PARSONS BRINCKERHOFF

May 2013

HIRWAUN POWER PROJECT

ENVIRONMENTAL IMPACT ASSESSMENT

SCOPING REPORT

Hirwaun Power Limited

Hirwaun Power Project

Environmental Impact Assessment Scoping Report

Prepared for
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CONTENTS

LIST OF ABBREVIATIONS

ACC	Air Cooled Condenser
AES	Annual Energy Statement
BAT	Best Available Technique
BGS	British Geological Survey
CCGT	Combined Cycle Gas Turbine
CCR	Carbon Capture Readiness
CCS	Carbon Capture and Storage
CCW	Countryside Council for Wales
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DBA	Desk Based Assessment
DECC	Department for Energy and Climate Change
DEFRA	Department for Environment, Food & Rural Affairs
DCO	Development Consent Order
EAW	Environment Agency (Wales)
EC	European Community
EfW	Energy from Waste
EIA	Environmental Impact Assessment
ELV	Emission Limit Value
EMR	Electricity Market Reform
ES	Environmental Statement
EU	European Union
GCN	Great Crested Newt
GGAT	Glamorgan and Gwent Archaeological Trust
GT	Gas Turbine
HER	Historic Environment Record
HPL	Hirwaun Power Limited.
HPP	Hirwaun Power Project

HRSG	Heat Recovery Steam Generator
IDB	Internal Drainage Board
IED	Industrial Emissions Directive
IGE	Institute of Gas Engineers
IPC	Infrastructure Planning Commission (Now abolished and references to "IPC" should be read as "PINS" or "the Secretary of State", as appropriate).
IPPC	Integrated Pollution Prevention and Control
km	Kilometres
kV	Kilovolt
LCPD	Large Combustion Plant Directive
LTS	Local Transmission System
m	Metres
m^2	Metres Squared
mm	Millimetres
MOC	Minimum Offtake Connection
MWe	Mega Watt Electrical
MWth	Mega Watt Thermal
NGC	National Grid Company
NGET	National Grid Electricity Transmission
NO_x	Nitrous Oxides
NPS	National Policy Statement
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
NTS	National Transmission System
PA 2008	Planning Act 2008
PIG	Pipeline Inspection Gauge
PINS	The Planning Inspectorate
PPW	Planning Policy Wales
PTF	Pig Trap Facility
RGE	Reciprocating Gas Engine
ROV	Remotely Operable Valve

SCGT	Simple Cycle Gas Turbine
SCR	Selective Catalytic Reduction
SoS	Secretary of State
SO_x	Sulphur Oxides
SPV	Special Purpose Vehicle
SWMP	Site Waste Management Plan
TAN	Technical Advice Note
UK	United Kingdom
UK-D	United Kingdom Distribution
UK-T	United Kingdom Transmission
WAG	Welsh Assembly Government
WPL	Watt Power Limited.
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

SECTION 1

INTRODUCTION

1 INTRODUCTION

1.1 Overview

1.1.1 This document presents the Environmental Impact Assessment (EIA) Scoping Report for the Hirwaun Power Project (HPP). This Report has been prepared by Parsons Brinckerhoff Ltd on behalf of Hirwaun Power Limited (HPL).

1.1.2 HPL is promoting a new thermal generating station on land at the Hirwaun Industrial Estate, in Aberdare, Mid-Glamorgan, South Wales (approximate grid reference SN 938 061) (referred to as the **'Power Generation Plant'**). The site location is shown in Figure 1.

1.1.3 The Power Generation Plant will be designed to provide an electrical output of up to 299 Megawatts Electrical (MWe) and would be fuelled by natural gas.

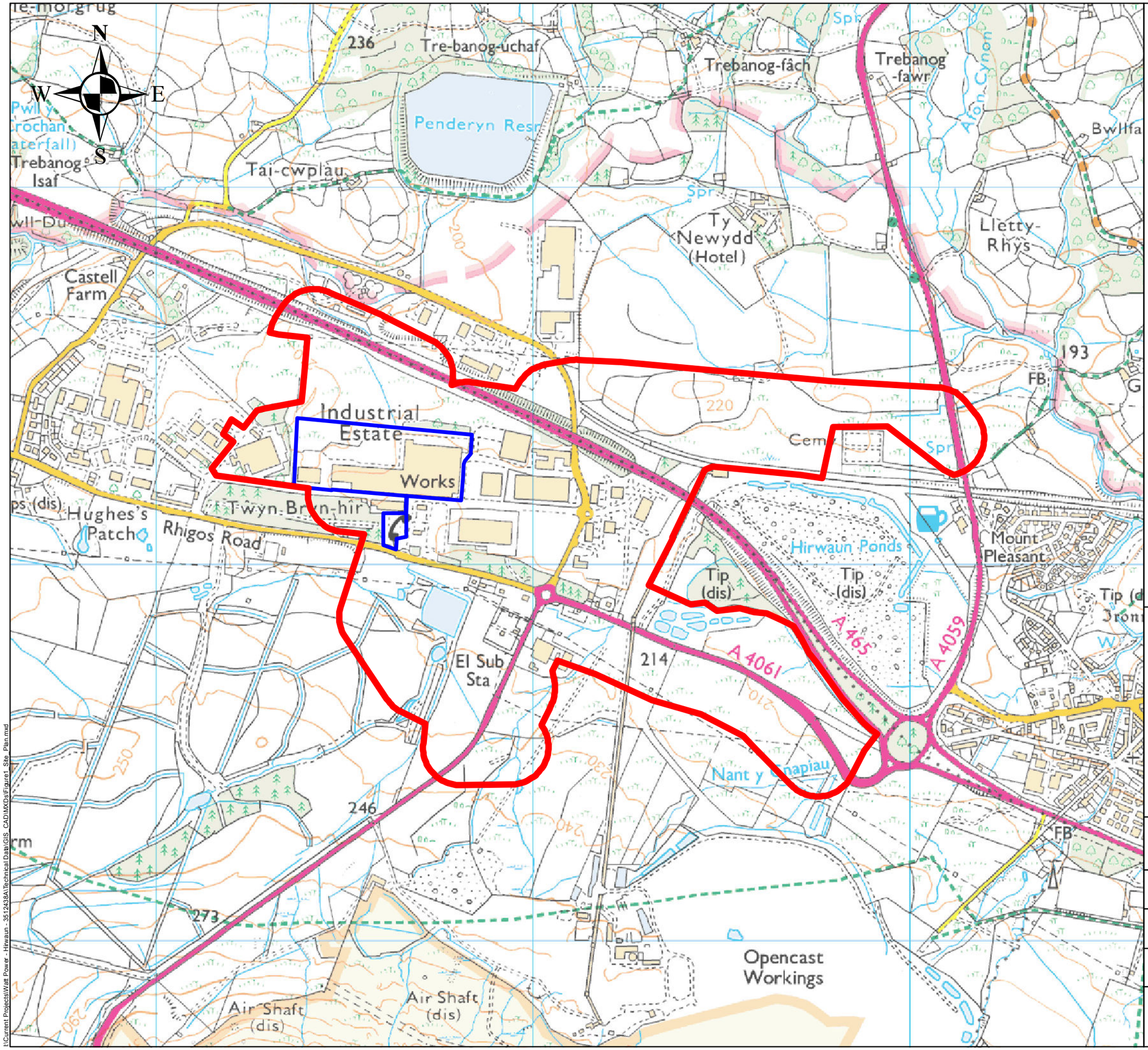
1.1.4 The Power Generation Plant constitutes a Nationally Significant Infrastructure Project (NSIP) under the terms of the Planning Act 2008 (PA 2008) and therefore an application for a development consent order (DCO) is to be made to the Secretary of State (SoS).

1.2 The Proposed Development

1.2.1 The three main elements of the HPP would comprise:

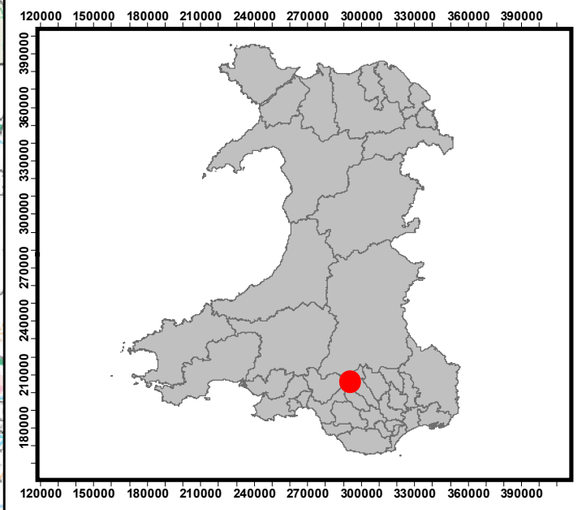
- The **Power Generation Plant**, a gas fired power generating station capable of providing up to 299 MWe;
- A new electrical connection (referred to as the **'Electrical Connection'**) to export power from the Power Generation Plant to the National Grid; and
- A new gas pipeline connection (referred to as the **'Gas Connection'**) to bring natural gas to the Power Generation Plant from the National Transmission System (NTS).

1.2.2 The Power Generation Plant, Gas Connection and Electrical Connection together are referred to as the **'Hirwaun Power Project or HPP'** and are all required for the generation of electricity and the subsequent export of that electricity to the National Grid. The DCO application may include the whole of the HPP.



Legend

- Project Red Line Boundary
- *Generating Station Complex Proposed Boundary*



Site Location Plan

DOCUMENT REF:	SITE DESIGN VERSION:	DATE:
PB	v1	15/05/2013

BAR SCALE 1:10,000 @ A3 — 0 0.1 0.2 0.3 0.4 Km

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Figure 1

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1.2.3 The three key elements which make up the HPP are described below:

Power Generation Plant

1.2.4 The Power Generation Plant would comprise of the following principal elements required for the generation of electricity:

- Gas / steam turbines;
- Stack(s);
- Cooling equipment;
- Workshops and stores;
- Water tanks;
- Administration and control buildings;
- Gas receiving station;
- Auxiliary boiler; and
- Miscellaneous buildings and associated equipment.

1.2.5 All of the above elements would be located within the proposed Power Generation Plant site boundary shown outlined in red on Figure 1 and are integral aspects of the NSIP. A potential layout of these main plant items is shown in Figure 2. Further details on their size and function are given in Section 3.3 of this Report.

Gas Connection

1.2.6 The Gas Connection would comprise a new gas pipeline which would connect the Power Generation Plant site with Feeder 2 (Garway to Rhigos Pipeline) on the NTS, which runs to the south and east of the Power Generation Plant site.

1.2.7 Currently, there are four connection route options available to HPL, which are being further considered for their suitability. The connection options will be further refined and the options narrowed to a single connection route prior to submission of the DCO application.

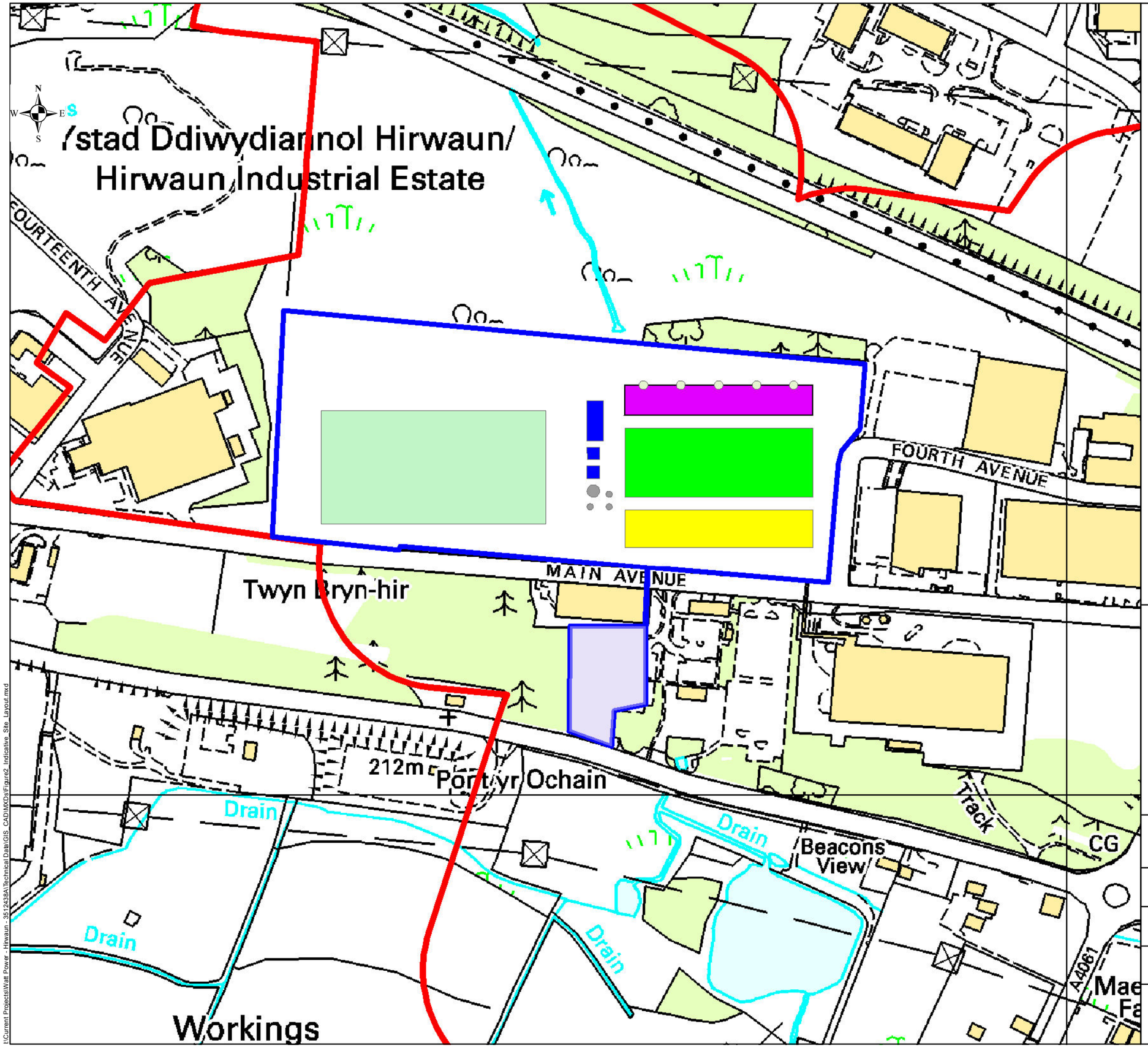
1.2.8 The potential route corridor options currently under consideration for the Gas Connection are shown on Figure 3 and Inserts 5 - 8. Further details of the potential connection route options are provided in Section 3.4 of this Report.

