.46%	0.00%
S 202	0.00%	0.00%	0.73%	0.18%	0.00%
S 203	0.00%	0.00%	0.00%	0.00%	0.00%
S 204	0.00%	0.00%	0.00%	0.00%	0.00%
S 205	0.00%	0.00%	2.01%	0.09%	0.00%
S 206	0.00%	0.00%	3.93%	0.73%	0.00%
S 207	0.00%	0.00%	0.00%	0.00%	0.00%
S 209	0.00%	0.00%	0.00%	0.00%	0.00%
S 210	0.00%	0.00%	0.00%	0.00%	0.00%
S 211	0.00%	0.00%	0.00%	0.00%	0.00%
S 212	0.00%	0.00%	0.00%	0.00%	0.00%
S 213	0.00%	0.00%	0.00%	0.00%	0.00%
S 214	0.00%	0.00%	0.00%	0.00%	0.00%
S 215	0.00%	0.00%	0.00%	0.00%	0.00%
S 216	0.00%	0.00%	0.00%	0.00%	0.00%
S 217	0.00%	0.00%	0.00%	0.00%	0.00%
S 218	0.00%	0.00%	0.00%	0.00%	0.00%
S 219	0.00%	0.00%	0.00%	0.00%	0.00%
S 220	0.00%	0.00%	0.00%	0.00%	0.00%
S 221	0.00%	0.00%	0.00%	0.00%	0.00%
S 222	0.00%	0.00%	0.00%	0.00%	0.00%
S 223	0.00%	0.00%	0.00%	0.00%	0.00%
S 224	0.00%	0.00%	0.00%	0.00%	0.00%
S 225	0.00%	0.00%	0.00%	0.00%	0.00%
S 226	0.00%	0.00%	0.00%	0.00%	0.00%
S 227	0.00%	0.00%	0.00%	0.00%	0.00%
S 228	0.00%	0.00%	0.00%	0.00%	0.00%

S 229	0.00%	0.00%	0.00%	0.00%	0.00%
S 230	0.00%	0.00%	0.00%	0.00%	0.00%
S 231	0.00%	0.00%	0.00%	0.00%	0.00%
S 232	0.00%	0.00%	0.00%	0.00%	0.00%
S 233	0.00%	0.00%	0.00%	0.00%	0.00%
S 234	0.00%	0.00%	0.00%	0.00%	0.00%
S 235	0.00%	0.00%	0.00%	0.00%	0.00%
S 236	0.00%	0.00%	0.00%	0.00%	0.00%
S 237	0.00%	0.00%	0.00%	0.00%	0.00%
S 238	0.00%	0.00%	0.00%	0.00%	0.00%
S 239	0.00%	0.00%	0.00%	0.00%	0.00%
S 240	0.00%	0.00%	0.00%	0.00%	0.00%
S 242	0.00%	0.00%	0.00%	0.00%	0.00%
S 243	0.00%	0.00%	0.00%	0.00%	0.00%
S 244	0.00%	0.00%	0.00%	0.00%	0.00%
S 245	0.00%	0.00%	0.00%	0.00%	0.00%
S 246	0.00%	0.00%	0.00%	0.00%	0.00%
S 247	0.00%	0.00%	0.00%	0.00%	0.00%
S 248	0.00%	0.00%	0.00%	0.00%	0.00%
S 249	0.00%	0.00%	0.00%	0.00%	0.00%
S 250	0.00%	0.00%	0.00%	0.00%	0.00%
S 251	0.00%	0.00%	0.00%	0.00%	0.00%
S 252	0.00%	0.00%	0.00%	0.00%	0.00%
S 253	0.00%	0.00%	0.00%	0.00%	0.00%
S 254	0.00%	0.00%	0.00%	0.00%	0.00%
S 255	0.00%	0.00%	0.00%	0.00%	0.00%
S 256	0.00%	0.00%	0.00%	0.00%	0.00%
S 257	0.00%	0.00%	0.00%	0.00%	0.00%
S 258	0.00%	0.00%	0.00%	0.00%	0.00%
S 259	0.00%	0.00%	0.00%	0.00%	0.00%
S 260	0.00%	0.00%	0.00%	0.00%	0.00%
S 261	0.00%	0.00%	0.00%	0.00%	0.00%
S 262	0.00%	0.00%	0.00%	0.00%	0.00%
S 263	0.00%	0.00%	0.64%	0.09%	0.00%
S 264	0.00%	0.00%	0.00%	0.00%	0.00%
S 265	0.00%	0.00%	0.00%	0.00%	0.00%
S 266	0.00%	0.00%	0.00%	0.00%	0.00%
S 269	0.00%	0.00%	0.00%	0.00%	0.00%
S 270	0.00%	0.00%	0.00%	0.00%	0.00%
S 271	0.00%	0.00%	0.00%	0.00%	0.00%
S 272	0.00%	0.00%	0.00%	0.00%	0.00%
S 273	0.00%	0.00%	0.00%	0.00%	0.00%
S 274	0.00%	0.00%	0.00%	0.00%	0.00%
S 276	0.00%	0.00%	0.00%	0.00%	0.00%
S 277	0.00%	0.00%	0.00%	0.00%	0.00%
S 278	0.00%	0.00%	0.00%	0.00%	0.00%
S 279	0.00%	0.00%	0.00%	0.00%	0.00%
S 280	0.00%	0.00%	0.00%	0.00%	0.00%
S 281	0.00%	0.00%	0.00%	0.00%	0.00%
S 282	0.00%	0.00%	0.00%	0.00%	0.00%
S 283	0.00%	0.00%	0.00%	0.00%	0.00%
S 284	0.00%	0.00%	0.00%	0.00%	0.00%
S 285	0.00%	0.00%	0.00%	0.00%	0.00%
S 286	0.00%	0.00%	0.00%	0.00%	0.00%
S 287	0.00%	0.00%	0.00%	0.00%	0.00%
S 288	0.00%	0.00%	0.00%	0.00%	0.00%
S 289	0.00%	0.00%	0.00%	0.00%	0.00%
S 290	0.00%	0.00%	0.00%	0.00%	0.00%
S 291	0.00%	0.00%	0.00%	0.00%	0.00%
S 292	0.00%	0.00%	0.00%	0.00%	0.00%
S 293	0.00%	0.00%	0.00%	0.00%	0.00%
S 294	0.00%	0.00%	0.00%	0.00%	0.00%
S 295	0.00%	0.00%	0.00%	0.00%	0.00%
S 296	0.00%	0.00%	0.00%	0.00%	0.00%
S 297	0.00%	0.00%	0.00%	0.00%	0.00%
S 298	0.00%	0.00%	0.00%	0.00%	0.00%
S 299	0.00%	0.00%	0.00%	0.00%	0.00%
S 300	0.00%	0.00%	0.00%	0.00%	0.00%
S 301	0.00%	0.00%	0.00%	0.00%	0.00%
S 302	0.00%	0.00%	0.00%	0.00%	0.00%
S 303	0.00%	0.00%	0.00%	0.00%	0.00%
S 304	0.00%	0.00%	0.00%	0.00%	0.00%
S 305	0.00%	0.00%	0.00%	0.00%	0.00%
S 306	0.00%	0.00%	0.00%	0.00%	0.00%
S 307	0.00%	0.00%	0.00%	0.00%	0.00%
S 308	0.00%	0.00%	0.00%	0.00%	0.00%

