

# Riverside Energy Park

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## Environmental Statement

### Appendix C.2 Stack Modelling

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VOLUME NUMBER:

**06**

PLANNING INSPECTORATE REFERENCE NUMBER:

**EN010093**

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DOCUMENT REFERENCE:

**6.3**

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May 2019 | Revision 1 (Deadline 2) | APFP Regulation 5(2)(a)

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Planning Act 2008 | Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

## C.2.1 Baseline Point Sources and Emissions

Table C.2.1.1 Input Parameters for Point Sources Modelled for Baseline Concentrations

Source Name	Crossness Sewage Sludge Incinerator	Riverside Resource Recovery Facility
OS Grid Co-ordinate X	549150	549700
OS Grid Co-ordinate Y	180740	180574
Stack height (m)	60	90
Diameter (m)	1.27	3.93
Flue gas temperature (°C)	120	129
Exit Velocity (m/s)	26.1	21

Table C.2.1.2 Modelled Emission Rates for Baseline Point Sources

Pollutant	Emission Rate (g/s)	
	Crossness Sewage Sludge Incinerator	Riverside Resource Recovery Facility
Arsenic	3.2 x 10 <sup>-5</sup>	0.003
Benzene	-	1.53
Benzo(a)pyrene	3.2 x 10 <sup>-5</sup>	1.4 x 10 <sup>-5</sup>
Cadmium	3.2 x 10 <sup>-5</sup>	0.008
Chromium VI	-	2.0 x 10 <sup>-5</sup>
Lead	0.003	0.077
Manganese	-	0.077
Nickel	-	0.077
Nitrogen Dioxide	3.2	21.4
Particulates (PM <sub>10</sub> /PM <sub>2.5</sub> )	0.3	1.53



## C.2.2 Impact of ERF Emissions – Human Receptors

Table C.2.2.1 Predicted Annual Arsenic Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (% of EAL)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$7.42 \times 10^{-5}$	2.47%	$9.9 \times 10^{-4}$	$1.13 \times 10^{-4}$	$1.10 \times 10^{-3}$	36.7%	Negligible
R2	$7.67 \times 10^{-5}$	2.56%		$9.87 \times 10^{-5}$	$1.09 \times 10^{-3}$	36.3%	Negligible
R3	$7.98 \times 10^{-5}$	2.66%		$1.33 \times 10^{-4}$	$1.12 \times 10^{-3}$	37.4%	Negligible
R4	$2.82 \times 10^{-5}$	0.94%		$6.04 \times 10^{-5}$	$1.05 \times 10^{-3}$	35.0%	Negligible
R5	$8.98 \times 10^{-5}$	2.99%		$1.30 \times 10^{-4}$	$1.12 \times 10^{-3}$	37.3%	Negligible
R6	$7.30 \times 10^{-5}$	2.43%		$1.51 \times 10^{-4}$	$1.14 \times 10^{-3}$	38.0%	Negligible
R7	$1.29 \times 10^{-4}$	4.31%		$2.29 \times 10^{-4}$	$1.22 \times 10^{-3}$	40.6%	Negligible
R8	$1.69 \times 10^{-4}$	5.65%		$2.53 \times 10^{-4}$	$1.24 \times 10^{-3}$	41.4%	Minor
R8B	$1.66 \times 10^{-4}$	5.54%		$2.55 \times 10^{-4}$	1.24E-03	41.5%	Minor
R9	$2.66 \times 10^{-5}$	0.89%		$3.96 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.3%	Negligible
R10	$2.42 \times 10^{-5}$	0.81%		$3.56 \times 10^{-5}$	$1.02 \times 10^{-3}$	34.2%	Negligible
R11	$9.65 \times 10^{-5}$	3.22%		$1.45 \times 10^{-4}$	$1.13 \times 10^{-3}$	37.8%	Negligible
R12	$2.87 \times 10^{-5}$	0.96%		$4.27 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.4%	Negligible
R13	$3.27 \times 10^{-5}$	1.09%		$5.02 \times 10^{-5}$	$1.04 \times 10^{-3}$	34.6%	Negligible
R14	$2.74 \times 10^{-5}$	0.91%		$4.17 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.4%	Negligible
R15	$8.63 \times 10^{-5}$	2.88%		$1.28 \times 10^{-4}$	$1.12 \times 10^{-3}$	37.2%	Negligible
R16	$7.42 \times 10^{-5}$	2.47%		$1.19 \times 10^{-4}$	$1.11 \times 10^{-3}$	36.9%	Negligible
R16B	$6.82 \times 10^{-5}$	2.27%		$1.09 \times 10^{-4}$	$1.10 \times 10^{-3}$	36.6%	Negligible
R17	$8.38 \times 10^{-5}$	2.79%		$1.20 \times 10^{-4}$	$1.11 \times 10^{-3}$	37.0%	Negligible
R18A 1st	$1.37 \times 10^{-4}$	4.58%		$2.40 \times 10^{-4}$	$1.23 \times 10^{-3}$	41.0%	Negligible
R18B 4th	$1.38 \times 10^{-4}$	4.58%		$2.40 \times 10^{-4}$	$1.23 \times 10^{-3}$	41.0%	Negligible
R19A 1st	$1.12 \times 10^{-4}$	3.75%		$1.35 \times 10^{-4}$	$1.12 \times 10^{-3}$	37.5%	Negligible
R19B 6th	$1.14 \times 10^{-4}$	3.81%		$1.39 \times 10^{-4}$	$1.13 \times 10^{-3}$	37.6%	Negligible
R20A GF	$1.35 \times 10^{-4}$	4.50%		$2.39 \times 10^{-4}$	$1.23 \times 10^{-3}$	40.9%	Negligible
R20B 5th	$1.35 \times 10^{-4}$	4.51%		$2.40 \times 10^{-4}$	$1.23 \times 10^{-3}$	41.0%	Negligible
R21	$2.45 \times 10^{-5}$	0.82%		$3.68 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.2%	Negligible
R22	$1.22 \times 10^{-4}$	4.06%		$2.09 \times 10^{-4}$	$1.20 \times 10^{-3}$	39.9%	Negligible
R23	$3.82 \times 10^{-5}$	1.27%	$6.29 \times 10^{-5}$	$1.05 \times 10^{-3}$	35.1%	Negligible	
R24	$2.38 \times 10^{-5}$	0.79%	$3.95 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.3%	Negligible	
R25	$2.34 \times 10^{-5}$	0.78%	$3.90 \times 10^{-5}$	$1.03 \times 10^{-3}$	34.3%	Negligible	
R26	$5.43 \times 10^{-5}$	1.81%	8.42E-05	$1.07 \times 10^{-3}$	35.8%	Negligible	
R27	$1.33 \times 10^{-5}$	0.44%	$2.28 \times 10^{-5}$	$1.01 \times 10^{-3}$	33.7%	Negligible	



Table C.2.2.2 Predicted Annual Average Benzene Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$2.97 \times 10^{-2}$	0.59%	$6.20 \times 10^{-1}$	0.0492	0.6694	13.39%	Negligible
R2	$3.07 \times 10^{-2}$	0.61%	$6.27 \times 10^{-1}$	0.0416	0.6687	13.37%	Negligible
R3	$3.19 \times 10^{-2}$	0.64%	$6.84 \times 10^{-1}$	0.0583	0.7424	14.85%	Negligible
R4	$1.13 \times 10^{-2}$	0.23%	$4.27 \times 10^{-1}$	0.0276	0.4545	9.09%	Negligible
R5	$3.59 \times 10^{-2}$	0.72%	$6.45 \times 10^{-1}$	0.0557	0.7005	14.01%	Negligible
R6	$2.92 \times 10^{-2}$	0.58%	$4.39 \times 10^{-1}$	0.0685	0.5079	10.16%	Negligible
R7	$5.17 \times 10^{-2}$	1.03%	$5.52 \times 10^{-1}$	0.1020	0.6541	13.08%	Negligible
R8	$6.78 \times 10^{-2}$	1.36%	$5.61 \times 10^{-1}$	0.1096	0.6708	13.42%	Negligible
R8B	$6.65 \times 10^{-2}$	1.33%	$7.00 \times 10^{-1}$	0.1110	0.6722	13.44%	Negligible
R9	$1.07 \times 10^{-2}$	0.21%	$5.90 \times 10^{-1}$	0.0171	0.7171	14.34%	Negligible
R10	$9.70 \times 10^{-3}$	0.19%	$5.61 \times 10^{-1}$	0.0154	0.6058	12.12%	Negligible
R11	$3.86 \times 10^{-2}$	0.77%	$7.11 \times 10^{-1}$	0.0628	0.6241	12.48%	Negligible
R12	$1.15 \times 10^{-2}$	0.23%	$9.06 \times 10^{-1}$	0.0184	0.7292	14.58%	Negligible
R13	$1.31 \times 10^{-2}$	0.26%	$7.11 \times 10^{-1}$	0.0218	0.9273	18.55%	Negligible
R14	$1.09 \times 10^{-2}$	0.22%	$5.61 \times 10^{-1}$	0.0181	0.7289	14.58%	Negligible
R15	$3.45 \times 10^{-2}$	0.69%	$6.20 \times 10^{-1}$	0.0555	0.6167	12.33%	Negligible
R16	$2.97 \times 10^{-2}$	0.59%	$6.45 \times 10^{-1}$	0.0519	0.6721	13.44%	Negligible
R16B	$2.73 \times 10^{-2}$	0.55%	$5.52 \times 10^{-1}$	0.0475	0.6677	13.35%	Negligible
R17	$3.35 \times 10^{-2}$	0.67%	$5.61 \times 10^{-1}$	0.0514	0.6962	13.92%	Negligible
R18A 1st	$5.49 \times 10^{-2}$	1.10%	$6.20 \times 10^{-1}$	0.1066	0.6587	13.17%	Negligible
R18B 4th	$5.50 \times 10^{-2}$	1.10%	$6.27 \times 10^{-1}$	0.1069	0.6590	13.18%	Negligible
R19A 1st	$4.50 \times 10^{-2}$	0.90%	$6.27 \times 10^{-1}$	0.0559	0.6830	13.66%	Negligible
R19B 6th	$4.58 \times 10^{-2}$	0.92%	$5.52 \times 10^{-1}$	0.0580	0.6851	13.70%	Negligible
R20A GF	$5.40 \times 10^{-2}$	1.08%	$5.52 \times 10^{-1}$	0.1065	0.6586	13.17%	Negligible
R20B 5th	$5.42 \times 10^{-2}$	1.08%	$5.52 \times 10^{-1}$	0.1069	0.6591	13.18%	Negligible
R21	$9.79 \times 10^{-3}$	0.20%	$6.99 \times 10^{-1}$	0.0159	0.7146	14.29%	Negligible
R22	$4.87 \times 10^{-2}$	0.97%	$5.52 \times 10^{-1}$	0.0927	0.6449	12.90%	Negligible
R23	$1.53 \times 10^{-2}$	0.31%	$6.46 \times 10^{-1}$	0.0276	0.6734	13.47%	Negligible
R24	$9.53 \times 10^{-3}$	0.19%	$6.27 \times 10^{-1}$	0.0174	0.6442	12.88%	Negligible
R25	$9.38 \times 10^{-3}$	0.19%	$6.27 \times 10^{-1}$	0.0172	0.6439	12.88%	Negligible
R26	$2.17 \times 10^{-2}$	0.43%	$6.83 \times 10^{-1}$	0.0365	0.7200	14.40%	Negligible
R27	$5.32 \times 10^{-3}$	0.11%	$6.25 \times 10^{-1}$	0.0101	0.6353	12.71%	Negligible