Electrical Connection

1.2.9 There are currently a number of options available for the Electrical Connection to export power from the Power Generation Plant to the National Grid. These options comprise a new 400 kV electricity export cable, either in the form of an underground cable or overhead line. In either case, the cable/line would run west from the boundary of the Power Generation Site, to the new 'Rhigos Substation'. This substation is expected to be completed by 2016, when the nearby 256 MW Pen Y Cymoedd Wind Farm is also due to be connected.

1.2.10 A new switchyard would also be required. This infrastructure would be situated within the Power Generation Plant site, as shown on Figure 3.

1.2.11 The potential route corridor options currently under consideration for the Electrical Connection are also shown on Figure 3 and Inserts 9 and 10. As with the Gas Connection, the options for the Electrical Connection will be refined and narrowed to a single connection route prior to submission of the DCO application. Further details are given in Section 3.5 of this Report.



Legend

- Project Red Line Boundary
- Generating Station Complex Proposed Boundary
- AIS Area
- Laydown Area
- ACC Area
- GT / ST Area
- Stacks
- Heat Recovery Area
- Water Tanks
- Admin Buildings / Workshops

Hirwaun Power Project

Indicative Site Layout

DOCUMENT REF:	SITE DESIGN VERSION:	DATE:
PB	v1	15/05/2013

BAR SCALE 1:3,000 @ A3 — 0 0.03 0.06 0.09 0.12 Km

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Figure 2

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N
W E
S

Tre-banog-uchaf

Trebanog-fâch

Trebanog -fawr

Afon Cynon

Penderyn Res

Tai-cwplau

Spr

Ty Newydd (Hotel)

Llett Rhys

200

220

Cem

Industrial Estate Works

Twyn Br n-hir

Rhigos Road

Hirwaun Ponds

Tip (dis)

Tip (dis)

A 465

A 4059

A 4061

El Sub Sta

214

210

230

240

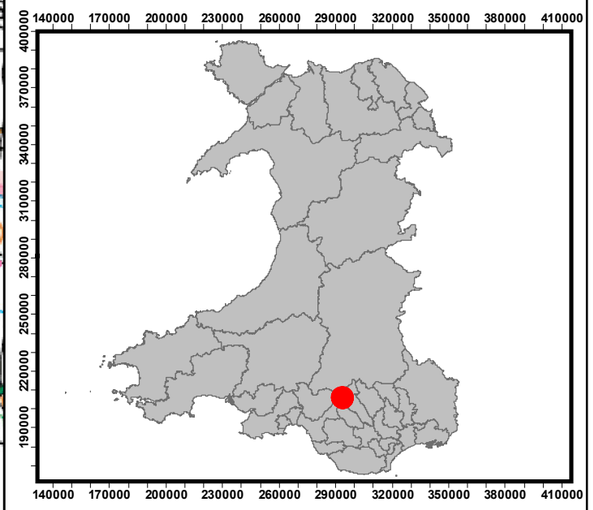
246

Nant y Caplau

Mour Pleasa

Legend

- Project Red Line Boundary
- Generating Station Complex Proposed Boundary
- Electrical Connection Corridor 1
- Electrical Connection Corridor 2
- Gas Route 1 Corridor
- Gas Route 2 Corridor
- Gas Route 3 Corridor
- Gas Route 4 Corridor
- Rhigos Substation
- Gas Distribution Network



Hirwaun Power Project

Gas & Electrical Connection Options

DOCUMENT REF:	SITE DESIGN VERSION:	DATE:
PB	v1	15/05/2013

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0 0.075 0.15 0.225 0.3 Km

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Figure 3

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1.3 Need for and Benefits of the Project

1.3.1 This section briefly summarises why the HPP is needed and how it would contribute towards ensuring greater reliability of electricity supply in the UK.

1.3.2 The Overarching National Policy Statement for Energy (NPS EN-1) sets out national policy for energy infrastructure and is part of a suite of National Policy Statements (NPS) designated to guide the examination and determination of DCO applications.

1.3.3 NPS EN-1 re-affirms the transitional role of new gas generation, and confirms that a diverse energy mix is required and that there is a significant need for new energy generation infrastructure to replace capacity that will be lost through the closure of existing large plant. Indeed it states that the decision-maker '*should start with a presumption in favour of granting consent to applications for energy NSIPs*' (paragraph 4.1.2).

1.3.4 NPS EN-1 therefore establishes the general need case for energy NSIPs, including gas generation. This has been preceded and followed by other government policy and evidence, some of which is summarised below to provide further context.

1.3.5 To ensure that there is reliability of supply, it is government policy that the electricity generation mix needs to incorporate a balance of technologies that continuously and reliably produce stable and controllable power and that within this scenario, gas-fuelled electricity generating technologies can play a significant role. Thus in the second Annual Energy Statement (AES) (November, 2011), the Department of Energy and Climate Change (DECC) directed the need to build new power generation infrastructure. In line with this requirement, DECC acknowledged the need for gas to continue to feature strongly in the energy mix, and also stated that while it is important that businesses play their part in the transition to a low-carbon economy, it is also important to remain competitive.

1.3.6 These statements are supported by the more recent Gas Generation Strategy, released by DECC in December 2012[1]. The Strategy sets out the important role that gas generation—as a reliable, flexible source of electricity—will play in any future generation mix, supporting a secure, low-carbon and affordable electricity system. It states that *"Gas currently forms an integral part of the UK's generation mix and is a reliable, flexible source of electricity. Using gas as a fuel in our power*

[1] http://www.decc.gov.uk/en/content/cms/meeting_energy/oil_gas/gasgenstrat/gasgenstrat.aspx#

stations currently provides a significant proportion of our electricity generation (around 40% in 2011)".

1.3.7 Moreover, it suggests that there could be as much as 37GW of new gas generation infrastructure required if the decarbonisation target is set at 200g/CO_2/kWh. It also indicates that in 2030 we could need more overall gas capacity than we have today, although operating at lower load factors. The modelling shows that gas could play a more extensive role, with higher load factors, should the 4th Carbon Budget be revised upwards" (Executive Summary).

1.3.8 The paper also presents scenarios which indicate that up to 41 GW of new gas generation capacity will be needed by 2030 to underpin long term electricity supplies and provide back-up to nuclear and wind generation at times of peak demand.

1.3.9 In October 2012, Ofgem (the electricity and gas regulatory body) prepared a report entitled 'Electricity Capacity Assessment' which was submitted to the SoS and estimates a set of plausible electricity capacity margins that could be delivered by the market over the next four years and the associated risks to security of supply.

1.3.10 One of the key findings of the Ofgem report is that electricity de-rated capacity margins will decrease significantly from the current historically high levels. In parallel, the risk of electricity customer disconnections will appreciably increase from near zero levels. This is primarily because of a significant reduction in electricity supplies from coal and oil plants, which are due to close under European environmental legislation.

1.3.11 Furthermore, the Welsh Assembly Government (WAG) publication, 'Energy Wales – a Low Carbon Transition' states that

1.3.12 *"Gas will be a key transitional fuel because greenhouse gas emissions from gas are significantly less than coal subject to the method of extraction. Gas is a flexible, responsive and reliable source of energy which can play a key role in the transition to a genuinely low carbon energy system.*

1.3.13 *In the short term, gas, nuclear and bio-energy will provide the energy to compensate for the intermittency in supply from renewable resources"* (page 10).

1.3.14 With the large number of wind turbines that are now providing electricity to the National Grid and the increasing number of solar farms being proposed, both of which represent an intermittent power supply, there is also significant consideration being given to the need for flexible

power on the network. Parsons Brinckerhoff's "Powering the Future" report[2] which maps the route to a low carbon economy, has predicted that up to 9,000 MW of flexible power would be needed by 2050 to help stabilise the National Grid due the intermittent supply, in particular from offshore wind.

1.3.15 Given the above, there is therefore a clear and significant requirement for further capacity to meet the projected need for both base load (i.e. continuously operational) and reactive/flexible generation. A dedicated gas fired plant at the Power Generation Plant site could allow for the rapid provision of reserve capacity to the National Grid, or provide a constant supply of reliable electricity generation, thus playing a role in meeting the energy requirements of the UK going forward.

1.4 The Developer

1.4.1 The Developer of the proposed HPP is HPL. HPL is the Special Purpose Vehicle (SPV) which has been set up to develop the HPP and supporting infrastructure.

1.4.2 HPL has been established by Watt Power Limited. (WPL). WPL has been established to develop flexible gas fired generation assets to support the UK Government drive to a low carbon economy. Stag Energy provides the resources through a management services agreement with WPL. Stag Energy was founded in 2002 and the company draws on a depth of experience with a team that has created and delivered over 10,000 MW of power generation and related infrastructure projects across the globe, of which 2,500 MW was delivered in the UK.

1.4.3 Similarly, Stag Energy provides resources to the Gateway Storage Company Ltd, which is developing an offshore salt cavern gas storage facility in the East Irish Sea. The project has been consented by the UK Government and the local planning authority (Barrow-in-Furness, Cumbria) (for further information on the project visit: www.gatewaystorage.co.uk).

1.4.4 WPL is committed to the development of assets to support the UK Government drive to a low carbon economy. HPL recognises the need to balance commercial issues with the environmental benefits and concerns of energy projects and believes this can be responsibly delivered at a local level.

[2] Powering the Future, Mapping our low carbon path to 2050, Parsons Brinckerhoff, 2010

1.4.5 HPL is also committed to acting in a socially and environmentally responsible manner. As part of this policy, they will seek the views and concerns of the local community and have regard to them in the application proposals. The HPP and supporting infrastructure will be designed and developed to high quality, safety and environmental standards.

1.4.6 For further details on the Developer, please visit: http://www.hirwaunpower.co.uk or http://www.wattpowerltd.co.uk

1.5 The Consenting Regime and EIA Process

The Planning Act 2008

1.5.1 In England and Wales, an onshore electricity generating station is considered to be a NSIP if its generating capacity is more than 50 MWe. As the proposed Power Generation Plant at Hirwaun will have a generating capacity of up to 299MWe, it will be classified as a NSIP under Part 3, Section 14(1)(a) and Section 15(2) of the PA 2008. Under Part 4, Section 31 of the PA 2008, development consent is required for development that is or forms part of a NSIP. It is HPL's intention to submit the DCO application to the SoS in due course.

1.5.2 Section 37 of the PA 2008 governs the content of an application for a DCO, including the requirements for the necessary accompanying documents.

1.5.3 The consenting process under the PA 2008 has been designed to ensure that the public, local authorities and interest groups are provided the opportunity to get involved and for their views to be given due regard, whilst also reducing the overall time required to obtain permission for nationally significant infrastructure by establishing the national needs case for such infrastructure through the publication of NPSs.

1.5.4 Further information on the application process for NSIPs and other information about PINS can be found at their website:

http://infrastructure.planningportal.gov.uk/application-process/planning-inspectorate-role/

Requirement for an EIA and Notification under Regulation 6(1)(b)

1.5.5 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (the EIA Regulations) impose procedural requirements, in particular, the carrying out of EIA in relation to applications for DCOs. All development in Schedule 1 (Schedule 1

development) requires EIA. Development in Schedule 2 (Schedule 2 development) requires EIA if it is likely to have significant effects on the environment.

1.5.6 The definition of Schedule 1 development includes thermal generating stations with a heat output of 300MW or more (Schedule 1(2)(a)).

1.5.7 Although, as described above, the Power Generation Plant will have an electrical output of up to 299MWe, the thermal output of the plant will be of the order of 400-950MW (depending on the final technology choice) and therefore an EIA will be required under the EIA regulations.

1.5.8 Thermal output is commonly defined as the amount of 'useable heat' which is produced as part of the process of the combustion of fuel. Only a part of this useable heat can be converted to electrical energy, which is why this is a larger value than electrical output.

1.5.9 This Report therefore constitutes formal notification to the SoS under Regulation 6(1)(b) of the EIA Regulations that HPL proposes to provide an Environmental Statement (ES) in respect of the DCO application. HPL understands that PINS will notify consultation bodies as required in accordance with Regulation 9(1)(a) of the EIA Regulations.

1.5.10 Section 5(2)(a) of The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended), require that where applicable, the ES required pursuant to the EIA Regulations, together with any scoping or screening opinions or directions, must accompany the DCO application.

Town and Country Planning Act 1990

1.5.11 The Gas Connection is integral to the Power Generation Plant NSIP and can be included in the DCO application. The Electrical Connection may also be included. However, it may be desirable for programme reasons to obtain separate consents for the connections. It is HPL's intention to confirm its consenting approach in light of the identification of the preferred corridor routes

1.5.12 HPL confirms that all components of the HPP included in the DCO application will be assessed in the accompanying ES (including cumulative impacts). If the Electrical and/or Gas Connection is separately consented, and so is not included in the DCO application, HPL proposes to include information on the indicative works required for the connection in the ES, insofar as it's available. The aim of this is to allow the SoS to understand if there are likely to be constraints and to allow for an assessment of cumulative effects.

1.5.13 For the purposes of EIA Scoping in respect of the DCO application, HPL seeks views on the scope of assessments for all elements of the HPP and also on the proposed approach to the Electrical and Gas Connections if they are separately consented.

Consultation Strategy

1.5.14 A well designed consultation strategy will allow all potentially affected parties to comment on and input to the planning and development process. HPL will ensure that all representations made during the consultation process are considered carefully, and where appropriate, taken account of, prior to submission of the DCO.

1.5.15 The PA 2008 and the associated secondary legislation set out the provisions for consultation with relevant parties prior to the submission of a DCO application to the SoS. As part of this, a Statement of Community Consultation (SoCC) will be discussed with the relevant local authorities before being published. The SoCC will set out how HPL intends to consult with the local community in accordance with Section 47 of the PA 2008. The document will also set out how HPL intends to provide opportunities for the community to access the Preliminary Environmental Information Report (PEIR) which will be prepared in due course.

1.5.16 In addition, and in accordance with Section 42 of the PA 2008, HPL will also consult with the relevant local authorities, other statutory consultees, and persons with an interest in any land that is affected by the DCO application. The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended) list the statutory consultees.