S 309	0.00%	0.00%	0.00%	0.00%	0.00%
S 310	0.00%	0.00%	0.00%	0.00%	0.00%
S 311	0.00%	0.00%	0.00%	0.00%	0.00%
S 312	0.00%	0.00%	0.00%	0.00%	0.00%
S 313	0.00%	0.00%	0.00%	0.00%	0.00%
S 314	0.00%	0.00%	0.00%	0.00%	0.00%
S 315	0.00%	0.00%	0.00%	0.00%	0.00%
S 316	0.00%	0.00%	0.00%	0.00%	0.00%
S 317	0.00%	0.00%	0.00%	0.00%	0.00%
S 318	0.00%	0.00%	0.00%	0.00%	0.00%
S 319	0.00%	0.00%	0.00%	0.00%	0.00%
S 320	0.00%	0.00%	0.00%	0.00%	0.00%
S 321	0.00%	0.00%	0.00%	0.00%	0.00%
S 322	0.00%	0.00%	0.00%	0.00%	0.00%
S 323	0.00%	0.00%	0.00%	0.00%	0.00%
S 324	0.00%	0.00%	0.00%	0.00%	0.00%
S 325	0.00%	0.00%	0.00%	0.00%	0.00%
S 326	0.00%	0.00%	0.00%	0.00%	0.00%
S 327	0.00%	0.00%	0.00%	0.00%	0.00%
S 328	0.00%	0.00%	0.00%	0.00%	0.00%
S 329	0.00%	0.00%	0.00%	0.00%	0.00%
S 330	0.00%	0.00%	0.00%	0.00%	0.00%
S 331	0.00%	0.00%	0.00%	0.00%	0.00%
S 332	0.00%	0.00%	0.00%	0.00%	0.00%
S 333	0.00%	0.00%	0.00%	0.00%	0.00%
S 334	0.00%	0.00%	0.00%	0.00%	0.00%
S 335	0.00%	0.00%	0.00%	0.00%	0.00%
S 336	0.00%	0.00%	0.00%	0.00%	0.00%
S 337	0.00%	0.00%	0.00%	0.00%	0.00%
S 338	0.00%	0.00%	0.00%	0.00%	0.00%
S 339	0.00%	0.00%	0.00%	0.00%	0.00%
S 340	0.00%	0.00%	0.00%	0.00%	0.00%
S 341	0.00%	0.00%	0.00%	0.00%	0.00%
S 342	0.00%	0.00%	0.00%	0.00%	0.00%
S 343	0.00%	0.00%	0.00%	0.00%	0.00%
S 344	0.00%	0.00%	0.00%	0.00%	0.00%
S 345	0.00%	0.00%	0.00%	0.00%	0.00%
S 346	0.00%	0.00%	0.00%	0.00%	0.00%
S 416	0.00%	0.00%	0.00%	0.00%	0.00%
N 348	0.00%	0.00%	0.00%	0.00%	0.00%
N 349	0.00%	0.00%	0.00%	0.00%	0.00%
N 350	0.00%	0.00%	0.00%	0.00%	0.00%
N 351	0.00%	0.00%	0.00%	0.00%	0.00%
N 352	0.00%	0.00%	0.00%	0.00%	0.00%
N 353	0.00%	0.00%	0.00%	0.00%	0.00%
N 354	0.00%	0.00%	0.00%	0.00%	0.00%
N 355	0.00%	0.00%	0.00%	0.00%	0.00%
N 356	0.00%	0.00%	0.00%	0.00%	0.00%
N 357	0.00%	0.00%	0.00%	0.00%	0.00%
N 358	0.00%	0.00%	0.00%	0.00%	0.00%
N 359	0.00%	0.00%	0.00%	0.00%	0.00%
N 360	0.00%	0.00%	0.00%	0.00%	0.00%
N 361	0.00%	0.00%	0.00%	0.00%	0.00%
N 362	0.00%	0.00%	0.00%	0.00%	0.00%
N 363	0.00%	0.00%	0.00%	0.00%	0.00%
N 364	0.00%	0.00%	0.00%	0.00%	0.00%
N 365	0.00%	0.00%	0.00%	0.00%	0.00%
N 366	0.00%	0.00%	0.00%	0.00%	0.00%
N 367	0.00%	0.00%	0.00%	0.00%	0.00%
N 368	0.00%	0.00%	0.00%	0.00%	0.00%
N 369	0.00%	0.00%	0.00%	0.00%	0.00%
N 370	0.00%	0.00%	0.00%	0.00%	0.00%
N 371	0.00%	0.00%	0.00%	0.00%	0.00%
N 372	0.00%	0.00%	0.00%	0.00%	0.00%
N 373	0.00%	0.00%	0.00%	0.00%	0.00%
N 374	0.00%	0.00%	0.00%	0.00%	0.00%
N 375	0.00%	0.00%	0.00%	0.00%	0.00%
N 376	0.00%	0.00%	0.00%	0.00%	0.00%
N 377	0.00%	0.00%	0.00%	0.00%	0.00%
N 378	0.00%	0.00%	0.00%	0.00%	0.00%
N 379	0.00%	0.00%	0.00%	0.00%	0.00%
N 380	0.00%	0.00%	0.00%	0.00%	0.00%
N 381	0.00%	0.00%	0.00%	0.00%	0.00%
N 382	0.00%	0.00%	0.00%	0.00%	0.00%
N 383	0.00%	0.00%	0.00%	0.00%	0.00%
N 384	0.00%	0.00%	0.00%	0.00%	0.00%

