Attachment 5.7

Appendix 8.11 Air Modelling Validation Study Using Roches Point Meteorological Station

Appendix 8.11

Air Modelling Validation Study Using Roches Point Meteorological Station

APPENDIX 8.11

8.11.1 Air Modelling Validation Study Using Roches Point Meteorological Station

As outlined in **Section 8.3** of **Chapter 8** of the EIS, an extensive baseline survey was carried out in the region of the proposed development over the period August 2024 – January 2025. This data supplements the extensive baseline surveys undertaken in November 2006 to February 2007, from April 2008 to July 2008, from August 2014 to July 2015, October 2018 to January 2019 and June 2019 – September 2019. These surveys focused on the significant pollutants likely to be emitted from the proposed development and which have been regulated in Council Directive 2010/75/EU. The substances monitored over these survey periods were NO_2, NO_X, PM_{10}, $PM_{2.5}$, benzene, SO_2, heavy metals, HCl, HF and PCDDs/PCDFs. The air monitoring program was used to determine long-term average concentrations for these pollutants in order to help quantify the existing ambient air quality in the region. NO_2, benzene and SO_2 were also monitored at a number of additional locations to give some spatial representation of the levels of these species.

The updated extensive baseline survey which was carried out in the region of the proposed development over the period August 2024 – January 2025 focused on NO_2, PM_{10}, $PM_{2.5}$, benzene and SO_2 (as shown in **Figure 8.1** and **8.2** of **Chapter 8** of the EIS). The air monitoring programme was used to determine long-term average concentrations for these pollutants in order to help quantify the existing ambient air quality in the region. NO_2, benzene and SO_2 were also monitored at a number of additional locations to give greater spatial representation of the levels of these species.

Full details of the monitoring methodology, assessment and results are outlined in **Section 8.4** of **Appendix 8.1** of **Chapter 8** of the EIS**.**

Ambient NO_2, SO_2, benzene, PM_{10} and $PM_{2.5}$ were measured for an approximate 6-month period from August 2024 – January 2025), to account for seasonal variations in these pollutants.

The NO_2 monitoring was carried out using passive diffusion tubes. The average NO_2 concentration measured over the six-month period at each of the 16 diffusion tube monitoring locations ranged from 4.0 – 10.3 $\mu g/m^3$, which is between 10% - 26% of the EU annual limit value of 40 $\mu g/m^3$.

The SO_2 diffusion tube concentrations measured over the six-month survey period are below the annual EU limit value of 20 $\mu g/m^3$ for the protection of vegetation. The average SO_2 concentration measured over the six-month period at each location ranged from 1.6 – 2.8 $\mu g/m^3$ which is between 8% – 14% of the EU annual limit value of 20 $\mu g/m^3$.

The benzene diffusion tube concentrations measured over the six-month survey period are below the annual EU limit value of 5 $\mu g/m^3$ for the protection of human health. The average benzene concentration measured over the six-month period at each location ranged from 0.20 – 0.38 $\mu g/m^3$ which is between 4% - 8% of the EU annual limit value of 5 $\mu g/m^3$.

The 24-hour PM_{10} concentrations measured using a continuous Osiris light scattering monitor over the six-month monitoring period are below the 24-hour EU limit value of 50 $\mu g/m^3$ and there were no exceedances of the 24-hour limit value recorded. The annualised average PM_{10} concentration is 9.4 $\mu g/m^3$ which is only 23% of the EU annual limit value of 40 $\mu g/m^3$.

The annualised average $PM_{2.5}$ concentration is 5.7 $\mu g/m^3$ which is below the annual average EU limit value of 25 $\mu g/m^3$.

HF / HCl, heavy metals and PCDD/PCDFs were measured over the period October 2018 – January 2019. The HF and HCl diffusion tube concentrations measured over the three-month survey period are well below the UK EALs[6]. The average HF concentration measured over the three-month period is 0.32

µg/m^3, which is only 2% of the annual limit value of 16 µg/m^3. The average HCl concentration measured over the three-month monitoring period is 2.21 µg/m^3 which is 11% of the annual limit value of 20 µg/m^3.

The average concentrations of antimony (Sb), arsenic (As), cadmium (Cd), cobalt (Co), chromium (Cr), copper (Cu), mercury (Hg), manganese (Mn), nickel (Ni), lead (Pb), thallium (Tl) and vanadium (V) were significantly below their respective annual limit values, with average levels reaching only 0.04% - 47% of these limits.

