

Permit ref: PAN-0055141/V002

Operator: Newbridge Energy Limited

Site Address: Blazers Fuels, Brick Lane, Denbigh Road, Ruthin, LL15 2TN

Supplementary Air Quality Assessment: Addendum

A Supplementary Air Quality Assessment¹, prepared by Smith Grant LLP (SGP), has been submitted to Natural Resources Wales (NRW) in response to a request for further information in relation to an application to vary Environmental Permit ref: PAN-0055141/V002.

This Addendum has been prepared in response to a request received from NRW² for additional information.

NRW Request: Assessment of short-term benzene (24-hour average) and short-term CO (1 hour) has not been completed. Both of these have Environmental Assessment Levels and are in the penultimate table of the guidance: [Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit).

SGP Response:

The additional EALs as detailed in the EA guidance referenced above are detailed below:

Pollutant	Short Term EAL ($\mu\text{g}/\text{m}^3$)
Benzene	30 (24-hour average)
Carbon Monoxide (CO)	30,000 (1 hour)

The ADMS model as detailed in Section 6 of the Supplementary AQA (Scenario B – combined existing and proposed scenarios) has been run to determine the maximum predicted PCs for these pollutants within the modelled domain and at each modelled receptor. Results are summarised below and provided in detail in Appendix A.

The maximum predicted ground level PCs within the modelled domain, with the combined existing and proposed emissions, are summarised below in Table 1.

Table 1: Maximum Predicted PCs within the Modelled Domain (Scenario B): Human Health

Pollutant	Averaging Period	EAL	PC ¹	Year	PC % EAL	Comment
Short-term concentrations						
Benzene ²	24 hr mean hour; P100	30	4.84	2017	16	PC $\geq 10\%$ EAL; further assessment required
CO	daily mean (P100)	30,000	176.45	2016	1	PC $< 10\%$ EAL; no further assessment required

Notes: No further assessment required when maximum predicted process contributions within the modelled domain are less than the screening thresholds (i.e. $< 10\%$ of EAL for short-term)

¹ Smith Grant LLP, Supplementary Air Quality Assessment, Additional CHP Plant, Blazer's Fuels, Ruthin, R2298D-R07-v2, September 2021

² Natural Resources Wales, Variation Application ref: PAN-0055141/V002, e-mail from Rebecca Williams, NRW to K. Hawkins SGP, dated 23.09.21

- 1: assumes facility operates 8,760 hours per annum
2: assumes benzene emitted as 100% TVOCs
All concentrations $\mu\text{g}/\text{m}^3$ unless stated otherwise

The maximum short-term benzene PC within the modelled domain is above the screening threshold. The maximums are experienced in close proximity to the plant and not necessarily at sensitive receptors; further assessment has therefore been undertaken of predicted PCs at the modelled receptors. Further assessment is not required with regards to CO as the predicted short-term PCs are well below 10% of the EAL within the modelled domain, but has been included below for reference.

The maximum predicted ground-level PCs across the modelled receptors across the 5 years are summarised below in Table 2.

Table 2: Maximum Predicted PCs at Modelled Receptors (Scenario B): Human Health¹

Pollutant	Averaging Period	EAL	PC ¹	Receptor	PC % EAL	Comment
Short-term concentrations						
Benzene ²	24 hr mean hour; P100	30	2.85	R4	10	PC \geq 10% EAL; further assessment required
CO	daily mean (P100)	30,000	34.26	R5	0	PC <10% EAL; no further assessment required

- Notes: No further assessment required when maximum predicted process contributions within the modelled domain are less than the screening thresholds (i.e. <10% of EAL for short-term)
- 1: assumes facility operates 8,760 hours per annum
2: assumes benzene emitted as 100% TVOCs
All concentrations $\mu\text{g}/\text{m}^3$ unless stated otherwise

The maximum predicted 24-hour mean CO PC at a modelled receptor is well below the screening threshold and no further assessment is required. The maximum predicted 1 hour concentration at a modelled receptor is 10% of the short-term EAL (at R4; is less than 10% of the EAL at all other modelled receptors) and further assessment has therefore been undertaken considering the background concentrations.

Table 3: Maximum Predicted PCs at a Relevant Receptor: Short-Term Assessment¹

Pollutant	Averaging period	EAL	PC ¹	Receptor	BC _{ST} ²	PEC	PEC %AQAL
Benzene ²	24 hr mean hour; P100	30	2.85	R4	0.2	3.05	10

- All concentrations $\mu\text{g}/\text{m}^3$ unless stated otherwise
- 1: assumes facility operates 8,760 hours per annum
2: BC_{ST} - short term background concentration = 2 x Defra predicted long-term background pollutant concentration for 2021 for relevant grid square
3: assumes benzene emitted as 100% TVOCs

The maximum resulting benzene PEC at a modelled receptor is 10% of the EAL. The above assumes that benzene is emitted as 100% total VOCs whereas in reality benzene will only form a proportion of any emitted VOCs.