1.5.17 Consultees, including members of the community, will be able to submit representations throughout the pre application stage and HPL will take account of representations made as the project progresses. The outputs generated from the formal statutory consultation undertaken in accordance with Sections 42 and 47 of the PA 2008 will be summarised in a consultation report, submitted with the DCO application.

1.5.18 HPL recognises that the SoS has a duty under Regulation 8(6) of the EIA Regulations to consult widely before adopting a Scoping Opinion. A full list of the bodies consulted by the SoS under Regulation 9(1)(a) will accompany the Scoping Opinion provided to HPL in accordance with Regulation 9(1)(b). It is also noted by HPL that whilst the SoS's list may inform HPL's future consultation, it should not be relied upon for that purpose. HPL is familiar with PINS Advice Note 3 '*Consultation and notification undertaken by the Planning Inspectorate*' (May 2012).

1.5.19 Before formal statutory consultation can start, it is a requirement of Section 46 of the PA 2008, for HPL to notify the SoS of its intention to commence formal consultation, and in doing so provide adequate information on which it intends to commence that consultation.

1.5.20 HPL has already commenced some early informal (i.e. non statutory) consultation, and, where relevant, the outcome of these consultations has informed this Report.

1.5.21 To date, discussions and pre planning advice and have been received from Rhondda Cynon Taf County Borough Council (RCT), Welsh Assembly Government (WAG), Environment Agency Wales (EAW) and the Countryside Council for Wales (CCW).

1.5.22 It is also acknowledged here that as of 1st April 2013, the EAW, Forestry Commission and CCW merged into one organisation called Natural Resources Wales (NRW). NRW will be a statutory consultee for the HPP.

1.5.23 Comments on this Report are invited, relating to the possible significant environmental effects of the HPP and the proposed assessment methodologies presented in this document. Comments are also invited on any other issues that should be addressed and any sources of information that may be relevant to the EIA.

1.5.24 Responses should be sent within 28 days of receipt of this scoping request to PINS at the address below.

The Planning Inspectorate
National Infrastructure Directorate
Temple Quay House
Temple Quay
Bristol
BS1 6PN

1.6 Purpose of the Document

1.6.1 This document sets out the proposed scope and content of the EIA to support the DCO application and the method by which it is intended to be carried out. It has been prepared to support a request for a Scoping Opinion from the SoS under Regulation 8 of the EIA Regulations.

1.6.2 In view of the above, and on behalf of the SoS, PINS is requested to provide a Scoping Opinion on the possible significant environmental effects of all elements of the HPP, the proposed methodologies to

assess the impacts, and the proposed structure of the the ES (as presented in Sections 4 and 5 of this document).Views are also requested on the proposed treatment of the Gas and Electrical Connections (described in paragraph 1.5 above) in the EIA should these were to be consented separately.

1.6.3 PINS and consultees are also invited to highlight any additional issues that they believe should be addressed within the EIA, and to identify any sources of information that may be of interest to HPL and the EIA team.

1.6.4 This Report also represents HPL's formal notification to the SoS under Regulation 6(1)(b) of the EIA Regulations. HPL confirms that it proposes to provide an ES in respect of the DCO application. HPL hereby requests that the SoS acknowledge the Regulation 6 notification and confirm that the proposed development is EIA development, in accordance with Regulation 4(2)(a) of the EIA Regulations.

1.7 Content of Scoping Report

1.7.1 This Report has been prepared in distinct sections to allow the reader to fully understand the project background, the purpose of the document, the regulatory framework in which the Report has been prepared, and the proposed methodology for undertaking the EIA.

1.7.2 The document is set out as follows:

- **Section 1** Comprises a description of the developer, a brief description of the HPP, an introduction to the consenting regime, the need for and benefits of the project, and the consultation strategy;
- **Section 2** Provides a brief description of the planning policy background and regulatory framework in which the Report has been prepared;
- **Section 3** Provides a more detailed project description, including a description of the Power Generation Plant, Gas Connection, Electrical Connection and the Power Generation Plant site and surrounding area.
- **Section 4** Provides a high level overview of the proposed scope of the EIA and lists each of the technical sections that will be included in the assessment process.
- **Section 5** Describes the content and assessment methodology of each of the impact sections in detail.

SECTION 2

REGULATORY AND POLICY BACKGROUND

2 REGULATORY AND POLICY BACKGROUND

2.1 Introduction

2.1.1 This section of the Report outlines the main regulatory and policy framework that is relevant to the proposed HPP.

2.1.2 Relevant EU directives are considered first, at a high level.

2.1.3 This section also gives an overview of the current and emerging policies relevant to the HPP at the national, regional and local levels as they relate to the consideration of the likely scope of EIA.

2.1.4 Further description of the planning policy background and its relevance to the HPP will be provided in the Planning Statement, which will be produced as a separate document to support the DCO application. A summary of the impacts of the proposed HPP on relevant and important planning policy will be discussed more fully within the ES and other documents submitted for examination in support of the draft DCO.

2.2 European Union (EU)

2.2.1 Current EU directives of particular relevance to the HPP with respect to environmental requirements are as follows:

Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the EIA Directive)

2.2.2 The EIA Directive ensures that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation. The Directive sets the thresholds for projects that require an EIA (as stated in Section 1.5) and also outlines the impacts on the environment to be assessed in the EIA process.

Directive 2003/35/EC of 26 May 2003 (the Public Participation Directive).

2.2.3 The Public Participation Directive implements the obligations arising from the Århus Convention and amends the EIA Directive and the Integrated Pollution Prevention and Control (IPPC) Directive (see 2.2.4 below) to improve public participation.

Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (the Industrial Emissions Directive (IED))

2.2.4 In December 2007 the EU adopted a Proposal for a Directive on industrial emissions (IED). The IED recasts seven existing directives related to industrial emissions, in particular Directive 2008/1/EC of 15 January 2008 concerning integrated pollution prevention and control (the IPPC Directive) and Directive 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants (the Large Combustion Plant Directive (LCPD)), into a single legislative instrument to improve the permitting, compliance and enforcement regimes adopted by Member States. However, the general principles of the IPPC Directive and the LCPD Directive described below are retained and will remain relevant to the HPP.

2.2.5 The purpose of the IPPC Directive was to achieve integrated prevention and control of pollution arising from certain potentially polluting processes and to ensure a high level of protection for the environment taken as a whole. Measures were laid down to prevent or, where that is not practicable, to reduce emissions in the air, water and land with the introduction of emission limit values (ELV) and best available techniques (BAT). With regard to power projects, combustion installations with a rated thermal input exceeding 50 MW are subject to the IPPC Directive. The IPPC Directive is transposed into UK legislation via the Environmental Permitting (England and Wales) Regulations 2010 (as amended) and the IED is to be transposed through amendments to the Environmental Permitting (England and Wales) Regulations 2010. An Environmental Permit will be required for the operation of the Power Generation Plant.

2.2.6 The purpose of the LCPD was to limit the emissions of certain pollutants into the atmosphere from large combustion processes. The LCPD applied to combustion plants with a rated thermal input equal to or greater than 50 MW. The emissions of nitrogen oxides (NOx), sulphur dioxide(SO_2) and particulates were subject to the stringent ELVs stipulated in the LCPD. The LCPD requirements for new plant are implemented in the UK regulations by the Environmental Permitting (England and Wales) Regulations 2010.

Directive 1992/43/EEC of 21 May 1992 on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive)

2.2.7 The aim of the Habitats Directive is to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora. Measures taken pursuant to this Directive by the Member States are designed to maintain or restore, at conservation status, natural habitats and species of wild fauna and flora of community interest whilst also taking into account economic, social and cultural requirements and regional and local characteristics. The Conservation

of Habitats and Species Regulations 2010 implement the Habitats Directive in England and Wales.

Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (the Birds Directive)

2.2.8 The Birds Directive provides a comprehensive scheme for the protection of wild bird species naturally occurring within the EU. The Directive places great emphasis on the protection of habitats suitable for supporting endangered and migratory species, introducing a system of Special Protection Area designation to protect important habitats. The Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2010 implement the requirements of the Birds Directive in England and Wales.

Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe (the Ambient Air Quality Directive)

2.2.9 Council Directive 96/62/EC on ambient air quality assessment and management (the Air Quality Framework Directive) described the basic principles of how air quality should be assessed and managed in the Member States. Subsequent 'Daughter Directives' introduced numerical limits, thresholds and monitoring requirements for a variety of pollutants including oxides of nitrogen and sulphur dioxide to guarantee that there are no adverse effects with regard to human health. The Air Quality Standards Regulations 2010 give effect, in England and Wales, to the Ambient Air Quality Directive.

2.3 Overview of Decision Making under the Planning Act 2008 & Policy Context

2.3.1 The Power Generation Plant is categorised as a NSIP and will be determined by the SoS under the regime established by the PA 2008.

2.3.2 As set out in NPS EN-1 (Overarching National Policy Statement for Energy), '*this NPS, when combined with the relevant technology-specific energy NPS, provides the primary basis for decisions'* (paragraph 1.1.1) and the decision-maker '*should start with a presumption in favour of granting consent to applications for energy NSIPs*' (paragraph 4.1.2).

2.3.3 Decisions must also be taken by the SoS having regard to the local impact report and any other matters which the SoS '*thinks are both important and relevant to its decision*' (paragraph 1.1.1), which may include the Development Plan Documents or other documents in the Local Development Framework.

2.3.4 The DCO application will be examined by PINS with the decision made by the SoS.

2.4 National Policy Statements

2.4.1 The PA 2008 required new policy to inform decisions on NSIPs in England and Wales. Policy for such infrastructure is set out in NPS. Those that are relevant to the consideration of the HPP are:

- The Overarching National Policy Statement for Energy (NPS EN-1);
- The National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2);
- NPS EN-4 National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines; and
- NPS EN-5 National Policy Statement for Electricity Networks Infrastructure

2.4.2 NPS EN-1 Overarching National Policy Statement for Energy contains government policy on energy and energy infrastructure development, representing the needs case for any proposal for an energy NSIP.

2.4.3 NPS EN-1 recognises that there is a significant need for new energy infrastructure. It states that pending plant closures in the UK will reduce available capacity by 22 GW by 2020 as a result of tightening environmental legislation and older power stations approaching the end of their useful life (paragraphs 3.3.7 to 3.3.9).

2.4.4 NPS EN-1 also sets out guidance on the consideration of alternatives when developing a new energy generation project (paragraphs 4.4.2-4.4.3) and guidance relating to criteria for 'good design' of new developments (Section 4.5)

2.4.5 Specific guidance on good design is also provided in NPS EN-2, including that "*applicants should demonstrate good design particularly in respect of landscape and visual amenity (…) and in the design of the project to mitigate impacts such as noise and vibration, transport impacts and air emissions*."

2.4.6 In Section 4.6 of EN-1, the consideration of Combined Heat and Power (CHP) is denoted as an assessment principle in itself and references to other guidance and viability considerations are set out. It is stated that applicants should consider CHP from the earliest point and it should be a criterion for site selection (paragraph 4.6.7).

2.4.7 Section 4.8 of NPS EN-1 also sets out how applicants and the SoS should take the effects of climate change into account when developing and consenting NSIPs. Paragraph 4.8.11 requires any adaptation measures to be based on the latest set of UK Climate Projections, the Government's latest UK Climate Change Risk Assessment (when available) and in consultation with the EA.

2.4.8 Other assessment principles that are particularly likely to be relevant to energy NSIPs are set out as follows in EN-1 (relevant paragraph numbers given in brackets):

- Pollution control (4.10) describes the relationship with other regimes (e.g. Environmental Permitting) which is essentially that the decision maker should be satisfied that '*potential releases can be adequately regulated under the pollution control framework*' without unacceptable cumulative impacts arising;

- Safety (4.11) and Hazardous Substances (4.12): describes the relationship with other regimes and the general requirement that the decision maker will need to be satisfied that they are complied with.

- Health (4.13): requires that an assessment of potential health impacts is made in relation to each element of the project, such as in relation to air quality, waste or noise and describing the relationship with other regimes, stating at 4.13.5 that where separate air quality regulations are (or will be) satisfied then the decision maker is likely to consider these effective mitigation, whereas for noise or other aspects it will take account of health concerns when setting requirements.

- Nuisance and amenity (4.14): the relationship with common law nuisance, statutory nuisance, and the importance to be attached by the SoS to their consideration during the determination process, are set out.

- Security (4.15): government policy is set out as being '*to ensure that, where possible, proportionate protective security measures are designed into new infrastructure projects at an early stage in the project development*' with documentary requirements and relationships to other guidance set out.

2.4.9 As well as generic assessment principles, EN-1 also identifies a generic list of impacts which could arise from an energy NSIP. These specific topics include ecology, landscape, noise and socio-economics. These topics have been discussed in more detail when describing the assessment of impacts in Section 5 of this Scoping Report.

2.4.10 NPS EN-2 outlines considerations and factors relating to site selection and design for developers for fossil fuel generating stations, although it states that these concerns must be considered by the applicant, and that: "…*the Government does not seek to direct applicants to particular sites for fossil fuel generating stations*."

2.4.11 NPS EN-4 sets government policy on the relevant considerations and factors that should be taken into account as to route selection for developers for gas supply infrastructure and gas pipelines, along with likely impacts of their construction, commissioning and operation.

2.4.12 NPS EN-5 provides the primary basis for decisions taken by PINS on applications it receives for electricity networks infrastructure, the relevant considerations and factors that should be taken into account related to route selection for developers, along with likely impacts of their construction, commissioning and operation.

2.5 Welsh Planning Policy

Planning Policy Wales (Edition 5, November 2012) (PPW) and Associated Technical Advice Notes (TAN)

2.5.1 'Planning Policy Wales' (PPW) sets out the land use planning policies of the Welsh Assembly Government (WAG) and is supplemented by 21 topic based Technical Advice Notes (TANs). TANs prescribe the government's policies on various planning issues that shape the preparation of development plans. The principles and objectives of TANs prescribe the overarching national guidance for specific individual environmental topics. Both the PPW and TANs are material considerations in determining planning applications under the TCPA regime. It may be determined that these policy documents are relevant and important under the PA 2008 regime.

