



Hydro Aluminium Deeside

Environmental Permit No. BK3638IF

2017 Performance Report

January 2018

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1. Introduction

- 1.1 Condition 4.2.2 of the Environmental Permit for Hydro Aluminium Deeside requires a report on the performance of our activities over the previous year.
- 1.2 As required by condition 4.2.2, the following sections detail:
 - (a) a review of the results of the monitoring and assessment carried out in accordance with the permit, including an interpretive review of that data;
 - (b) the annual production / treatment data set out in Schedule 5, Table S5.2; and
 - (c) the performance parameters set out in Schedule 5, Table S5.3 using the forms specified in Table S5.4 of that Schedule.
- 1.3 There were no major breakdowns, modifications to the process or variations to the Permit in 2017. The installation operated at close to full capacity with 331.8 production days in the year and a total output of 58004 tonnes of aluminium extrusion ingot.

2. Emissions to Air

- 2.1 Particulate emissions to air from points A1, A12 and A13 are monitored using a PCME model DT780 continuous emissions monitor (an MCERTS-certified CEM). The results of continuous monitoring have been reported each quarter to Natural Resources Wales using permit reporting form Air1a.
- 2.2 Proprietary "Dust Monitor" software enables analysis of the data collected by the CEM. The maximum readings from 2017 for each emission point are detailed in the table below.

Table 2.1. Summary of PCME monitoring results for 2017

Emission Point	Limit	Max daily average in 2017
A1	10 mg/m ³ daily average	3.71 mg/m ³ (09/05/17)
A12	10 mg/m ³ daily average	0.29 mg/m ³ (29/12/17)
A13	10 mg/m ³ daily average	0.63 mg/m ³ (04/02/17)

Emission Point	Limit	Max result, average of daily average values
A1	5 mg/m ³ monthly average	2.05 mg/m ³ (May)
A12	5 mg/m ³ monthly average	0.19 mg/m ³ (May, June, July & August)
A13	No limit set	0.24 mg/m ³ (March)

- 2.3 No breaches of the emission limits for particulates were recorded in 2017. Results from May to July were higher than usual, due to a series of small leaks in the filter bags in Bag Plant 1 (release point A1). All daily average results were below 5 mg/m³. (the highest being 3.71 mg/m³ on 9th May as noted in Table 2.1 above). The failed filter bags were identified and isolated in response to each occurrence, and a full set of new filter bags was installed during the planned production stop in August. Results from release point A1 have been consistently low since then.
- 2.4 Operational procedures have been reviewed and are deemed satisfactory to ensure continued data collection and analysis (site procedure OPL2905), and investigation of equipment alarms that may indicate a fault or limit breach (site procedure OPL2103). Alarms on the CEM are set at 3 mg/m³ and 4.75 mg/m³ to ensure that action is taken if the emission limit value of 5 mg/m³ (monthly average limit) is in danger of being breached. Internal audits include checks that PCME alarms are being reported and acted upon.
- 2.5 Extractive sampling of particulates was undertaken between 19th and 21st June 2017 by Environmental Scientifics Group Ltd (MCERTS accredited) to enable calibration of the CEM. Servicing and calibration of the PCME Dust Monitor was also completed by ESG.
- 2.6 The Environmental Permit for the site requires twice-yearly extractive monitoring of stacks A1 and A12, and annual extractive monitoring of stack A13. All three stacks were tested between 19th and 21st June by ESG (job no. LNO 13650). A1 and A12 were tested again by ESG on 29th – 30th November (job no. LNO 13965).
- 2.7 The results of extractive monitoring have been reported to Natural Resources Wales using permit reporting forms Air1b, Air1c and Air1d. Analysis of these results shows that all results are below the emission limit values detailed in the permit, for both sampling exercises conducted in 2017.

3. Emissions to Water

- 3.1 Emissions to water from discharge point W1 are monitored whenever the contents of the Casting Pit are discharged. In 2017 this occurred in June and August. The results of this monitoring are summarised below. Results from sampling undertaken prior to start-up in January 2018 are also included.

Table 3.1. Summary of W1 monitoring results

Parameter	ELV	27/06/17	15/08/17	02/01/18	Average
BOD (mg/l)	10	2.94	3.91	<1	2.61
Suspended solids (mg/l)	35	5.4	12.6	7.4	8.47
COD (mg/l)	125	26.4	34.0	14.5	24.97
Ammoniacal nitrogen (mg/l)	5	0.52	0.26	0.24	0.34
Aluminium (mg/l)	0.5	0.08	0.07	0.02	0.06
Total hydrocarbon oil (mg/l)	2	1.03	<1	<1	1.0
pH	6 – 9	7.45	7.66	7.96	7.69
Temperature (°C)	25	20	18	8	15.3
Flow (l/sec)	No limit	-	-	-	-

Notes:

- Flow rate at release point W1 is not measured, following the removal of the v-notch weir during installation of a penstock valve at W1. Agreed with EA that water emission volumes can be calculated from cooling water bleed-off and casting pit emptying (see EA Compliance Assessment Report no. I/110329/BK3638).

- 3.2 These results show that all releases are within the permitted limits, with some results being below the limit of detection in some cases (indicated by a "<" symbol in the table).

4. Environmental Noise

- 4.1 An environmental noise survey was conducted on 17th and 18th July 2017. Results from this are as follows, with the results from previous surveys included for comparison.

