



Natural Resources Wales  
Chester Road  
Buckley  
Flintshire  
CH7 3AJ

Attention of: Alison Soper – Regulatory Officer PPC/RSR

12<sup>th</sup> February 2016

Dear Mrs Soper

**Re: Annual Monitoring Report for 2015 - Permit Number: EPR/BR9383ID**

Please find enclosed a review of the monitoring results for 2015 and the completed annual emissions reporting forms for the year in accordance with Section 4.2 of the Environmental Permit.

I trust this information is satisfactory, however, please do not hesitate to contact me should you require any further information.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Keouski'.

**Claire Keouski**  
**HSE Manager**

**Introduction**

This document is submitted to meet the requirement of section 4.2.2 (a) of the EPR Permit that is for an annual '*review of the results of the monitoring and assessment carried out in accordance with the Permit including an interpretive review of that data*'.

**Manual Extractive Monitoring**

Annual and six monthly monitoring was undertaken, by the prescribed methods, and reported as per the Permit requirements for Emission Points A, C, D, F and G. Any emission breaches were notified under Schedule 5 Part A notifications with follow up Part B notifications.

Annual manual monitoring for Emission Point A Cupola Furnace Main Stack, for the parameters of chlorides (as HCl), fluorides (as hydrogen fluoride), hydrogen sulphide and metals (Group 1 and Group 2 as defined in the Permit) are measured in triplicate. The results recorded for these parameters are consistently low by comparison and consistently below their respective emission limit values, with the exception of chlorides. A breach of HCl was reported with the results of the triplicate monitoring being 76mg/Nm<sup>3</sup>, 37mg/Nm<sup>3</sup> and 45mg/Nm<sup>3</sup> against a limit of 10mg/m<sup>3</sup>. Investigatory work is on-going to find the source of the high HCl.

For Emission Point C Mainline Forming Stack, there is a six monthly monitoring requirement to determine, by triplicate measurement, Particulate, Volatile Organic Compounds (as Carbon) (VOCs), Ammonia, Formaldehyde, Phenol and Amines. The first monitoring visit undertaken in April 2015 recorded results below the emission limit values for all the parameters.

The second monitoring visit for Emission Point C, undertaken in October 2015, recorded results in excess of the emission limit value for particulates on two (Run 1 and Run 2) out of the three tests with respective values of 79mg/Nm<sup>3</sup> and 122mg/Nm<sup>3</sup> (uncertainty data not subtracted). The operating conditions were analysed for the period of the manual monitoring, using SCADA (the plant monitoring system), however, no abnormalities were identified in relation to CO, back pressure and top temperature, which are the key indicators for the cupola; and the parameters associated with the extraction system appeared normal.

To ensure compliance, a re-test for particulates, by triplicate measurement, was undertaken on 2<sup>nd</sup> February 2016 and analytical results are currently awaited. These will be reported to NRW upon receipt.

For Emission Points D, F and G, there is an annual monitoring requirement to determine, by triplicate measurement, Particulate, VOC as C, Ammonia, Formaldehyde, Phenol and Amines. There are no permit limits applied to Emission Point "D" Binder Plant Local Exhaust Ventilation; however, the monitoring results are considered to be low (<2 mg/Nm<sup>3</sup> for amines, formaldehyde, phenol, particulates and VOCs and an average of 136mg/Nm<sup>3</sup> for ammonia (uncertainty not deleted)) and comparable with historic annual data.

With respect to Emission Point F Mainline Oven Oxidiser, all of the parameters returned results considerably lower than the permitted emission limit values. Work to improve the performance of the curing oven is continuous, which is reflected in the much reduced emissions.

For Emission Point G Mainline Cooling Zone, the higher levels of particulates (maximum concentration of 17mg/Nm<sup>3</sup>, (uncertainty not subtracted)) and ammonia (maximum concentration of 22mg/Nm<sup>3</sup> (uncertainty not subtracted)) are an on-going problem that is subject to an improvement condition to investigate improvements, which is due for submission by 31/07/16. However, in the

interim, continual cleaning and maintenance works have been undertaken to maintain the lowest emission levels as possible.