2.5.2 Potentially relevant chapters of PPW are:

- Chapter 4 - Planning for Sustainability;
- Chapter 5 - Conserving and Improving Natural Heritage and the Coast;
- Chapter 7 - Economic Development;
- Chapter 12 - Infrastructure and Services; and
- Chapter 13 - Minimising and Managing Environmental Risks and Pollution.

2.5.3 Potentially relevant TANs to the proposed HPP are:

- TAN 5: Nature Conservation and Planning;
- TAN 6: Planning for Sustainable Rural Communities;
- TAN 11: Noise;
- TAN 12: Design;
- TAN 15: Development and Flood Risk; and
- TAN 18: Transport.

2.6 Local Planning Policy

Rhondda Cynon Taf Local Development Plan up to 2021(2011)

2.6.1 The Rhondda Cynon Taf Local Development Plan up to 2021 was adopted by the Council in March 2011 and sets out *".....the framework for decisions to be made up until 2021 on how land is used in the County Borough, for example what type of development is appropriate or desirable and how best to protect our environment*".

2.6.2 The Local Development Plan provides part of the Development Plan against which applications under the TCPA regime are to be determined, and parts may be relevant and important under the PA 2008 regime.

2.6.3 Section 4 of the plan sets out the Core Strategy for Rhondda Cynon Taf and outlines the spatial strategy for guiding all future development and land use in the Borough. Section 5 sets out detailed area wide policies, and Section 6 outlines specific policies for the northern and southern areas of the Borough.

2.6.4 The area of Hirwaun Industrial Estate proposed for the development of the Power Generation Plant is designated in the Proposals Map as Policy CS 9 Waste Management. The Hirwaun Industrial Estate is identified as a regional site that is able to accommodate a range of waste management options to meet the capacity requirements set out in the South East Wales Regional Waste Plan. The Local Development Plan notes that *"in identifying Hirwaun Industrial Estate as a suitable site for waste management, it is not the intention that the employment uses at the site should cease."*

2.6.5 Other policies of the Local Development Plan of potential relevance to the proposed HPP are:

- CS1 – Development in the North
- CS9 – Waste Management
- AW2 – Sustainable Locations

- AW5 – New Development
- AW6 – Design and Placemaking
- AW8 – Protection and Enhancement of the Natural Environment
- AW10 – Environmental Protection and Public Health
- AW12 – Renewable and Non-Renewable Energy
- NSA 12 – Housing Development within and adjacent to Settlement Boundaries
- NSA 14 – Employment Allocations
- NSA 15 – Small Industrial and Business Sites
- NSA 16 - Re-development of Vacant / Redundant Industrial Sites

2.7 Other Relevant Policy and Guidance

2.7.1 The following are considered to be potentially relevant policy and guidance in considering the potential impact of the HPP:

- The Electricity Market Reform (2012);
- A Low Carbon Revolution: Wales' Energy Policy Statement (2010);
- Environment Strategy for Wales (2006);
- Gas Generation Strategy (2012); and
- Turning Heads – A Strategy for the Heads of the Valleys (June 2006).
- Energy Wales – A Low Carbon Transition

2.7.2 A comprehensive review of potentially relevant policy and evidence will be undertaken during the pre application process.

The Electricity Market Reform (2012)

2.7.3 The Electricity Market Reform (EMR) has been developed to meet three main objectives:

- Ensuring the future security of electricity supplies;
- Driving the decarbonisation of electricity generation; and
- Minimising costs to consumers.

2.7.4 These measures are designed to provide both technical and economic encouragement for an increase in the development of low carbon technologies.

2.7.5 In terms of the proposed HPP, one of the most relevant aims of the EMR is to provide *".... a mechanism to support security of supply, if needed, in the form of a Capacity Market".*

2.7.6 Although the EMR focuses heavily on the need for decarbonisation, there is also a strong focus on the need for security of supply and a mix of energy generation technologies on line at any one time. The EMR also recognises that gas fired power generation will continue to play a crucial role in the UK energy mix going forward.

2.7.7 The Energy Bill will be the primary piece of legislation to come about as a result of the EMR, although it is currently at Committee Stage in the House of Commons. The Energy Bill seeks to enact the key drivers that are necessary to achieve the recommendations set out in the EMR.

A Low Carbon Revolution: Wales' Energy Policy Statement (2010)

2.7.8 In terms of energy production, the WAG reflects the UK policy position, the work of the UK Climate Change Commission and the UK National Policy Statements on Energy and Renewables through its Policy Statement: 'A Low Carbon Revolution: Wales' Energy Policy Statement, March 2010.' The statement sets out a framework for carbon reduction in Wales, provides targets and advice to LPAs for implementation of policy into LDPs.

2.7.9 The Energy Policy Statement aims to maximise energy savings and energy efficiency to make producing the majority of the energy Wales needs from low carbon sources that are more feasible and less costly. Secondly the statement recognises energy needs in a modern society will remain considerable, and must be met securely from low carbon sources.

2.7.10 It draws on the work of: the Wales Climate Change Strategy; the National Energy Efficiency and Savings Plan; the Green Jobs Strategy; and the Ministerial Advisory Group on Economy and Transport's report on "The Energy Sector".

2.7.11 The statement also reflects the UK policy position, the work of the UK Climate Change Commission and the UK National Policy Statements on Energy and Renewables.

The Environment Strategy for Wales (2006)

2.7.12 The Environment Strategy for Wales outlines the WAG's long term strategy for the environment of Wales, setting out the strategic direction for the next 20 years. The purpose of the Strategy is to provide a

framework within which to achieve an environment that is clean, healthy, biologically diverse and valued by the people of Wales. The WAG wish to see the Welsh environment thriving and contributing to the economic and social well-being and health of all of the people of Wales.

Turning Heads – A Strategy for the Heads of the Valleys (2006)

2.7.13 Turning Heads – A Strategy for the Heads of the Valleys 2020 outlines a strategy for regenerating the northern valley areas of South East Wales. In Rhondda Cynon Taf the strategy area includes Treorchy, Treherbert, Ferndale, Hirwaun, Mountain Ash and Aberdare. The objectives of the programme reflect those of the Wales Spatial Plan in seeking to ensure:

- An attractive and well used natural, historic and built environment;
- A vibrant economic landscape offering new opportunities;
- A well educated, skilled and healthier population;
- An appealing and coherent tourism and leisure experience, and
- Public confidence in a shared bright future.

SECTION 3

PROJECT DESCRIPTION

3 PROJECT DESCRIPTION

3.1 Overview of the Development

3.1.1 The proposed Power Generation Plant would be situated within Hirwaun Industrial Estate, approximately 1.3 km north east of Rhigos, 2km west of Hirwaun, and 5 km west of Aberdare, south Wales. (Grid Reference SN 938 061). The Power Generation Plant would be located on an area of land which is currently occupied by a large industrial building used for storage and distribution.

3.1.2 A small area to the south of the main Power Generation Plant boundary (to the south of Main Avenue) could be used as a laydown area for the storage of plant and equipment during construction.

3.1.3 The Gas Connection would run from the Power Generation Plant to the east into Feeder 2 on the gas NTS, with an approximate length ranging from 1.1 to 1.7 km dependant upon which connection route option is chosen.

3.1.4 The Electrical Connection would connect the Power Generation Plant to a new substation, constructed approximately 350m west of the Power Generation Plant site (Rhigos Substation). The substation is currently under construction by National Grid Company (NGC) in connection with the development of the Pen Y Cymoedd Wind Farm, which has recently been granted planning consent. The electrical connection would be a 400kV overhead line or underground cable.

3.1.5 Figure 2 shows a potential plant layout and likely maximum extent of the Power Generation Plant, and Figure 3 shows potential Electrical Connection and Gas Connection route corridor options.

3.2 Site and Surroundings

3.2.1 The site for the Power Generation Plant is situated entirely within the Hirwaun Industrial Estate and covers an area of approximately 7.5 ha. The site is entirely within the jurisdiction of Rhondda Cynon Taf County Borough Council (RCT), although it is also close to the area administered by the Brecon Beacons National Park (BBNP) Authority. RCT covers an area of the South Wales Valleys stretching from the Brecon Beacons in the north, to the outskirts of Cardiff in the south. It comprises a mixture of urban, semi-suburban and rural communities, situated in mountains and lowland farmland.

3.2.2 The Power Generation Plant site and immediate surrounding area are characterised by industrial buildings (some in use, others vacant); scrub grassland and plantation woodland. The boundary of the Power

Generation Plant, as shown on Figure 2, is currently occupied by a large distribution warehouse building. The majority of other buildings in the Hirwaun Industrial Estate are disused and some have fallen into a state of disrepair.

3.2.3 The Power Generation Plant site is accessed via Main Avenue and Fourth Avenue, which both run through the Hirwaun Industrial Estate. These roads connect to Fifth Avenue, again, with the Industrial Estate which in turn connects to Rhigos Road (to the south of the site). The Industrial Estate is well served in terms of highway connections.

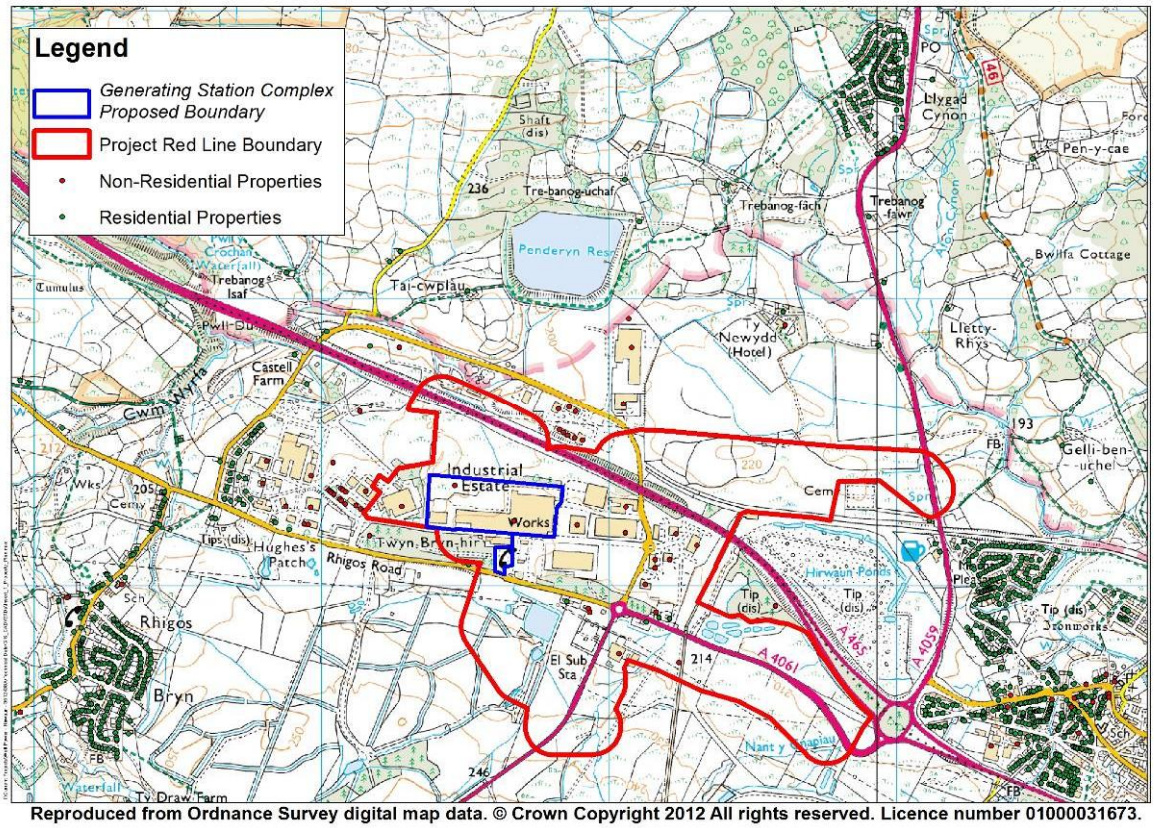
3.2.4 The road network in the vicinity of the Power Generation Plant can be seen in Figure 1.

3.2.5 The A465 'Heads of the Valleys' Road runs approximately 0.1km north of the site, Tower Colliery is approximately 1 km south of the site, the BBNP is approximately 0.3 km to the north of the site and Penderyn Reservoir is approximately 1 km north of the site. The closest residential receptors include;

- Rhigos (1.3km south west);
- Hirwaun (1.4km east);
- Penderyn (1.8km north); and
- Aberdare (5km east).

3.2.6 These receptors are shown below in Insert 1 below.

Insert 1- Residential and Non-Residential Properties in the Vicinity of the Power Generation Plant Site



3.2.7 Hirwaun Industrial Estate was established in WWII as a Royal Ordnance Factory (ROF), one of 4 across South Wales.

3.2.8 The estate passed into public sector ownership, eventually coming under the control of the Welsh Development Agency who invested in the location and undertook the speculative development of smaller factory units around the estate. In the 1960s, GEC Marconi established a TV factory at Hirwaun; in c.1974 a joint venture was entered into by GEC with Hitachi and in 1984 Hitachi took over the factory entirely. Hitachi expanded the plant with the 'Advance Factory' constructed in 1988 however by 2001 the decision had been taken to close the plant.

3.2.9 In 2002 International Greetings Plc acquired the freehold interest in the entire facility and has operated a storage and distribution facility for its paper gift wrap product since that date.

3.2.10 Enviroparks were granted planning permission in 2010 to build an Energy from Waste (EfW) plant on a site approximately 500m north of the proposed Power Generation Plant to power local industrial sites. The initial site clearance is planned to commence in August 2013 and

the plant will process around 150,000 tonnes of waste per year by 2014/15. By 2016, it is envisaged that the plant will process around 240,000 tonnes of waste per year.

3.2.11 The Pen Y Cymoedd Wind Farm has recently been granted consent under Section 36 of the Electricity Act 1989 and deemed planning permission. It is approximately 5km south west of proposed Power Generation Plant at its closest point and comprises 76 turbines across an area of 4,680 hectares. The land ranges in altitude between 360m and 600m AOD, with each turbine being up to 145m in height. Site preparation, in the form of tree felling has already begun at the site.

3.2.12 The land south of Hirwaun has been designated as a Strategic Site in the RCT Local Development Plan. This land has been allocated for the construction of 400 dwellings, 89 acres of employment, a new primary school, a 2000m^2 retail store, medical / community centre and informal recreation. Development of the Strategic Site will be subject to a large-scale reclamation scheme due to the fact that it overlaps with the site of Tower Colliery, presently subject of open cast operation likely to last for approximately six years hence.

