

## **Environment Agency**

### **Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)**

#### **Decision document recording our decision-making process following review of a permit**

The Permit number is:                   EPR/FP3137CG  
The Operator is:                         Lynemouth Power Limited  
The Installation is:                     Lynemouth Power Station  
This Variation Notice number is:   EPR/FP3137CG/V005

#### **What this document is about**

All Environmental permits which permit the operation of large combustion plant (LCP), as defined by articles 28 and 29 of the Industrial Emissions Directive (IED), need to be varied to implement the special provisions for LCP given in the IED, by the 1 January 2016 (Article 82(3)). The IED makes special provisions for LCP under Chapter III, introducing new Emission Limit Values (ELVs) applicable to LCP, referred to in Article 30(2) and set out in Annex V.

The IED provides a period of transition towards the new ELVs via Article 32, the Transitional National Plan (TNP). It also makes provision for plant that wish to be exempted from compliance with the new ELVs in Article 33, the Limited Life Derogation (LLD). Other derogations include limited operating hour regimes for sites using 500 hr or 1500 hr derogations. There are also options for exemption from emission limits based on operating hours.

The operator has submitted a response to our notice requiring information, issued under Regulation 60(1) of the Environmental Permitting Regulations (EPR), which has provided us with information on which compliance route they wish to follow for each LCP. The response also includes specific details relating to each LCP, necessary for accurate implementation the IED requirements. A copy of the Regulation 60 Notice and the operator's response is available on the public register.

We have reviewed the permit for this installation, including all variations since the last permit consolidation, and referred to the operator's response to the Regulation 60 Notice requiring information. This is our decision document, which explains the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the compliance routes and, where relevant, the emissions limits proposed by the Operator for each LCP on the installation. This review has been undertaken with reference to the:

- Chapter III and Annex V of the IED
- “IED BAT ESI Review Paper, 28 October 2014” produced by the Environment Agency (referred to as the “2014 ESI BAT review paper” in this document)
- “Electricity Supply Industry – IED compliance protocol for Utility Boilers and Gas Turbines”, published by the Joint Environmental Programme.

It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as implementing the Chapter III IED compliance of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue. It also modernises the entire permit to reflect the conditions contained in our current generic permit template and deletes any references to burning coal.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been deleted because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to Chapter III Review and any changes to the operation of the installation.

## **How this document is structured**

Glossary

1. Our decision
2. How we reached our decision
3. The legal framework
4. Key Issues

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## GLOSSARY

Baseload	means: (i) as a mode of operation, operating for >4000hrs per annum; and (ii) as a load, the maximum load under ISO conditions that can be sustained continuously, i.e. maximum continuous rating
BAT	best available techniques
BREF	best available techniques reference document
ELV	emission limit value set out in either IED or LCPD
ESP	electrostatic precipitators
FGD	flue-gas desulphurisation
IED	Industrial Emissions Directive 2010/75/EC
LCP	large combustion plant – combustion plant subject to Chapter III of IED
LCPD	Large Combustion Plant Directive 2001/80/EC
MCR	Maximum Continuous Rating
MSUL/MSDL	Minimum start up load/minimum shut-down load
TNP	Transitional National Plan

# 1 Our decision

We have decided to issue the Variation Notice to the Operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains many conditions taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the EPR and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

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## 2 How we reached our decision

### 2.1 Requesting information relating to the requirements of Chapter III of and Annex V to the IED

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 31 October 2014 requiring the Operator to provide information for each LCP they operate, including:

- The type of plant, size and configuration.
- The proposed compliance routes.
- Minimum start up and shut down loads.
- For coal fired power stations entering into the TNP or LLD, confirmation of whether they will follow the sector approach in the 2014 BAT review paper for the setting of emission limits, or if not propose emission limits with a justification based on the principles outlined in the 2014 BAT review paper.
- The proposed emission limits and how they accord with the 2014 BAT review paper.

The Regulation 60 Notice response from the Operator was received on 31 March 2015.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that determination.

The Operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

### 2.2 Requests for Further Information during determination

Although we were able to consider the Regulation 60 Notice response generally satisfactory at receipt, we did in fact need more information in order to complete our permit review assessment, and issued a further information request on 29 October 2015. A copy of the further information request and the operator's response were placed on our public register.