Background levels of PCDD / PCDFs cannot be compared to ambient air quality concentration or deposition standards. However, levels of PCDDs and PCDFs can be compared to existing levels measured sporadically in Ireland and continuously in the UK as part of the TOMPS network. The mean PCDD/PCDF concentration measured over the period October 2018 – January 2019 indicates that results are in line with measurements conducted elsewhere in Ireland, with an upper limit of 29.8 fg/m^3 compared to previous measurements ranging from 2.8 – 46 fg/m^3.

In summary, baseline ambient concentrations are in compliance with the ambient air quality standards which are based on the protection of the environment and human health.

In terms of the modelled air quality assessment, as outlined in Appendix 8.1 of the EIS all results are in compliance with the ambient air quality standards based on a stack height of 70m above local ground level. The results are outlined in Sections 8.6 – 8.8 of Appendix 8.1 of the EIS. The modelling was undertaken using Cork Airport data from 2021 – 2025 in addition to the onsite meteorological station which collected a full year of meteorological data in 2007.

The only other meteorological station operated by Met Eireann within the modelling domain is Roches Point which is located in a very exposed location 5.5km south-east of the facility. Roches Point is an automatic station and thus does not collect cloud cover which is required by the air dispersion model (AERMOD). In the absence of this data, data for Cork Airport has been substituted for the same time period (2021 – 2025).

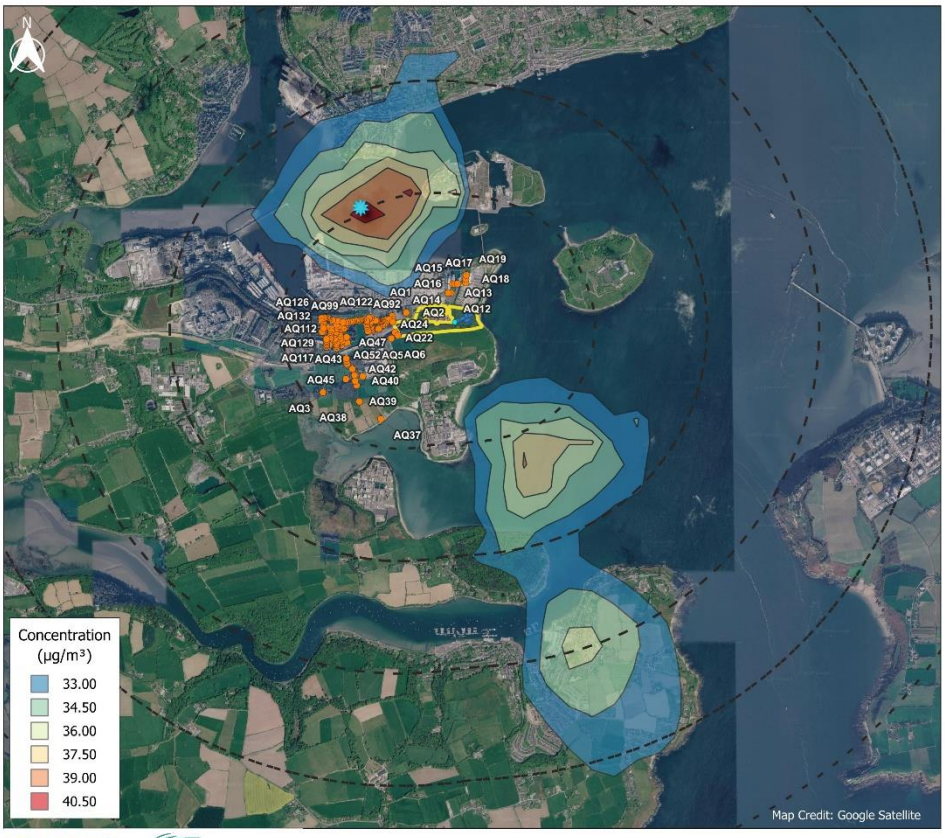
All pollutants have been re-run based on meteorological data from Roches Point and compared to the results based on the Cork Airport data from 2021 – 2025 and the onsite data from 2007.