3.3 Description of the Power Generation Plant Options

3.3.1 The Power Generation Plant will be designed to provide a total output of up to 299 MWe (gross capacity) at rated site conditions.

3.3.2 The choice of plant and technology have not been finalised yet and are still the focus of ongoing technical studies. Plant choice will also be driven by the outcome of the EMR (previously described in Section 2 of this Report). Further studies will ensure that the most suitable plant is selected for the site, taking into consideration local constraints and the ultimate operational regime of the plant. However, it is known at this stage that the project would either comprise a Combined Cycle Gas Turbine (CCGT) plant, a Simple Cycle Gas Turbine (SCGT) plant or a reciprocating gas ignition engine (RGE) plant. Additionally, under certain circumstances it may be that two of these technologies are used at the site at any one time. The ability to utilise CHP to supply local users with waste heat from the plant is also being investigated, as outlined later in this Section of the Report. A description of how each of these technologies operate and the key differences between them are provided below.

3.3.3 Although the choice of plant may vary, the scope and methodology of the EIA, as set out in Sections 4 and 5 of this Report will not differ significantly between different plant and technology choices. There will be some key differences between the plant configuration for each technology type (e.g. water usage and stack height) and, where these

will impact on the assessment methodology, this has been drawn out below.

3.3.4 Additionally, it is noted that no matter which technology choice is selected, they are all able to fit within the Power Generation Plant site boundary shown in Figures 1 and 2. All of the potential technology choices would also fall within identified 'maximum adverse' scenarios for potential environmental impacts which will be assessed as part of the EIA. A range of indicative dimensions of main plant items are provided in Table 3.1 below, which may be reduced depending upon the outcome of further studies and consultation, and depending upon final design and plant choices.

CCGT Plant

3.3.5 If a CCGT plant is chosen for the Power Generation Plant, the configuration of the plant would comprise of a gas turbine(s) (GT) fuelled by natural gas, a heat recovery steam generator(s) (HRSG) utilising heat from the GT exhaust gases, and a steam turbine plant with associated condensing system.

3.3.6 Natural gas is burnt in the combustors of each GT, utilising the air that is compressed by the compressor section of the GT. The hot gases expand through the turbine section of the GT to drive the compressor section and to generate electricity. The hot exhaust gases are then routed through the HRSG to generate steam, which in turn is used to generate electricity via the steam turbine plant.

3.3.7 After the useful heat has been extracted from the exhaust gases in the HRSG, the flue gas enters the stack where it rises to be released to atmosphere at height for dispersion. A bypass stack may be employed between the GT and the HRSG to allow for simple cycle (GT only) operation where required.

3.3.8 Spent steam leaving the steam turbine plant passes to a condenser where it is condensed. The resultant condensate is returned to the HRSG for reuse as boiler feed water, closing the water/steam cycle.

3.3.9 The gas turbines would be equipped with standard proven emissions control technology, which would limit the production of Nitrous oxides ($NO_{x)}$ to ensure that the plant meets all relevant guidelines and legislation.

3.3.10 Natural gas in the UK (where sulphur content in the gas is generally negligible) is a clean burning fuel and does not produce the particulate or sulphur emissions associated with burning coal; consequently flue gas cleaning equipment is not required.

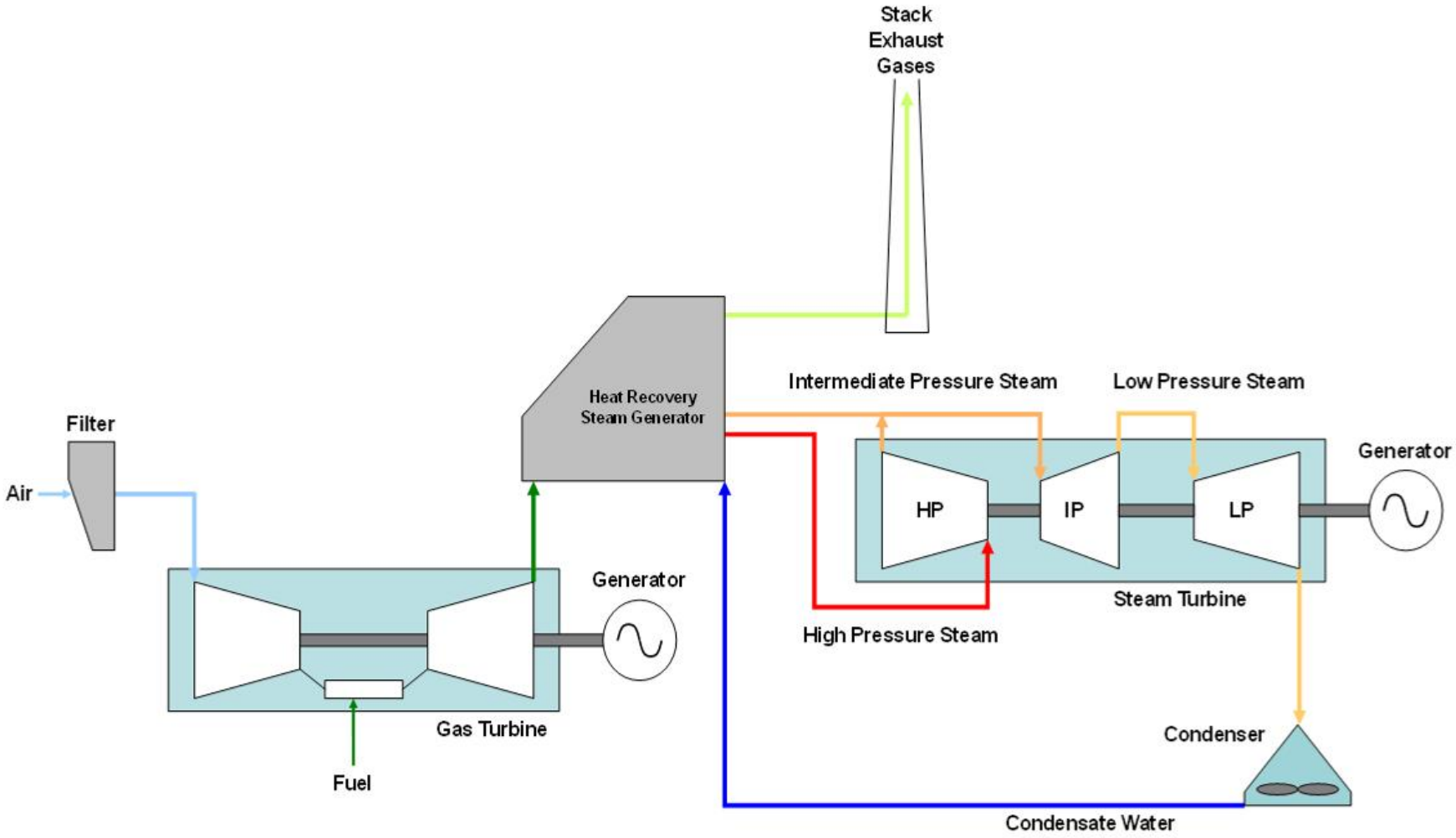
3.3.11 To achieve the condensing of the spent steam, dry air cooling utilising an Air Cooled Condenser (ACC) is proposed. This cooling system results in significantly lower water usage by the plant than if cooling towers were employed.

3.3.12 In utilising an ACC, the spent steam leaving the steam turbine passes through ductwork to the top of the ACC, where it is distributed to a multiplicity of tubes for condensation. Ambient air is forced past the tubes by motor-driven fans and the heat of the condensation process is transferred to the air. The use of an ACC means that there is no need for cooling towers or a once-through cooling water system, thereby minimising the plant's net water consumption and water abstraction requirements.

3.3.13 An ACC is typically taller and narrower than an equivalent duty forced draught cooling tower, but it bears no risk of visible plume formation from the cooling system.

3.3.14 Insert 2 shows a simple schematic of CCGT operation.

Insert 2 Schematic of CCGT Operation



SCGT Plant

3.3.15 In essence, the configuration of a simple cycle gas turbine (SCGT) plant consists of the front end of a CCGT plant. SCGT plants usually use aero-derivative GTs, primarily because of their suitability to frequent starts, high SCGT efficiency and high-availability maintenance options.

3.3.16 As with CCGT plants, natural gas is burnt in the combustors of each GT, utilising the air that is compressed by the compressor section of the GT. The hot gases expand through the turbine section of the GT to drive the compressor section and to generate electricity. However, the hot exhaust gases are then routed directly to the stack, which contains a silencer to reduce noise pollution.

3.3.17 The stack for an SCGT plant is usually significantly shorter than the main stack of a CCGT plant because the flue gases are much hotter and therefore do not typically require the same height needed for adequate dispersion.

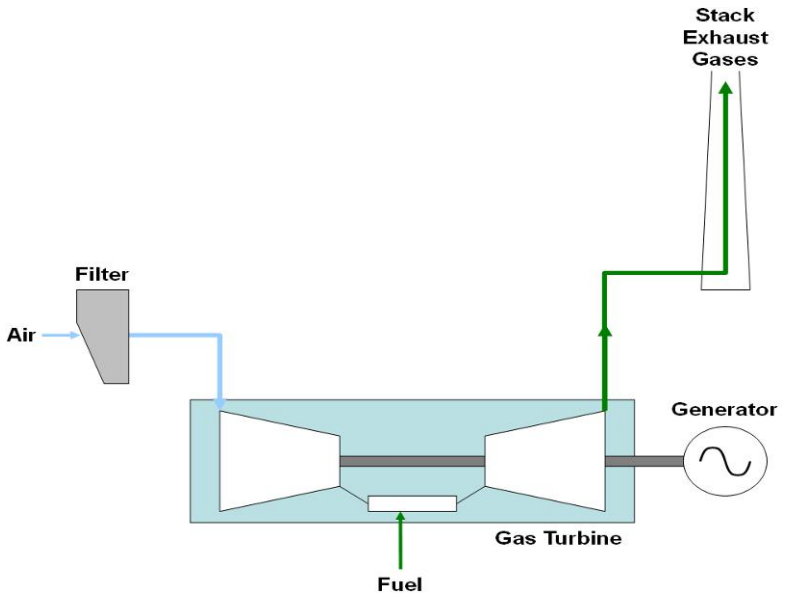
3.3.18 The gas turbines would be equipped with standard proven emissions control technology, which limits the production of NOx to a maximum of 50 mg/Nm^3 (corrected to 15% O_2 dry). Whether by water injection or dry low emission combustors, these techniques represents BAT for limiting emissions of NO_x to atmosphere from gas turbines without the addition of chemical solutions, such as selective catalytic reduction using ammonia.

3.3.19 Once again, natural gas in the UK (where sulphur content in the gas is generally negligible) is a clean burning fuel and does not produce the particulate or sulphur emissions associated with burning coal; consequently flue gas cleaning equipment is not required.

3.3.20 Since no cooling is required for the condensing of steam, the cooling requirements of SCGT plants are significantly lower than for CCGT plants. The auxiliary cooling requirements (for lubrication oil, etc.) would be met via dry air cooling through the use of fin-fan coolers.

3.3.21 Insert 3 shows a simple schematic of SCGT operation.

Insert 3 Schematic of SCGT Operation



Reciprocating Gas Engine Plant

3.3.22 The configuration of a large RGE plant is similar to that of an SCGT plant. It consists of modular reciprocating gas engine generator units, typically below 20 MW each, which operate using the ignition of gaseous fuels and air in a specific mix which causes motion of a piston to generate electricity. New plants generally have a high net plant electrical efficiency of over 45%, which is greater than any SCGT plant, although lower than a CCGT plant (typical efficiency of 55-60%). Full plant output is maintained over a range of ambient temperatures and barometric pressures (altitudes).

3.3.23 Natural gas is burnt in the cylinders of the multi-cylinder RGEs, utilising the air that is first pressurised by the turbo charger(s) of each RGE and then compressed by the pistons. Four-stroke, medium-speed, lean-burn gas engines that utilise either spark ignition or pilot injection to initiate combustion are employed. In the case of pilot injection, a small quantity of compression ignition fuel (such as diesel) is required. As a result of the piston being utilised to compress the combustion air and gas fuel mixture, there is a low gas fuel supply pressure requirement.

3.3.24 The size of the stacks for an RGE plant is similar to that for a SCGT plant even though the exhaust gas flow rate of the RGE plant is lower than the equivalent SCGT plant. This is because the flues from several

engines are combined into a single stack-like structure. The flue gas temperature is slightly lower but of a similar order to aeroderivative GTs and thus stack heights are generally similar to SCGT plants.

3.3.25 Gas engines produce a higher amount of NO_x than GTs, up to 500 mg/Nm^3 (corrected to 5% O_2 dry). Therefore, for the HPP there may be a requirement to install Selective Catalyst Reduction (SCR) to treat the engine exhaust gas to reduce the NO_x emissions to required levels.

3.3.26 Once again, natural gas in the UK (where sulphur content in the gas is generally negligible) is a clean burning fuel and does not produce the particulate or sulphur emissions associated with burning coal; consequently flue gas cleaning equipment (beyond that of SCR, potentially) is not required.

3.3.27 Since no cooling is required for the condensing of steam, the cooling requirements of RGE plants are significantly lower than for CCGT plants. The auxiliary cooling requirements (for lubrication oil, jacket cooling, etc.) is met via dry air cooling through the use of fin-fan coolers.

3.3.28 Unlike SCGT plants, there is no potential for boosting power output using water injection, so the total plant water requirement is negligible.

Laydown Area

3.3.29 A small area to the south of the main Power Generation Plant boundary (to the south of main Avenue) could be used as a laydown area for the storage of plant and equipment during construction.

Dimensions

3.3.30 Table 3.1 provides indicative dimensions for the main plant items which would be present at the Power Generation Plant site.