#### **Continuous Emissions Monitoring (CEMs)**

A differential optical attenuation spectroscopy (DOAS) system, working in both infrared and ultraviolet light, is employed for direct measurement of Carbon Monoxide, Oxides of Nitrogen and Oxides of Sulphur with Particulate monitoring by triboelectric probe. To enable continuous correction to the required conditions of NTP at 8% oxygen and dry gas the equipment monitors Hydrogen Sulphide, Oxygen, temperature, barometric pressure and also flowrate to enable mass emission calculations. The equipment is serviced and calibrated, by technicians from the equipment suppliers, every six months using certified gases for the gas calibrations. The CEMs equipment is generally reliable, giving relatively little down time with low data loss, however, if this occurs, every effort is made to restore normal operation as quickly as is practical and if there is delay, then some means is pursued to produce a best estimate of emissions so that compliance with limits may be demonstrated in addition to the manual extractive sampling.

The CEMs data for Emission Point A Cupola Stack After Oxidiser are reported quarterly in monthly summaries as required by the Permit. The validated data demonstrates compliance with the limits, enables reporting of un-authorized releases and the calculation of period averaged concentration data and mass emission values.

#### **Storm Water**

For storm water, the concentrations of Suspended Solids, pH and Chemical Oxygen Demand (COD) are measured on a six monthly basis as required by the Permit from each of the four release points referenced as L3 to L6 that are discharging.

During 2015, the storm water sampling was undertaken during the Months of February and September and samples were analysed by an independent, UKAS accredited laboratory. The Permit does not impose any limits on the discharge of the stated parameters, however, the analytical results for both monitoring periods are generally within the expected ranges normally seen for storm water discharges from the site. The results for COD ranged between 12.1mg/l (February 2015) and 141mg/l (February 2015); pH results ranged between 7.29 (February 2015) and 8.15 (February 2015); and suspended solids from 4.5mg/l (September 2015) to 392mg/l (February 2015).

#### **Conclusion**

Process emissions are monitored in accordance with the Permit requirements and show that the controls and abatement normally result in the emissions being maintained within permitted limits. Where there are problems with un-authorized emissions, equipment breakdown and/or other unforeseen situations, every effort is made to ensure the plant regains compliance as soon as is possible within practical timescales.

C. Keouski  
HSE Manager

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Air1b

**Reporting of emissions to air for year 2015**

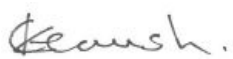
**Periodic Emissions Point A**

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
A	Chlorides (expressed as hydrogen chloride)	10 mg/m <sup>3</sup>	76	6.0	20/04/2015 10:56 to 11:56	37	2.9	20/04/2015 14:24 to 15:24	45	3.6	20/04/2015 15:36 to 16:36
A	Fluorides (expressed as hydrogen fluoride)	5 mg/m <sup>3</sup>	1.1	0.0095	27/04/2015 10:25 to 11:25	0.22	0.019	27/04/2015 11:40 to 12:40	<0.046	0.0040	27/04/2015 13:05 to 14:05
A	Hydrogen sulphide	5 mg/m <sup>3</sup>	<1.9	0.17	23/04/2015 10:26 to 11:26	<1.2	0.10	23/04/2015 11:47 to 12:47	<1.3	0.12	23/04/2015 13:30 to 14:30
A	Metals (groups 1 & 2)	5 mg/m <sup>3</sup>	0.257	0.0279	23/04/2015 10:32 to 11:35	0.222	0.0298	23/04/2015 11:47 to 12:51	0.242	0.0343	23/04/2015 13:30 to 14:35
A	Metals (group 1)	1 mg/m <sup>3</sup>	0.22	0.025	23/04/2015 10:32 to 11:35	0.19	0.027	23/04/2015 11:47 to 12:51	0.2	0.031	23/04/2015 13:30 to 14:35

Group 1 Metals (and their compounds): Arsenic, Cobalt, Nickel, Selenium, Chromium VI

Group 2 Metals (and their compounds): Antimony, Lead Chromium III, Copper, Manganese, Vanadium, Tin

Note: The monitoring results recorded concentrations of Hydrogen Chloride (all results) in excess of the Emission Limit Values. This was reported as an un-authorised release on 5<sup>th</sup> June 2015 (Reference EP\_EX\_148).