Table C.2.2.3 Predicted Annual Average Benzo(a)pyrene Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossnes s ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$6.23 \times 10^{-7}$	0.25%	2.1 x 10 <sup>-4</sup>	$2.12 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.18%	Negligible
R2	$6.44 \times 10^{-7}$	0.26%		$2.06 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.16%	Negligible
R3	$6.70 \times 10^{-7}$	0.27%		$2.40 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.30%	Negligible
R4	$2.37 \times 10^{-7}$	0.09%		$8.18 \times 10^{-7}$	$2.07 \times 10^{-4}$	82.66%	Negligible
R5	$7.54 \times 10^{-7}$	0.30%		$2.67 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.40%	Negligible
R6	$6.13 \times 10^{-7}$	0.25%		$1.99 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.13%	Negligible
R7	$1.09 \times 10^{-6}$	0.43%		$3.35 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.67%	Negligible
R8	$1.42 \times 10^{-6}$	0.57%		$4.27 \times 10^{-6}$	$2.10 \times 10^{-4}$	84.04%	Negligible
R8 B	$1.40 \times 10^{-6}$	0.56%		$4.51 \times 10^{-6}$	$2.10 \times 10^{-4}$	84.14%	Negligible
R9	$2.24 \times 10^{-7}$	0.09%		$6.84 \times 10^{-7}$	2.07E-04	82.61%	Negligible
R10	$2.04 \times 10^{-7}$	0.08%		$6.32 \times 10^{-7}$	$2.06 \times 10^{-4}$	82.59%	Negligible
R11	$8.10 \times 10^{-7}$	0.32%		$2.67 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.40%	Negligible
R12	$2.41 \times 10^{-7}$	0.10%		$7.28 \times 10^{-7}$	$2.07 \times 10^{-4}$	82.62%	Negligible
R13	$2.74 \times 10^{-7}$	0.11%		$9.44 \times 10^{-7}$	$2.07 \times 10^{-4}$	82.71%	Negligible
R14	$2.30 \times 10^{-7}$	0.09%		$7.51 \times 10^{-7}$	$2.07 \times 10^{-4}$	82.63%	Negligible
R15	$7.25 \times 10^{-7}$	0.29%		$2.38 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.28%	Negligible
R16	$6.24 \times 10^{-7}$	0.25%		$2.16 \times 10^{-6}$	2.08E-04	83.20%	Negligible
R16B	$5.73 \times 10^{-7}$	0.23%		$1.99 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.13%	Negligible
R17	$7.04 \times 10^{-7}$	0.28%		$2.39 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.29%	Negligible
R18A 1st	$1.15 \times 10^{-6}$	0.46%		$3.55 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.75%	Negligible
R18B 4th	$1.16 \times 10^{-6}$	0.46%		$3.55 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.75%	Negligible
R19A 1st	$9.45 \times 10^{-7}$	0.38%		$2.54 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.35%	Negligible
R19B 6th	$9.61 \times 10^{-7}$	0.38%		$2.60 \times 10^{-6}$	$2.08 \times 10^{-4}$	83.37%	Negligible
R20A GF	$1.13 \times 10^{-6}$	0.45%		$3.50 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.73%	Negligible
R20B 5th	$1.14 \times 10^{-6}$	0.45%		$3.50 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.73%	Negligible
R21	$2.06 \times 10^{-7}$	0.08%		$6.38 \times 10^{-7}$	$2.06 \times 10^{-4}$	82.59%	Negligible
R22	$1.02 \times 10^{-6}$	0.41%		$3.16 \times 10^{-6}$	$2.09 \times 10^{-4}$	83.60%	Negligible
R23	$3.21 \times 10^{-7}$	0.13%	$1.02 \times 10^{-6}$	$2.07 \times 10^{-4}$	82.74%	Negligible	
R24	$2.00 \times 10^{-7}$	0.08%	$6.35 \times 10^{-7}$	$2.06 \times 10^{-4}$	82.59%	Negligible	
R25	$1.97 \times 10^{-7}$	0.08%	$6.25 \times 10^{-7}$	$2.06 \times 10^{-4}$	82.58%	Negligible	
R26	$4.56 \times 10^{-7}$	0.18%	$1.65 \times 10^{-6}$	$2.07 \times 10^{-4}$	83.00%	Negligible	
R27	$1.12 \times 10^{-7}$	0.04%	$3.66 \times 10^{-7}$	$2.06 \times 10^{-4}$	82.48%	Negligible	



Table C.2.2.4 Predicted Annual Average Cadmium Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$5.93 \times 10^{-5}$	1.19%	$2.5 \times 10^{-4}$	1.58E-04	$4.04 \times 10^{-4}$	8.08%	Negligible
R2	$6.14 \times 10^{-5}$	1.23%		1.20E-04	$3.66 \times 10^{-4}$	7.31%	Negligible
R3	$6.38 \times 10^{-5}$	1.28%		1.97E-04	$4.43 \times 10^{-4}$	8.85%	Negligible
R4	$2.25 \times 10^{-5}$	0.45%		1.05E-04	$3.51 \times 10^{-4}$	7.01%	Negligible
R5	$7.18 \times 10^{-5}$	1.44%		1.71E-04	$4.17 \times 10^{-4}$	8.34%	Negligible
R6	$5.84 \times 10^{-5}$	1.17%		2.56E-04	$5.02 \times 10^{-4}$	10.04%	Negligible
R7	$1.03 \times 10^{-4}$	2.07%		3.57E-04	$6.02 \times 10^{-4}$	12.05%	Negligible
R8	$1.36 \times 10^{-4}$	2.71%		3.46E-04	$5.92 \times 10^{-4}$	11.84%	Negligible
R8B	$1.33 \times 10^{-4}$	2.66%		3.57E-04	$6.03 \times 10^{-4}$	12.05%	Negligible
R9	$2.13 \times 10^{-5}$	0.43%		5.45E-05	$3.00 \times 10^{-4}$	6.01%	Negligible
R10	$1.94 \times 10^{-5}$	0.39%		4.89E-05	$2.95 \times 10^{-4}$	5.90%	Negligible
R11	$7.72 \times 10^{-5}$	1.54%		2.02E-04	$4.47 \times 10^{-4}$	8.95%	Negligible
R12	$2.30 \times 10^{-5}$	0.46%		5.82E-05	$3.04 \times 10^{-4}$	6.08%	Negligible
R13	$2.61 \times 10^{-5}$	0.52%		6.99E-05	$3.16 \times 10^{-4}$	6.32%	Negligible
R14	$2.19 \times 10^{-5}$	0.44%		5.77E-05	$3.04 \times 10^{-4}$	6.07%	Negligible
R15	$6.90 \times 10^{-5}$	1.38%		1.75E-04	$4.21 \times 10^{-4}$	8.42%	Negligible
R16	$5.94 \times 10^{-5}$	1.19%		1.71E-04	$4.17 \times 10^{-4}$	8.34%	Negligible
R16B	$5.46 \times 10^{-5}$	1.09%		1.56E-04	$4.02 \times 10^{-4}$	8.05%	Negligible
R17	$6.71 \times 10^{-5}$	1.34%		1.57E-04	$4.03 \times 10^{-4}$	8.06%	Negligible
R18A 1st	$1.10 \times 10^{-4}$	2.20%		3.70E-04	$6.16 \times 10^{-4}$	12.32%	Negligible
R18B 4th	$1.10 \times 10^{-4}$	2.20%		3.71E-04	$6.17 \times 10^{-4}$	12.34%	Negligible
R19A 1st	$9.00 \times 10^{-5}$	1.80%		1.49E-04	$3.95 \times 10^{-4}$	7.90%	Negligible
R19B 6th	$9.15 \times 10^{-5}$	1.83%		1.58E-04	$4.04 \times 10^{-4}$	8.07%	Negligible
R20A GF	$1.08 \times 10^{-4}$	2.16%		3.72E-04	$6.18 \times 10^{-4}$	12.36%	Negligible
R20B 5th	$1.08 \times 10^{-4}$	2.17%		3.74E-04	$6.20 \times 10^{-4}$	12.40%	Negligible
R21	$1.96 \times 10^{-5}$	0.39%		5.09E-05	$2.97 \times 10^{-4}$	5.93%	Negligible
R22	$9.75 \times 10^{-5}$	1.95%		3.19E-04	$5.65 \times 10^{-4}$	11.30%	Negligible
R23	$3.05 \times 10^{-5}$	0.61%	9.25E-05	$3.38 \times 10^{-4}$	6.77%	Negligible	
R24	$1.91 \times 10^{-5}$	0.38%	5.90E-05	$3.05 \times 10^{-4}$	6.10%	Negligible	
R25	$1.88 \times 10^{-5}$	0.38%	5.82E-05	$3.04 \times 10^{-4}$	6.08%	Negligible	
R26	$4.35 \times 10^{-5}$	0.87%	1.18E-04	$3.64 \times 10^{-4}$	7.28%	Negligible	
R27	$1.06 \times 10^{-5}$	0.21%	3.49E-05	$2.81 \times 10^{-4}$	5.61%	Negligible	