3.3.31 Figure 2 shows a typical arrangement of how these plant items may be sited.

Table 3.1 –Indicative dimensions of main plant items

Plant Item	*Minimum Dimensions(m)*	*Maximum Dimensions (m)*
Stacks (Dimension)	30 (height) 10 (diameter) (SCGT)	90 (height) 10 (diameter) (CCGT).
Stacks (number)	1 main stack (CCGT)	Up to 5 stacks and 5 bypass stacks (SCGT)
Gas turbine (plant housing dimensions)	55 (length) x 38 (width) x 20 (height) (CCGT). 1 gas turbine plant housing	55 (length) x 120 (width) x 20 (height) (SCGT). 1 gas turbine plant housing incorporating several gas turbine units.
HRSG (plant housing dimensions)	N/A as only required for CCGT.	38 (width) x 24 (length) x 20 (height) (CCGT)
ACC / Cooling (plant housing dimensions) (All technology choices).	150 (width) x 30 (width) x 20 (height)	150 (width) x 30 (width) x 20 (height)
Water tanks (All technology choices).	10 (diameter) x 10 (height) for each tank. Maximum of 3 tanks.	10 (diameter) x 10 (height) for each tank. Maximum of 3 tanks.
Administration / workshop / control building (All technology choices).	40 (length) x 10 (width) x 15 (height)	40 (length) x 10 (width) x 15 (height)
Gas receiving station (All technology choices)	30 (width) x 30 (length) x 10 (height)	30 (width) x 30 (length) x 10 (height)
Switchyard	50m x 50 (Gas insulated).	200 x 200 (Air insulated).

3.3.32 Maximum Power Generation Plant site dimensions will be in the order of 2.4ha, which is enough space to fit in all of the technologies considered.

Construction, Operational and Decommissioning Timescales

3.3.33 Construction and commissioning of the HPP will take approximately 12 to 36 months, depending on the final choice of plant technology selected.

3.3.34 The main works associated with the construction phase would be the demolition of existing buildings, removal of old foundations / hardstanding, excavation and site levelling for new foundations, potential piling (if required) and the laying of the Gas Connection and Electrical Connection.

3.3.35 The construction of RGE / SCGT plant would most likely involve the least site preparation and construction time, as the units are often available as complete packaged units which can be delivered to the site and installed relatively quickly. The construction period for a CCGT plant could be significantly longer (of the order of 36 months) as more tailored plant items are required which will need on-site assembly, as well as more permanent structures and larger quantities of pipework and interconnections.

3.3.36 The Power Generation Plant will be designed to have an operational life of up to 25 years, after which time it will be decommissioned or re-powered depending on the nature of the electricity market and energy mix at the time. For the purposes of the EIA, it will be assumed that the Power Generation Plant will be decommissioned.

3.3.37 Decommissioning would comprise the removal of all Power Generation Plant items and restoration of the Power Generation Plant site to a similar condition as to when the site was taken over by HPL. It is likely that some underground structures, including the Electrical and Gas connections, may be left in situ to avoid any adverse environmental impacts associated with their removal. Due regard would be paid to all best practice guidelines on the decommissioning of projects which are relevant at the time. Where possible, items of plant would be re-cycled or re-used.

Carbon Capture Readiness (CCR) and Carbon Capture and Storage (CCS)

3.3.38 The HPP will be designed to provide a total output of up to 299 Megawatts Electrical (MWe) (gross capacity) at rated site conditions. Directive 2009 /31/EC on the Geological Storage of Carbon Dioxide ($CO_{2)}$ requires an amendment to Directive 2001/80/EC (LCPD Directive) and subsequently Directive 2010/75/EU (the IED) such that member states are to ensure that operators of all combustion plants with an electrical output of 300MWe or more have assessed the

feasibility of; storage sites, transport facilities and economic considerations of the capture of CO_2 produced as a result of the combustion process.

3.3.39 As this does not apply to plants which are sized below 300MWe, in the context of the HPP it is not necessary to assess the viability of CO_2 capture and this is not considered further in this Report.

Combined Heat and Power (CHP)

3.3.40 Plants which have a CHP capability supply power to the National Grid, but also supply heat to local businesses through a direct connection to waste heat / steam produced as part of the combustion process. As noted at section 4.6 of NPS EN-1, the UK Government seeks that applicants give early consideration to CHP viability.

3.3.41 Given that it is possible that the Power Generation Plant would be designed to operate as a flexible plant, which could be called upon to operate at any time of the day, the heat production available for an off-taker cannot be defined with any certainty. A preliminary search of local businesses in the vicinity of the Power Generation Plant site has revealed that there are few opportunities to provide to a heat off-taker, given the nature of the industrial estate.

3.3.42 Notwithstanding these constraints, CHP has not been ruled out and is still the subject of active ongoing consultations and investigation to confirm its technical and economic potential, in the light of other planned development at the Industrial Estate and a further update and assessment as necessary will be provided in the DCO application, in accordance with Section 4.6 of NPS EN-1 (Consideration of Combined Heat and Power (CHP)).

3.4 Description of the Gas Connection and Corridor Options

3.4.1 The UK National Grid Gas system is split into two parts, the NTS and the LTS (Local Transmission System).

3.4.2 The NTS represents the infrastructure designed to transmit gas large distances around the country, these are generally large diameter pipelines (> 24”/600mm) operating at high pressure (~70barg). The NTS is the backbone of the UK gas infrastructure and as such does not reach all points of mainland Britain; the load driven extremities are covered by the LTS.

3.4.3 The LTS distributes the gas supply from the NTS to the locations where the load requirement is required, these are generally smaller pipelines (< 24”/600mm diameter) operating at lower pressure (< 50barg).

3.4.4 A Gas Connection Feasibility study was undertaken for the HPP in December 2012. The purpose of the study was to define and evaluate the options available for connecting the Power Generation Plant to a suitable source of fuel gas, and provide a recommendation on the most appropriate option for this connection.

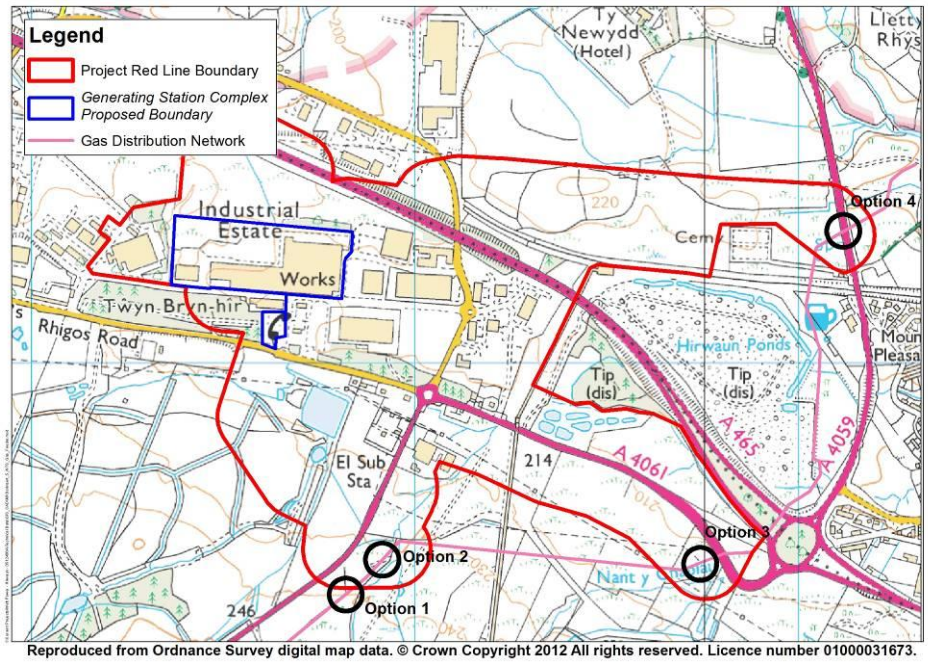
3.4.5 Preliminary pipeline calculations were performed, including Maximum Operating Pressure of the system, Maximum Incidental Pressure, Pipe Nominal Diameter, Design Factor, Wall Thickness, Minimum Building Proximity Distance and Area Classification;

3.4.6 A Crossing / Risk Register has been prepared for each potential corridor routeing. A Level 1 Route Study has been performed for this report, which has analysed a specified relevant area of interest for archaeological, natural and built environment issues having regard to considerations raised in NPS EN-4.

3.4.7 Four possible connection points have been identified as being potentially suitable locations to connect into the NTS infrastructure. All four options connect to *Feeder 2*, a 600mm high pressure steel pipeline (known as the Garway to Rhigos Pipeline) that passes between the village of Hirwaun and the Power Generation Plant site. No suitable connections were identified to the LTS.

3.4.8 The Location of Feeder 2 and the four possible connection options are shown below in Insert 4.

Insert 4 NTS Feeder 2 Connection Options



3.4.9 Discussions with NGC have confirmed that presently there is enough capacity in Feeder 2 to accommodate the loads associated with the development of a 299 MWe plant at Hirwaun.

3.4.10 There are four route corridor options which are considered suitable to connect into the four points shown in Insert 2. The routes have been selected to include a minimal amount of crossings (water, road and rail) over the shortest feasible distance. Preliminary route calculations have suggested that a steel pipeline 200 mm nominal outside diameter with a standard wall thickness of 6.4 mm would be appropriate for this project.

Gas Connection Corridor Option 1

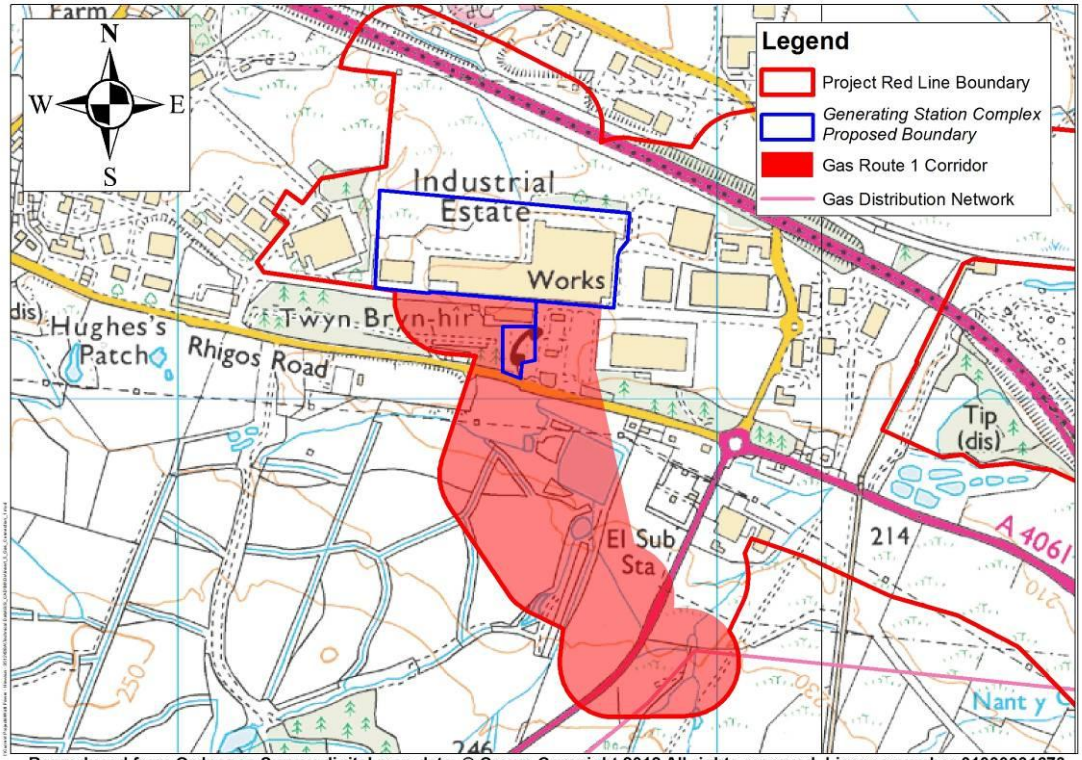
3.4.11 The 1st route corridor option (Route 1) is approximately 1.1 km in length including 0 major road crossings, 2 minor road crossings, 0 major water crossings, 6 minor water crossings and 0.19 km of in-road mainlaying.

3.4.12 The pipeline begins at the Power Generation Plant site heading south out of the site immediately turning east, mainlaying (laying pipeline beneath the road) down Main Avenue. The route then turns south once again passing between industrial buildings until it passes under Rhigos Road; a single carriageway that runs along the entire south side of Hirwaun Industrial Estate.

3.4.13 The route continues south of Rhigos Road into fields where it would cross under a set of overhead lines and continues heading south where it then crosses two field drains. Shortly after the crossing of the second field drain the route takes a south easterly turn where it continues through the field. The route is then faced with another field drain crossing. Continuing south easterly, the route heads through a brief strip of trees and straight after the trees are another two consecutive field drain crossings. The route then passes under a set of overhead lines before reaching the field boundary and A4061. The route crosses under A4061, shortly after which the route turns in a southerly direction.

3.4.14 After a short distance the route then turns in an easterly direction once again where it makes its final crossing, a field drain. The route reaches the NTS east of A4061.

Insert 5 Gas Connection Corridor Option – Route 1



Gas Connection Corridor Option 2

3.4.15 The 2nd route corridor option (Route 2) is approximately 1.25 km in length including 0 major road crossings, 0 minor road crossings, 0 major water crossings, 0 minor water crossings and 0.79 km of in-road mainlaying.

