



Hydro Aluminium Deeside

Environmental Permit No. BK3638IF

2013 Performance Report

January 2014

MONITORING RETURNS N. WALIS

	INITIALS	DATE
CHECKED vs AUTHORISATION	SR	27.1.14
TRACKING	JB	27.1.14
OK FOR PUBLIC REGISTER	SR	27.1.14
	JB	Edem

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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 have been no changes to the permit in 2013.
- 1.4 There has been one major project relating to production processes in 2013, regarding the installation of a continuous homogeniser and sawing line. This was purchased from Anglesey Aluminium in August with the aim of replacing the current batch homogenisers and saw.
- 1.5 The continuous homogeniser and sawing line, manufactured by Hertwich, has been in operation at Anglesey Aluminium for ten years. Similar Hertwich equipment is in operation at other Hydro casthouses. It will replace equipment that has been in operation at Hydro Aluminium Deeside for 30 years. The "new" equipment has a rated thermal input of 4.3MW and will replace two heat treatment ovens each rated at 3.2MW (6.4MW together). The aggregate thermal capacity of combustion equipment on-site will therefore be reduced by 2.1MW.
- 1.6 The new equipment will see a slight increase in theoretical maximum production, from 60,000 to 63,000 tonnes per annum, due to the ability to homogenise logs that are 7 metres long (current maximum length is 6.4m). The project includes increasing the scrap storage, segregation and sorting capacity by demolishing the old homogenisers and saw which will be replaced with new scrap bays. It should also bring positive environmental impacts through improved energy efficiency and reduced noise.
- 1.7 Operation of the new equipment will be subject to a permit variation, to be submitted in Quarter 1 of 2014.

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 the Environment Agency using permit reporting form Air1a.
- 2.2 Proprietary "Dust Monitor" software enables analysis of the data collected by the CEM. The maximum readings from 2013 for each emission point are detailed in the table below.

Table 2.1. Summary of PCME monitoring results for 2013

Emission Point	Limit	Max daily average in 2013
A1	10 mg/m ³ daily average	2.48 mg/m ³ (December)
A12	10 mg/m ³ daily average	35.49 mg/m ³ (April)
A13	10 mg/m ³ daily average	1.57 mg/m ³ (January)

Emission Point	Limit	Max result, average of daily average values
A1	5 mg/m ³ monthly average	0.55 mg/m ³ (December)
A12	5 mg/m ³ monthly average	1.83 mg/m ³ (April)
A13	No limit set	0.77 mg/m ³ (February)

- 2.3 There was one high result in 2013, for maximum daily average from A12 in April. This occurred on Sunday 14th April, with an average reading for that day of 35.49mg/m³. This high daily average result was due to a period of very high readings between 08:00 – 10:00am, ranging from 69.93 to 769.67mg/m³, and a second period of high readings between 17:00 and 18:30, with 15 minute average results peaking at 11.04mg/m³ in this period. This was reported via a Schedule 6 Notification dated 15/04/13. Before and after these high readings were experienced, CEM results were in the range normally expected – between 0.16 and 1.63 mg/m³. Outside of the period of strong southerly / south-westerly winds, the maximum daily average result was 0.21mg/m³. Other emission points had low results in this period (0.14mg/m³ for A1 and 0.71mg/m³ for A13), and the monthly average result was below the ELV of 5mg/m³ despite the high results of 14th April.
- 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.
- 2.5 Extractive sampling of particulates was undertaken on 25th and 27th June by Environmental Scientifics Group Ltd (MCERTS accredited) to enable calibration of the CEM. Annual servicing and calibration of the PCME Dust Monitor was undertaken on 25/07/13 with certificates issued by ESG for each of the three emission points.
- 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 on 25th – 27th June by ESG (job no. LNO 11335). A1 and A12 were tested again by ESG on 4th – 9th December (job no. LNO 11570).
- 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 2013.

- 2.8 The sampling exercise in June also included the use of a temporary scaffold to allow the platform of Stack A13 to be extended in order to provide enough space for a full traverse across both sampling planes in the stacks (see Figure 1 below).

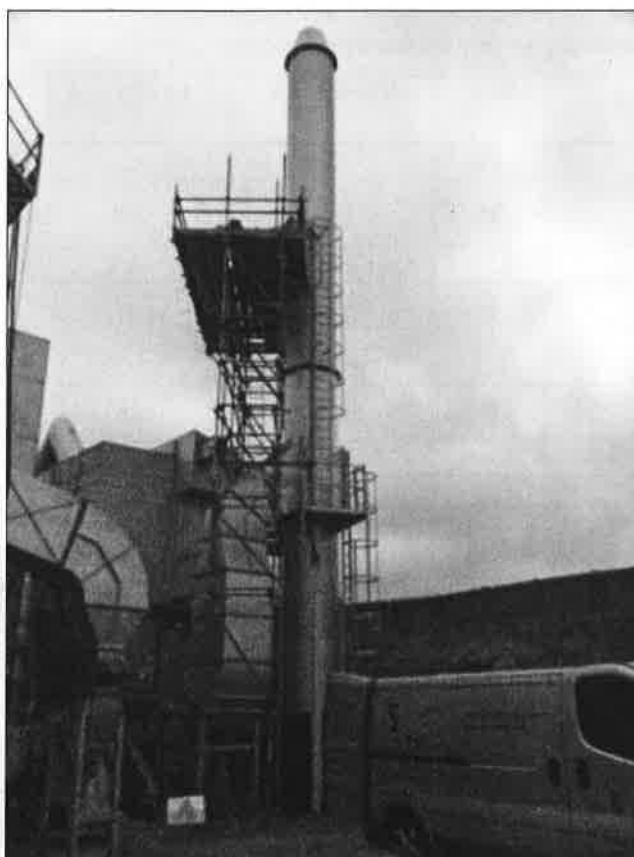


Figure 1 – Sampling of A13 using temporary scaffold to extend sampling platform, 26/06/13