Table C.2.2.5 Predicted Annual Average Chromium (VI) Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$3.86 \times 10^{-7}$	0.19%	$3.2 \times 10^{-4}$	$6.40 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.91%	Negligible
R2	$3.99 \times 10^{-7}$	0.20%		$5.41 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.91%	Negligible
R3	$4.15 \times 10^{-7}$	0.21%		$7.58 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.92%	Negligible
R4	$1.47 \times 10^{-7}$	0.07%		$3.59 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.79%	Negligible
R5	$4.67 \times 10^{-7}$	0.23%		$7.23 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.95%	Negligible
R6	$3.80 \times 10^{-7}$	0.19%		$8.91 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.90%	Negligible
R7	$6.72 \times 10^{-7}$	0.34%		$1.33 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.05%	Negligible
R8	$8.81 \times 10^{-7}$	0.44%		$1.42 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.15%	Negligible
R8B	$8.65 \times 10^{-7}$	0.43%		$1.44 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.15%	Negligible
R9	$1.38 \times 10^{-7}$	0.07%		$2.23 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.78%	Negligible
R10	$1.26 \times 10^{-7}$	0.06%		$2.00 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.78%	Negligible
R11	$5.02 \times 10^{-7}$	0.25%		$8.16 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.97%	Negligible
R12	$1.49 \times 10^{-7}$	0.07%		$2.40 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.79%	Negligible
R13	$1.70 \times 10^{-7}$	0.08%		$2.83 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.80%	Negligible
R14	$1.42 \times 10^{-7}$	0.07%		$2.35 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.79%	Negligible
R15	$4.49 \times 10^{-7}$	0.22%		$7.21 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.94%	Negligible
R16	$3.86 \times 10^{-7}$	0.19%		$6.75 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.91%	Negligible
R16B	$3.55 \times 10^{-7}$	0.18%		$6.18 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.89%	Negligible
R17	$4.36 \times 10^{-7}$	0.22%		$6.68 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.93%	Negligible
R18A 1st	$7.14 \times 10^{-7}$	0.36%		$1.39 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.07%	Negligible
R18B 4th	$7.15 \times 10^{-7}$	0.36%		$1.39 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.07%	Negligible
R19A 1st	$5.85 \times 10^{-7}$	0.29%		$7.26 \times 10^{-7}$	$3.22 \times 10^{-4}$	161.01%	Negligible
R19B 6th	$5.95 \times 10^{-7}$	0.30%		$7.54 \times 10^{-7}$	$3.22 \times 10^{-4}$	161.01%	Negligible
R20A GF	$7.02 \times 10^{-7}$	0.35%		$1.38 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.07%	Negligible
R20B 5th	$7.04 \times 10^{-7}$	0.35%		$1.39 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.07%	Negligible
R21	$1.27 \times 10^{-7}$	0.06%		$2.07 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.78%	Negligible
R22	$6.33 \times 10^{-7}$	0.32%		$1.21 \times 10^{-6}$	$3.22 \times 10^{-4}$	161.03%	Negligible
R23	$1.98 \times 10^{-7}$	0.10%	$3.59 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.81%	Negligible	
R24	$1.24 \times 10^{-7}$	0.06%	$2.27 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.78%	Negligible	
R25	$1.22 \times 10^{-7}$	0.06%	$2.23 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.78%	Negligible	
R26	$2.83 \times 10^{-7}$	0.14%	$4.75 \times 10^{-7}$	$3.22 \times 10^{-4}$	160.86%	Negligible	
R27	$6.92 \times 10^{-8}$	0.03%	$1.31 \times 10^{-7}$	$3.21 \times 10^{-4}$	160.75%	Negligible	



Table C.2.2.6 Predicted Annual Mean Lead Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$1.49 \times 10^{-4}$	0.06%	0.0112	$1.26 \times 10^{-3}$	0.0125	5.00%	Negligible
R2	$1.54 \times 10^{-4}$	0.06%		$8.66 \times 10^{-4}$	0.0121	4.84%	Negligible
R3	$1.61 \times 10^{-4}$	0.06%		$1.62 \times 10^{-3}$	0.0129	5.14%	Negligible
R4	$5.67 \times 10^{-5}$	0.02%		$9.20 \times 10^{-4}$	0.0122	4.86%	Negligible
R5	$1.81 \times 10^{-4}$	0.07%		$1.33 \times 10^{-3}$	0.0126	5.03%	Negligible
R6	$1.47 \times 10^{-4}$	0.06%		$2.21 \times 10^{-3}$	0.0135	5.38%	Negligible
R7	$2.60 \times 10^{-4}$	0.10%		$2.95 \times 10^{-3}$	0.0142	5.68%	Negligible
R8	$3.41 \times 10^{-4}$	0.14%		$2.67 \times 10^{-3}$	0.0139	5.56%	Negligible
R8B	$3.35 \times 10^{-4}$	0.13%		$2.78 \times 10^{-3}$	0.0140	5.61%	Negligible
R9	$5.36 \times 10^{-5}$	0.02%		$4.24 \times 10^{-4}$	0.0117	4.67%	Negligible
R10	$4.88 \times 10^{-5}$	0.02%		$3.81 \times 10^{-4}$	0.0116	4.65%	Negligible
R11	$1.94 \times 10^{-4}$	0.08%		$1.58 \times 10^{-3}$	0.0128	5.13%	Negligible
R12	$5.78 \times 10^{-5}$	0.02%		$4.49 \times 10^{-4}$	0.0117	4.68%	Negligible
R13	$6.57 \times 10^{-5}$	0.03%		$5.55 \times 10^{-4}$	0.0118	4.72%	Negligible
R14	$5.51 \times 10^{-5}$	0.02%		$4.53 \times 10^{-4}$	0.0117	4.68%	Negligible
R15	$1.74 \times 10^{-4}$	0.07%		$1.37 \times 10^{-3}$	0.0126	5.04%	Negligible
R16	$1.49 \times 10^{-4}$	0.06%		$1.38 \times 10^{-3}$	0.0126	5.05%	Negligible
R16B	$1.37 \times 10^{-4}$	0.05%		$1.26 \times 10^{-3}$	0.0125	5.00%	Negligible
R17	$1.69 \times 10^{-4}$	0.07%		$1.20 \times 10^{-3}$	0.0124	4.98%	Negligible
R18A 1st	$2.76 \times 10^{-4}$	0.11%		$3.05 \times 10^{-3}$	0.0143	5.72%	Negligible
R18B 4th	$2.77 \times 10^{-4}$	0.11%		$3.06 \times 10^{-3}$	0.0143	5.72%	Negligible
R19A 1st	$2.26 \times 10^{-4}$	0.09%		$9.67 \times 10^{-4}$	0.0122	4.88%	Negligible
R19B 6th	$2.30 \times 10^{-4}$	0.09%		$1.05 \times 10^{-3}$	0.0123	4.91%	Negligible
R20A GF	$2.72 \times 10^{-4}$	0.11%		$3.08 \times 10^{-3}$	0.0143	5.73%	Negligible
R20B 5th	$2.72 \times 10^{-4}$	0.11%		$3.10 \times 10^{-3}$	0.0143	5.73%	Negligible
R21	$4.92 \times 10^{-5}$	0.02%		$3.97 \times 10^{-4}$	0.0116	4.65%	Negligible
R22	$2.45 \times 10^{-4}$	0.10%		$2.62 \times 10^{-3}$	0.0139	5.54%	Negligible
R23	$7.68 \times 10^{-5}$	0.03%	$7.47 \times 10^{-4}$	0.0120	4.79%	Negligible	
R24	$4.79 \times 10^{-5}$	0.02%	$4.81 \times 10^{-4}$	0.0117	4.69%	Negligible	
R25	$4.72 \times 10^{-5}$	0.02%	$4.75 \times 10^{-4}$	0.0117	4.69%	Negligible	
R26	$1.09 \times 10^{-4}$	0.04%	$9.53 \times 10^{-4}$	0.0122	4.88%	Negligible	
R27	$2.68 \times 10^{-5}$	0.01%	$2.89 \times 10^{-4}$	0.0115	4.61%	Negligible	





