

REDCAR ENERGY CENTRE APPENDIX 11.7

WI BAT Results

Redcar Energy Centre
Environmental Statement
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1 INTRODUCTION

1.1 Predicted Concentrations at the BAT Conclusions Emission Limit Values for Waste Incineration

1.1.1 Table 1.1 shows the PC for all pollutants assuming that the project is operating at the long-term emission limit values as set out in the BATs for waste incineration.

Table 1.1: Predicted Maximum Process Contribution at Long-Term BAT Conclusions Emission Limit Values for Waste Incineration

Pollutant	Averaging Period	EAL ($\mu\text{g.m}^{-3}$)	Max PC ($\mu\text{g.m}^{-3}$)	Max PC as % of EAL	Criteria (%)	Is PC Potentially Significant?
PM ₁₀	24 hour (90.41st percentile)	50	0.4	1	10	No
	24 hour (annual mean)	40	0.11	0	1	No
PM _{2.5}	24 hour (annual mean)	25	0.11	0	1	No
HCl	1 hour (maximum)	750	3.0	0	10	No
HF	1 hour (maximum)	160	0.5	0	10	No
SO ₂	15 minute (99.90th percentile)	266	8.1	3	10	No
	1 hour (99.73th percentile)	350	7.3	2	10	No
	24 hour (99.18th percentile)	125	4.3	3	10	No
	1 hour (annual mean)	50	0.6	1	1	No
NO ₂	1 hour (99.79th percentile)	200	10.5	5	10	No
	1 hour (annual mean)	40	1.8	5	1	Yes
CO	8 hour (maximum daily running)	10,000	11.6	0	10	No
Cd	1 hour (annual mean)	0.005	0.0004	9	10	No
Tl	1 hour (maximum)	30	0.0101	0	10	No
	1 hour (annual mean)	1	0.0004	0	1	No
Hg	1 hour (maximum)	7.5	0.0101	0	10	No
	1 hour (annual mean)	0.25	0.0004	0	1	No
Sb	1 hour (maximum)	150	0.1509	0	10	No
	1 hour (annual mean)	5	0.0064	0	1	No
As	1 hour (annual mean)	0.003	0.0064	214	1	Yes
Cr	1 hour (maximum)	150	0.1509	0	10	No
	1 hour (annual mean)	5	0.0064	0	1	No
Co	1 hour (maximum)	6	0.1509	3	10	No
	1 hour (annual mean)	0.2	0.0064	3	1	Yes
Cu	1 hour (maximum)	200	0.1509	0	10	No
	1 hour (annual mean)	10	0.0064	0	1	No
Pb	1 hour (annual mean)	0.25	0.0064	3	1	Yes
Mn	1 hour (maximum)	1500	0.1509	0	10	No
	1 hour (annual mean)	0.15	0.0064	4	1	Yes
Ni	1 hour (annual mean)	0.02	0.0064	32	1	Yes
V	1 hour (maximum)	5	0.1509	3	10	No
	1 hour (annual mean)	1	0.0064	1	1	No

Pollutant	Averaging Period	EAL ($\mu\text{g.m}^{-3}$)	Max PC ($\mu\text{g.m}^{-3}$)	Max PC as % of EAL	Criteria (%)	Is PC Potentially Significant?
Dioxins & Furans	1 hour (annual mean)	-	8.57E-10	#	1	-
PAHs	1 hour (annual mean)	0.00025	6.43E-05	26	1	Yes
PCB	1 hour (annual mean)	0.2	1.29E-09	0	1	No
NH ₃	1 hour (annual mean)	5	2.14E-01	4	10	No

1.1.2 The results presented in Table 1.1 show that the predicted PC is below 10% of the relevant short-term EAL and below 1% of the long-term EAL for all pollutants, except for annual-mean NO₂, As (arsenic), Co (cobalt), Pb (lead), Mn (manganese), Ni (nickel) and PAHs.