N 385	0.00%	0.00%	0.00%	0.00%	0.00%
N 386	0.00%	0.00%	0.00%	0.00%	0.00%
N 387	0.00%	0.00%	0.00%	0.00%	0.00%
N 388	0.00%	0.00%	0.00%	0.00%	0.00%
N 389	0.00%	0.00%	0.00%	0.00%	0.00%
N 390	0.00%	0.00%	0.00%	0.00%	0.00%
N 391	0.00%	0.00%	0.00%	0.00%	0.00%
N 392	0.00%	0.00%	0.00%	0.00%	0.00%
N 393	0.00%	0.00%	0.00%	0.00%	0.00%
N 394	0.00%	0.00%	0.00%	0.00%	0.00%
N 395	0.00%	0.00%	0.00%	0.00%	0.00%
N 396	0.00%	0.00%	0.00%	0.00%	0.00%
N 397	0.00%	0.00%	0.00%	0.00%	0.00%
N 398	0.00%	0.00%	0.00%	0.00%	0.00%
N 399	0.00%	0.00%	0.00%	0.00%	0.00%
N 400	0.00%	0.00%	0.00%	0.00%	0.00%
N 401	0.00%	0.00%	0.00%	0.00%	0.00%
N 402	0.00%	0.00%	0.00%	0.00%	0.00%
N 403	0.00%	0.00%	0.00%	0.00%	0.00%
N 404	0.00%	0.00%	0.00%	0.00%	0.00%
N 405	0.00%	0.00%	0.00%	0.00%	0.00%
N 406	0.00%	0.00%	0.00%	0.00%	0.00%
N 407	0.00%	0.00%	0.00%	0.00%	0.00%
N 408	0.00%	0.00%	0.00%	0.00%	0.00%
N 409	0.00%	0.00%	0.00%	0.00%	0.00%
N 410	0.00%	0.00%	0.00%	0.00%	0.00%
N 411	0.00%	0.00%	0.00%	0.00%	0.00%
N 412	0.00%	0.00%	0.00%	0.00%	0.00%
N 413	0.00%	0.00%	0.00%	0.00%	0.00%
N 414	0.00%	0.00%	0.00%	0.00%	0.00%

Table B2 Project Case Maximum Predicted Frequency of Exceedance of PMs with background

Contaminants	PM2.5		PM10	TSP	
Averaging Period	24-hr	Annual	24-hr	24-hr	Anuual
Sensitive Receptors	Frequency of Exceedance (%) with Background Concentration				
S 1	0.00%	0.00%	0.00%	0.00%	0.00%
S 2	0.00%	0.00%	0.00%	0.00%	0.00%
S 3	0.00%	0.00%	0.00%	0.00%	0.00%
S 4	0.00%	0.00%	0.00%	0.00%	0.00%
S 5	0.00%	0.00%	0.00%	0.00%	0.00%
S 6	0.5%	0.00%	3.4%	0.1%	0.00%
S 7	57.6%	100.00%	79.4%	56.7%	100.00%
S 8	0.00%	0.00%	0.00%	0.00%	0.00%
S 9	0.00%	0.00%	0.00%	0.00%	0.00%
S 10	0.0%	0.00%	0.1%	0.0%	0.00%
S 11	0.2%	0.00%	0.3%	0.0%	0.00%
S 12	0.00%	0.00%	0.00%	0.00%	0.00%
S 13	0.00%	0.00%	0.00%	0.00%	0.00%
S 14	0.00%	0.00%	0.00%	0.00%	0.00%
S 15	0.00%	0.00%	0.00%	0.00%	0.00%
S 16	0.00%	0.00%	0.00%	0.00%	0.00%
S 17	0.00%	0.00%	0.00%	0.00%	0.00%
S 18	0.00%	0.00%	0.00%	0.00%	0.00%
S 19	0.00%	0.00%	0.00%	0.00%	0.00%
S 20	0.00%	0.00%	0.00%	0.00%	0.00%
S 21	0.0%	0.00%	0.1%	0.0%	0.00%
S 22	0.00%	0.00%	0.00%	0.00%	0.00%
S 23	0.00%	0.00%	0.00%	0.00%	0.00%
S 24	0.00%	0.00%	0.00%	0.00%	0.00%
S 25	6.4%	0.00%	29.3%	18.5%	0.00%
S 26	0.00%	0.00%	0.00%	0.00%	0.00%
S 27	0.00%	0.00%	0.00%	0.00%	0.00%
S 28	0.00%	0.00%	0.00%	0.00%	0.00%
S 29	0.00%	0.00%	0.00%	0.00%	0.00%
S 30	0.00%	0.00%	0.00%	0.00%	0.00%
S 31	0.00%	0.00%	0.00%	0.00%	0.00%
S 32	0.00%	0.00%	0.00%	0.00%	0.00%
S 33	0.00%	0.00%	0.00%	0.00%	0.00%
S 34	0.00%	0.00%	0.00%	0.00%	0.00%
S 35	0.00%	0.00%	0.00%	0.00%	0.00%
S 36	0.00%	0.00%	0.00%	0.00%	0.00%
S 37	0.00%	0.00%	0.00%	0.00%	0.00%
S 38	0.00%	0.00%	0.00%	0.00%	0.00%
S 39	0.00%	0.00%	0.00%	0.00%	0.00%
S 40	0.00%	0.00%	0.00%	0.00%	0.00%
S 41	0.00%	0.00%	0.00%	0.00%	0.00%
S 42	0.00%	0.00%	0.00%	0.00%	0.00%
S 43	0.00%	0.00%	0.00%	0.00%	0.00%
S 44	0.00%	0.00%	0.00%	0.00%	0.00%
S 45	0.00%	0.00%	0.00%	0.00%	0.00%
S 46	0.00%	0.00%	0.00%	0.00%	0.00%
S 47	1.5%	0.00%	2.2%	0.2%	0.00%
S 48	49.0%	100.00%	65.7%	64.7%	100.00%
S 49	0.2%	0.00%	0.5%	0.0%	0.00%
S 50	0.1%	0.00%	0.1%	0.0%	0.00%
S 51	0.00%	0.00%	0.00%	0.00%	0.00%
S 52	0.00%	0.00%	0.00%	0.00%	0.00%
S 53	7.0%	0.00%	10.3%	2.0%	0.00%
S 54	14.6%	0.00%	18.6%	5.8%	0.00%
S 55	0.00%	0.00%	0.00%	0.00%	0.00%
S 56	9.3%	0.00%	19.5%	13.9%	0.00%
S 57	0.00%	0.00%	0.00%	0.00%	0.00%
S 58	0.00%	0.00%	0.00%	0.00%	0.00%
S 59	0.00%	0.00%	0.00%	0.00%	0.00%
S 61	5.7%	0.00%	12.0%	4.6%	0.00%
S 62	3.1%	0.00%	8.9%	3.1%	0.00%
S 63	4.0%	0.00%	10.4%	4.0%	0.00%
S 64	3.6%	0.00%	8.8%	4.6%	0.00%
S 65	14.5%	0.00%	26.3%	20.6%	0.00%
S 66	9.3%	0.00%	20.1%	14.2%	0.00%
S 67	0.00%	0.00%	0.00%	0.00%	0.00%
S 68	0.00%	0.00%	0.00%	0.00%	0.00%
S 69	14.5%	0.00%	42.2%	36.8%	100.00%
S 70	0.00%	0.00%	0.00%	0.00%	0.00%
S 71	0.00%	0.00%	0.00%	0.00%	0.00%
S 72	0.00%	0.00%	0.00%	0.00%	0.00%

