APPENDIX D4:B

Appendix D4:B Calpuff source information

Calpuff was setup with the parameters as described in *Chapter B16, Appendix A*, using a three-dimensional wind field prepared using TAPM/Calmet. Aircraft were modelled using the following general approach:

- Emissions from Commercial and General Aviation were subdivided into Taxi, Takeoff and Approach/Climbout sections
- The taxi emissions were modelled as an area source covering the taxi and runway areas
- The takeoff emissions were modelled as an area source limited to the new runway area
- The approach/climbout emissions were modelled as a two 250 m wide area sources, 100 m and 250 m above ground, stretching 3 km in total past the western end of the runway
- Helicopter emissions are spread over volume sources in the following way:
    - 1 volume source at 5 m for taxi/idle emissions
    - 3 volume sources between 40 m and 160 m covering takeoff and one fifth of the approach emissions
    - 3 volume sources between 250 m and 750 m covering climbout and the remaining approach emissions
- VOC emissions from the fuel storage facility were modelled as a volume source at the height of the breather pipe vents. Source characteristics are provided in Table 32.
- VOC emissions from aircraft refuelling were modelled as a volume source based on the dimensions of a typical commercial aircraft (12m high, wingspan and length of approximately 35m). Source characteristics are provided in Table 32.

Details of the inputs are presented in **Table 1** (area sources) and **Table 2** (volume sources)

Table 1 Area source inputs

Source	X coordinates (m)	Y coordinates (m)	Effective height (m)	Initial sigma Z (m)	Emission rates (g/m²/s)			
					CO	NOx	SO2	PM
Approach	507298.5	7060112	100	50	8.95E-06	1.12E-06	1.11E-07	3.23E-07
	507097.9	7059962						
	506201	7061169						
	506401.6	7061318						
Approach	506401.6	7061318	250	75	8.95E-06	1.12E-06	1.11E-07	3.23E-07
	506201	7061169						
	505304	7062375						
	505504.6	7062525						
Runway	509154.8	7057507	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	509115.1	7057477						
	508844.5	7057829						
	508884.2	7057859						
Runway	508884.2	7057859	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	508844.5	7057829						
	508573.9	7058181						
	508613.5	7058212						
Runway	508613.5	7058212	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	508573.9	7058181						
	508303.2	7058533						
	508342.9	7058564						

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Source	X coordinates (m)	Y coordinates (m)	Effective height (m)	Initial sigma Z (m)	Emission rates (g/m²/s)			
					CO	NOx	SO2	PM
Runway	508342.9	7058564	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	508303.2	7058533						
	508032.6	7058886						
	508072.3	7058916						
Runway	508072.3	7058916	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	508032.6	7058886						
	507762	7059238						
	507801.6	7059268						
Runway	507801.6	7059268	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	507762	7059238						
	507491.4	7059590						
	507531	7059621						
Runway	507531	7059621	10	5	6.99E-06	1.11E-05	5.66E-07	4.27E-07
	507491.4	7059590						
	507220.7	7059942						
	507260.4	7059973						
Taxi	507321.9	7059484	10	5.0	8.44E-06	1.15E-06	3.05E-07	3.31E-08
	507519.1	7059638						
	508341.9	7058582						
	508144.7	7058428						
Taxi	508144.7	7058428	10	5.0	8.44E-06	1.15E-06	3.05E-07	3.31E-08
	508341.9	7058582						
	509164.8	7057526						
	508967.6	7057373						

Table 2 Volume source inputs (helicopters)

Source	X coordinate (m)	Y coordinate (m)	Effective height (m)	Initial sigma Z (m)	Emission rates (g/s)			
					CO	NOx	SO2	PM
Level 1	507900	7058650	5	5	2.851	0.054	0.033	0.088
Level 2			40	20	0.045	0.001	0.001	0.112
Level 3			100	20	0.045	0.001	0.001	0.112
Level 4			160	20	0.045	0.001	0.001	0.112
Level 5			250	100	3.968	0.020	0.003	0.730
Level 6			500	100	3.968	0.020	0.003	0.730
Level 7			750	100	3.968	0.020	0.003	0.730

Table 3 Volume source inputs (fuel storage and aircraft refuelling)

Source	X coordinate (m)	Y coordinate (m)	Effective height (m)	Initial sigma Z (m)	VOC emission rates (g/s)				
					1,3-butadiene	Benzene	Formalde hyde	Xylene	Toluene
Fuel storage	508811	7057114	5.5	2.6	0.002	0.005	0.013	0.035	0.025
Aircraft refuelling	508919	7057311	5.9	5.5	0.003	0.01	0.023	0.064	0.045