Signed .....   
(Authorised to sign as representative of Operator)

Date.....17/01/2016

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

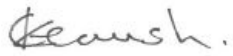
Form Number: Air1c

Reporting of emissions to air for the 6 month period for 1<sup>st</sup> January to 30<sup>th</sup> June 2015

Point C, Mainline forming stack

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
C	Particulate Matter	50 mg/m <sup>3</sup>	24	0.85	14/04/2015 13:15 to 14:18	21	0.73	14/04/2015 14:25 to 15:28	27	0.91	15/04/2015 11:50 to 12:53
C	Volatile Organic Compounds as C	50 mg/m <sup>3</sup>	6.9	0.28	14/04/2015 13:15 to 14:15	8.8	0.35	14/04/2015 14:16 to 15:16	9.3	0.37	15/04/2015 10:15 to 11:15
C	Ammonia	50 mg/m <sup>3</sup>	50	4.3	13/04/2015 12:41 to 13:41	0.074	0.0064	13/04/2015 13:47 to 14:48	33	2.9	13/04/2015 14:52 to 15:52
C	Formaldehyde	10 mg/m <sup>3</sup>	0.088	0.0068	14/04/2015 13:15 to 14:18	0.092	0.0071	14/04/2015 14:25 to 15:28	0.055	0.0043	15/04/2015 11:50 to 12:53
C	Phenol	10 mg/m <sup>3</sup>	2.0	0.42	14/04/2015 14:36 to 15:36	<0.27	0.058	15/04/2015 10:38 to 11:38	<0.29	0.06	11/04/2015 11:53 to 12:53
C	Amines	20 mg/m <sup>3</sup>	<0.23	0.048	13/04/2015 13:07 to 14:07	<0.23	0.048	13/04/2015 14:08 to 15:09	<0.39	0.081	14/04/2015 13:29 to 14:29

Note: \* Ammonia run 3 deemed erroneous.

Signed .....   
(Authorised to sign as representative of Operator)

Date.....01/07/2015

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Air1c

Reporting of emissions to air for the 6 month period for 1<sup>st</sup> July to 31<sup>st</sup> December 2015

Point C, Mainline forming stack

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
C	Particulate Matter	50 mg/m <sup>3</sup>	79	2.5	05/10/2015 14:37 to 15:55	122	2.5	06/10/2015 12:10 to 13:15	19	0.69	06/10/2015 15:24 to 16:29
C	Volatile Organic Compounds as C	50 mg/m <sup>3</sup>	28	1.1	06/10/2015 12:30 to 13:30	22	0.87	06/10/2015 13:30 to 14:30	17	0.68	06/10/2015 14:30 to 15:30
C	Ammonia	50 mg/m <sup>3</sup>	46	3.9	05/10/2015 14:37 to 15:55	50	4.3	06/10/2015 12:10 to 13:15	36	3.1	06/10/2015 15:24 to 16:29
C	Formaldehyde	10 mg/m <sup>3</sup>	0.79	0.06	07/10/2015 09:45 to 10:50	0.040	0.0032	07/10/2015 10:55 to 12:00	2.0	0.16	07/10/2015 12:00 to 13:04
C	Phenol	10 mg/m <sup>3</sup>	5.1	1.1	06/10/2015 13:29 to 14:29	2.2	0.47	07/10/2015 09:50 to 10:50	2.3	0.49	07/10/2015 11:00 to 12:00
C	Amines	20 mg/m <sup>3</sup>	<0.24	0.05	05/10/2015 15:55 to 16:55	<0.27	0.057	06/10/2015 09:05 to 10:05	<0.19	0.04	06/10/2015 10:07 to 11:47

Note: The monitoring results recorded concentrations of Particulate Matter in excess of the Emission Limit Values (Run 1 & Run 2). This was reported as an un-authorized release on 5<sup>th</sup> January 2016 (Reference EP\_EX\_156). Re-test in triplicate for Particulate Matter was undertaken on 2<sup>nd</sup> February 2016 and analytical results are currently awaited.