S 74	0.00%	0.00%	0.00%	0.00%	0.00%
S 75	0.00%	0.00%	0.00%	0.00%	0.00%
S 76	0.00%	0.00%	0.00%	0.00%	0.00%
S 77	0.00%	0.00%	0.00%	0.00%	0.00%
S 78	0.00%	0.00%	0.00%	0.00%	0.00%
S 79	0.00%	0.00%	0.00%	0.00%	0.00%
S 80	0.00%	0.00%	0.00%	0.00%	0.00%
S 81	0.00%	0.00%	0.00%	0.00%	0.00%
S 82	0.00%	0.00%	0.00%	0.00%	0.00%
S 83	0.00%	0.00%	0.00%	0.00%	0.00%
S 84	0.00%	0.00%	0.00%	0.00%	0.00%
S 85	0.00%	0.00%	0.00%	0.00%	0.00%
S 86	0.00%	0.00%	0.00%	0.00%	0.00%
S 87	0.00%	0.00%	0.00%	0.00%	0.00%
S 88	0.00%	0.00%	0.00%	0.00%	0.00%
S 89	0.1%	0.00%	0.1%	0.0%	0.00%
S 90	18.3%	0.00%	20.1%	7.0%	0.00%
S 91	1.0%	0.00%	5.0%	0.1%	0.00%
S 92	0.5%	0.00%	2.5%	0.1%	0.00%
S 93	0.2%	0.00%	0.7%	0.0%	0.00%
S 94	0.0%	0.00%	0.2%	0.0%	0.00%
S 95	0.00%	0.00%	0.00%	0.00%	0.00%
S 96	0.00%	0.00%	0.00%	0.00%	0.00%
S 97	0.00%	0.00%	0.00%	0.00%	0.00%
S 98	0.00%	0.00%	0.00%	0.00%	0.00%
S 99	0.00%	0.00%	0.00%	0.00%	0.00%
S 100	0.00%	0.00%	0.00%	0.00%	0.00%
S 101	0.00%	0.00%	0.00%	0.00%	0.00%
S 102	0.00%	0.00%	0.00%	0.00%	0.00%
S 103	0.00%	0.00%	0.00%	0.00%	0.00%
S 104	0.00%	0.00%	0.00%	0.00%	0.00%
S 105	0.00%	0.00%	0.00%	0.00%	0.00%
S 106	0.00%	0.00%	0.00%	0.00%	0.00%
S 107	0.00%	0.00%	0.00%	0.00%	0.00%
S 108	0.00%	0.00%	0.00%	0.00%	0.00%
S 109	0.00%	0.00%	0.00%	0.00%	0.00%
S 110	0.00%	0.00%	0.00%	0.00%	0.00%
S 111	0.00%	0.00%	0.00%	0.00%	0.00%
S 112	0.00%	0.00%	0.00%	0.00%	0.00%
S 113	0.00%	0.00%	0.00%	0.00%	0.00%
S 114	0.00%	0.00%	0.00%	0.00%	0.00%
S 115	0.1%	0.00%	0.1%	0.0%	0.00%
S 116	0.00%	0.00%	0.00%	0.00%	0.00%
S 117	0.00%	0.00%	0.00%	0.00%	0.00%
S 118	0.00%	0.00%	0.00%	0.00%	0.00%
S 119	0.00%	0.00%	0.00%	0.00%	0.00%
S 120	0.00%	0.00%	0.00%	0.00%	0.00%
S 121	0.00%	0.00%	0.00%	0.00%	0.00%
S 122	0.00%	0.00%	0.00%	0.00%	0.00%
S 123	0.00%	0.00%	0.00%	0.00%	0.00%
S 124	0.00%	0.00%	0.00%	0.00%	0.00%
S 125	0.00%	0.00%	0.00%	0.00%	0.00%
S 126	0.00%	0.00%	0.00%	0.00%	0.00%
S 127	0.00%	0.00%	0.00%	0.00%	0.00%
S 128	0.00%	0.00%	0.00%	0.00%	0.00%
S 129	0.00%	0.00%	0.00%	0.00%	0.00%
S 130	0.00%	0.00%	0.00%	0.00%	0.00%
S 131	0.00%	0.00%	0.00%	0.00%	0.00%
S 132	0.00%	0.00%	0.00%	0.00%	0.00%
S 133	0.00%	0.00%	0.00%	0.00%	0.00%
S 134	0.00%	0.00%	0.00%	0.00%	0.00%
S 135	0.00%	0.00%	0.00%	0.00%	0.00%
S 137	0.00%	0.00%	0.00%	0.00%	0.00%
S 138	0.00%	0.00%	0.00%	0.00%	0.00%
S 139	0.00%	0.00%	0.00%	0.00%	0.00%
S 140	0.00%	0.00%	0.00%	0.00%	0.00%
S 141	0.00%	0.00%	0.00%	0.00%	0.00%
S 142	0.00%	0.00%	0.00%	0.00%	0.00%
S 143	0.2%	0.00%	0.4%	0.0%	0.00%
S 144	0.00%	0.00%	0.00%	0.00%	0.00%
S 145	0.00%	0.00%	0.00%	0.00%	0.00%
S 146	0.00%	0.00%	0.00%	0.00%	0.00%
S 147	0.00%	0.00%	0.00%	0.00%	0.00%
S 148	0.00%	0.00%	0.00%	0.00%	0.00%
S 149	0.00%	0.00%	0.00%	0.00%	0.00%
S 150	0.00%	0.00%	0.00%	0.00%	0.00%