- 2.9 The site underwent an Operator Monitoring Assessment for emissions to air on 12th September. This resulted in an overall score of 97%, with no compliance issues raised. The report from this assessment also concluded on the additional monitoring undertaken by ESG in June, stating that, "whilst the emissions platforms are not strictly compliant with the required standards, all the evidence provided to date strongly indicates that they do allow for representative sampling and they are therefore deemed satisfactory".

3. Emissions to Water

- 3.1 Emissions to water from discharge point W1 are monitored whenever the contents of the Casting Pit are discharged. This occurred during the summer production stop, on 8th August. There were no further samples taken in 2013, however a sample was taken on 14th January – the results of this have been included below.

Table 3.1. Summary of W1 monitoring results

Parameter	ELV	08/08/13	14/01/14	Average
BOD (mg/l)	10	<1	<1	<1
Suspended solids (mg/l)	35	2.5	3.0	2.75
COD (mg/l)	125	23.2	13.2	18.2
Ammoniacal nitrogen (mg/l)	5	0.77	<0.2	0.48
Aluminium (mg/l)	0.5	0.08	0.08	0.08
Total hydrocarbon oil (mg/l)	2	0.07	0.33	0.2
pH	6 – 9	8.12	8.18	8.15
Temperature (°C)	25	21	17	19
Flow (l/sec)	No limit	-	-	-

Note: 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 shows that all releases are within the permitted limits, with some results being below the limit of detection (both results for BOD and the most recent result for ammoniacal nitrogen).
- 3.3 An Operator Monitoring Assessment for emissions to water was conducted on 27th March. The overall score from this was 96%, with no compliance issues raised regarding the on-site sampling and off-site analysis of emissions to water.

4. Environmental Noise

- 4.1 An external noise survey was conducted on 12th-13th November 2013. 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)			
	2010	2011	2012	2013	2010	2011	2012	2013
Measured noise (Factory operating)	49	46	49	47	44	46	43	42
Residual noise (Factory not operating)	47	45	44	46	41	43	39	36
Specific noise at nearest property	44	38	46	39	40	42	40	40
Background noise (L_{90})	43	42	39	43	37	41	38	35

- 4.2 There is a marked difference between day and night time readings compared to previous years, with higher background noise in the daytime and the lowest result for background noise at night. There was construction-type noise from diggers being used on the proposed new prison site (opposite the Hydro Aluminium plant on Bridge Road), which may have contributed to the raised background noise level. Measured noise with the factory operating during the day was 2dB lower than in 2012, and the survey concluded that complaints would be unlikely in the daytime. During the night, measured noise with the factory operating was lower than in the previous three years. Despite this, the survey concluded that complaints from noise at night would be likely due to the difference between measured noise with the factory operating and background noise.
- 4.3 Noise reduction measures continue to be used, including good practices when removing logs from the casting pit, the use of a soft-start/variable speed crane for this task, and bumper strips on the laydown station (where cast logs are transferred from vertical to horizontal position prior to being stacked for transport to the homogenisers). In addition, the planned installation of a continuous homogenising furnace and sawing line will further reduce noise as there will be less manual handling of logs, and the transition from the casting pit to the laydown station for the new homogeniser will not require the logs to be turned in the air through 90 degrees. Also, the sawing operation will take place inside an acoustic enclosure, further reducing noise.

5. Operational Performance

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

Secondary aluminium produced	48,677 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 2013

Water Source		Usage (m ³ /year)	Specific Usage (m ³ /unit output)
Mains water		27,911 m ³	0.57 m ³ per tonne of aluminium produced
TOTAL WATER USAGE		27,911 m ³	0.57 m ³ per tonne of aluminium produced

Operator's comments :

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

Date.....23/01/14.....

Permit Number EA/EPR/BK3638IF/V002

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Date of form 24/06/09

Permit Number: EA/EPR/BK3638IF/V002

Operator:

Hydro Aluminium Limited

Facility:

Wrexham Aluminium Works

Form Number:

Energy1

Reporting of Energy Usage for the year 2013

Energy Source	Energy Usage		Specific Usage (MWh/unit output)
	Quantity	Primary Energy (MWh)	
Electricity *	6,386.61 MWh	16605.19 MWh	0.341 MWh per tonne of aluminium produced
Natural Gas	69,108.22 MWh		1.420 MWh per tonne of aluminium produced
TOTAL	-	85713.41 MWh	1.76 MWh per tonne of aluminium produced

* Conversion factor for delivered electricity to primary energy = 2.6

Operator's comments :

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

Date 23/01/14.....

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 01/01/2013 to 31/12/2013

Parameter	Tonne		Tonne / Tonne Product
Total raw material used (tonnes of primary aluminium)	11,743		0.24
Dross and skimmings, used filters and swarf produced	2,260.56		0.046
Bag plant residues and waste lime	74.56		0.002

Operator's comments :

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

Date 23/01/14

Permit Number EA/EPR/BK3638IF/V002

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Date of form 24/06/09