Table C.2.2.7 Predicted Annual Mean Manganese Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$1.78 \times 10^{-4}$	0.12%	$5.42 \times 10^{-3}$	$1.15 \times 10^{-3}$	$6.58 \times 10^{-3}$	4.38%	Negligible
R2	$1.84 \times 10^{-4}$	0.12%		$7.73 \times 10^{-4}$	$6.20 \times 10^{-3}$	4.13%	Negligible
R3	$1.91 \times 10^{-4}$	0.13%		$1.50 \times 10^{-3}$	$6.93 \times 10^{-3}$	4.62%	Negligible
R4	$6.76 \times 10^{-5}$	0.05%		$8.91 \times 10^{-4}$	$6.31 \times 10^{-3}$	4.21%	Negligible
R5	$2.15 \times 10^{-4}$	0.14%		$1.19 \times 10^{-3}$	$6.61 \times 10^{-3}$	4.41%	Negligible
R6	$1.75 \times 10^{-4}$	0.12%		$2.14 \times 10^{-3}$	$7.56 \times 10^{-3}$	5.04%	Negligible
R7	$3.10 \times 10^{-4}$	0.21%		$2.82 \times 10^{-3}$	$8.25 \times 10^{-3}$	5.50%	Negligible
R8	$4.07 \times 10^{-4}$	0.27%		$2.49 \times 10^{-3}$	$7.91 \times 10^{-3}$	5.27%	Negligible
R8B	$3.99 \times 10^{-4}$	0.27%		$2.61 \times 10^{-3}$	$8.03 \times 10^{-3}$	5.36%	Negligible
R9	$6.39 \times 10^{-5}$	0.04%		$3.94 \times 10^{-4}$	$5.82 \times 10^{-3}$	3.88%	Negligible
R10	$5.82 \times 10^{-5}$	0.04%		$3.52 \times 10^{-4}$	$5.77 \times 10^{-3}$	3.85%	Negligible
R11	$2.32 \times 10^{-4}$	0.15%		$1.47 \times 10^{-3}$	$6.89 \times 10^{-3}$	4.59%	Negligible
R12	$6.89 \times 10^{-5}$	0.05%		$4.18 \times 10^{-4}$	$5.84 \times 10^{-3}$	3.89%	Negligible
R13	$7.84 \times 10^{-5}$	0.05%		$5.09 \times 10^{-4}$	$5.93 \times 10^{-3}$	3.95%	Negligible
R14	$6.57 \times 10^{-5}$	0.04%		$4.18 \times 10^{-4}$	$5.84 \times 10^{-3}$	3.89%	Negligible
R15	$2.07 \times 10^{-4}$	0.14%		$1.25 \times 10^{-3}$	$6.68 \times 10^{-3}$	4.45%	Negligible
R16	$1.78 \times 10^{-4}$	0.12%		$1.28 \times 10^{-3}$	$6.70 \times 10^{-3}$	4.47%	Negligible
R16B	$1.64 \times 10^{-4}$	0.11%		$1.17 \times 10^{-3}$	$6.59 \times 10^{-3}$	4.39%	Negligible
R17	$2.01 \times 10^{-4}$	0.13%		$1.08 \times 10^{-3}$	$6.50 \times 10^{-3}$	4.34%	Negligible
R18A 1st	$3.30 \times 10^{-4}$	0.22%		$2.91 \times 10^{-3}$	$8.33 \times 10^{-3}$	5.56%	Negligible
R18B 4th	$3.30 \times 10^{-4}$	0.22%		$2.92 \times 10^{-3}$	$8.35 \times 10^{-3}$	5.56%	Negligible
R19A 1st	$2.70 \times 10^{-4}$	0.18%		$8.59 \times 10^{-4}$	$6.28 \times 10^{-3}$	4.19%	Negligible
R19B 6th	$2.75 \times 10^{-4}$	0.18%		$9.38 \times 10^{-4}$	$6.36 \times 10^{-3}$	4.24%	Negligible
R20A GF	$3.24 \times 10^{-4}$	0.22%		$2.94 \times 10^{-3}$	$8.37 \times 10^{-3}$	5.58%	Negligible
R20B 5th	$3.25 \times 10^{-4}$	0.22%		$2.96 \times 10^{-3}$	$8.39 \times 10^{-3}$	5.59%	Negligible
R21	$5.87 \times 10^{-5}$	0.04%		$3.69 \times 10^{-4}$	$5.79 \times 10^{-3}$	3.86%	Negligible
R22	$2.92 \times 10^{-4}$	0.19%		$2.49 \times 10^{-3}$	$7.91 \times 10^{-3}$	5.28%	Negligible
R23	$9.16 \times 10^{-5}$	0.06%	$7.04 \times 10^{-4}$	$6.13 \times 10^{-3}$	4.08%	Negligible	
R24	$5.72 \times 10^{-5}$	0.04%	$4.54 \times 10^{-4}$	$5.88 \times 10^{-3}$	3.92%	Negligible	
R25	$5.63 \times 10^{-5}$	0.04%	$4.48 \times 10^{-4}$	$5.87 \times 10^{-3}$	3.91%	Negligible	
R26	$1.30 \times 10^{-4}$	0.09%	$8.68 \times 10^{-4}$	$6.29 \times 10^{-3}$	4.19%	Negligible	
R27	$3.19 \times 10^{-5}$	0.02%	$2.73 \times 10^{-4}$	$5.70 \times 10^{-3}$	3.80%	Negligible	



Table C.2.2.8 Predicted Annual Average Nickel Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background (2016) ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$6.53 \times 10^{-4}$	3.26%	$8.8 \times 10^{-4}$	$1.63 \times 10^{-3}$	$2.51 \times 10^{-3}$	12.56%	Negligible
R2	$6.75 \times 10^{-4}$	3.38%		$1.24 \times 10^{-3}$	$2.13 \times 10^{-3}$	10.64%	Negligible
R3	$7.02 \times 10^{-4}$	3.51%		$2.02 \times 10^{-3}$	$2.90 \times 10^{-3}$	14.50%	Negligible
R4	$2.48 \times 10^{-4}$	1.24%		$1.07 \times 10^{-3}$	$1.95 \times 10^{-3}$	9.75%	Negligible
R5	$7.90 \times 10^{-4}$	3.95%		$1.77 \times 10^{-3}$	$2.65 \times 10^{-3}$	13.26%	Negligible
R6	$6.42 \times 10^{-4}$	3.21%		$2.61 \times 10^{-3}$	$3.49 \times 10^{-3}$	17.45%	Negligible
R7	$1.14 \times 10^{-3}$	5.69%		$3.65 \times 10^{-3}$	$4.53 \times 10^{-3}$	22.67%	Minor
R8	$1.49 \times 10^{-3}$	7.45%		$3.57 \times 10^{-3}$	$4.46 \times 10^{-3}$	22.29%	Minor
R8B	$1.46 \times 10^{-3}$	7.32%		$3.68 \times 10^{-3}$	$4.56 \times 10^{-3}$	22.81%	Minor
R9	$2.34 \times 10^{-4}$	1.17%		$5.62 \times 10^{-4}$	$1.45 \times 10^{-3}$	7.23%	Negligible
R10	$2.13 \times 10^{-4}$	1.07%		$5.04 \times 10^{-4}$	$1.39 \times 10^{-3}$	6.94%	Negligible
R11	$8.49 \times 10^{-4}$	4.24%		$2.08 \times 10^{-3}$	$2.96 \times 10^{-3}$	14.80%	Negligible
R12	$2.53 \times 10^{-4}$	1.26%		$6.01 \times 10^{-4}$	$1.48 \times 10^{-3}$	7.42%	Negligible
R13	$2.87 \times 10^{-4}$	1.44%		$7.20 \times 10^{-4}$	$1.60 \times 10^{-3}$	8.01%	Negligible
R14	$2.41 \times 10^{-4}$	1.20%		$5.95 \times 10^{-4}$	$1.48 \times 10^{-3}$	7.39%	Negligible
R15	$7.59 \times 10^{-4}$	3.80%		$1.81 \times 10^{-3}$	$2.69 \times 10^{-3}$	13.45%	Negligible
R16	$6.53 \times 10^{-4}$	3.27%		$1.76 \times 10^{-3}$	$2.64 \times 10^{-3}$	13.20%	Negligible
R16B	$6.01 \times 10^{-4}$	3.00%		$1.61 \times 10^{-3}$	$2.49 \times 10^{-3}$	12.45%	Negligible
R17	$7.38 \times 10^{-4}$	3.69%		$1.62 \times 10^{-3}$	$2.51 \times 10^{-3}$	12.53%	Negligible
R18A 1st	$1.21 \times 10^{-3}$	6.04%		$3.79 \times 10^{-3}$	$4.67 \times 10^{-3}$	23.37%	Minor
R18B 4th	$1.21 \times 10^{-3}$	6.05%		$3.80 \times 10^{-3}$	$4.69 \times 10^{-3}$	23.43%	Minor
R19A 1st	$9.90 \times 10^{-4}$	4.95%		$1.56 \times 10^{-3}$	$2.45 \times 10^{-3}$	12.23%	Negligible
R19B 6th	$1.01 \times 10^{-3}$	5.03%		$1.65 \times 10^{-3}$	$2.53 \times 10^{-3}$	12.67%	Negligible
R20A GF	$1.19 \times 10^{-3}$	5.94%		$3.81 \times 10^{-3}$	$4.69 \times 10^{-3}$	23.46%	Minor
R20B 5th	$1.19 \times 10^{-3}$	5.96%		$3.83 \times 10^{-3}$	$4.71 \times 10^{-3}$	23.57%	Minor
R21	$2.15 \times 10^{-4}$	1.08%		$5.25 \times 10^{-4}$	$1.41 \times 10^{-3}$	7.04%	Negligible
R22	$1.07 \times 10^{-3}$	5.36%		$3.27 \times 10^{-3}$	$4.15 \times 10^{-3}$	20.77%	Negligible
R23	$3.36 \times 10^{-4}$	1.68%	$9.50 \times 10^{-4}$	$1.83 \times 10^{-3}$	9.17%	Negligible	
R24	$2.10 \times 10^{-4}$	1.05%	$6.06 \times 10^{-4}$	$1.49 \times 10^{-3}$	7.44%	Negligible	
R25	$2.06 \times 10^{-4}$	1.03%	$5.97 \times 10^{-4}$	$1.48 \times 10^{-3}$	7.40%	Negligible	
R26	$4.78 \times 10^{-4}$	2.39%	$1.22 \times 10^{-3}$	$2.10 \times 10^{-3}$	10.50%	Negligible	
R27	$1.17 \times 10^{-4}$	0.59%	$3.58 \times 10^{-4}$	$1.24 \times 10^{-3}$	6.20%	Negligible	