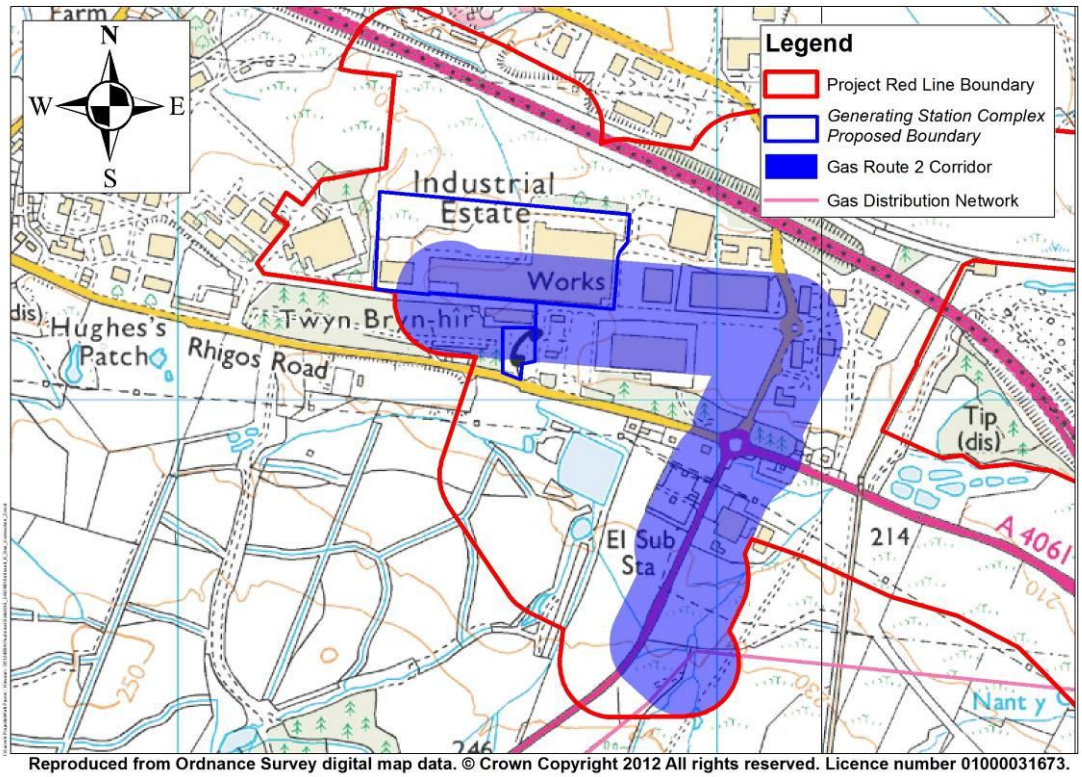
3.4.16 The route begins at the Power Generation Plant site heading south out of the site, immediately turning east, mainlaying down Main Avenue. Mid way down Main Avenue the route passes under an overhead walkway. The route then continues for a short distance up Main Avenue before turning south east through a field and reaches Fifth Avenue.

3.4.17 The route then turns south, mainlaying down Fifth Avenue, the single carriageway road that runs along part of the eastern boundary to the site. The route then continues being mainlayed across the Rhigos Road/A4061 and continues heading south where it crosses under a set of overhead lines. The route continues being mainlayed down Rhigos Road/A4061 before leaving the road.

3.4.18 The route turns into the field east of the A4061 for a short distance before turning back to run south, parallel to the A4061 where it crosses under another set of overhead lines. Shortly after crossing the

overhead lines the route turns to the east where it connects to the NTS east of A4061.

Insert 6 Gas Connection Corridor Option – Route 2



Gas Connection Corridor Option 3

3.4.19 The 3rd route corridor option (Route 3) is approximately 1.71 km in length including 0 major road crossings, 2 minor road crossings, 0 major water crossings, 5 minor water crossings and 0.64km of in-road mainlaying.

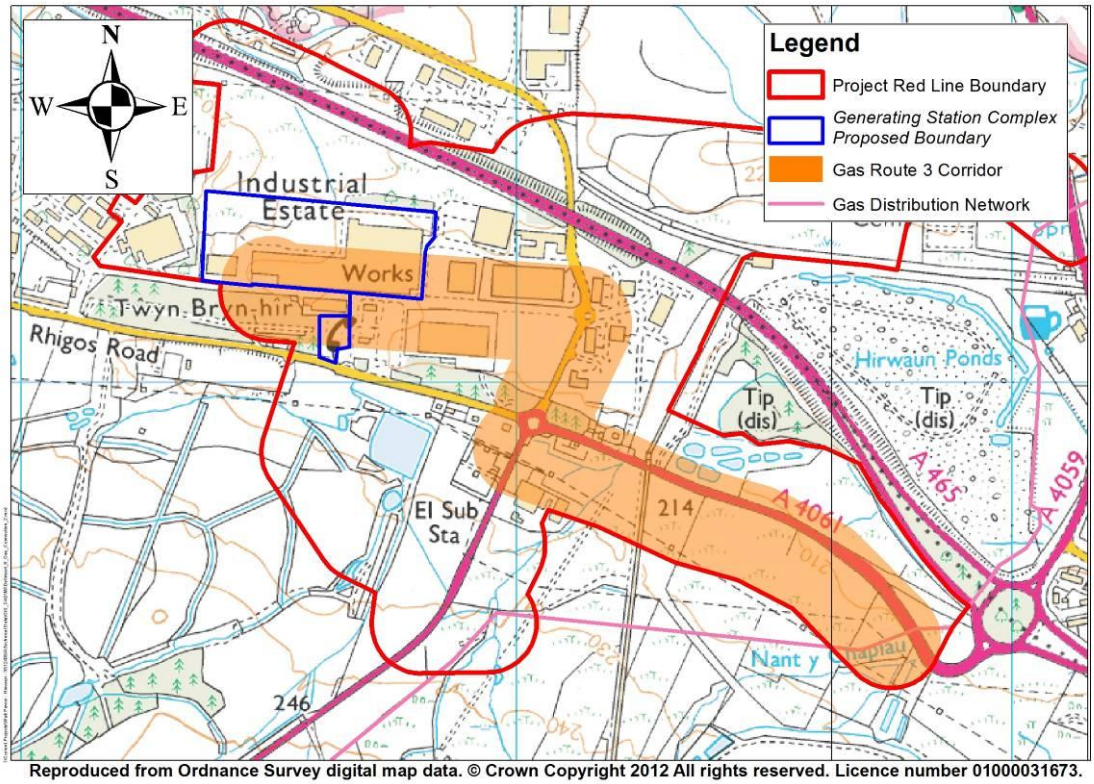
3.4.20 The pipeline begins at the Power Generation Plant site heading immediately south out of the site immediately turning east, mainlaying down Main Avenue. Mid way down Main Avenue the route passes under an overhead walkway and continues down Main Avenue. The route then turns south east through a field and reaches Fifth Avenue.

3.4.21 The route then turns south, mainlaying down Fifth Avenue, the single carriageway road that runs along part of the eastern boundary to the Power Project site. The route then continues being mainlayed down A4061 before turning east into the field to the east.

3.4.22 The route heads into a field in an easterly direction and crosses a field drain before continuing and reaching another field drain followed

immediately by a minor road crossing. Continuing through a short area of land before crossing another minor road (access to Tower Colliery) then immediately passing under the overhead mineral conveyor structure. The route then continues into the next field and comes to a field drain crossing and continues in an easterly direction running parallel to Rhigos Road/A4061 where it reaches another field drain crossing. The route takes a south easterly turn where it crosses the final field drain before connecting to the NTS south of Rhigos Road/A4061.

Insert 7 Gas Connection Corridor Option – Route 3



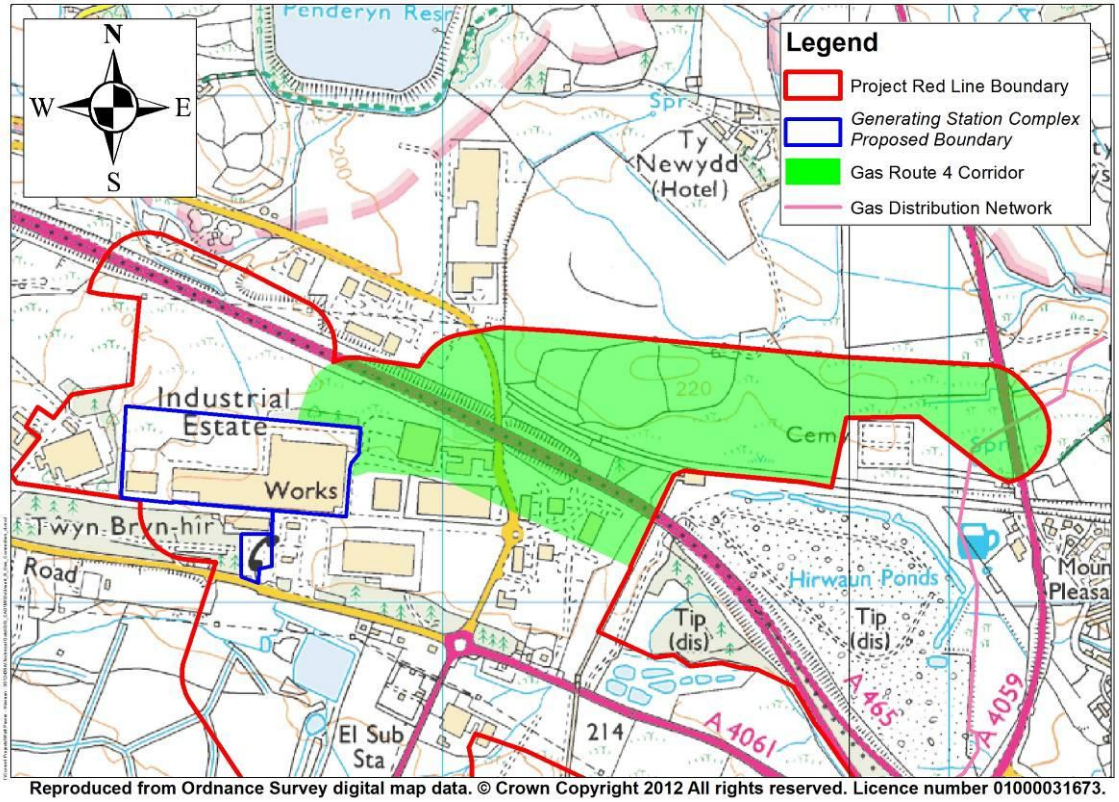
Gas Connection Corridor Option 4

3.4.23 The 4th route corridor option (Route 4) is approximately 1.39km in length including 1 major road crossing, 1 minor road crossing, 0 major water crossings and 0 minor water crossings.

3.4.24 The pipeline begins at the Power Generation Plant site heading immediately north out of the site, immediately turning east before turning north easterly to prepare to cross the A465 at 90°. Immediately after the A465 crossing, the route passes through a stand of trees.

3.4.25 The route then turns to the east where it crosses Fifth Avenue and continues east for about 1km before turning south to connect to the NTS west of A4059.

Insert 8 Gas Connection Corridor Option – Route 4



3.4.26 All of these route corridors are shown together on Figure 3. It is noted that Figure 3, and the above plans show large buffers or potential areas in which each route may be developed. This is due to the fact that no detailed studies have yet been undertaken to assess constraints. However, following more detailed studies, the route choices will be refined as the project progresses and the options narrowed to a single route corridor option.

3.4.27 Connection to the NTS at any high pressure pipeline would require two above ground facilities to be installed, a Minimum Offtake Connection (MOC) facility, which would be owned by NGC, and a PIG Trap Facility (PTF) which will be owned by HPL. The two facilities would contain the following pieces of equipment.

The MOC (approximately 30x30m) would contain:

- Remotely Operable Valve (ROV)

- Control and Instrumentation Kiosk
- Electrical supply kiosk

PTF (approximately 30x23m) would contain:

- PIG launching facility;
- Emergency Control Valve;
- Isolation Valve;
- Control and Instrumentation Kiosk
- Electrical Supply Kiosk.

3.4.28 Termination of the Gas Connection would be at a PTF on the Hirwaun Power Generation Plant site. This facility would contain the following equipment:

- PIG receiving facility;
- Isolation Valve; and
- Control and Instrumentation Kiosk.

3.4.29 The gas pipeline would be designed, constructed and tested to comply with the Institute of Gas Engineers' (IGE) Recommendations on Transmission and Distribution Practice – IGE/TD/1: Edition 5, 2009 - Steel Pipelines and Associated Installations for High Pressure Gas Transmission (IGE/TD/1).

3.4.30 The standard gas pipeline wall thickness would comply with the requirements of IGE/TD/1, which defines the minimum safe separation distance between a high pressure gas pipeline and normally inhabited buildings / major roads / major railways. This minimum safe separation distance is known as the Building Proximity Distance (BPD). If normally inhabited buildings / major roads / major railways are closer than 1 BPD (i.e. the gas pipeline is in an area where additional protection is required), thicker wall steel pipe (known as proximity pipe) would be used. The exact locations and lengths of where thicker wall steel pipe will be used will be confirmed throughout the assessment and detailed design stages.

3.4.31 The gas pipeline would be buried to a depth of cover which is in accordance with recognised industry standards. For example, depths of cover would be:

- No less than 1.2m in agricultural land;
- No less than 2m under road crossings; and

- No less than 1.7m under water crossings.

3.5 Description of the Electrical Connection and Corridor Options

3.5.1 A new connection would be required to allow electricity generated by the Power Generation Plant to be exported to the electricity transmission network.

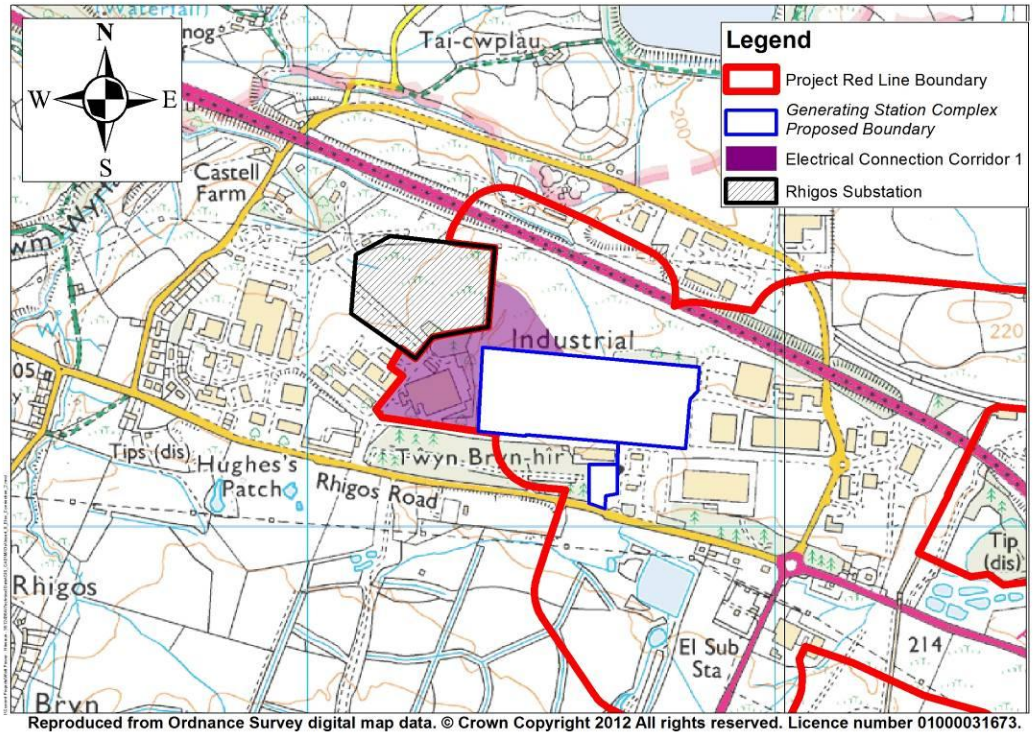
3.5.2 A grid connection assessment was undertaken for the Power Generation site in 2012. This assessment was subsequently reviewed and updated, also in 2012. The assessments analysed the transmission and distribution grid connection options and determined the available thermal and fault level capacity on the electrical network. Discussions were also held with NGC.