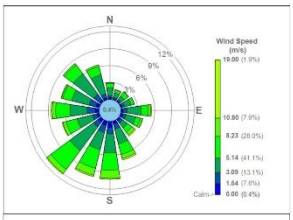
The results of this assessment are outlined in Table.1 - Table.15 below. Results remain in compliance with the ambient air quality standards based on data from Roches Point. Compared to Cork Airport results and the onsite station, for some averaging periods results are marginally lower and for some averaging periods and pollutants results are a little higher but overall for all stations, results are similar and, moreover, for all meteorological stations and time periods ambient results are well below the ambient air quality standards.

A direct comparison between the modelled results and the baseline data is not possible. The modelling is based on the facility being in operation which it currently is not. The baseline data is measuring the background ambient air quality in the absence of the facility. Thus, there will be no correlation between the baseline data and the process contribution (PC) from the facility. Baseline data is often comparable to the predicted environmental concentration (PEC). However, where this occurs, it is a reflection of the fact that the main contributor to the PEC is the background concentration which is derived from the baseline data and the predicted PC is a small contributor to the overall PEC.

As shown in Figure A8.1, Figure A8.2 and Figure A8.3, for nitrogen dioxide, the maximum offsite locations are located at similar distances from the facility compared to Cork Airport 2021 - 2025.

Figure A8.1 Maximum Operation: Predicted Maximum 1-Hr NO_2 Concentration (as a 99.97th%ile)





Air Dispersion Modelling Assessment

Proposed Operations

Year 2022

Reference:
247501.0490

99.97th%ile 1-Hour Mean NO_2 Concentrations

Maximum predicted environmental concentration (PEC):
41.73 µg/m³

Site Location
Emission Points
Modelled Buildings
1 km Buffer
Modelled Sensitive Receptor
Max. PEC

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Figure A8.2 Maximum Operation: Predicted Maximum 24-Hr NO_2 Concentration (as a 95th%ile)