Table C.2.2.9 Predicted Annual Average Nitrogen Dioxide Concentrations

Sensitive Human Receptor ID	REP PC ( $\mu\text{g}/\text{m}^3$ )	PC (%)	Background + Traffic ( $\mu\text{g}/\text{m}^3$ )	REP + RRRF + Crossness ( $\mu\text{g}/\text{m}^3$ )	Total PEC ( $\mu\text{g}/\text{m}^3$ )	PEC (%)	IAQM Significance
R1	$2.49 \times 10^{-1}$	0.62%	19.84	0.65	20.49	51.2%	Negligible
R2	$2.58 \times 10^{-1}$	0.64%	24.45	0.54	24.99	62.5%	Negligible
R3	$2.68 \times 10^{-1}$	0.67%	20.69	0.79	21.48	53.7%	Negligible
R4	$9.47 \times 10^{-2}$	0.24%	20.80	0.37	21.17	52.9%	Negligible
R5	$3.02 \times 10^{-1}$	0.75%	21.59	0.75	22.34	55.8%	Negligible
R6	$2.45 \times 10^{-1}$	0.61%	18.24	0.90	19.14	47.8%	Negligible
R7	$4.34 \times 10^{-1}$	1.09%	27.95	1.32	29.27	73.2%	Negligible
R8	$5.69 \times 10^{-1}$	1.42%	26.59	1.40	27.99	70.0%	Negligible
R8B	$5.59 \times 10^{-1}$	1.40%	28.58	1.42	30.00	75.0%	Negligible
R9	$8.95 \times 10^{-2}$	0.22%	20.64	0.22	20.86	52.2%	Negligible
R10	$8.14 \times 10^{-2}$	0.20%	18.87	0.20	19.07	47.7%	Negligible
R11	$3.24 \times 10^{-1}$	0.81%	31.69	0.82	32.51	81.3%	Negligible
R12	$9.65 \times 10^{-2}$	0.24%	25.12	0.24	25.36	63.4%	Negligible
R13	$1.10 \times 10^{-1}$	0.27%	29.03	0.29	29.32	73.3%	Negligible
R14	$9.20 \times 10^{-2}$	0.23%	31.67	0.24	31.91	79.8%	Negligible
R15	$2.90 \times 10^{-1}$	0.72%	28.73	0.73	29.46	73.6%	Negligible
R16	$2.49 \times 10^{-1}$	0.62%	19.65	0.69	20.34	50.9%	Negligible
R16B	$2.29 \times 10^{-1}$	0.57%	21.66	0.63	22.29	55.7%	Negligible
R17	$2.82 \times 10^{-1}$	0.70%	21.59	0.68	22.27	55.7%	Negligible
R18A 1st	$4.61 \times 10^{-1}$	1.15%	23.08	1.38	24.46	61.1%	Negligible
R18B 4th	$4.62 \times 10^{-1}$	1.16%	21.44	1.38	22.82	57.1%	Negligible
R19A 1st	$3.78 \times 10^{-1}$	0.94%	25.60	0.69	26.29	65.7%	Negligible
R19B 6th	$3.84 \times 10^{-1}$	0.96%	22.25	0.72	22.97	57.4%	Negligible
R20A GF	$4.54 \times 10^{-1}$	1.13%	22.92	1.38	24.30	60.7%	Negligible
R20B 5th	$4.55 \times 10^{-1}$	1.14%	21.19	1.38	22.57	56.4%	Negligible
R21	$8.22 \times 10^{-2}$	0.21%	32.89	0.21	33.10	82.7%	Negligible
R22	$4.09 \times 10^{-1}$	1.02%	23.05	1.20	24.25	60.6%	Negligible
R23	$1.28 \times 10^{-1}$	0.32%	25.40	0.36	25.76	64.4%	Negligible
R24	$8.00 \times 10^{-2}$	0.20%	29.81	0.23	30.04	75.1%	Negligible
R25	$7.88 \times 10^{-2}$	0.20%	30.82	0.22	31.04	77.6%	Negligible
R26	$1.83 \times 10^{-1}$	0.46%	20.44	0.50	20.94	52.3%	Negligible
R27	$4.47 \times 10^{-2}$	0.11%	25.65	0.13	25.78	64.5%	Negligible



Table C.2.2.10 Predicted Annual Mean PM<sub>10</sub> Concentrations

Sensitive Human Receptor ID	REP PC (µg/m <sup>3</sup> )	PC (%)	Background + Traffic (µg/m <sup>3</sup> )	REP + RRRF + Crossness (µg/m <sup>3</sup> )	Total PEC (µg/m <sup>3</sup> )	PEC (%)	IAQM Significance
R1	0.015	0.04%	15.40	0.048	15.45	38.6%	Negligible
R2	0.015	0.04%	16.66	0.039	16.70	41.7%	Negligible
R3	0.016	0.04%	16.24	0.057	16.30	40.7%	Negligible
R4	0.006	0.01%	16.75	0.026	16.77	41.9%	Negligible
R5	0.018	0.04%	15.22	0.055	15.28	38.2%	Negligible
R6	0.015	0.04%	15.70	0.064	15.77	39.4%	Negligible
R7	0.026	0.06%	17.62	0.094	17.72	44.3%	Negligible
R8	0.034	0.08%	17.43	0.100	17.53	43.8%	Negligible
R8B	0.033	0.08%	18.12	0.101	18.22	45.5%	Negligible
R9	0.005	0.01%	16.01	0.016	16.03	40.1%	Negligible
R10	0.005	0.01%	15.83	0.014	15.84	39.6%	Negligible
R11	0.019	0.05%	19.19	0.059	19.25	48.1%	Negligible
R12	0.006	0.01%	17.84	0.017	17.86	44.6%	Negligible
R13	0.007	0.02%	17.99	0.021	18.01	45.0%	Negligible
R14	0.005	0.01%	19.45	0.017	19.47	48.7%	Negligible
R15	0.017	0.04%	17.93	0.053	17.99	45.0%	Negligible
R16	0.015	0.04%	15.38	0.050	15.43	38.6%	Negligible
R16B	0.014	0.03%	16.01	0.046	16.06	40.1%	Negligible
R17	0.017	0.04%	15.22	0.050	15.27	38.2%	Negligible
R18A 1st	0.027	0.07%	16.12	0.098	16.22	40.6%	Negligible
R18B 4th	0.028	0.07%	15.65	0.099	15.74	39.4%	Negligible
R19A 1st	0.022	0.06%	17.21	0.049	17.26	43.1%	Negligible
R19B 6th	0.023	0.06%	15.90	0.051	15.95	39.9%	Negligible
R20A GF	0.027	0.07%	16.07	0.098	16.17	40.4%	Negligible
R20B 5th	0.027	0.07%	15.57	0.099	15.67	39.2%	Negligible
R21	0.005	0.01%	21.52	0.015	21.54	53.8%	Negligible
R22	0.024	0.06%	16.14	0.086	16.22	40.6%	Negligible
R23	0.008	0.02%	18.51	0.026	18.54	46.3%	Negligible
R24	0.005	0.01%	19.89	0.016	19.91	49.8%	Negligible
R25	0.005	0.01%	20.17	0.016	20.19	50.5%	Negligible
R26	0.011	0.03%	15.63	0.036	15.67	39.2%	Negligible
R27	0.003	0.01%	18.55	0.010	18.56	46.4%	Negligible