### 2.3 Alternative compliance routes

In their Regulation 60 Notice response, the operator initially requested multiple compliance routes be considered for their LCP because at that point they had not decided which route they wanted to apply. The routes requested were: Limited Life Derogation (LLD) and Transitional National Plan (TNP).

We were only able to issue the variation notice for single compliance routes per LCP (other than TNP which can apply by pollutant), and the operator confirmed which route they wanted in the variation notice by letter dated 01 December 2015. The confirmed route was: conversion to 100% biomass during the TNP, with site specific ELVs agreed once commissioning is complete.

The operator has also requested an extension to their coal operations for a short period between 01 January 2016 and 31 March 2016 to provide continuation of employment for 135 staff and contractors into the biomass conversion project, and to demonstrate an operational plant to potential investors.

This is what is considered in this decision document.

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### 3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

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## Meeting the requirements of the IED

The table below shows how each requirement of the IED has been addressed by the permit conditions.

IED Article Reference	IED requirement	Permit condition
30(6)	If there is an interruption in the supply of gas, an alternative fuel may be used and the permit emission limits deferred for a period of up to 10 days, except where there is an overriding need to maintain energy supplies. The EA shall be notified immediately.	Not applicable
32(4)	For installations that have applied to derogate from the IED Annex V emission limits by means of the transitional national plan, the monitoring and reporting requirements set by UK Government shall be complied with.	3.1.5 Schedule 3, Table S3.3a
33(1)b	For installations that have applied to derogate from the IED Annex V emission limits by means of the Limited Life Derogation, the operator shall submit annually a record of the number of operating hours since 1 January 2016;	Not applicable
37	Provisions for malfunction and breakdown of abatement equipment including notifying the EA.	2.3.6 4.2.6 4.3.1d
38	Monitoring of air emissions in accordance with Ann V Pt 3	3.5, 3.6
40	Multi-fuel firing	Not applicable
41(a)	Determination of start-up and shut-down periods	2.3.5 Schedule 1 Table S1.5a and S1.5b
Ann V Pt 1(1)	All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised O <sub>2</sub> content of 6 % for solid fuels, 3 % for combustion plants, other than gas turbines and gas engines using liquid and gaseous fuels and 15 % for gas turbines and gas engines.	Schedule 6, Interpretation
Ann V Pt 1	Emission limit values	3.1.2 Schedule 3, Table S3.1a and S3.1b
Ann V Pt 1	For plants operating less than 500 hours per year, record the used operating hours	Not applicable
Ann V Pt 1(6(1))	Definition of natural gas	Not applicable
Ann V Pt 2	Emission limit values	Not applicable
AnnV Pt 3(1)	Continuous monitoring for >100MWth for specified substances	3.5, 3.6 Schedule 3, Table S3.1a and S3.1b

<b>IED Article Reference</b>	<b>IED requirement</b>	<b>Permit condition</b>
AnnV Pt 3(2, 3, 5)	Monitoring derogations	Not applicable
AnnV Pt3(4)	Measurement of total mercury	Not applicable
AnnV Pt3(6)	EA informed of significant changes in fuel type or in mode of operation so can check Pt3 (1-4) still apply	2.3.1 Schedule 1, Table S1.2
AnnV Pt3(7)	Monitoring requirements	3.5.1 Schedule 3, Table S3.1a and S3.1b
AnnV Part 3(8,9,10)	Monitoring methods	3.5, 3.6
AnnV Pt 4	Monthly, daily, 95%ile hourly emission limit value compliance	3.5.1 Schedule 3, Table S3.1a and S3.1b
AnnV Pt7	Refinery multi-fuel firing SO <sub>2</sub> derogation	Not applicable

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## 4. Key Issues

**Unless the decision document specifies otherwise we have accepted the applicant's proposals.**

Where relevant and appropriate, we have incorporated the techniques described by the Operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table S1.2 of the Consolidated Variation Notice.

The variation notice uses an updated LCP number in accordance with the most recent DEFRA LCP reference numbers. The LCP reference has changed as follows:

- **LCP 87A** is changed to **LCP 418**.

### **LCP 418**

This LCP consists of three 350 MWth boilers which vent via multiple flues within a common windshield at emission points AU1, AU2 and AU3. In 2016, the units will be converted from coal to 100% biomass, during the TNP.

#### **Compliance Route:**

The operator has proposed to operate this LCP under the TNP compliance route.