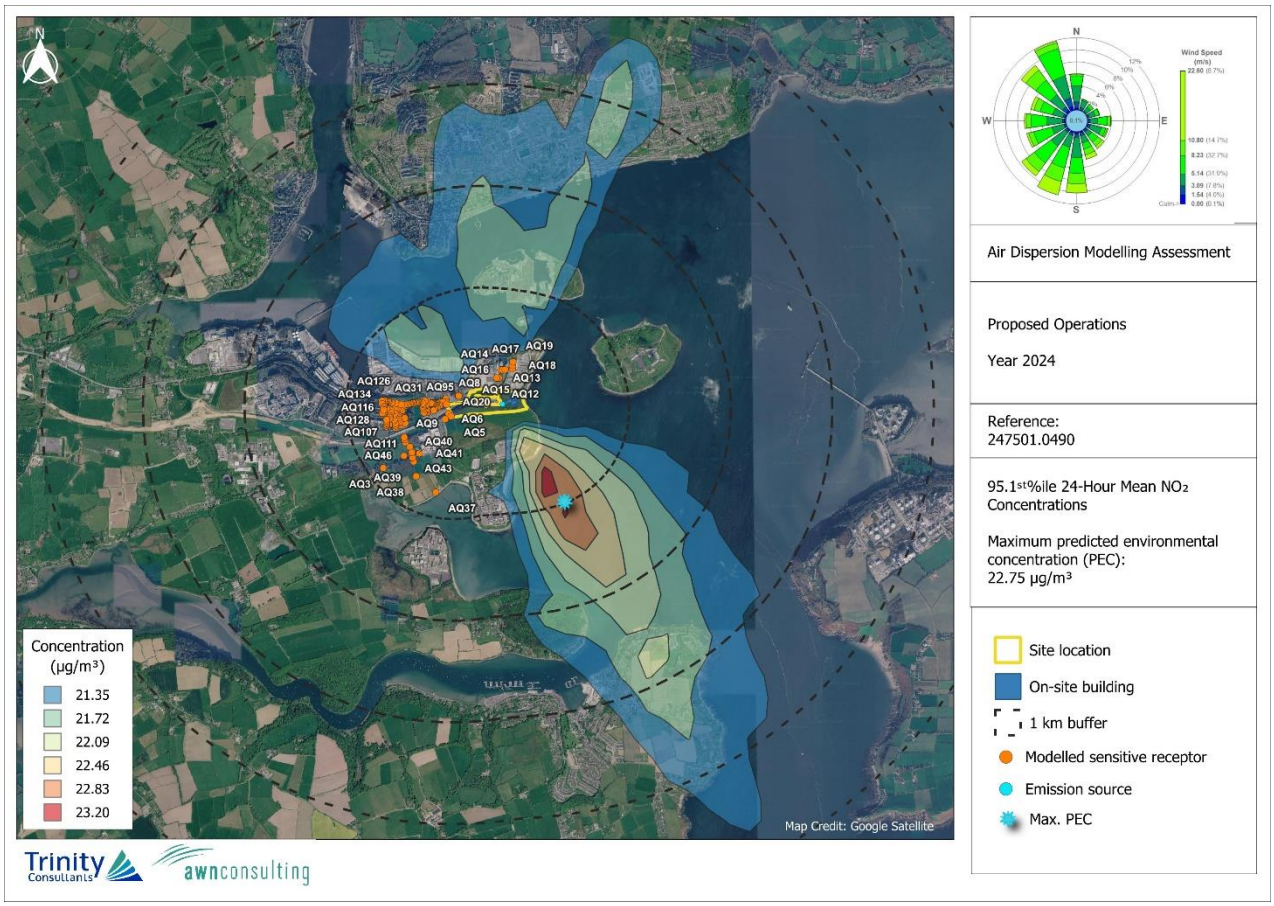


Figure A8.3 Maximum Operation: Predicted Annual Mean Concentration

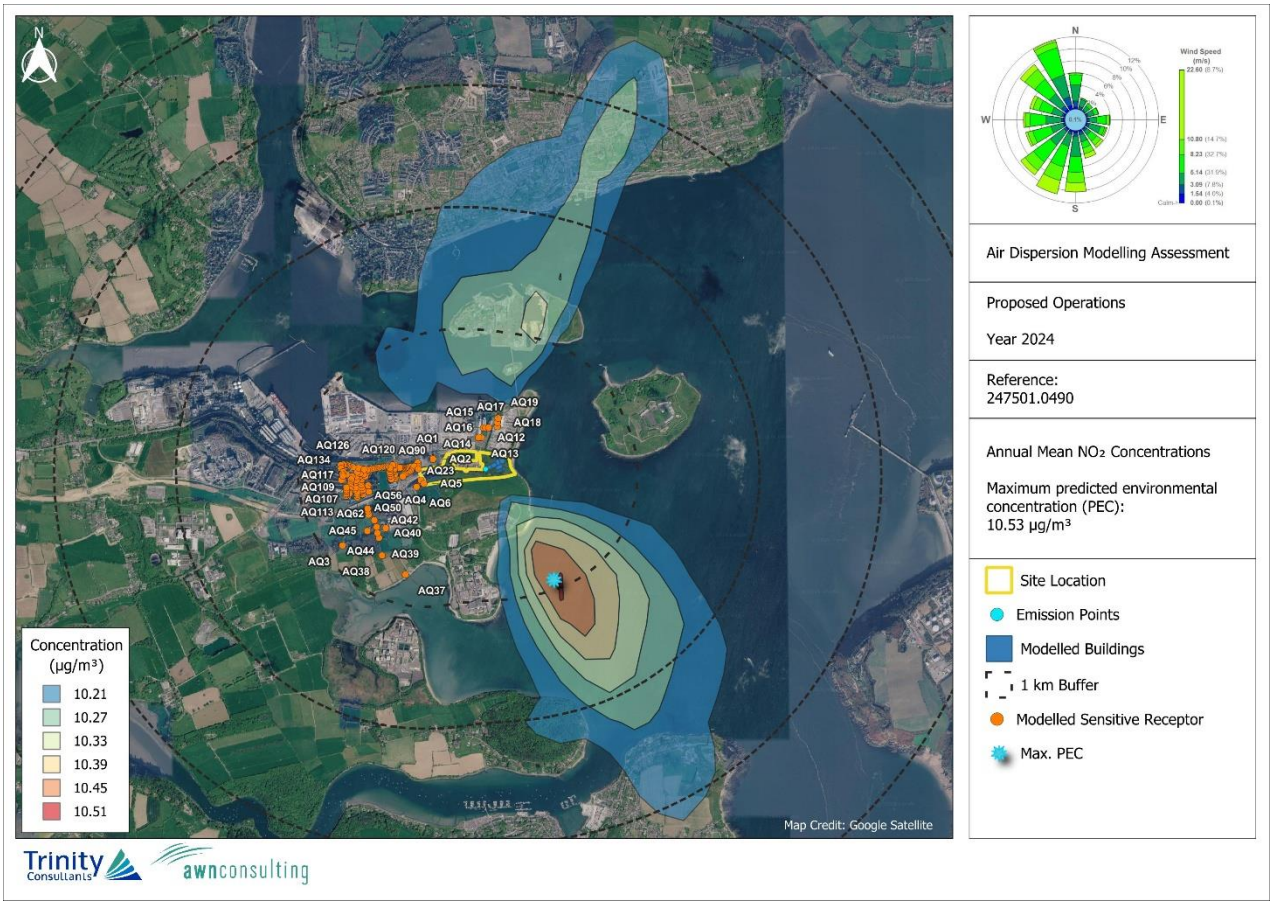


Table.1 Roches Point Dispersion Model Results – Nitrogen Dioxide

Pollutant / Year	Averaging Period	Worst Case Receptor		PC (µg/m³)	Back-ground Conc. (µg/m³)	PEC (µg/m³)	Limit Values (µg/Nm³)	PEC as a % of Limit Value
		Type	X,Y (UTM Zone 29 N)					
NO_2 / 2021	Annual Mean	Boundary	548500, 5741425	0.47	10	10.5	20	52%
	1-hr Mean (as 99.97th%ile)	Grid	547525, 5743550	20.90	20	40.9	200	20%
	24-hr Mean (as 95.1st%ile)	Grid	548375, 5741525	2.59	20	22.6	50	45%
NO_2 / 2022	Annual Mean	Boundary	548500, 5741450	0.42	10	10.4	20	52%
	1-hr Mean (as 99.97th%ile)	Grid	547050, 5743375	21.73	20	41.7	200	21%
	24-hr Mean (as 95.1st%ile)	Grid	548350, 5741650	2.36	20	22.4	50	45%
NO_2 / 2023	Annual Mean	Boundary	548625, 5741550	0.38	10	10.4	20	52%
	1-hr Mean (as 99.97th%ile)	Grid	547600, 5743600	20.41	20	40.4	200	20%
	24-hr Mean (as 95.1st%ile)	Grid	548475, 5741700	2.11	20	22.1	50	44%
NO_2 / 2024	Annual Mean	Boundary	548450, 5741450	0.53	10	10.5	20	53%
	1-hr Mean (as 99.97th%ile)	Grid	547600, 5743600	21.20	20	41.2	200	21%
	24-hr Mean (as 95.1st%ile)	Grid	548375, 5741550	2.75	20	22.7	50	45%
NO_2 / 2025	Annual Mean	Boundary	548250, 5743450	0.39	10	10.4	20	52%