Table C.2.2.11 Predicted Annual Mean PM<sub>2.5</sub> Concentrations

Sensitive Human Receptor ID	REP PC (µg/m <sup>3</sup> )	PC (%)	Background + Traffic (µg/m <sup>3</sup> )	REP + RRRF + Crossness (µg/m <sup>3</sup> )	Total PEC (µg/m <sup>3</sup> )	PEC (%)	IAQM Significance
R1	0.015	0.07%	8.89	0.048	8.94	44.7%	Negligible
R2	0.015	0.08%	10.15	0.039	10.19	50.9%	Negligible
R3	0.016	0.08%	9.12	0.057	9.18	45.9%	Negligible
R4	0.006	0.03%	9.69	0.026	9.71	48.6%	Negligible
R5	0.018	0.09%	8.69	0.055	8.75	43.7%	Negligible
R6	0.015	0.07%	9.12	0.064	9.18	45.9%	Negligible
R7	0.026	0.13%	11.35	0.094	11.45	57.2%	Negligible
R8	0.034	0.17%	10.16	0.100	10.26	51.3%	Negligible
R8B	0.033	0.17%	10.95	0.101	11.05	55.2%	Negligible
R9	0.005	0.03%	9.05	0.016	9.07	45.3%	Negligible
R10	0.005	0.02%	8.97	0.014	8.98	44.9%	Negligible
R11	0.019	0.10%	12.18	0.059	12.24	61.2%	Negligible
R12	0.006	0.03%	10.07	0.017	10.09	50.5%	Negligible
R13	0.007	0.03%	10.38	0.021	10.40	52.0%	Negligible
R14	0.005	0.03%	11.95	0.017	11.97	59.8%	Negligible
R15	0.017	0.09%	10.75	0.053	10.81	54.0%	Negligible
R16	0.015	0.07%	8.86	0.050	8.91	44.6%	Negligible
R16B	0.014	0.07%	9.58	0.046	9.63	48.1%	Negligible
R17	0.017	0.08%	8.69	0.050	8.74	43.7%	Negligible
R18A 1st	0.027	0.14%	9.64	0.098	9.74	48.7%	Negligible
R18B 4th	0.028	0.14%	9.09	0.099	9.19	46.0%	Negligible
R19A 1st	0.022	0.11%	10.76	0.049	10.81	54.0%	Negligible
R19B 6th	0.023	0.11%	9.30	0.051	9.35	46.7%	Negligible
R20A GF	0.027	0.14%	9.58	0.098	9.68	48.4%	Negligible
R20B 5th	0.027	0.14%	9.01	0.099	9.11	45.6%	Negligible
R21	0.005	0.02%	14.11	0.015	14.13	70.6%	Negligible
R22	0.024	0.12%	9.65	0.086	9.73	48.7%	Negligible
R23	0.008	0.04%	12.23	0.026	12.25	61.3%	Negligible
R24	0.005	0.02%	13.43	0.016	13.44	67.2%	Negligible
R25	0.005	0.02%	13.75	0.016	13.77	68.8%	Negligible
R26	0.011	0.05%	8.85	0.036	8.89	44.4%	Negligible
R27	0.003	0.01%	11.21	0.010	11.22	56.1%	Negligible

## C.2.3 Impact of ERF Emissions – Terrestrial



# Biodiversity Receptors

Table C.2.3.1 Predicted Annual Average NO<sub>x</sub> Process Contributions and Predicted Environmental Concentrations

Site Name	Background µg/m <sup>3</sup>	PC µg/m <sup>3</sup>	PC <sup>1</sup> %	PEC µg/m <sup>3</sup>	PEC <sup>1</sup> %
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI)/ Rainham Marshes (SSSI/LNR)	40.9	0.83	2.75%	41.8	139%
Ingrebourne Marshes (SSSI/LNR)	33.6	0.64	2.12%	34.2	114%
Oxleas Woodlands (SSSI)	33.8	0.07	0.24%	33.9	113%
Thorndon Park (SSSI)	21.2	0.07	0.23%	21.3	71%
Darenth Wood (SSSI)	33.4	0.04	0.14%	33.5	112%
Grays Thurrock Chalk Pit (SSSI)	36.9	0.04	0.12%	36.9	123%
Farningham Wood (SSSI/LNR)	33.6	0.03	0.12%	33.6	112%
Epping Forest (SSSI)	42.4	0.03	0.10%	42.4	141%
Curtismill Green (SSSI)	29.4	0.03	0.10%	29.4	98%
Hangman's Wood & Deneholes (SSSI)	28.9	0.03	0.09%	28.9	96%
Epping Forest (SSSI and SAC)	45.4	0.02	0.08%	45.4	151%
Hainault Forest (SSSI)	22.9	0.02	0.07%	22.9	76%
<b>Locally Designated Sites</b>					
Crossness LNR	37.5	0.47	1.57%	38.0	127%
M039	40.9	0.80	2.66%	41.7	139%
BxL07	31.8	0.67	2.24%	32.5	108%
BxL16	35.4	0.60	1.99%	36.0	120%
BxBI14	33.3	0.54	1.80%	33.8	113%
Lesnes Abbey Wood LNR	31.4	0.25	0.84%	31.7	106%
BxB103	31.7	0.21	0.70%	31.9	106%
M041	28.8	0.18	0.59%	29.0	97%

<sup>1</sup> Expressed as percentage of the annual target (mean) of oxides of nitrogen of 30 µg/m<sup>3</sup>





Table C.2.3.2 Predicted Daily Mean NO<sub>x</sub> Process Contributions and Predicted Environmental Concentrations

Site Name	Background µg/m <sup>3</sup>	PC µg/m <sup>3</sup>	PC %	PEC µg/m <sup>3</sup>	PEC %
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI/LNR)/ Rainham Marshes (SSSI)	40.9	5.2	6.9%	46.1	61.5%
Ingrebourne Marshes (SSSI/LNR)	33.6	3.1	4.1%	36.7	48.9%
Epping Forest (SAC)	45.4	1.4	1.9%	46.8	62.4%
Oxleas Woodlands (SSSI)	33.8	1.1	1.5%	34.9	46.6%
Epping Forest (SSSI)	42.4	0.7	1.0%	43.1	57.5%
Thorndon Park (SSSI)	21.2	0.7	1.0%	21.9	29.3%
Darenth Wood (SSSI)	33.4	0.7	1.0%	34.2	45.5%
Farningham Wood (SSSI/LNR)	33.6	0.7	0.9%	34.2	45.6%
Grays Thurrock Chalk Pit (SSSI)	36.9	0.5	0.7%	37.4	49.9%
Hainault Forest (SSSI)	22.9	0.4	0.6%	23.3	31.1%
Curtismill Green (SSSI)	29.4	0.4	0.6%	29.8	39.7%
Hangman's Wood & Deneholes (SSSI)	28.9	0.3	0.4%	29.2	38.9%
<b>Locally Designated Sites</b>					
Crossness LNR	37.5	15.6	20.8%	53.1	70.8%
BxB114	33.3	7.5	9.9%	40.7	54.3%
Lesnes Abbey Wood LNR	31.4	7.3	9.7%	38.7	51.6%
BxL07	31.8	6.6	8.7%	38.3	51.1%
BxL16	35.4	5.6	7.4%	41.0	54.6%
BxB103	31.7	5.0	6.7%	36.7	48.9%
M039	40.9	5.0	6.7%	46.0	61.3%
M041	28.8	2.9	3.8%	31.6	42.2%

<sup>1</sup> Expressed as percentage of the daily mean of oxides of nitrogen of 75 µg/m<sup>3</sup>

Table C.2.3.3 Predicted Annual Mean SO<sub>2</sub> Process Contributions and Predicted Environmental Concentrations





Site Name	Background µg/m <sup>3</sup>	PC µg/m <sup>3</sup>	PC %	PEC µg/m <sup>3</sup>	PEC %
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI) / Rainham Marshes (SSSI/LNR)	2.3	0.206	0.69%	2.47	8.2%
Ingrebourne Marshes (SSSI/LNR)	2.3	0.159	0.53%	2.42	8.1%
Epping Forest (SSSI)	1.5	0.007	0.07%	1.48	14.8%
Oxleas Woodlands (SSSI)	1.5	0.018	0.06%	1.54	5.1%
Thorndon Park (SSSI)	1.5	0.017	0.06%	1.55	5.2%
Grays Thurrock Chalk Pit (SSSI)	3.5	0.009	0.03%	3.51	11.7%
Darenth Wood (SSSI)	2.0	0.010	0.03%	2.03	6.8%
Farningham Wood (SSSI/LNR)	2.0	0.009	0.03%	2.00	6.7%
Epping Forest (SAC)	1.5	0.006	0.02%	1.50	5.0%
Hainault Forest (SSSI)	2.8	0.006	0.02%	2.78	9.3%
Curtismill Green (SSSI)	0.3	0.007	0.02%	0.35	1.2%
Hangman's Wood & Deneholes (SSSI)	3.5	0.007	0.02%	3.51	11.7%
<b>Locally Designated Sites</b>					
Crossness LNR	1.6	0.118	0.39%	1.72	5.7%
M039	2.3	0.199	0.66%	2.46	8.2%
BxL07	1.9	0.168	0.56%	2.04	6.8%
BxL16	1.9	0.149	0.50%	2.02	6.7%
BxB114	1.9	0.135	0.45%	2.01	6.7%
Lesnes Abbey Wood LNR	1.6	0.063	0.21%	1.66	5.5%
BxB103	1.6	0.053	0.18%	1.65	5.5%
M041	1.9	0.045	0.15%	1.91	6.4%

<sup>1</sup>Expressed as percentage of annual target (mean) of Sulphur dioxide of 30 µg/m<sup>3</sup> with exception of Epping Forest (SSSI) where the annual target of Sulphur dioxide is 10 µg/m<sup>3</sup> for lichens





Table C.2.3.4 Predicted Annual Mean Ammonia Process Contributions and Predicted Environmental Concentrations