S 151	0.00%	0.00%	0.00%	0.00%	0.00%
S 152	0.00%	0.00%	0.00%	0.00%	0.00%
S 153	0.2%	0.00%	0.3%	0.0%	0.00%
S 154	0.00%	0.00%	0.00%	0.00%	0.00%
S 155	0.00%	0.00%	0.00%	0.00%	0.00%
S 156	0.00%	0.00%	0.00%	0.00%	0.00%
S 157	0.00%	0.00%	0.00%	0.00%	0.00%
S 158	0.00%	0.00%	0.00%	0.00%	0.00%
S 159	0.00%	0.00%	0.00%	0.00%	0.00%
S 160	0.00%	0.00%	0.00%	0.00%	0.00%
S 161	0.00%	0.00%	0.00%	0.00%	0.00%
S 162	0.00%	0.00%	0.00%	0.00%	0.00%
S 163	0.00%	0.00%	0.00%	0.00%	0.00%
S 164	0.00%	0.00%	0.00%	0.00%	0.00%
S 165	0.00%	0.00%	0.00%	0.00%	0.00%
S 166	0.00%	0.00%	0.00%	0.00%	0.00%
S 167	0.00%	0.00%	0.00%	0.00%	0.00%
S 168	0.00%	0.00%	0.00%	0.00%	0.00%
S 169	0.00%	0.00%	0.00%	0.00%	0.00%
S 170	0.00%	0.00%	0.00%	0.00%	0.00%
S 171	0.00%	0.00%	0.00%	0.00%	0.00%
S 172	0.00%	0.00%	0.00%	0.00%	0.00%
S 173	0.00%	0.00%	0.00%	0.00%	0.00%
S 174	0.00%	0.00%	0.00%	0.00%	0.00%
S 175	0.00%	0.00%	0.00%	0.00%	0.00%
S 176	8.6%	0.00%	11.1%	2.2%	0.00%
S 177	1.3%	0.00%	6.9%	0.3%	0.00%
S 178	57.4%	100.00%	70.2%	70.3%	100.00%
S 179	5.8%	0.00%	15.2%	7.7%	0.00%
S 180	3.5%	0.00%	14.6%	6.6%	0.00%
S 181	0.0%	0.00%	0.4%	0.0%	0.00%
S 182	0.00%	0.00%	0.00%	0.00%	0.00%
S 183	0.00%	0.00%	0.00%	0.00%	0.00%
S 184	0.0%	0.00%	0.1%	0.0%	0.00%
S 185	0.00%	0.00%	0.00%	0.00%	0.00%
S 186	0.00%	0.00%	0.00%	0.00%	0.00%
S 187	0.00%	0.00%	0.00%	0.00%	0.00%
S 188	0.00%	0.00%	0.00%	0.00%	0.00%
S 189	0.00%	0.00%	0.00%	0.00%	0.00%
S 190	0.00%	0.00%	0.00%	0.00%	0.00%
S 191	0.00%	0.00%	0.00%	0.00%	0.00%
S 192	0.00%	0.00%	0.00%	0.00%	0.00%
S 193	0.00%	0.00%	0.00%	0.00%	0.00%
S 194	0.00%	0.00%	0.00%	0.00%	0.00%
S 195	0.00%	0.00%	0.00%	0.00%	0.00%
S 196	0.00%	0.00%	0.00%	0.00%	0.00%
S 197	0.00%	0.00%	0.00%	0.00%	0.00%
S 199	23.7%	100.00%	42.6%	38.9%	100.00%
S 200	100.0%	100.00%	100.0%	100.0%	100.00%
S 201	3.7%	0.00%	8.5%	4.6%	0.00%
S 202	2.8%	0.00%	4.5%	1.9%	0.00%
S 203	1.3%	0.00%	2.3%	0.1%	0.00%
S 204	0.00%	0.00%	0.00%	0.00%	0.00%
S 205	15.0%	0.00%	21.6%	2.6%	0.00%
S 206	14.7%	0.00%	19.4%	5.8%	0.00%
S 207	0.00%	0.00%	0.00%	0.00%	0.00%
S 209	0.00%	0.00%	0.00%	0.00%	0.00%
S 210	0.1%	0.00%	0.1%	0.0%	0.00%
S 211	0.00%	0.00%	0.00%	0.00%	0.00%
S 212	0.00%	0.00%	0.00%	0.00%	0.00%
S 213	0.00%	0.00%	0.00%	0.00%	0.00%
S 214	0.00%	0.00%	0.00%	0.00%	0.00%
S 215	0.00%	0.00%	0.00%	0.00%	0.00%
S 216	0.00%	0.00%	0.00%	0.00%	0.00%
S 217	0.00%	0.00%	0.00%	0.00%	0.00%
S 218	0.00%	0.00%	0.00%	0.00%	0.00%
S 219	0.00%	0.00%	0.00%	0.00%	0.00%
S 220	0.00%	0.00%	0.00%	0.00%	0.00%
S 221	0.00%	0.00%	0.00%	0.00%	0.00%
S 222	0.00%	0.00%	0.00%	0.00%	0.00%
S 223	0.00%	0.00%	0.00%	0.00%	0.00%
S 224	0.00%	0.00%	0.00%	0.00%	0.00%
S 225	0.00%	0.00%	0.00%	0.00%	0.00%
S 226	0.00%	0.00%	0.00%	0.00%	0.00%
S 227	0.00%	0.00%	0.00%	0.00%	0.00%
S 228	0.00%	0.00%	0.00%	0.00%	0.00%