For plant operating under the TNP, ELVs are set which have been derived for the period 01 January 2016 – 30 June 2020 (the duration of the TNP). At the end of this period it is expected that both Annex V and the revised LCP BREF will become applicable, in which case Annex V or the BAT conclusions must be achieved (whichever is stricter), or operators must have applied for a derogation from the BAT conclusion (if that is stricter). Annex V will apply in any event. The operator will apply, at the appropriate time, to vary the permit again to reflect this.

#### **Net Rated Thermal Input:**

The Applicant has stated that the Net Thermal Input is 1050MWth (3x350MWth). This has been calculated from the current maximum electrical output (140MWe), assuming a typical gross efficiency of 40%. Further evidence is required once the biomass conversion is complete and this has been required by Improvement Condition IC27 within the permit.

#### **Minimum start up load and Minimum shut-down load:**

Once the commissioning on 100% biomass is complete in early 2017, Improvement Condition IC26 will require the submission of MSUL/MSDL proposals and evidence.

**Emission limits:**

This LCP will convert from coal to 100% biomass whilst in the TNP. Once 100% conversion is complete, site specific ELVs will be set for biomass, using primary measures. The operator has confirmed that they will comply with the sector approach in the 2014 BAT review paper. Consequently we have set the emission limits for this LCP in line with the BAT paper in table S3.1 of the permit, and we have also set the standard annual emission target in table S3.3.

**Sulphur dioxide:**

Table 1: Main stack AU1, AU2 and AU3. SO<sub>2</sub> ELVs mg/m<sup>3</sup>.

Biomass-firing during the TNP, until 100% commissioning is complete.

	95%ile of hourly averages	24 hourly averages	Monthly averages
Existing on biomass	No limit	No limit	No limit
IED Annex V	-	-	200
IED BAT paper	-	-	-
Applied for	700	440	350
Granted	-*	440	350

\*Not required in the TNP, see IED BAT paper

This installation will undergo a complete shutdown in 2016 to convert to 100% biomass. The operator proposed the above SO<sub>2</sub> ELVs in accordance with our IED BAT paper and these have been accepted as applicable until the whole LCP has been commissioned on biomass. Once the conversion is complete, Improvement Condition IC19 will propose new site specific ELVs, which will apply until the implementation of the BREF conclusions and the end of the TNP.

**Oxides of nitrogen:**

Table 2: Main stack AU1, AU2 and AU3. NO<sub>x</sub> ELVs mg/m<sup>3</sup>.

Biomass-firing during the TNP, until 100% commissioning is complete.

	95%ile of hourly averages	24 hourly averages	Monthly averages
IED Annex V biomass	-	-	200
IED BAT paper	-	550	450
Applied for	900	550	450
Granted	-*	550	450

\*Not required in the TNP, see IED BAT paper

The operator proposed NO<sub>x</sub> ELVs in accordance with our IED BAT paper and this has been accepted as applicable during the biomass conversion period. Once the conversion is complete, Improvement Condition IC19 will propose new site specific ELVs based on primary measures, which will apply until the implementation of the BREF conclusions and the end of the TNP.

**Dust:**

Table 3: Main stack AU1, AU2 and AU3. dust ELVs mg/m<sup>3</sup>.  
Biomass-firing until commissioning is complete. TNP.

	95%ile of hourly averages	24 hourly averages	Monthly averages
IED Annex V biomass	-	35	20
IED BAT paper Existing			50*
IED BAT paper Proposed	-	35	20 (with FGD)
Draft BREF			2-16
Applied for	70	42	35
Granted	- **	42	35

\* When all the units fitted with FGD are operating for <75% of the operational hours within the calendar month, in the TNP (5392MWth total). Eggborough Power Station.

\*\* Not required in the TNP, see IED BAT paper

Lynemouth Power Station currently operates with ESPs but without FGD, which can also abate dust. The operator proposed the above ELVs reflecting the expected improvement on current coal performance, without any additional investment during the biomass conversion stage. In May 2014, the operator conducted a cost benefit analysis (CBA) of available NOx and dust abatement options when firing on 100% biomass and concluded that upgrading the existing ESPs is BAT with the expectation that an ELV of 15mg/m<sup>3</sup> is achievable, which is within the draft BREF range. Future emission reduction options will be subjected to a BAT review (Improvement Conditions IC17 and IC19) once the performance of the converted plant has been confirmed and the requirements of the BREF conclusions have been considered.