Site Name	Background µg/m <sup>3</sup>	PC µg/m <sup>3</sup>	PC %	PEC µg/m <sup>3</sup>	PEC %
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI)/ Rainham Marshes (SSSI/LNR)	2.4	0.0688	2.3%	2.4	81.3%
Ingrebourne Marshes (SSSI/LNR)	2.4	0.0530	1.8%	2.4	80.8%
Oxleas Woodlands (SSSI)	2.1	0.0060	0.2%	2.1	69.9%
Epping Forest (SSSI)	2.6	0.0025	0.2%	2.6	263.2%
Thorndon Park (SSSI)	1.7	0.0056	0.2%	1.7	56.5%
Epping Forest (SAC)	2.8	0.0020	0.1%	2.8	94.1%
Hainault Forest (SSSI)	1.8	0.0019	0.1%	1.8	59.7%
Curtismill Green (SSSI)	1.8	0.0025	0.1%	1.8	59.4%
Grays Thurrock Chalk Pit (SSSI)	1.5	0.0030	0.1%	1.5	49.8%
Hangman's Wood & Deneholes (SSSI)	1.5	0.0022	0.1%	1.5	49.7%
Darenth Wood (SSSI)	1.6	0.0034	0.1%	1.6	54.1%
Farningham Wood (SSSI/LNR)	1.7	0.0029	0.1%	1.7	56.8%
<b>Locally Designated Sites</b>					
Crossness LNR	2.0	0.0392	1.3%	2.1	69.0%
M039	2.4	0.0664	2.2%	2.4	81.2%
BxL07	3.1	0.0560	1.9%	3.2	106.2%
BxL16	3.1	0.0498	1.7%	3.2	106.0%
BxB114	3.1	0.0451	1.5%	3.2	105.8%
Lesnes Abbey Wood LNR	2.0	0.0211	0.7%	2.1	68.4%
BxB103	2.0	0.0175	0.6%	2.0	68.3%
M041	3.1	0.0148	0.5%	3.1	104.8%

<sup>1</sup> Expressed as percentage of annual target (mean) of Ammonia of 3 µg/m<sup>3</sup> with exception of Epping Forest (SSSI) where the annual target of Ammonia is 1 µg/m<sup>3</sup> for lichens





Table C.2.3.5 Predicted Daily HF Process Contributions and Predicted Environmental Concentrations

Site Name	Background µg/m <sup>3</sup>	PC µg/m <sup>3</sup>	PC %	PEC µg/m <sup>3</sup>	PEC %
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI)/ Rainham Marshes (SSSI/LNR)	1.0	0.0430	0.9%	1.043	20.9%
Oxleas Woodlands (SSSI)		0.0091	0.2%	1.009	20.2%
Epping Forest (SSSI)		0.0060	0.1%	1.006	20.1%
Epping Forest (SAC)		0.0120	0.2%	1.012	20.2%
Ingrebourne Marshes (SSSI/LNR)		0.0256	0.5%	1.026	20.5%
Thorndon Park (SSSI)		0.0062	0.1%	1.006	20.1%
Hainault Forest (SSSI)		0.0036	0.1%	1.004	20.1%
Curtismill Green (SSSI)		0.0037	0.1%	1.004	20.1%
Grays Thurrock Chalk Pit (SSSI)		0.0044	0.1%	1.004	20.1%
Hangman's Wood & Deneholes (SSSI)		0.0023	0.0%	1.002	20.0%
Darenth Wood (SSSI)		0.0062	0.1%	1.006	20.1%
Farningham Wood (SSSI/LNR)		0.0055	0.1%	1.005	20.1%
<b>Locally Designated Sites</b>					
Crossness LNR	1.0	0.1299	2.6%	1.130	22.6%
BxB103		0.0418	0.8%	1.042	20.8%
M039		0.0419	1.1%	1.055	21.1%
BxL07		0.0546	0.9%	1.046	20.9%
BxL16		0.0465	1.2%	1.061	21.2%
Lesnes Abbey Wood LNR		0.0605	0.5%	1.024	20.5%
M041		0.0239	1.2%	1.062	21.2%
BxB114		0.0621	0.8%	1.042	20.8%

<sup>1</sup> Expressed as percentage of daily target of HF of 5 µg/m<sup>3</sup>

Table C.2.3.6 Predicted Nitrogen Deposition



Site Name	Lower Critical Load (kgN/ha/yr)	Background (kgN/ha/yr)	PC (kgN/ha/yr)	PC %	PEC (kgN/ha/yr)	PEC %
<b>International and Nationally Designated Sites</b>						
Inner Thames Marshes (SSSI) / Rainham Marshes (SSSI/LNR)	20	16.9	0.44	2.20%	17.4	87%
Ingrebourne Marshes (SSSI/LNR)	15	16.9	0.34	2.26%	17.3	115%
Oxleas Woodlands (SSSI)	10	28.3	0.06	0.61%	28.3	283%
Thorndon Park (SSSI)	10	27.6	0.06	0.58%	27.6	276%
Darenth Wood (SSSI)	10	26.3	0.03	0.34%	26.4	264%
Grays Thurrock Chalk Pit (SSSI)	10	24.2	0.03	0.31%	24.3	243%
Farningham Wood (SSSI/LNR)	10	28.7	0.03	0.30%	28.7	287%
Epping Forest (SAC)	10	19.7	0.02	0.20%	19.8	198%
Hainault Forest (SSSI)	10	26.5	0.02	0.19%	26.5	265%
Hangman's Wood & Deneholes (SSSI)	10	24.2	0.02	0.22%	24.2	242%
Epping Forest (SSSI)	8	18.3	0.02	0.20%	18.4	229%
Curtismill Green (SSSI)	20	16.4	0.02	0.08%	16.4	82%
<b>Locally Designated Sites</b>						
Crossness LNR	20	16.4	0.25	1.26%	16.6	83%
BxL16	10	34.4	0.51	5.08%	34.9	349%
BxBI14	5	19.3	0.29	5.77%	19.6	392%
BxL07	10	34.4	0.36	3.59%	34.8	348%
Lesnes Abbey Wood LNR	10	28.4	0.22	2.16%	28.6	286%
BxB103	10	28.4	0.18	1.79%	28.6	286%
M039	20	16.9	0.43	2.13%	17.4	87%
M041	20	19.3	0.10	0.48%	19.4	97%

Table C.2.3.7 Predicted Total Acid Deposition (Nitrogen and Sulphur)



Site Name	Critical Load (keq/ha/yr)	Background (keq/ha/yr)	PC (keq/ha/yr)	PC %	PEC (keq/ha/yr)	PEC %
<b>International and Nationally Designated Sites</b>						
Inner Thames Marshes (SSSI) / Rainham Marshes (SSSI/LNR)	5.071	1.4	0.083	1.63%	1.48	29.2%
Oxleas Woodlands (SSSI)	2.721	2.22	0.014	0.52%	2.23	82.1%
Epping Forest (SSSI)	4.45	1.48	0.003	0.07%	1.48	33.3%
Epping Forest (SAC)	1.594	1.59	0.005	0.29%	1.59	100.0%
Ingrebourne Marshes	not sensitive to acidification					
Thorndon Park (SSSI)	2.065	2.16	0.013	0.65%	2.17	105.2%
Hainault Forest (SSSI)	2.908	2.07	0.004	0.15%	2.07	71.3%
Curtismill Green (SSSI)	2.078	1.32	0.003	0.14%	1.32	63.7%
Grays Thurrock Chalk Pit (SSSI)	1.739	1.98	0.007	0.41%	1.99	114.3%
Hangman's Wood & Deneholes (SSSI)	1.739	1.98	0.005	0.30%	1.99	114.2%
Darenth Wood (SSSI)	8.57	2.1	0.008	0.09%	2.11	24.6%
Farningham Wood (SSSI/LNR)	1.511	2.28	0.007	0.46%	2.29	151.3%
<b>Locally Designated Sites</b>						
Crossness LNR	5.071	1.35	0.047	0.93%	1.40	27.6%
BxB103	1.031	2.24	0.042	4.03%	2.28	221.3%
M039	NA					
BxL07	8.612	2.7	0.067	0.78%	2.77	32.1%
BxL16	8.612	2.7	0.118	1.37%	2.82	32.7%
Lesnes Abbey Wood LNR	1.034	2.24	0.050	4.84%	2.29	221.5%
M041	NA					
BxBI14	NA					







Table C.2.3.8 Predicted Nitrogen Acid Deposition (keqN/ha/year)