S 229	0.00%	0.00%	0.00%	0.00%	0.00%
S 230	0.00%	0.00%	0.00%	0.00%	0.00%
S 231	0.00%	0.00%	0.00%	0.00%	0.00%
S 232	0.00%	0.00%	0.00%	0.00%	0.00%
S 233	0.00%	0.00%	0.00%	0.00%	0.00%
S 234	0.00%	0.00%	0.00%	0.00%	0.00%
S 235	0.00%	0.00%	0.00%	0.00%	0.00%
S 236	0.00%	0.00%	0.00%	0.00%	0.00%
S 237	0.00%	0.00%	0.00%	0.00%	0.00%
S 238	0.00%	0.00%	0.00%	0.00%	0.00%
S 239	0.00%	0.00%	0.00%	0.00%	0.00%
S 240	0.00%	0.00%	0.00%	0.00%	0.00%
S 242	0.00%	0.00%	0.00%	0.00%	0.00%
S 243	0.00%	0.00%	0.00%	0.00%	0.00%
S 244	0.00%	0.00%	0.00%	0.00%	0.00%
S 245	0.00%	0.00%	0.00%	0.00%	0.00%
S 246	0.00%	0.00%	0.00%	0.00%	0.00%
S 247	0.00%	0.00%	0.00%	0.00%	0.00%
S 248	0.00%	0.00%	0.00%	0.00%	0.00%
S 249	0.00%	0.00%	0.00%	0.00%	0.00%
S 250	0.00%	0.00%	0.00%	0.00%	0.00%
S 251	0.00%	0.00%	0.00%	0.00%	0.00%
S 252	0.00%	0.00%	0.00%	0.00%	0.00%
S 253	0.00%	0.00%	0.00%	0.00%	0.00%
S 254	0.00%	0.00%	0.00%	0.00%	0.00%
S 255	0.00%	0.00%	0.00%	0.00%	0.00%
S 256	0.00%	0.00%	0.00%	0.00%	0.00%
S 257	0.00%	0.00%	0.00%	0.00%	0.00%
S 258	0.00%	0.00%	0.00%	0.00%	0.00%
S 259	0.00%	0.00%	0.00%	0.00%	0.00%
S 260	0.00%	0.00%	0.00%	0.00%	0.00%
S 261	0.00%	0.00%	0.00%	0.00%	0.00%
S 262	0.00%	0.00%	0.00%	0.00%	0.00%
S 263	3.5%	0.00%	12.2%	5.3%	0.00%
S 264	0.00%	0.00%	0.00%	0.00%	0.00%
S 265	0.00%	0.00%	0.00%	0.00%	0.00%
S 266	0.00%	0.00%	0.00%	0.00%	0.00%
S 269	0.00%	0.00%	0.00%	0.00%	0.00%
S 270	0.00%	0.00%	0.00%	0.00%	0.00%
S 271	0.00%	0.00%	0.00%	0.00%	0.00%
S 272	0.00%	0.00%	0.00%	0.00%	0.00%
S 273	0.00%	0.00%	0.00%	0.00%	0.00%
S 274	0.00%	0.00%	0.00%	0.00%	0.00%
S 276	0.00%	0.00%	0.00%	0.00%	0.00%
S 277	0.00%	0.00%	0.00%	0.00%	0.00%
S 278	0.00%	0.00%	0.00%	0.00%	0.00%
S 279	0.00%	0.00%	0.00%	0.00%	0.00%
S 280	0.00%	0.00%	0.00%	0.00%	0.00%
S 281	0.00%	0.00%	0.00%	0.00%	0.00%
S 282	0.00%	0.00%	0.00%	0.00%	0.00%
S 283	0.00%	0.00%	0.00%	0.00%	0.00%
S 284	0.00%	0.00%	0.00%	0.00%	0.00%
S 285	0.00%	0.00%	0.00%	0.00%	0.00%
S 286	0.00%	0.00%	0.00%	0.00%	0.00%
S 287	0.00%	0.00%	0.00%	0.00%	0.00%
S 288	0.00%	0.00%	0.00%	0.00%	0.00%
S 289	0.00%	0.00%	0.00%	0.00%	0.00%
S 290	0.00%	0.00%	0.00%	0.00%	0.00%
S 291	0.00%	0.00%	0.00%	0.00%	0.00%
S 292	0.00%	0.00%	0.00%	0.00%	0.00%
S 293	0.00%	0.00%	0.00%	0.00%	0.00%
S 294	0.00%	0.00%	0.00%	0.00%	0.00%
S 295	0.00%	0.00%	0.00%	0.00%	0.00%
S 296	0.00%	0.00%	0.00%	0.00%	0.00%
S 297	0.00%	0.00%	0.00%	0.00%	0.00%
S 298	0.00%	0.00%	0.00%	0.00%	0.00%
S 299	0.00%	0.00%	0.00%	0.00%	0.00%
S 300	0.00%	0.00%	0.00%	0.00%	0.00%
S 301	0.00%	0.00%	0.00%	0.00%	0.00%
S 302	0.00%	0.00%	0.00%	0.00%	0.00%
S 303	0.00%	0.00%	0.00%	0.00%	0.00%
S 304	0.00%	0.00%	0.00%	0.00%	0.00%
S 305	0.00%	0.00%	0.00%	0.00%	0.00%
S 306	0.00%	0.00%	0.00%	0.00%	0.00%
S 307	0.00%	0.00%	0.00%	0.00%	0.00%
S 308	0.00%	0.00%	0.00%	0.00%	0.00%

S 309	0.00%	0.00%	0.00%	0.00%	0.00%
S 310	0.00%	0.00%	0.00%	0.00%	0.00%
S 311	0.00%	0.00%	0.00%	0.00%	0.00%
S 312	0.00%	0.00%	0.00%	0.00%	0.00%
S 313	0.00%	0.00%	0.00%	0.00%	0.00%
S 314	0.00%	0.00%	0.00%	0.00%	0.00%
S 315	0.00%	0.00%	0.00%	0.00%	0.00%
S 316	0.00%	0.00%	0.00%	0.00%	0.00%
S 317	0.00%	0.00%	0.00%	0.00%	0.00%
S 318	0.00%	0.00%	0.00%	0.00%	0.00%
S 319	0.00%	0.00%	0.00%	0.00%	0.00%
S 320	0.00%	0.00%	0.00%	0.00%	0.00%
S 321	0.00%	0.00%	0.00%	0.00%	0.00%
S 322	0.00%	0.00%	0.00%	0.00%	0.00%
S 323	0.00%	0.00%	0.00%	0.00%	0.00%
S 324	0.00%	0.00%	0.00%	0.00%	0.00%
S 325	0.00%	0.00%	0.00%	0.00%	0.00%
S 326	0.00%	0.00%	0.00%	0.00%	0.00%
S 327	0.00%	0.00%	0.00%	0.00%	0.00%
S 328	0.00%	0.00%	0.00%	0.00%	0.00%
S 329	0.00%	0.00%	0.00%	0.00%	0.00%
S 330	0.00%	0.00%	0.00%	0.00%	0.00%
S 331	0.00%	0.00%	0.00%	0.00%	0.00%
S 332	0.00%	0.00%	0.00%	0.00%	0.00%
S 333	0.00%	0.00%	0.00%	0.00%	0.00%
S 334	0.00%	0.00%	0.00%	0.00%	0.00%
S 335	0.00%	0.00%	0.00%	0.00%	0.00%
S 336	0.00%	0.00%	0.00%	0.00%	0.00%
S 337	0.00%	0.00%	0.00%	0.00%	0.00%
S 338	0.00%	0.00%	0.00%	0.00%	0.00%
S 339	0.00%	0.00%	0.00%	0.00%	0.00%
S 340	0.00%	0.00%	0.00%	0.00%	0.00%
S 341	0.00%	0.00%	0.00%	0.00%	0.00%
S 342	0.00%	0.00%	0.00%	0.00%	0.00%
S 343	0.00%	0.00%	0.00%	0.00%	0.00%
S 344	0.00%	0.00%	0.00%	0.00%	0.00%
S 345	0.00%	0.00%	0.00%	0.00%	0.00%
S 346	0.00%	0.00%	0.00%	0.00%	0.00%
S 416	0.2%	0.00%	0.8%	0.0%	0.00%
N 348	0.00%	0.00%	0.00%	0.00%	0.00%
N 349	0.00%	0.00%	0.00%	0.00%	0.00%
N 350	0.00%	0.00%	0.00%	0.00%	0.00%
N 351	0.00%	0.00%	0.00%	0.00%	0.00%
N 352	0.00%	0.00%	0.00%	0.00%	0.00%
N 353	0.00%	0.00%	0.00%	0.00%	0.00%
N 354	0.00%	0.00%	0.00%	0.00%	0.00%
N 355	0.00%	0.00%	0.00%	0.00%	0.00%
N 356	0.00%	0.00%	0.00%	0.00%	0.00%
N 357	0.00%	0.00%	0.00%	0.00%	0.00%
N 358	0.00%	0.00%	0.00%	0.00%	0.00%
N 359	0.00%	0.00%	0.00%	0.00%	0.00%
N 360	0.00%	0.00%	0.00%	0.00%	0.00%
N 361	0.00%	0.00%	0.00%	0.00%	0.00%
N 362	0.00%	0.00%	0.00%	0.00%	0.00%
N 363	0.00%	0.00%	0.00%	0.00%	0.00%
N 364	0.2%	0.00%	0.8%	0.0%	0.00%
N 365	0.1%	0.00%	0.2%	0.0%	0.00%
N 366	0.2%	0.00%	0.5%	0.0%	0.00%
N 367	0.2%	0.00%	0.6%	0.0%	0.00%
N 368	0.1%	0.00%	0.2%	0.0%	0.00%
N 369	0.00%	0.00%	0.00%	0.00%	0.00%
N 370	0.00%	0.00%	0.00%	0.00%	0.00%
N 371	0.00%	0.00%	0.00%	0.00%	0.00%
N 372	0.00%	0.00%	0.00%	0.00%	0.00%
N 373	0.00%	0.00%	0.00%	0.00%	0.00%
N 374	0.00%	0.00%	0.00%	0.00%	0.00%
N 375	0.00%	0.00%	0.00%	0.00%	0.00%
N 376	0.2%	0.00%	0.2%	0.0%	0.00%
N 377	0.2%	0.00%	0.3%	0.0%	0.00%
N 378	0.00%	0.00%	0.00%	0.00%	0.00%
N 379	0.00%	0.00%	0.00%	0.00%	0.00%
N 380	0.00%	0.00%	0.00%	0.00%	0.00%
N 381	0.00%	0.00%	0.00%	0.00%	0.00%
N 382	0.00%	0.00%	0.00%	0.00%	0.00%
N 383	0.00%	0.00%	0.00%	0.00%	0.00%
N 384	0.00%	0.00%	0.00%	0.00%	0.00%