Pollutant / Year	Averaging Period	Worst Case Receptor		PC (µg/m³)	Back-ground Conc. (µg/m³)	PEC (µg/m³)	Limit Values (µg/Nm³)	PEC as a % of Limit Value
		Type	X,Y (UTM Zone 29 N)					
	1-hr Mean (as 99.97thO%ile)	Grid	548900, 5741525	4.36	20	24.4	200	12%
	24-hr Mean (as 95.1st%ile)	Grid	548425, 5741525	2.90	20	22.9	50	46%

Table.2 Roches Point Dispersion Model Results – Carbon Monoxide

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (mg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
CO / 2021	Maximum Daily 8-Hour Mean	Grid	547400, 5742650	0.027	1.0	1.027	10	10%
	24-hr Mean (as 95.1st %ile)	Grid	548225, 5741825	0.006	1.0	1.006	4	25%
CO/ 2022	Maximum Daily 8-Hour Mean	Grid	5742100, 547950	0.029	1.0	1.029	10	10%
	24-hr Mean (as 95.1st %ile)	Grid	548225, 5741825	0.006	1.0	1.006	4	25%
CO/ 2023	Maximum Daily 8-Hour Mean	Grid	5742625, 547575	0.029	1.0	1.029	10	10%
	24-hr Mean (as 95.1st %ile)	Grid	548175, 5741975	0.006	1.0	1.006	4	25%
CO/ 2024	Maximum Daily 8-Hour Mean	Grid	5742700, 547525	0.026	1.0	1.026	10	10%
	24-hr Mean (as 95.1st %ile)	Grid	548300, 5741650	0.007	1.0	1.007	4	25%
CO/ 2025	Maximum Daily 8-Hour Mean	Grid	5742700, 547500	0.030	1.0	1.030	10	10%
	24-hr Mean (as 95.1st %ile)	Grid	548150, 5743200	0.006	1.0	1.006	4	25%