Site Name	NO <sub>2</sub> (µg/m <sup>3</sup> )	Acidification from NO <sub>2</sub> (keq/ha/year)	NH <sub>3</sub> (µg/m <sup>3</sup> )	Acidification from NH <sub>3</sub> (keq/ha/year)	Total Nitrogen Acid Deposition (keqN/ha/yr)
<b>International and Nationally Designated Sites</b>					
Oxleas Woodlands (SSSI)	0.050	1.03 x 10 <sup>-3</sup>	0.0060	3.32 x 10 <sup>-3</sup>	4.35 x 10 <sup>-3</sup>
Thorndon Park (SSSI)	0.047	9.73 x 10 <sup>-4</sup>	0.0056	3.13 x 10 <sup>-3</sup>	4.11 x 10 <sup>-3</sup>
Darenth Wood (SSSI)	0.028	5.82 x 10 <sup>-4</sup>	0.0034	1.87 x 10 <sup>-3</sup>	2.46 x 10 <sup>-3</sup>
Grays Thurrock Chalk Pit (SSSI)	0.025	5.19 x 10 <sup>-4</sup>	0.0030	1.67 x 10 <sup>-3</sup>	2.19 x 10 <sup>-3</sup>
Farningham Wood (SSSI/LNR)	0.024	5.01 x 10 <sup>-4</sup>	0.0029	1.61 x 10 <sup>-3</sup>	2.12 x 10 <sup>-3</sup>
Hangman's Wood & Deneholes (SSSI)	0.018	3.78 x 10 <sup>-4</sup>	0.0022	1.22 x 10 <sup>-3</sup>	1.59 x 10 <sup>-3</sup>
Epping Forest (SAC)	0.017	3.41 x 10 <sup>-4</sup>	0.0020	1.10 x 10 <sup>-3</sup>	1.44 x 10 <sup>-3</sup>
Hainault Forest (SSSI)	0.016	3.23 x 10 <sup>-4</sup>	0.0019	1.04 x 10 <sup>-3</sup>	1.36 x 10 <sup>-3</sup>
Epping Forest (SSSI)	0.021	2.14 x 10 <sup>-4</sup>	0.0025	9.19 x 10 <sup>-4</sup>	1.13 x 10 <sup>-3</sup>
Curtismill Green (SSSI)	0.021	2.12 x 10 <sup>-4</sup>	0.0025	9.09 x 10 <sup>-4</sup>	1.12 x 10 <sup>-3</sup>
Inner Thames Marshes (SSSI) / Rainham Marshes (SSSI/LNR)	0.578	5.93 x 10 <sup>-3</sup>	0.0688	2.54 x 10 <sup>-2</sup>	3.14 x 10 <sup>-2</sup>
Ingrebourne Marshes (SSSI)	0.446	4.57 x 10 <sup>-3</sup>	0.0530	1.96 x 10 <sup>-2</sup>	2.42 x 10 <sup>-2</sup>
<b>Locally Designated Sites</b>					
Crossness LNR	0.330	3.38 x 10 <sup>-3</sup>	0.0392	1.45 x 10 <sup>-2</sup>	1.79 x 10 <sup>-2</sup>
M041	0.125	1.28 x 10 <sup>-3</sup>	0.0148	5.49 x 10 <sup>-3</sup>	6.77 x 10 <sup>-3</sup>
M039	0.558	5.72 x 10 <sup>-3</sup>	0.0664	2.46 x 10 <sup>-2</sup>	3.03 x 10 <sup>-2</sup>
BxL07	0.471	4.83 x 10 <sup>-3</sup>	0.0560	2.07 x 10 <sup>-2</sup>	2.56 x 10 <sup>-2</sup>
BxBI14	0.378	3.88 x 10 <sup>-3</sup>	0.0451	1.67 x 10 <sup>-2</sup>	2.06 x 10 <sup>-2</sup>
Lesnes Abbey Wood LNR	0.177	3.64 x 10 <sup>-3</sup>	0.0211	1.17 x 10 <sup>-2</sup>	1.54 x 10 <sup>-2</sup>
BxB103	0.147	3.02 x 10 <sup>-3</sup>	0.0175	9.72 x 10 <sup>-3</sup>	1.27 x 10 <sup>-2</sup>
BxL16	0.418	8.58 x 10 <sup>-3</sup>	0.0498	2.76 x 10 <sup>-2</sup>	3.62 x 10 <sup>-2</sup>





Table C.2.3.9 Predicted Sulphur Acid Deposition (keqS/ha/year)

Site Name	SO <sub>2</sub> (µg/m <sup>3</sup> )	Acidification from SO <sub>2</sub> (keq/ha/year)	HCl (µg/m <sup>3</sup> )	Acidification from HCl <sup>1</sup> (keq/ha/year)	Total Sulphur Acid Deposition (keqS/ha/yr)
<b>International and Nationally Designated Sites</b>					
Inner Thames Marshes (SSSI) / Rainham Marshes (SSSI/LNR)	0.206	2.44 x 10 <sup>-2</sup>	0.0413	2.68 x 10 <sup>-2</sup>	0.0512
Ingrebourne Marshes (SSSI)	0.159	1.88 x 10 <sup>-2</sup>	0.0318	2.06 x 10 <sup>-2</sup>	0.0395
Oxleas Woodlands (SSSI)	0.018	4.25 x 10 <sup>-3</sup>	0.0036	5.59 x 10 <sup>-3</sup>	0.0098
Thorndon Park (SSSI)	0.017	4.01 x 10 <sup>-3</sup>	0.0034	5.27 x 10 <sup>-3</sup>	0.0093
Darenth Wood (SSSI)	0.010	2.40 x 10 <sup>-3</sup>	0.0020	3.16 x 10 <sup>-3</sup>	0.0056
Grays Thurrock Chalk Pit (SSSI)	0.009	2.14 x 10 <sup>-3</sup>	0.0018	2.81 x 10 <sup>-3</sup>	0.0050
Farningham Wood (SSSI/LNR)	0.009	2.06 x 10 <sup>-3</sup>	0.0017	2.72 x 10 <sup>-3</sup>	0.0048
Hangman's Wood & Deneholes (SSSI)	0.007	1.56 x 10 <sup>-3</sup>	0.0013	2.05 x 10 <sup>-3</sup>	0.0036
Epping Forest (SAC)	0.006	1.40 x 10 <sup>-3</sup>	0.0012	1.85 x 10 <sup>-3</sup>	0.0032
Hainault Forest (SSSI)	0.006	1.33 x 10 <sup>-3</sup>	0.0011	1.75 x 10 <sup>-3</sup>	0.0031
Epping Forest (SSSI)	0.007	8.81 x 10 <sup>-4</sup>	0.0015	9.67 x 10 <sup>-4</sup>	0.0018
Curtismill Green (SSSI)	0.007	8.72 x 10 <sup>-4</sup>	0.0015	9.56 x 10 <sup>-4</sup>	0.0018
<b>Locally Designated Sites</b>					
Crossness LNR	0.118	1.39 x 10 <sup>-2</sup>	0.0235	1.53 x 10 <sup>-2</sup>	0.0292
BxL16	0.149	3.53 x 10 <sup>-2</sup>	0.0299	4.65 x 10 <sup>-2</sup>	0.0818
M039	0.199	2.36 x 10 <sup>-2</sup>	0.0398	2.59 x 10 <sup>-2</sup>	0.0494
BxL07	0.168	1.99 x 10 <sup>-2</sup>	0.0336	2.18 x 10 <sup>-2</sup>	0.0417
Lesnes Abbey Wood LNR	0.063	1.50 x 10 <sup>-2</sup>	0.0127	1.97 x 10 <sup>-2</sup>	0.0347
BxBI14	0.135	1.60 x 10 <sup>-2</sup>	0.0270	1.75 x 10 <sup>-2</sup>	0.0335
BxB103	0.053	1.24 x 10 <sup>-2</sup>	0.0105	1.64 x 10 <sup>-2</sup>	0.0288
M041	0.045	5.27 x 10 <sup>-3</sup>	0.0089	5.78 x 10 <sup>-3</sup>	0.0110

<sup>1</sup>Using wet and dry deposition





## C.2.4 Stepped Buildings Results – Point of Maximum Concentration

Pollutant	Averaging Time	AQAL ( $\mu\text{g}/\text{m}^3$ )	PC % using Rochdale Envelope (worst case)	PC % using Stepped Buildings (realistic case)
Ammonia	Annual	180	0.25%	0.07%
Ammonia	Hourly	2500	0.17%	0.13%
Antimony	Annual	5	0.01%	0.003%
Antimony	Hourly	150	0.003%	0.002%
Arsenic	Annual	0.003	38.19%	10.49%
Benzene	Annual	5	9.16%	2.52%
Benzene	Hourly	195	2.17%	1.63%
Benzo(a)pyrene	Annual	0.00025	3.85%	1.06%
Cadmium	Annual	0.005	18.33%	5.03%
Cadmium	Hourly	15	0.06%	0.04%
Carbon monoxide	8-hourR	10000	0.14%	0.04%
Carbon monoxide	Hourly	30000	0.07%	0.05%
Chromium (Total)	Annual	3	0.14%	0.04%
Chromium III	Annual	5	0.27%	0.08%
Chromium III	Hourly	150	0.08%	0.06%
Chromium VI	Annual	0.0002	2.98%	0.82%
Cobalt	Annual	0.2	0.13%	0.04%
Cobalt	Hourly	1.5	0.16%	0.12%
Copper	Annual	10	0.01%	0.004%
Copper	Hourly	200	0.01%	0.005%
Hydrogen chloride	Hourly	750	0.34%	0.25%
Hydrogen fluoride	Annual	16	0.29%	0.08%
Hydrogen fluoride	Hourly	160	0.26%	0.20%
Lead	Annual	0.25	0.92%	0.25%
Manganese	Annual	0.15	1.83%	0.50%
Manganese	Hourly	1500	0.002%	0.001%
Mercury	Annual	0.25	0.37%	0.10%
Mercury	Hourly	7.5	0.11%	0.08%
Nickel	Annual	0.02	50.41%	13.84%
Nickel	Hourly	30	0.31%	0.23%
Nitrogen Dioxide	Annual	40	9.62%	2.64%
Nitrogen Dioxide	99.79%ile hourly	200	6.66%	2.24%
Particulates (PM10)	Annual	40	0.57%	0.16%



Pollutant	Averaging Time	AQAL (µg/m3)	PC % using Rochdale Envelope (worst case)	PC % using Stepped Buildings (realistic case)
Particulates (PM <sub>10</sub> )	90.41 <sup>th</sup> %ile daily	50	1.27%	0.38%
Particulates (PM <sub>2.5</sub> )	Annual	25	0.92%	0.25%
Particulates (PM <sub>2.5</sub> )	Annual	20	1.15%	0.31%
Sulphur dioxide	99.90 <sup>th</sup> %ile 15 minute	266	3.92%	1.40%
Sulphur dioxide	99.18 <sup>th</sup> %ile daily	125	5.55%	1.58%
Sulphur dioxide	99.73 <sup>th</sup> %ile hourly	350	2.70%	0.89%
Thallium	Annual	1	0.09%	0.03%
Thallium	Hourly	30	0.03%	0.02%
Vanadium	Annual	5	0.01%	0.002%
Vanadium	Hourly	1	0.25%	0.19%