Table 4.1. Noise survey results

	Day, dB(A)						Night, dB(A)					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
Measured noise (Factory operating)	49	47	48	49	49	50	43	42	46	43	42	46
Residual noise (Factory not operating)	44	46	46	47	48	47	39	36	42	38	37	42
Specific noise at nearest property	46	39	43	44	41	46	40	40	39	40	39	43
Background noise (L ₉₀)	39	43	42	42	43	45	38	35	41	35	35	42

- 4.2 The results of the 2017 noise survey indicate that the likelihood of complaints, during both the day and night time, would be of marginal significance at the nearest residential property on The Oval. This is consistent with the results of the 2016 survey.
- 4.3 A series of noise complaints was received between April and July 2017. These were passed to site management by NRW on 05/04/2017, 12/04/17 and 11/07/17, and received directly via phone call from the complainant on 04/05/17. The same local resident was the source of each complaint. In each case the complaint was investigated and the results of the investigations were passed-on to NRW. Where times and dates were given, these could not be related to specific events on-site, with the exception of collecting scrap wheels from an external bay for one furnace charge. Corrective actions were put in place to avoid a recurrence of this. Prior to these complaints, the last noise complaint was dated July 2013.
- 4.4 Noise reduction measures continue to be applied. The automated laydown station (where aluminium logs are placed after their removal from the casting pit) has removed the chiming created by rolling logs by hand along the old laydown station. The automated laydown station has also removed the need for logs to be turned through 90 degrees when suspended vertically, thereby avoiding noise created from logs hitting the turning frame and colliding with each other. The "anti-twist device" remains in use on the load hook of the overhead crane used to remove logs from the casting pit, helping to reduce chiming during the transfer from Caster to Laydown. Noise from sawing operations continues to be minimised, with sawing of logs and discharge of butt ends taking place within an acoustic enclosure. Cut logs are picked-up and carried by automated equipment to the packing area, in contrast to the old saw where logs rolled under gravity to a manual banding station. Preventative maintenance includes condition monitoring on all fans, including those serving the automated homogeniser and air cooling station. "White noise" reversing alarms are in use on all site vehicles to further reduce tonal noise emanating from on-site activities.

5. Operational Performance

5.1 Annual production data required by Table S5.2 is as follows.

Secondary aluminium produced	58,004 tonnes
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5.2 Additional performance parameters are reported using permit reporting forms WaterUsage1, Energy1 and Performance1. These are included below.

Permit Number: EA/EPR/BK3638IF/V002

Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works

Form Number: WaterUsage1

Reporting of Water Usage for the year 2017

Water Source	Usage (m ³ /year)	Specific Usage (m ³ /unit output)
Mains water	30,743 m ³	0.53 m ³ per tonne of aluminium produced
TOTAL WATER USAGE	30,743 m ³	0.53 m ³ per tonne of aluminium produced

Operator's comments :

Approximately a 5% reduction in water consumption of 0.03 m³ per tonne of aluminium produced compared to 2016. This is attributed to reduced bleed-off and top-up of cooling water to the casting pit.

SignedJoel Priest.....
(authorised to sign as representative of Operator)

Date.....29/01/18.....

Permit Number: EA/EPR/BK3638IF/V002

Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works

Form Number: Energy1

Reporting of Energy Usage for the year 2017

Energy Source	Energy Usage		
	Quantity	Primary Energy (MWh)	Specific Usage (MWh/unit output)
Electricity *	7017.3 MWh (cf 7129.7 in 2016)	18245 MWh	0.315 MWh per tonne of aluminium produced (cf 0.329 in 2016)
Natural Gas	70377.16 MWh (cf 66936.82 in 2016)		1.213 MWh per tonne of aluminium produced (cf 1.188 in 2016)
TOTAL	-	88622.14 MWh (cf 85474.02 MWh in 2016)	1.528 MWh per tonne of aluminium produced (cf 1.517 in 2016)

* Conversion factor for delivered electricity to primary energy = 2.6

Operator's comments:

1.6% reduction in total electricity use which translates to a 4% decrease in electricity use per tonne of product, and 5% increase in total gas use translating to a 2% increase in gas consumption per tonne compared to 2016. Overall specific usage has increased by 0.7% compared to 2016, but is still 7.3% lower than 2014 energy consumption (prior to installation of the continuous homogeniser and saw). 2018 will see further focus on energy control and reduction, with improved data collection and targeted improvement actions on key energy consumers across the plant, in-line with the energy management system certified under ISO 50001 (certificate issued 16/02/17).

Signed Joel Priest
(Authorised to sign as representative of Operator)

Date.....29/01/18.....

Permit Number: EA/EPR/BK3638IF/V002

Operator: Hydro Aluminium Limited

Facility: Wrexham Aluminium Works

Form Number: Performance1

Reporting of other performance indicators for the period 01/01/2017 to 31/12/2017

Parameter	Tonne	Tonne / Tonne Product
Total raw material used (tonnes of primary aluminium)	14,289 (13,436 in 2016)	0.25 (0.24 in 2016)
Dross and skimmings, used filters and swarf produced	2,931 (2,725 in 2016)	0.05 (0.048 in 2016)
Bag plant residues and waste lime	93.16 (100.02 in 2016)	0.002 (0.002 in 2016)

Operator's comments :

Total prime use has increased in-line with increased production, with use per tonne of finished product slightly greater than in 2016, reflecting changing product mix and customer demand for certain specifications in the finished product.

Total dross production has increased slightly, and is comparable to 2016 on a per tonne basis. 2017 saw a 1% increase in the use of post-consumed scrap in furnace fills.

Lime consumption is comparable to 2016 in terms of waste produced per tonne of finished product.

Signed Joel Priest
(Authorised to sign as representative of Operator)

Date.....29/01/18.....