Appendix 9-D

CALPUFF Model Input Parameters

APPENDIX 9-D. CALPUFF MODEL INPUT PARAMETERS

Table 9-D1. Building Dimensions

Name	Height (m)	X Length (m)	Y Length (m)
Constriction			
Camp (600 man camp)	6	212	170
Truck shop, wash and mine dry	21	177	31
Concentrator	30	254	48
Warehouse	10	50	28
Camp (600 man camp)	6	212	170
Operation			
Truck shop, wash and mine dry	21	177	31
Concentrator	30	254	48
Warehouse	10	50	28

Table 9-D2. Implementation of Point Sources

Emission Source	Location	UTM Coordinates (mE)	UTM Coordinates (mN)	Stack Height (m above ground)	Stack Inner Diameter (m)	Velocity m/s	Exhaust Temperature (°C)	Emission Rates (g/s) TSP	Emission Rates (g/s) PM_{10}	Emission Rates (g/s) $PM_{2.5}$
Construction										
Diesel generator	Substation area	305492	5709709	10.0	0.50	22.5	490	0.097	0.097	0.097
Diesel generator	Substation area	305492	5709700	10.0	0.50	22.5	490	0.097	0.097	0.097
Diesel generator	Substation area	305492	5709718	10.0	0.50	22.5	490	0.097	0.097	0.097
Incinerator	Near temporary construction camp	305692	5710472	8.0	0.20	16.4	1,000	0.321	0.160	0.107
Operations										
Incinerator[a]	Near temporary construction camp	305692	5710472	8.0	0.20	16.4	1,000	0.011	0.011	0.010
Primary crusher EP001	Primary crusher building	304180	5710361	20	0.5	13.2	5.0	0.129	0.129	0.129
Lime silo vent EP005	Lime silo	305291	5709692	20	0.2	10.6	0.7	0.017	0.017	0.017
Bucking room EP008	Mill	305364	5709738	5	0.5	17.8	0.7	0.175	0.175	0.175

[a] *The incinerator was included in the modelling study during operation, however due to a change in design, the incinerator will only be used during construction.*

Table 9-D3. Implementation of Volume Sources

Emission Source	Location	Emission Rate (g/m^3-s) TSP	Emission Rate (g/m^3-s) PM_{10}	Emission Rate (g/m^3-s) $PM_{2.5}$
Construction				
Material handling	Open pit (truck loading)	0.201	0.095	0.014
Operations				
Material handling	Open pit (truck loading)	0.307	0.145	0.022
	Plant site (conveyor drop off)	0.131	0.062	0.009

Table 9-D4. Implementation of Area Sources

Emission Source	Location	Modelled Area (m^2)	Emission Rate (g/m^2-s)		
			TSP	PM_{10}	$PM_{2.5}$
Construction					
Vehicle Emissions (exhaust)	Open pit (north)	98,863	8.0E-07	8.0E-07	7.8E-07
	Open pit (south)	364,838	8.0E-07	8.0E-07	7.8E-07
	Non-PAG low-grade	69,135	6.9E-08	6.9E-08	6.7E-08
	North top soil stockpile	81,180	6.9E-08	6.9E-08	6.7E-08
	West top soil stockpile	131,191	6.9E-08	6.9E-08	6.7E-08
	PAG low-grade	253,359	6.9E-08	6.9E-08	6.7E-08
	Non-PAG waste rock	105,775	6.9E-08	6.9E-08	6.7E-08
	South top soil stockpile	69,013	6.9E-08	6.9E-08	6.7E-08
	Tailings dam	148,606	6.9E-08	6.9E-08	6.7E-08
	Road (pit to crusher)	59,304	7.6E-07	7.6E-07	7.4E-07
	Roads (crusher to plant site)	78,411	5.4E-08	5.4E-08	5.3E-08
	Access road (plant site to edge of Vavenby)	198,461	4.5E-08	4.5E-08	4.4E-08
	Access road (Vavenby)	10,444	4.5E-08	4.5E-08	4.4E-08
	Access road (Vavenby to highway)	10,541	3.4E-08	3.4E-08	3.3E-08
	Access road (Vavenby to rail)	42,878	1.2E-08	1.2E-08	1.1E-08
	Plant site	189,591	2.2E-08	2.2E-08	2.1E-08
Unpaved Road Dust (fugitive dust)	Open pit a (north)	98,863	3.97E-05	1.05E-05	1.05E-06
	Open pit b (south)	364,838	3.97E-05	1.05E-05	1.05E-06
	Road (pit to crusher)	59,304	6.27E-05	1.66E-05	1.66E-06
	Roads (crusher to plant site)	78,411	2.29E-05	6.07E-06	6.07E-07
	Access road (plant site to edge of Vavenby)	198,461	4.32E-05	1.14E-05	1.14E-06
Paved Road Dust (Summer)	Access road	10444	4.60E-06	8.83E-07	2.14E-07
Paved Road Dust (Winter)	Access road	10444	1.19E-05	2.28E-06	5.51E-07