N 385	0.00%	0.00%	0.00%	0.00%	0.00%
N 386	0.00%	0.00%	0.00%	0.00%	0.00%
N 387	0.00%	0.00%	0.00%	0.00%	0.00%
N 388	0.00%	0.00%	0.00%	0.00%	0.00%
N 389	0.00%	0.00%	0.00%	0.00%	0.00%
N 390	0.00%	0.00%	0.00%	0.00%	0.00%
N 391	0.00%	0.00%	0.00%	0.00%	0.00%
N 392	0.00%	0.00%	0.00%	0.00%	0.00%
N 393	0.00%	0.00%	0.00%	0.00%	0.00%
N 394	0.00%	0.00%	0.00%	0.00%	0.00%
N 395	0.00%	0.00%	0.00%	0.00%	0.00%
N 396	0.00%	0.00%	0.00%	0.00%	0.00%
N 397	0.00%	0.00%	0.00%	0.00%	0.00%
N 398	0.00%	0.00%	0.00%	0.00%	0.00%
N 399	0.00%	0.00%	0.00%	0.00%	0.00%
N 400	0.00%	0.00%	0.00%	0.00%	0.00%
N 401	0.00%	0.00%	0.00%	0.00%	0.00%
N 402	0.00%	0.00%	0.00%	0.00%	0.00%
N 403	0.00%	0.00%	0.00%	0.00%	0.00%
N 404	0.00%	0.00%	0.00%	0.00%	0.00%
N 405	0.00%	0.00%	0.00%	0.00%	0.00%
N 406	0.00%	0.00%	0.00%	0.00%	0.00%
N 407	0.00%	0.00%	0.00%	0.00%	0.00%
N 408	0.00%	0.00%	0.00%	0.00%	0.00%
N 409	0.00%	0.00%	0.00%	0.00%	0.00%
N 410	0.00%	0.00%	0.00%	0.00%	0.00%
N 411	0.00%	0.00%	0.00%	0.00%	0.00%
N 412	0.00%	0.00%	0.00%	0.00%	0.00%
N 413	0.00%	0.00%	0.00%	0.00%	0.00%
N 414	0.00%	0.00%	0.00%	0.00%	0.00%

Table B3 Maximum Predicted Frequency of Exceedance of CACs without background

Contaminants	CO		NO2		SO2	
Averaging Period	1-hr	8-hr	1-hr	Annual	1-hr	Annual
Sensitive Receptors	Frequency of Exceedance (%) without Background Concentration					
S 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 18	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 22	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 24	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 25	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%
S 26	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 31	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 32	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 36	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 37	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 40	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 41	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 43	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 44	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 45	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 46	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 47	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 48	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 49	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 51	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 52	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 53	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 54	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 55	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 56	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 58	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 59	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 61	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%
S 62	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 63	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
S 64	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 65	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 66	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 67	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 68	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 69	0.00%	0.00%	0.55%	0.00%	0.00%	0.00%
S 70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 71	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 72	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 74	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 75	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 76	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 77	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 78	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 79	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 80	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 81	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 82	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 83	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 84	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 85	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 86	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 87	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 88	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 89	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 90	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 91	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 92	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 93	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 94	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 95	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 96	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 97	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 98	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 101	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 102	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 103	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 104	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 105	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 106	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 107	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 108	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 109	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 110	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 111	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 112	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 113	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 114	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 115	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 116	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 117	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 118	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 119	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 120	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 121	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 122	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 123	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 124	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 125	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 126	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 127	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 128	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 129	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 130	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 131	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 132	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 133	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 134	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 135	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 137	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 138	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 139	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 140	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 141	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 142	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 143	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 144	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 145	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 146	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 147	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 148	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 149	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 150	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 151	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 152	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 153	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 154	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 155	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 156	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 157	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 158	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 159	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 160	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 161	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 162	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 163	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 164	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 165	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 166	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 167	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 168	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 169	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 170	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 171	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 172	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 173	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 174	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 175	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 176	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 177	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 178	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%
S 179	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 180	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 181	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 182	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 183	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 184	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 185	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 186	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 187	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 188	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 189	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 190	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 191	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 192	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 193	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 194	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 195	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 196	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 197	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 199	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 200	0.00%	0.00%	9.52%	0.00%	0.00%	0.00%
S 201	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 202	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 203	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 204	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 205	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 206	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 207	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 209	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 210	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 211	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 213	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 214	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 215	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 216	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 217	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 218	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 219	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 220	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 221	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 222	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 223	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 224	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 225	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 226	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 227	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 228	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 229	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 230	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 231	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 232	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 233	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 234	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 235	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 236	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 237	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 238	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 239	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 240	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 242	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 243	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 244	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 245	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 246	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 247	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 248	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 249	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 250	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 251	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 252	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 253	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 254	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 255	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 256	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 257	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 258	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 259	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 260	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 261	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 262	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 263	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 264	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 265	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 266	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 269	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 270	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 271	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 272	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 273	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 274	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 276	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 277	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 278	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 279	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 280	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 281	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 282	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 283	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 284	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 285	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 286	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 287	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 288	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 289	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 290	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 291	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 292	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 293	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 294	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 295	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 296	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 297	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 298	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 301	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 302	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 303	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 304	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 305	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 306	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 307	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 308	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 309	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 310	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 311	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 312	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 313	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 314	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 315	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 316	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 317	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 318	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 319	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 320	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 321	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 322	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 323	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 324	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 325	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 326	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 327	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 328	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 329	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 330	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 331	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 332	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 333	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 334	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 335	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 336	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 337	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 338	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 339	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 340	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 341	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 342	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 343	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 344	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 345	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 346	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 416	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 348	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 349	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 350	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 351	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 352	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 353	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 354	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 355	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 356	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 357	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 358	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 359	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 360	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 361	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 362	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 363	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 364	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 365	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 366	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 367	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 368	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 369	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 370	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 371	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 372	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 373	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 374	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 375	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 376	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 377	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 378	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 379	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 380	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 381	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 382	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