1.1.3 Table 1.2 summarises the Project PECs for all pollutants that were considered to be potentially significant in Table 1.1.

Table 1.2: Predicted Environmental Concentrations at Long-Term BAT Conclusions Emission Limit Values for Waste Incineration

Pollutant	Averaging Period	EAL ($\mu\text{g.m}^{-3}$)	AC ($\mu\text{g.m}^{-3}$)	Max PEC ($\mu\text{g.m}^{-3}$)	Max PEC as % of EAL	Is PEC Potentially Significant?
NO ₂	1 hour (annual mean)	40	28.5	30.3	76	No
As	1 hour (annual mean)	0.003	0.00084	0.00727	242	Yes
Co	1 hour (annual mean)	0.2	0.00013	0.00656	3	No
Pb	1 hour (annual mean)	0.25	0.01676	0.02319	9	No
Mn	1 hour (annual mean)	0.25	0.02185	0.02828	19	No
Ni	1 hour (annual mean)	0.02	0.00116	0.00759	38	No
PAHs	1 hour (annual mean)	0.00025	0.00021	0.00028	110	Yes

1.1.4 The results presented in Table 1.2 show that the PEC is below the EAL for NO₂, Co, Pb, Mn and Ni and the impacts are therefore not considered significant.

1.1.5 For As, the PEC is above the EAL, however these predictions are based on the assumption that arsenic comprises the total of the group 3 metals emissions. In reality, the IED emission limit applies to all nine of the group 3 metals. The Environment Agency 'Releases from waste incinerators – Guidance on assessing group 3 metal stack emissions from incinerators' version 4 (undated), provides a summary of 34 measured values for each metal recorded at 18 municipal waste and waste wood co-incinerators between 2007 and 2015. For As, the measured concentration varies from 0.04% to 5% of the IED emission concentration limit.

1.1.6 Table 1.3 shows the predicted PC if As is only 5.0% of the emission limit. i.e. the PC for As has been divided by 20 (5% of the IED emission concentration limit).

Table 1.3: Predicted Environmental Concentrations at Long-Term Emission Limit Values

Pollutant	Averaging Period	EAL ($\mu\text{g.m}^{-3}$)	Max PC ($\mu\text{g.m}^{-3}$)	Max PC as % of EAL	Is PC Potentially Significant?	AC ($\mu\text{g.m}^{-3}$)	Max PEC ($\mu\text{g.m}^{-3}$)	Max PEC as % of EAL	Is PEC Potentially Significant?
As	1 hour (annual mean)	0.003	0.00032	11	Yes	0.00084	0.001164	39	No

1.1.7 In this case, the predicted PC remains more than 1% above the EAL; however, the PEC for As is below the EAL. At long-term emission limits, the As impacts are therefore not considered significant.

- 1.1.8 For PAHs, the PEC is 110% of the EAL, therefore the long-term PAH impact based on modelling across the grid would be considered to be potentially significant if public exposure was possible. Table 10.6.2 in Appendix 10.6 shows that, at the nearest sensitive receptors, the maximum predicted PC is less than 1% of the EAL and the long-term PAH impacts are considered to be insignificant.
- 1.1.9 For hexavalent chromium (CrVI), the measured concentrations in the Environment Agency document 'Releases from waste incinerators – Guidance on assessing group 3 metal stack emissions from incinerators' version 4 (undated), varies from 0.0005% to 0.03% of the IED emission concentration limit. Table 1.4 shows the predicted PC at these proportions.

Table 1.4: Predicted Environmental Concentrations at Long-Term Emission Limit Values

Pollutant	Averaging Period	EAL ($\mu\text{g.m}^{-3}$)	Max PC ($\mu\text{g.m}^{-3}$)	Max PC as % of EAL	Percentage of the IED Emission Limit
CrVI	1 hour (annual mean)	0.0002	3.21E-08	0	0.0005% (min)
			1.937E-06	1	0.03% (max)

- 1.1.10 The PC at each end of the range is below 1% of the EAL and the impacts are not considered significant.