Table 9-D4. Implementation of Area Sources

Emission Source	Location	Modelled Area (m^2)	Emission Rate (g/m^2-s)		
			TSP	PM_{10}	$PM_{2.5}$
Construction *(cont'd)*					
Blasting	Open Pit	463,702	1.0E-06	5.2E-07	3.0E-08
Drilling	Open Pit	463,702	3.7E-07	1.9E-07	5.6E-08
Grading	Roads	137,715	5.8E-07	1.7E-07	1.8E-08
Bulldozing	Open pit/stockpiles/tailings dam	1,321,960	1.1E-06	2.1E-07	1.2E-07
Material handling	North top soil stockpile	81,180	1.1E-06	5.2E-07	7.9E-08
	West top soil stockpile	131,191	4.2E-07	2.0E-07	3.0E-08
	South top soil stockpile	69,013	2.4E-07	1.1E-07	1.7E-08
	Overburden stockpile	17,954	2.7E-07	1.3E-07	1.9E-08
	Non PAG low grade	69,135	2.7E-07	1.3E-07	2.0E-08
	PAG stockpile	253,359	1.3E-07	6.1E-08	9.2E-09
	Non PAG waste rock	105,775	2.7E-07	1.3E-07	2.0E-08
Operations					
Vehicle Emissions (exhaust)	Open pit	2,315,402	1.3E-07	1.3E-07	1.2E-07
	Stockpile 4 (PAG low-grade)	395,669	2.4E-09	2.4E-09	2.4E-09
	Stockpile 5 (non-PAG waste rock)	349,723	2.4E-09	2.4E-09	2.4E-09
	Stockpile 7	699,226	2.4E-09	2.4E-09	2.4E-09
	Stockpile 8	500,261	2.4E-09	2.4E-09	2.4E-09
	Road (pit to crusher)	59,304	1.6E-07	1.6E-07	1.6E-07
	Roads (crusher to plant site)	78,411	3.6E-08	3.6E-08	3.5E-08
	Access road (plant site to edge of Vavenby)	197,542	3.0E-08	3.0E-08	2.9E-08
	Access road (Vavenby)	10,444	3.0E-08	3.0E-08	2.9E-08
	Access road (Vavenby to highway)	10,541	2.6E-08	2.6E-08	2.6E-08
	Access road (Vavenby to rail)	42,977	3.9E-09	3.9E-09	3.8E-09
	Plant site	189,591	3.4E-09	3.4E-09	3.3E-09

Table 9-D4. Implementation of Area Sources

Emission Source	Location	Modelled Area (m^2)	Emission Rate (g/m^2-s)		
			TSP	PM_{10}	$PM_{2.5}$
Operations *(cont'd)*					
Unpaved Road Dust (fugitive dust)	Open pit	2,314,870	1.70E-05	4.51E-06	5.26E-07
	Road (pit to crusher)	59,304	4.75E-05	1.26E-05	1.33E-06
	Roads (crusher to plant site)	78,411	3.05E-05	8.06E-06	8.06E-07
	Access road (plant site to edge of Vavenby)	198,464	5.08E-05	1.34E-05	1.34E-06
Paved Road Dust (Summer)	Access road	10444	2.4E-05	4.7E-06	1.1E-06
Paved Road Dust (Winter)	Access road	10444	4.6E-05	8.8E-06	2.1E-06
Blasting	Open Pit	2,315,402	4.8E-07	2.5E-07	1.4E-08
Drilling	Open Pit	2,315,402	1.7E-07	8.5E-08	2.5E-08
Grading	Roads	137,715	5.8E-07	1.7E-07	1.8E-08
Bulldozing	Open pit/stockpiles/tailings dam	4,260,282	3.0E-07	5.6E-08	3.1E-08
Stockpiles	PAG stockpile	395,669	1.4E-07	6.5E-08	9.8E-09
	Non PAG waste rock	699,226	8.4E-08	4.0E-08	6.0E-09
	Non PAG low grade	349,723	8.4E-08	4.0E-08	6.0E-09
	Overburden stockpile	500,261	1.2E-11	5.8E-12	8.8E-13

Table 9-D5. CALPUFF Model Switch Settings

Parameter	Recommended Value	Project	Explanation and Justification
MGAUSS	1	1	
MCTADJ	3	3	
MCTSG	0	0	
MSLUG	0	0	
MTRANS	1	1	
MBDW	2	2	
MTIP	1	1	
MSHEAR	0	0	
MSPLIT	0	0	
MCHEM	1	0	Chemical transformation not modelled
MAQCHEM	0	0	
MWET	1	1	
MDRY	1	1	
MDISP	2 or 3	2	
MTURBVW	(3)	(3)	Not used (only used if MDISP = 1 or 5)
MDISP2	(2)	(2)	Not used (only used if MDISP = 1 or 5)
MROUGH	0	0	
MPARTL	1	1	
MTINV	0	0	
MPDF	0 or 1	1	
MSGTIBL	0	0	
MBCON	0	0	
MFOG	0	0	
MREG	0	0	