Table.3 Roches Point Dispersion Model Results – PM_{10}

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
PM_{10} / 2021	Annual Mean	Boundary	548225, 5741825	0.075	10	10.07	20	50%
	95.1st%ile 24-hr Mean	Grid	548225, 5741825	0.430	20	20.07	45	45%
PM_{10} / 2022	Annual Mean	Boundary	548350, 5741675	0.068	10	10.07	20	50%
	95.1st%ile 24-hr Mean	Grid	548350, 5741675	0.398	20	20.07	45	45%
PM_{10} / 2023	Annual Mean	Boundary	548300, 5741875	0.062	10	10.06	20	50%
	95.1st%ile 24-hr Mean	Grid	548300, 5741875	0.386	20	20.06	45	45%
PM_{10} / 2024	Annual Mean	Boundary	548225, 5741825	0.091	10	10.09	20	50%
	95.1st%ile 24-hr Mean	Grid	548225, 5741825	0.460	20	20.09	45	45%
PM_{10} / 2025	Annual Mean	Boundary	548175, 5743200	0.074	10	10.07	20	50%
	95.1st%ile 24-hr Mean	Grid	548175, 5743200	0.390	20	20.07	45	45%

Table.4 Roches Point Dispersion Model Results – $PM_{2.5}$

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
	Annual	Boundary	548225, 5741825	0.075	6.0	6.075	10	61%

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
$PM_{2.5}$ / 2021	Mean							
	24-hr Mean (as 95.1st%ile)	Grid	548225, 5741825	0.322	12.0	12.07	25	48%
$PM_{2.5}$ / 2022	Annual Mean	Boundary	548350, 5741675	0.068	6.0	6.068	10	61%
	24-hr Mean (as 95.1st%ile)	Grid	548350, 5741675	0.398	12.0	12.07	25	48%
$PM_{2.5}$ / 2023	Annual Mean	Boundary	548300, 5741875	0.062	6.0	6.062	10	61%
	24-hr Mean (as 95.1st%ile)	Grid	548300, 5741875	0.386	12.0	12.06	25	48%
$PM_{2.5}$ / 2024	Annual Mean	Boundary	548225, 5741825	0.091	6.0	6.091	10	61%
	24-hr Mean (as 95.1st%ile)	Grid	548225, 5741825	0.460	12.0	12.09	25	48%
$PM_{2.5}$ / 2025	Annual Mean	Boundary	548175, 5743200	0.074	6.0	6.074	10	61%
	24-hr Mean (as 95.1st%ile)	Grid	548175, 5743200	0.390	12.0	12.07	25	48%

Table.5 Roches Point Dispersion Model Results – Sulphur Dioxide

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
SO_2 / 2021	Annual Mean	Boundary	548225, 5741825	0.37	3.0	3.37	20	17%
	1-hr Mean (99.97thO%ile)	Grid	548225, 5741825	52.54	6.0	58.54	350	17%
	24-hr Mean (95.1ndO%ile)	Grid	548225, 5741825	2.15	6.0	8.15	50	16%
SO_2 / 2022	Annual Mean	Boundary	548350, 5741675	0.34	3.0	3.34	20	17%
	1-hr Mean (99.97thO%ile)	Grid	548350, 5741675	51.40	6.0	57.40	350	16%
	24-hr Mean (95.1ndO%ile)	Grid	548350, 5741675	1.99	6.0	7.99	50	16%
SO_2 / 2023	Annual Mean	Boundary	548300, 5741875	0.31	3.0	3.31	20	17%
	1-hr Mean (99.97thO%ile)	Grid	548300, 5741875	53.49	6.0	59.49	350	17%
	24-hr Mean (95.1ndO%ile)	Grid	548300, 5741875	1.93	6.0	7.93	50	16%
SO_2 / 2024	Annual Mean	Boundary	548225, 5741825	0.45	3.0	3.45	20	17%
	1-hr Mean (99.97thO%ile)	Grid	548225, 5741825	49.47	6.0	55.47	350	16%
	24-hr Mean (95.1ndO%ile)	Grid	548225, 5741825	2.30	6.0	8.30	50	17%
SO_2 / 2025	Annual Mean	Boundary	548175, 5743200	0.37	3.0	3.37	20	17%
	1-hr Mean (99.97thO%ile)	Grid	548175, 5743200	48.50	6.0	54.50	350	16%

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
	24-hr Mean (95.1ndo%ile)	Grid	548175, 5743200	1.95	6.0	7.95	50	16%