In addition, the above assumes TVOCs are emitted at the Emission Limit Value of 30 mg/m³ (reference conditions of 273K, 101.3kPa, dry gas and 6% O₂), whereas monitoring data for the existing CHP stack in 2021 demonstrates the emitted TVOC concentrations are well below this (laboratory certificates provided in Appendix B of R2298E-N01-V3, 02.07.21 show TVOCs reported at 9.9 µg/m³ and 0.67 µg/m³ at reference conditions).

Accordingly, the expected PCs of benzene would be well below those provided above and the above assessment is therefore highly conservative.

NRW Request: Appendix 8 – Short Term Assessment results table – the headings for NO_x reads ‘annual mean (1 hour)’ Can you either amend the table or just confirm this is just a typo error and should read 1 hour (99.79 %ile)?

SGP Response: It is confirmed this is a typographical error and the headings should have read 1 hour (99.79%ile). The corrected Appendix is attached as Appendix B to this Addendum.

We trust this meets the requirements and provide the required additional information.

Prepared on behalf of Smith Grant LLP by:

Name:

Signature:

Date:

K. Hawkins, Partner

BSc MSc MIAQM MEnvSci CEnv



27.09.21

APPENDIX A

Additional ADMS Model Results

R2298D**Maximum predicted Process Contributions within Modelled Domain***maximums across 5 years*

Pollutant	Averaging Period	Units	2013	2014	2015	2016	2017	max	EAL	%EAL
Short Term Concentrations										
CO	1hr; P100	ug/m3	166.9	156.67	155.22	176.45	146.73	176.45	30000	1
Benzene	24hrs; P100	ug/m3	4.84	4.41	4.35	4.27	4.84	4.84	30	16

1: assumes benzene emitted as 100% TVOCs

R2298D
Maximum Predicted Process Contributions at Modelled Receptors
Short-Term Assessment
Maximums across 5 years modelled met data

Receptor name	X(m)	Y(m)	Z(m)	CO		Benzene					
				PC	PC %EAL	PC	PC %EAL	LT BG	ST BG	PEC	PEC %EAL
				ug/m3		ug/m3		ug/m3	ug/m3	ug/m3	
				(1 hr; P100)		(24 hr mean; P100)		(annual mean; 1 hr)		(24 hr mean; P100)	
R1	311576	358668	0	19.80	0	0.93	3	0.1	0.2	1.13	4
R2	311673	358718	0	22.56	0	1.80	6	0.1	0.2	2.00	7
R3	311731	358743	0	25.04	0	1.83	6	0.1	0.2	2.03	7
R4	311741	358816	0	32.86	0	2.85	10	0.1	0.2	3.05	10
R5	311799	358892	0	34.26	0	2.60	9	0.1	0.2	2.80	9
R6	311886	358937	0	28.08	0	2.14	7	0.1	0.2	2.34	8
R7	311195	358842	0	12.90	0	0.66	2	0.1	0.2	0.86	3
R8	311580.5	358621.5	0	16.94	0	0.80	3	0.1	0.2	1.00	3
R9	311112	359186	0	15.38	0	0.95	3	0.1	0.2	1.15	4
R10	311904	359136	0	23.26	0	1.62	5	0.1	0.2	1.82	6
R11	311543	358868	0	33.22	0	1.83	6	0.1	0.2	2.03	7
R12	311221.4	359538.2	0	12.73	0	0.70	2	0.1	0.2	0.90	3
R13	311221.8	359577.5	0	13.25	0	0.63	2	0.1	0.2	0.83	3
R14	311148.4	359589.1	0	10.89	0	0.62	2	0.1	0.2	0.82	3
R15	311921.2	358456.5	0	9.92	0	0.79	3	0.1	0.2	0.99	3
R16	311804.5	358473.7	0	12.65	0	0.72	2	0.1	0.2	0.92	3
R17	311582	358503.2	0	11.66	0	0.55	2	0.1	0.2	0.75	3
R18	312326.9	358695.2	0	11.80	0	0.54	2	0.1	0.2	0.74	2
R19	312219.6	358440.8	0	9.41	0	0.46	2	0.1	0.2	0.66	2
R20	311691	359394	0	19.88	0	1.23	4	0.1	0.2	1.43	5
			max	34.26	0	2.85	10	0.1	0.2	3.05	10

- 1: assumes benzene = 100% TVOCs
 2: BG = Defra predicted background annual mean background for relevant grid square
 3: ST BG = 2 x LT BG
 4: PEC = ST BG + PC
 screening threshold = 10% EAL; where <10% EAL no further assessment necessary

EALs CO 30,000 ug/m3 1 hour
 Benzene 30 ug/m3 24 hour average

APPENDIX B
Corrected Short term Assessment
(Appendix F of R2298-R07-v2, September 2010)