The ELVs proposed by the operator have therefore been accepted, with the daily average calculated in accordance with the IED BAT paper. These ELVs are applicable during the few months of commissioning on biomass and until the agreed outcome of Improvement Condition IP19. IP19 will propose new site specific elvs which will apply until the implementation of the BREF conclusions and the end of the TNP.

**Energy efficiency:**

The installation does not currently have CHP, but has previously delivered warm water to a neighbouring wormery. This facility has since closed but there have been discussions regarding a replacement facility with possible CHP opportunities. In line with the DEFRA Part A guidance, to report on the scope for further improvement, condition 1.2.1 has been included within the permit for the operator to carry out a 4-yearly efficiency review.

**Reporting efficiency:**

In order to ensure the efficiency of plant using biomass is maximised and regularly recorded, condition 1.2.1(c), condition 4.2.2(b) and table S4.2 have been added to the permit.

**Notifications:**

Schedule 5, Part C, takes account of the malfunction and breakdown requirements. A breach of permit condition is NOT implicit in notification under Part C.

**Monitoring & standards:**

Standards for assessment of the monitoring location and for measurement of oxygen, water vapour, temperature and pressure have been added to the permit template for clarity.

A row has been included in table S3.1 which requires the operator to confirm compliance with BS EN 15259 in respect of monitoring location and stack gas velocity profile in the event there is a significant operational change (such as a change of fuel type) to the LCP.

**Resource efficiency metrics:**

A more comprehensive suite of reporting metrics has been added to the permit template for ESI plant. Table S4.2 "Resource Efficiency Metrics" has been added requiring the reporting of various resource parameters, as this is an Electrical Supply Industry (ESI) power plant. This table is being used for all ESI plant.

**Additional IED Chapter II requirements:**

Condition 3.1.5 relating to protection of soil, groundwater and groundwater monitoring, has been added in compliance with IED requirements.

Conditions 4.3.1 and 4.3.2 relating to notifications have been amended in compliance with IED requirements.

## Annex 1 additional issues

### **Small combustion plants**

Table S1.1 of the permit now includes all combustion plants on site >1MWth, as required by the permit template. These are not new plant, simply previously unlisted plant.

### **Local Air Quality Management Plan**

This site is not within an Air Quality Management Area and coal-firing will cease before 31 December 2015 therefore the current requirement for ambient air monitoring (permit condition 3.7) has been removed from the permit. In 2014, in agreement with the Environment Agency, the operator reduced the number of local air quality monitoring locations but upgraded the remaining CAMS (continuous ambient monitors) and in December 2015 the operator proposed adding NOx monitoring to confirm the predicted reductions in air emissions as a result of the conversion. These agreements have been included in Table S1.2 Operating Techniques dated 17 January 2014, 19 September 2013 and 03 December 2015.

### **Newly prescribed activities**

The current permit includes a Section 3.5 Part B(f) activity under Schedule 1 of the Environmental Permitting regulations for pulverised fuel ash (PFA) handling and storage. Treatment of PFA is now covered under Section 5.4 Part A(1)(b)(iii) of Schedule 1 and is known as a “newly prescribed activity” (NPA) following new requirements introduced by the IED. As a result of these changes the operator submitted an administrative variation on 29 September 2014 to operate the following newly prescribed activities:

- Treatment of PFA

We are satisfied that our original assessment of these activities when they were part of the Section 3.5 Part B(f) activity remains valid and that the change is administrative in nature only, with no actual changes have taken place to the way in which PFA is processed at the installation, and we have therefore included the 5.4 Part A(1)(b)(iii) activity within Table S1.1.

### **Pre-operational conditions**

PO 06 in the existing permit requires the submission of a proposed methodology for assessing the impact of biomass ash waste on the environment. This is duplicated in the as pre-op condition PO2 in the Lynemouth Power ash lagoons permit (EPR/FP3437CZ/V003) and has therefore been deleted to avoid repetition.

### **Additional variation request from the operator**

The operator's response to the draft IED permit (dated 03 December 2015) included a request to consider the inclusion of two construction village areas which will be built to accommodate contractors and staff working on the biomass conversion project. Effluent from these areas will be directed to the existing sewage treatment plant and a newly installed package plant. These changes resulted in the reintroduction of Table S3.2 and the quarterly

monitoring on W4 (previously deleted by written agreement on 06 June 2013) to ensure protection of the water environment.

The description of W6 as a surface water drain from the coal stocking area has also been retained in the permit as the final decision on pellet storage has not been made.

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