Table.6 Roches Point Dispersion Model Results – Benzene

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
Benzene / 2021	Annual Mean	Boundary	548225, 5741825	0.07	1.0	1.07	3.4	32%
Benzene / 2022	Annual Mean	Boundary	548350, 5741675	0.07	1.0	1.07	3.4	31%
Benzene / 2023	Annual Mean	Boundary	548300, 5741875	0.06	1.0	1.06	3.4	31%
Benzene / 2024	Annual Mean	Boundary	548225, 5741825	0.09	1.0	1.09	3.4	32%
Benzene / 2025	Annual Mean	Boundary	548175, 5743200	0.07	1.0	1.07	3.4	32%

Table.7 Roches Point Dispersion Model Results – Ammonia

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
NH_3 / 2021	Annual Mean	Boundary	548225, 5741825	0.11	1.9	2.01	180	1.1%
	1-hr Mean	Boundary	547900, 5744600	4.31	3.8	8.11	2500	0.3%
NH_3 / 2022	Annual Mean	Boundary	548350, 5741675	0.10	1.9	2.00	180	1.1%
	1-hr Mean	Boundary	548300, 5740300	4.29	3.8	8.09	2500	0.3%
NH_3 / 2023	Annual Mean	Boundary	548300, 5741875	0.09	1.9	1.99	180	1.1%
	1-hr Mean	Boundary	548300, 5740300	4.27	3.8	8.07	2500	0.3%
NH_3 / 2024	Annual Mean	Boundary	548225, 5741825	0.14	1.9	2.04	180	1.1%
	1-hr Mean	Boundary	548200, 5740300	4.13	3.8	7.93	2500	0.3%
NH_3 / 2025	Annual Mean	Boundary	548175, 5743200	0.11	1.9	2.01	180	1.1%
	1-hr Mean	Boundary	548300, 5740300	4.25	3.8	8.05	2500	0.3%

Table.8 Roches Point Dispersion Model Results – HCl

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
HCl / 2021	Annual Mean	Boundary	548225, 5741825	0.07	1.9	1.97	180	1.1%
	1-hr Mean	Boundary	547900, 5744600	17.25	3.8	21.05	2500	0.8%
HCl / 2022	Annual Mean	Boundary	548350, 5741675	0.07	1.9	1.97	180	1.1%
	1-hr Mean	Boundary	548300, 5740300	17.14	3.8	20.94	2500	0.8%
HCl / 2023	Annual Mean	Boundary	548300, 5741875	0.06	1.9	1.96	180	1.1%

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
	1-hr Mean	Boundary	548300, 5740300	17.10	3.8	20.90	2500	0.8%
HCl / 2024	Annual Mean	Boundary	548225, 5741825	0.09	1.9	1.99	180	1.1%
	1-hr Mean	Boundary	548200, 5740300	16.51	3.8	20.31	2500	0.8%
HCl / 2025	Annual Mean	Boundary	548175, 5743200	0.07	1.9	1.97	180	1.1%
	1-hr Mean	Boundary	548300, 5740300	17.01	3.8	20.81	2500	0.8%

Table.9 Roches Point Dispersion Model Results – HF

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
HF / 2021	Annual Mean	Boundary	548150, 5741825	0.02	0.32	0.34	16	2.13%
	1-hr Mean	Boundary	547900, 5744600	1.15	0.64	1.79	160	1.12%
HF / 2022	Annual Mean	Boundary	548225, 5741825	0.02	0.32	0.34	16	2.13%
	1-hr Mean	Boundary	548300, 5740300	1.14	0.64	1.78	160	1.11%
HF / 2023	Annual Mean	Boundary	548250, 5742000	0.02	0.32	0.34	16	2.13%
	1-hr Mean	Boundary	548300, 5740300	1.14	0.64	1.78	160	1.11%
HF / 2024	Annual Mean	Boundary	548200, 5741825	0.02	0.32	0.34	16	2.13%
	1-hr Mean	Boundary	548200, 5740300	1.10	0.64	1.74	160	1.09%
HF / 2025	Annual Mean	Boundary	548250, 5741975	0.02	0.32	0.34	16	2.13%
	1-hr Mean	Boundary	548300, 5740300	1.13	0.64	1.77	160	1.11%