Signed ..... *Keaush*  
(Authorised to sign as representative of Operator)

Date.....17/01/2016

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Air1d

**Reporting of emissions to air for the year 2015**

**Point D, Binder Fume Plant Extraction**

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
D	Particulate Matter	N/A	1.9	0.24	14/04/2015 12:15 to 13:15	2.0	0.22	14/04/2015 13:45 to 14:45	2.1	0.24	14/04/2015 15:05 to 16:05
D	Volatile Organic Compounds as C	N/A	1.81	0.055	16/04/2015 11:42 to 12:42	0.92	0.028	16/04/2015 12:43 to 13:43	0.95	0.029	16/04/2015 13:44 to 14:44
D	Ammonia	N/A	133	12	15/04/2015 10:35 to 11:35	188	16	15/04/2015 12:00 to 13:00	87	7.6	16/04/2015 11:40 to 12:40
D	Formaldehyde	N/A	<0.038	0.0029	14/04/2015 12:15 to 13:15	0.031	0.0024	14/04/2015 13:45 to 14:45	0.034	0.0026	14/04/2015 15:05 to 16:05
D	Phenol	N/A	0.086	0.018	15/04/2015 10:35 to 11:35	0.12	0.025	15/04/2015 12:00 to 13:00	0.55	0.12	16/04/2015 11:40 to 12:40
D	Amines	N/A	<0.076	0.016	14/04/2015 12:15 to 13:15	<0.080	0.017	14/04/2015 13:45 to 14:45	<0.11	0.024	14/04/2015 15:05 to 16:05

Signed ..... *Keush*  
(Authorised to sign as representative of Operator)

Date.....17/01/2016

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Air1e

**Reporting of emissions to air for the year 2015**

**Point F, Mainline Curing Oven**

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
F	Particulate Matter	10 mg / m <sup>3</sup>	0.57	0.30	06/10/2015 14:35 to 16:10	0.59	0.31	06/10/2015 16:21 to 17:21	0.45	0.23	07/10/2015 09:14 to 10:14
F	Volatile Organic Compounds as C	10 mg / m <sup>3</sup>	4.5	0.14	07/10/2015 10:30 to 11:30	4.9	0.15	07/10/2015 11:30 to 12:30	5.5	0.17	07/10/2015 12:30 to 13:30
F	Ammonia	10 mg / m <sup>3</sup>	1.3	0.11	02/12/2015 13:55 to 14:55	1.2	0.10	02/12/2015 14:02 to 15:02	1.3	0.12	02/12/2015 16:04 to 17:04
F	Formaldehyde	5 mg / m <sup>3</sup>	0.058	0.0045	07/10/2015 11:18 to 12:18	0.035	0.0027	07/10/2015 12:46 to 13:46	0.033	0.0025	07/10/2015 13:55 to 14:55
F	Phenol	5 mg / m <sup>3</sup>	<0.54	0.11	05/10/2015 15:09 to 16:09	<0.56	0.12	05/10/2015 16:15 to 17:15	<0.73	0.15	06/10/2015 09:22 to 10:22
F	Amines	5 mg/m <sup>3</sup>	<1.2	0.25	06/10/2015 11:58 to 12:58	<0.41	0.085	06/10/2015 13:45 to 14:45	<1.3	0.26	06/10/2015 15:18 to 16:50
F	Nitrous Oxides	N/A	286	17	06/10/2015 11:47 to 12:47	318	19	06/10/2015 12:47 to 13:47	368	22	06/10/2015 13:47 to 14:47
F	Nitrogen Dioxide	N/A	14	0.70	06/10/2015 11:47 to 12:47	20	1.0	06/10/2015 12:47 to 13:47	22	1.1	06/10/2015 13:47 to 14:47

Signed ..... *Keusch*  
(Authorised to sign as representative of Operator)