R2298D

Maximum Predicted Process Contributions at Modelled Receptors

Short-Term Assessment

Maximums across 5 years modelled met data

Receptor name	X(m)	Y(m)	Z(m)	NO2							PM10							CO	
				PC		PC%EAL	LT BG ³	ST BG ⁴	PEC ⁵	PEC%EAL	PC	%EAL	LT BG ³	ST BG ⁴	PEC ⁵	PEC%EAL	PC	PC %EAL	
				NO ₂ ¹	NO ₂ ²														
				ug/m3	ug/m3		ug/m3	ug/m3	ug/m3			ug/m3	ug/m3	ug/m3	mg/m3				
				1 hr; 99.79%ile	1 hr; 99.79%ile		annual mean (1 hr)				24 hr mean (90.41%ile)	annual mean (1 hr)		8 hour running mean; P100					
R1	311576	358668	0	24.57	8.60	4.30	4.83	9.66	18.26	9.13	2.52	5.03	9.49	18.98	21.50	42.99	0.01	0.001	
R2	311673	358718	0	32.80	11.48	5.74	4.83	9.66	21.14	10.57	7.47	14.94	9.49	18.98	26.45	52.90	0.02	0.002	
R3	311731	358743	0	35.98	12.59	6.30	4.83	9.66	22.25	11.13	8.43	16.87	9.49	18.98	27.41	54.83	0.02	0.002	
R4	311741	358816	0	48.57	17.00	8.50	4.83	9.66	26.66	13.33	10.76	21.51	9.49	18.98	29.74	59.47	0.03	0.003	
R5	311799	358892	0	54.18	18.96	9.48	4.83	9.66	28.62	14.31	9.96	19.92	9.49	18.98	28.94	57.88	0.03	0.003	
R6	311886	358937	0	42.18	14.76	7.38	4.83	9.66	24.42	12.21	6.72	13.43	9.49	18.98	25.70	51.39	0.02	0.002	
R7	311195	358842	0	16.79	5.88	2.94	4.83	9.66	15.54	7.77	0.79	1.58	9.49	18.98	19.77	39.54	0.01	0.001	
R8	311581	358622	0	21.26	7.44	3.72	4.83	9.66	17.10	8.55	2.12	4.24	9.49	18.98	21.10	42.20	0.01	0.001	
R9	311112	359186	0	19.28	6.75	3.37	5.98	11.96	18.71	9.35	3.71	7.43	10.92	21.84	25.55	51.11	0.01	0.001	
R10	311904	359136	0	31.99	11.20	5.60	5.98	11.96	23.16	11.58	5.80	11.61	10.92	21.84	27.64	55.29	0.02	0.002	
R11	311543	358868	0	48.81	17.08	8.54	4.83	9.66	26.74	13.37	3.95	7.91	9.49	18.98	22.93	45.87	0.03	0.003	
R12	311221	359538	0	15.92	5.57	2.79	5.98	11.96	17.53	8.77	2.67	5.35	10.92	21.84	24.51	49.03	0.01	0.001	
R13	311222	359578	0	14.68	5.14	2.57	5.98	11.96	17.10	8.55	2.63	5.25	10.92	21.84	24.47	48.93	0.01	0.001	
R14	311148	359589	0	14.21	4.97	2.49	5.98	11.96	16.93	8.47	2.32	4.63	10.92	21.84	24.16	48.31	0.01	0.001	
R15	311921	358457	0	14.78	5.17	2.59	4.83	9.66	14.83	7.42	2.63	5.27	9.49	18.98	21.61	43.23	0.01	0.001	
R16	311805	358474	0	15.67	5.49	2.74	4.83	9.66	15.15	7.57	2.90	5.80	9.49	18.98	21.88	43.76	0.01	0.001	
R17	311582	358503	0	15.42	5.40	2.70	4.83	9.66	15.06	7.53	1.37	2.74	9.49	18.98	20.35	40.70	0.01	0.001	
R18	312327	358695	0	12.48	4.37	2.18	6.86	13.72	18.09	9.04	1.40	2.79	9.79	19.58	20.98	41.95	0.01	0.001	
R19	312220	358441	0	11.45	4.01	2.00	6.86	13.72	17.73	8.86	1.59	3.18	9.79	19.58	21.17	42.34	0.01	0.001	
R20	311691	359394	0	25.71	9.00	4.50	5.98	11.96	20.96	10.48	3.64	7.28	10.92	21.84	25.48	50.96	0.01	0.001	
			max	54.18	18.96	9.48	6.86	13.72	28.62	14.31	10.76	21.51	10.92	21.84	29.74	59.47	0.03	0.00	

- 1: assumes 100% NOx to NO2 conversion
- 2: assumes 35% NOx to NO2 conversion
- 3: BG = Defra predicted annual mean background for relevant grid square
- 4: ST BG = 2 x LT BG
- 5: PEC = ST BG + PC

screening threshold = 10% EAL; where <10% EAL no further assessment necessary