Table.10 Roches Point Dispersion Model Results – Dioxins/Furans

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
Dioxin / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	0.774	31.00	31.774	-	n/a
Dioxin / 2021	Annual Mean	Boundary	548325, 5741650	0.709	31.00	31.709	-	n/a
Dioxin / 2022	Annual Mean	Boundary	548300, 5741875	0.635	31.00	31.635	-	n/a
Dioxin / 2023	Annual Mean	Boundary	548225, 5741825	0.936	31.00	31.936	-	n/a
Dioxin / 2024	Annual Mean	Boundary	548175, 5743200	0.766	31.00	31.766	-	n/a
Dioxin / 2025	Annual Mean	Boundary	548225, 5741825	0.774	31.00	31.774	-	n/a

Table.11 Roches Point Dispersion Model Results – PAHs

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (pg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
PAHs / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	7.74	250.0	257.74	1000	26%
PAHs / 2021	Annual Mean	Boundary	548325, 5741650	7.09	250.0	257.09	1000	26%
PAHs / 2022	Annual Mean	Boundary	548300, 5741875	6.35	250.0	256.35	1000	26%
PAHs / 2023	Annual Mean	Boundary	548225, 5741825	9.36	250.0	259.36	1000	26%
PAHs / 2024	Annual Mean	Boundary	548175, 5743200	7.66	250.0	257.66	1000	26%
PAHs / 2025	Annual Mean	Boundary	548225, 5741825	7.74	250.0	257.74	1000	26%

Table.12 Roches Point Dispersion Model Results – Hg

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
Hg / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	0.374	8.00	8.374	1000	0.8%
Hg / 2021	Annual Mean	Boundary	548350, 5741675	0.338	8.00	8.338	1000	0.8%
Hg / 2022	Annual Mean	Boundary	548300, 5741875	0.308	8.00	8.308	1000	0.8%
Hg / 2023	Annual Mean	Boundary	548225, 5741825	0.452	8.00	8.452	1000	0.8%
Hg / 2024	Annual Mean	Boundary	548175, 5743200	0.369	8.00	8.369	1000	0.8%
Hg / 2025	Annual Mean	Boundary	548225, 5741825	0.374	8.00	8.374	1000	0.8%

Table.13 Roches Point Dispersion Model Results – Cd

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
Cd / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	0.387	1.00	1.387	5	28%
Cd / 2021	Annual Mean	Boundary	548325, 5741650	0.355	1.00	1.355	5	27%
Cd / 2022	Annual Mean	Boundary	548300, 5741875	0.318	1.00	1.318	5	26%
Cd / 2023	Annual Mean	Boundary	548225, 5741825	0.468	1.00	1.468	5	29%
Cd / 2024	Annual Mean	Boundary	548175, 5743200	0.383	1.00	1.383	5	28%
Cd / 2025	Annual Mean	Boundary	548225, 5741825	0.387	1.00	1.387	5	28%

Table.14 Roches Point Dispersion Model Results – As

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
As / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	0.034	1.00	1.034	6	17%
As / 2021	Annual Mean	Boundary	548325, 5741650	0.031	1.00	1.031	6	17%
As / 2022	Annual Mean	Boundary	548300, 5741875	0.028	1.00	1.028	6	17%
As / 2023	Annual Mean	Boundary	548225, 5741825	0.041	1.00	1.041	6	17%
As / 2024	Annual Mean	Boundary	548175, 5743200	0.034	1.00	1.034	6	17%
As / 2025	Annual Mean	Boundary	548225, 5741825	0.034	1.00	1.034	6	17%

Table.15 Roches Point Dispersion Model Results – Ni

Pollutant / Year	Averaging Period	Worst Case Receptor		Concentrations (µg/m³)				PEC as % of Limit
		Type	X,Y (UTM Zone 29 N)	PC	Back-ground	PEC	Limit Value	
Ni / 2007 Onsite	Annual Mean	Boundary	548225, 5741825	0.489	9.00	9.489	20	47%
Ni / 2021	Annual Mean	Boundary	548325, 5741650	0.448	9.00	9.448	20	47%
Ni / 2022	Annual Mean	Boundary	548300, 5741875	0.401	9.00	9.401	20	47%
Ni / 2023	Annual Mean	Boundary	548225, 5741825	0.591	9.00	9.591	20	48%
Ni / 2024	Annual Mean	Boundary	548175, 5743200	0.483	9.00	9.483	20	47%
Ni / 2025	Annual Mean	Boundary	548225, 5741825	0.489	9.00	9.489	20	47%