Date.....17/01/2016

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Air1f

**Reporting of emissions to air for the year 2015**

**Point G, Mainline Cooling Zone Stack**

Emission Point	Substance / Parameter	Emission Limit Value	Result 1	Uncertainty	Sample Date and Time	Result 2	Uncertainty	Sample Date and Time	Result 3	Uncertainty	Sample date and Time
G	Particulate Matter	10 mg / m <sup>3</sup>	12	0.41	06/10/2015 09:10 to 10:10	17	0.57	06/10/2015 11:53 to 12:53	17	0.56	06/10/2015 13:08 to 14:08
G	Volatile Organic Compounds as C	15 mg / m <sup>3</sup>	0.34	0.010	06/10/2015 11:55 to 12:55	0.85	0.026	06/10/2015 12:55 to 13:55	0.46	0.014	06/10/2015 13:55 to 14:55
G	Ammonia	10 mg / m <sup>3</sup>	8.3	0.75	07/10/2015 09:48 to 10:48	15	1.4	07/10/2015 11:14 to 12:14	22	2.0	07/10/2015 12:34 to 13:34
G	Formaldehyde	5 mg / m <sup>3</sup>	4.6	0.36	07/10/2015 09:48 to 10:48	4.6	0.36	07/10/2015 11:14 to 12:14	4.6	0.36	07/10/2015 12:34 to 13:34
G	Phenol	5 mg / m <sup>3</sup>	<0.65	0.13	06/10/2015 08:52 to 09:52	<0.73	0.15	06/10/2015 09:53 to 12:28	<0.67	0.14	06/10/2015 12:29 to 13:29
G	Amines	5 mg/m <sup>3</sup>	<0.17	0.035	05/10/2015 13:20 to 14:20	<0.15	0.03	05/10/2015 14:24 to 15:24	<0.14	0.029	05/10/2015 15:25 to 16:25

Note: The monitoring results recorded concentrations of Particulate Matter (all results) and Ammonia (two out of three results) in excess of the Emission Limit Values. This was reported as an un-authorised release on 5<sup>th</sup> January 2016 (Reference EP\_EX\_155).

Signed .....   
(Authorised to sign as representative of Operator)

Date.....17/01/2016

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Water1

**Reporting of emissions to water (other than to sewer) for the six months from 1<sup>st</sup> January to 30<sup>th</sup> June 2015**

Emission Point	pH	Suspended Solids	COD	Sample Date	Sample Time
L3	7.29	41.5	12.1	26/02/2015	10:50
L4	7.88	36	31	26/02/2015	10:35
L5	8.15	99	55.6	26/02/2015	10:05
L6	7.61	392	141	26/02/2015	10:00

Signed ..... *Keaush*  
(Authorised to sign as representative of Operator)

Date.....15/04/2015

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

Form Number: Water1

**Reporting of emissions to water (other than to sewer) for the six months from 1<sup>st</sup> July to 31<sup>st</sup> December 2015**

Emission Point	pH	Suspended Solids	COD	Sample Date	Sample Time
L3	7.63	4.5	16.4	22/09/2015	12:10
L4	7.9	37	40.9	22/09/2015	12:00
L5	7.87	10.5	14.3	22/09/2015	11:35
L6	7.62	18.5	35.5	22/09/2015	11:30

Signed ..... *Keaush*  
(Authorised to sign as representative of Operator)

Date.....12/10/2015

Permit Number: EPR/BR9383ID/V007

Operator: Knauf Insulation Ltd

Facility: Queensferry Mineral Fibre Works

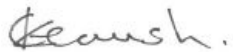
Form Number: Performance1

**Reporting of performance indicators for the year 2015**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Total hours operating with by-pass stack open &amp; blast air on</i>	0.00	0.00	0.23	7.59	0.00	0.24	1.06	0.30	0.003	0.14	0.00	0.01

Energy	Primary Energy Imported MWh
Total Energy	79,248,285

Water Source	Usage (m3/year)
Mains water	26442
Other water	
TOTAL WATER USAGE	26422

Signed .....   
(Authorised to sign as representative of Operator)

Date.....10/02/2016