N 383	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 384	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 385	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 386	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 387	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 388	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 389	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 390	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 391	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 392	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 393	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 394	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 395	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 396	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 397	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 398	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 399	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 401	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 402	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 403	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 404	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 405	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 406	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 407	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 408	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 409	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 410	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 411	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 412	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 413	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 414	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table B4 Maximum Predicted Frequency of Exceedance of CACs with background

Contaminants	CO		NO2		SO2	
Averaging Period	**1-hr**	**8-hr**	**1-hr**	**Annual**	**1-hr**	**Annual**
Sensitive Receptors	Frequency of Exceedance (%) with Background Concentration					
S 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 5	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 11	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 12	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 15	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 16	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 18	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 20	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 21	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 22	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 23	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 24	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 25	0.00%	0.00%	1.75%	0.00%	0.00%	0.00%
S 26	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 27	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 28	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 29	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 30	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 31	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 32	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 33	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 34	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 35	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 36	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 37	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 38	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 39	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 40	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 41	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 42	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 43	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 44	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 45	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 46	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 47	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 48	0.00%	0.00%	2.26%	0.00%	0.00%	0.00%
S 49	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 51	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 52	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 53	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 54	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 55	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 56	0.00%	0.00%	0.004%	0.00%	0.00%	0.00%
S 57	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 58	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 59	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 61	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%
S 62	0.00%	0.00%	0.12%	0.00%	0.00%	0.00%
S 63	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%
S 64	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
S 65	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%
S 66	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 67	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 68	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 69	0.00%	0.00%	4.33%	0.00%	0.00%	0.00%
S 70	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 71	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 72	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 74	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 75	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 76	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 77	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 78	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 79	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 80	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 81	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 82	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 83	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 84	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 85	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 86	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 87	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 88	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 89	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 90	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 91	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 92	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 93	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 94	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 95	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 96	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 97	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 98	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 101	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 102	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 103	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 104	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 105	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 106	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 107	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 108	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 109	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 110	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 111	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 112	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 113	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 114	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 115	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 116	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 117	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 118	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 119	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 120	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 121	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 122	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 123	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 124	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 125	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 126	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 127	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 128	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 129	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 130	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 131	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 132	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 133	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 134	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 135	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 137	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 138	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 139	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 140	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 141	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 142	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 143	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 144	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 145	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 146	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 147	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 148	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 149	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 150	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 151	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 152	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 153	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 154	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 155	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 156	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 157	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 158	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 159	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 160	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 161	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 162	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 163	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 164	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 165	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 166	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 167	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 168	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 169	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 170	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 171	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 172	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 173	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 174	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 175	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 176	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 177	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 178	0.00%	0.00%	2.81%	0.00%	0.00%	0.00%
S 179	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
S 180	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%
S 181	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 182	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 183	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 184	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 185	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 186	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 187	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 188	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 189	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 190	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 191	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 192	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 193	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 194	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 195	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 196	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 197	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 199	0.00%	0.00%	0.84%	0.00%	0.00%	0.00%
S 200	0.00%	0.00%	23.86%	0.00%	0.00%	0.00%
S 201	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%
S 202	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 203	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 204	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 205	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
S 206	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%
S 207	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 209	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 210	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 211	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 212	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 213	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 214	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 215	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 216	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 217	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 218	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 219	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 220	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 221	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 222	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 223	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 224	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 225	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 226	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 227	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 228	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 229	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 230	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 231	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 232	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 233	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 234	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 235	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 236	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 237	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 238	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 239	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 240	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 242	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 243	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 244	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 245	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 246	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 247	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 248	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 249	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 250	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 251	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 252	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 253	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 254	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 255	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 256	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 257	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 258	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 259	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 260	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 261	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 262	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 263	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%
S 264	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 265	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 266	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 269	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 270	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 271	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 272	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 273	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 274	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 276	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 277	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 278	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 279	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 280	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 281	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 282	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 283	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 284	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 285	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 286	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 287	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 288	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 289	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 290	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 291	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 292	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 293	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 294	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 295	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 296	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 297	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 298	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 301	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 302	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 303	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 304	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 305	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 306	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

S 307	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 308	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 309	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 310	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 311	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 312	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 313	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 314	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 315	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 316	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 317	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 318	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 319	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 320	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 321	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 322	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 323	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 324	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 325	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 326	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 327	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 328	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 329	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 330	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 331	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 332	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 333	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 334	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 335	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 336	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 337	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 338	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 339	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 340	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 341	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 342	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 343	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 344	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 345	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 346	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
S 416	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 348	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 349	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 350	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 351	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 352	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 353	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 354	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 355	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 356	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 357	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 358	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 359	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 360	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 361	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 362	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 363	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 364	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 365	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 366	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
N 367	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 368	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
N 369	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 370	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 371	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 372	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 373	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 374	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 375	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 376	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 377	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 378	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 379	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 380	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 381	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 382	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

N 383	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 384	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 385	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 386	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 387	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 388	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 389	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 390	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 391	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 392	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 393	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 394	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 395	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 396	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 397	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 398	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 399	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 400	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 401	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 402	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 403	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 404	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 405	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 406	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 407	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 408	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 409	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 410	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 411	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 412	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 413	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
N 414	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%