3.5.3 Following discussions with NGC it is proposed that the most suitable point of connection for the HPP is at the new 400 kV Rhigos substation, which will require a dedicated 400 kV cable of between 60-475m in length from the Power Generation Plant to the substation. This substation is expected to be completed by 2016, when the nearby 256 MW Pen Y Cymoedd Wind Farm is also due to be connected.

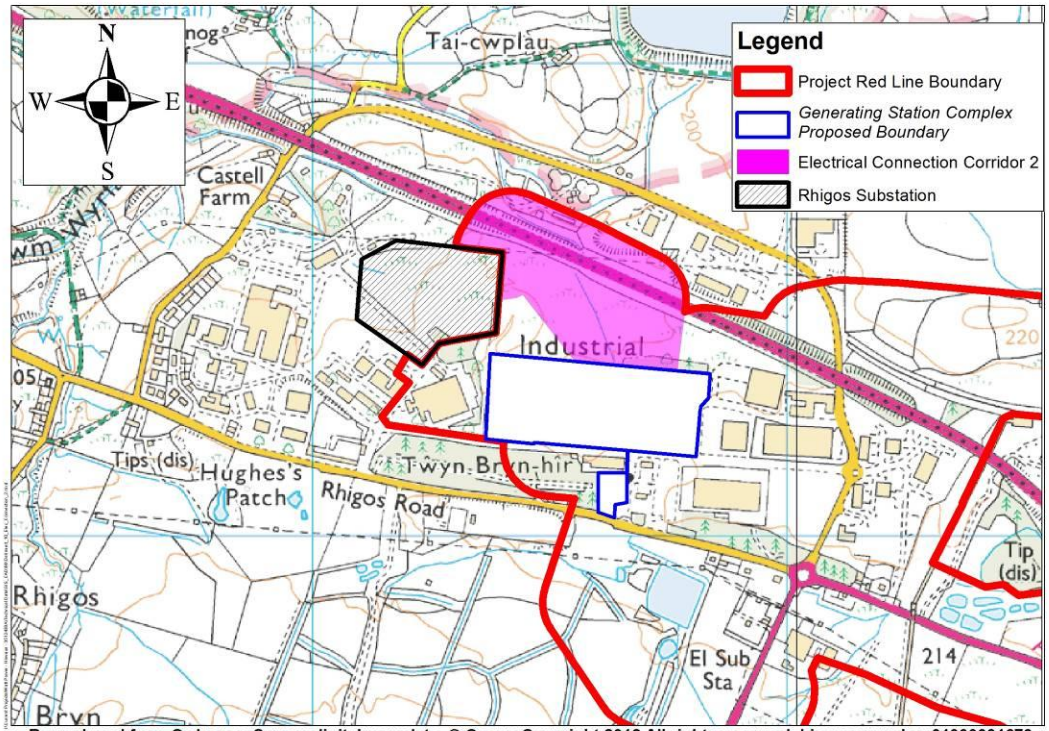
3.5.4 Two indicative route corridor options for the electrical connection are shown below in Inserts 9 and 10 and also on Figure 3. It is possible that the connection would be via underground cable or overhead line. Should an overhead line be required then this would also be within the route corridor areas outlined below. An overhead line may be considered preferable in order to avoid direct impacts on sensitive habitat land. Likewise, an underground cable may be preferable to e.g. limit visual impacts.

3.5.5 If an overhead line is required, it is also likely that the tower heights would range between 35 m and 60 m depending on final design requirements

Insert 9 – Electrical Connection Corridor 1



Insert 10 – Electrical Connection Corridor 2



3.6 Site Selection / Design Evolution

3.6.1 The choice of the Power Generation Plant site for the development of a 299MWe gas fired power station has been the subject of feasibility studies undertaken by HPL over a number of months. Over 600 sites have been assessed for their suitability of supporting the development of a project of this size. These site selection studies have assessed a number of relevant factors, such as those set out in paragraph 4.4.1 of NPS EN-1, in considering a suitable location for the development of a plant of this size and type.

3.6.2 NPS EN-2 also outlines considerations and factors influencing site selection by developers for fossil fuel generating stations, although it states that these concerns must be considered by the applicant, and that: "…*the Government does not seek to direct applicants to particular sites for fossil fuel generating stations*."

3.6.3 Some of the factors included in the selection of the site at Hirwaun are:

- It is on previously developed industrial land (brownfield site);
- It is in close proximity to a suitable electrical connection point;
- It is in close proximity to a suitable gas connection point;
- It is in an industrial setting, thereby limiting potential impacts on the natural and cultural environment and residential amenity;
- It has a well developed road network and site access; and
- There is more than adequate space to develop the Power Generation Plant.

3.6.4 As stated in Section 3.2 of this Report, the final plant technology choice has not yet been determined and is the ongoing subject of more detailed engineering and design studies. These studies will ensure that the most suitable plant will be chosen for the site, taking into consideration design and environmental considerations, amongst others.

3.6.5 Similarly, the final route of the Gas Connection has not yet been determined, and is the subject of ongoing studies. A feasibility study for the Gas Connection has already been undertaken which has narrowed down the potential connection options to four separate locations on the NTS Feeder 2, with a possible four different route corridors to tie in to these connection points.

3.6.6 The final choice of Gas and Electrical Connection route corridors will be selected following further consultation and a more thorough assessment of constraints and environmental impacts.

3.6.7 A more detailed appraisal of the site selection process and design evolution will be set out in the ES.

SECTION 4

SCOPE AND STRUCTURE OF THE EIA

4 SCOPE AND STRUCTURE OF THE EIA

4.1 Introduction

4.1.1 This section describes the proposed scope and structure for the EIA that will be undertaken to support the DCO application.

4.1.2 The key output of the EIA process is the ES, which sets out the predicted significant environmental effects of the proposed development. The ES will enable PINS and consultees, and ultimately the SoS, to determine whether the proposals (and associated impacts) are acceptable.

4.1.3 Schedule 4 of the EIA Regulations provides that the ES should describe, in particular, the environmental effects on: *"Population, fauna, flora, soil, water, air, climatic factors, material assets, including architectural and archaeological heritage, landscape and the inter-relationship between the above factors".* The structure proposed in this document seeks to address all of these requirements.

4.1.4 The EIA will be undertaken in full accordance with the EIA Regulations. Impacts arising during the construction, operation and decommissioning will all be considered, as will cumulative impacts with other existing and planned developments in the area. The Gas and Electrical Connections may be considered in separate sections to the Power Generation Plant. The connections will be fully assessed to the extent they form part of the DCO application and, even if separately consented, indicative information will be included in the ES. In any event, any cumulative impacts which may arise from developing the Gas and Electrical Connections at the same time as the Power Generation Plant will also be assessed.

4.2 Overall ES Structure

4.2.1 Table 4.1 sets out the proposed structure of the main ES document. A number of supporting documents will also be submitted to the SoS as part of the DCO application. These are summarised in Table 4.2.

Table 4.1 - Proposed ES structure

Section	*Description*
Introduction	Providing: • A brief introduction to the Developer; • A high level description of the HPP; • A description of the consenting regime; and A description of the purpose and structure of the ES.
Project Description	Detailed description of the HPP, and how the different aspects (i.e. Power Generation Plant, Electrical Connection and Gas Connection) are interconnected / interrelated. Also provides a detailed description of the Gas and Electrical Connections and route corridors. Outline of the proposed construction methods and indicative programme, including working hours etc.
Site Description	To describe the site settings and surroundings of the development site, including for the Gas and Electrical Connections.
Project Development and Alternatives	To include a description of: • Site selection; • Alternative generating capacities; • Alternative layout / design options; and • Assessment of alternatives for the gas and electrical connection route corridors.
EIA Assessment Methodology	Detailing the assessment methodology that the EIA has followed.

Section	Description
ES- Main Impact Sections	This sub-section would present the results of the EIA that has been undertaken. Accordingly, the following sub –sections would be provided: • Planning Policy Context • Air Quality; • Noise and Vibration; • Ecology; • Water Resources • Geology and Soils including ground conditions and land use; • Landscape and Visual; • Waste; • Traffic and Infrastructure; • Cultural Heritage / Archaeology; • Socio-Economics; • EMF; and • Cumulative Assessment.
Environmental Report – Electrical Connection	Providing a detailed assessment of the environmental impacts of the Electrical Connection. The structure will be as set out above for the Power Generation Plant, although impacts relating to EMF may be included. Following discussion with consultees, some aspects may be scoped out*.
Environmental Report – Gas Connection	Providing a detailed assessment of the environmental impacts of the Gas Connection. The structure will be as set out above for the Power Generation Plant, although following discussion with consultees, some aspects may be scoped out*.
Assessment of the NSIP and Connections	Conclusion drawing together the previous three sections.
Indirect / Secondary and Cumulative Impact Assessment	This Section would present the results of the indirect / secondary and cumulative impact assessment of the overall HPP.

Section	Description
ES Volume 2	Containing technical appendices
ES Volume 3	Containing all figures associated with the ES.
Non-Technical Summary	Providing a summary of the main findings of the ES in easy to understand, non-technical language.

* Note that if the Electrical Connection is not included in the DCO application then indicative information will be provided.

Table 4.2 – Supporting Environmental Documents to the DCO Application

Document Name	Description
Design and Access Statement	Provides details on the main access and egress routes to the site and the design process and philosophy that have been followed in developing the project.
Flood Risk Assessment	Providing details on the risk to the site from flooding and risks elsewhere that could be caused by the development.
Planning Statement	Describing the planning policy background and demonstrating that the project has been developed in compliance with the relevant NPS and other relevant and important considerations.
Climate Change / Sustainability Assessment	Providing details on the sustainability of the proposed project.
Consultation Report	Consolidating all consultations that have taken place throughout the project, and how issues raised have been addressed.
Statement to Inform / Habitat Regulations Assessment	Depending on the potential for impacts as a result of the HPP on designated Natura sites, a Habitat Regulations Assessment or 'Statement to Inform' a Habitat Regulation Assessment may be required. This will draw on the Ecology chapter of the ES (described in Section 5.4 below).

SECTION 5

DETAILED DESCRIPTION OF ES IMPACT SECTIONS

5 DETAILED DESCRIPTION OF ES IMPACT SECTIONS

5.1 Introduction

5.1.1 This section provides a description of the proposed methodology that will be used when undertaking the main impact sections of the ES. It addresses each separate section in turn and describes the current understanding of the baseline conditions and the likely impacts and assessment methodology for each discipline. Potential mitigation measures have also been identified where appropriate, although these will be set out in detail in the ES and will ensure that the project complies with current legislation and best practice guidance. Consultees are invited to comment on the methodologies within their scoping responses.

5.1.2 Each section deals with the Power Generation Plant, then the Gas Connection followed by the Electrical Connection. The Gas Connection and/or Electrical Connection may be consented separately to the Power Generation Plant. If this is the case then Gas Connection and/or Electrical Connection would be assessed as required. The below sections should therefore be read in this light.

5.1.3 The sections described are set out in the following list:

- Air Quality (5.3);
- Noise and Vibration (5.4);
- Ecology (5.5);
- Water Resources (5.6);
- Geology, Ground Conditions and Agriculture (5.7);
- Landscape and Visual (5.8);
- Waste Management (5.9);
- Traffic, Transport and Access (5.10);
- Cultural Heritage and Archaeology (5.11);
- Socio-economics (5.12);
- EMF (5.13) and
- Cumulative Impacts (5.14).

5.2 Significance Criteria

5.2.1 The significance of environmental effects resulting from the construction, operation and decommissioning of the HPP will generally

be assessed in the ES using a series of matrices. These will be developed to describe the sensitivity of receptors which have the potential to be impacted by the development and the magnitude of any impacts which are likely to arise. The magnitude of impact and sensitivity of receptor will be cross referenced to give an overall significance of effect for any potential impact. Where it is not possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgement.

5.2.2 In order to provide a consistent approach and enable comparison of impacts upon different environmental components, the assessments will generally follow the structure and use the terminology outlined below in Tables 5.1 – 5.3. However, it is noted here that for some impact sections, significance criteria may need to differ depending on the conditions encountered at the site. The criteria will therefore be subject to further discussion with statutory consultees. Each technical chapter of the ES will clearly identify and explain any specific criteria used.

5.2.3 Potential mitigation measures described in the ES will include embedded mitigation through design/standard control measures (which will be used to produce an initial assessment of impact) and further specific mitigation which will be required (which will be taken into account to produce an assessment of residual impacts).

Table 5.1 – Determining Receptor Sensitivity

Sensitivity	***Example***
Very High	Internationally designated site (e.g. Ramsar / SPA / World Heritage Site.
High	Nationally designated site (SSSI), / designated Landscape (e.g. NP) / principal aquifer / main watercourse / human health.
Medium	Regionally designated ecology / heritage site / secondary aquifer / minor watercourse
Low (or lower)	Locally designated ecology / heritage site; area of hardstanding / brownfield land / industrial site / low ecological value.
Negligible	No sensitivity to change

Table 5.2 – Determining Magnitude of Impact

Magnitude		***Example***
Major	Adverse	A permanent or long term adverse impact on the integrity and value of an environmental attribute or receptor
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse	An adverse impact on the integrity and/or value of an environmental attribute or receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of attribute quality.
Minor	Adverse	An adverse impact on the value of an environmental attribute or receptor, but recovery is expected in the short- term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No Change		No change would be perceptible, either positive or negative.

Table 5.3 – Determining Significance of Effect

		Magnitude of Impact				
		No Change	***Negligible***	***Minor***	***Moderate***	***Major***
Receptor Sensitivity	***Very High***	Neutral	Slight	Moderate	Large	Very Large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

5.3 Air Quality

Introduction

Power Generation Plant

5.3.1 The air quality assessment of the ES will assess baseline conditions (air quality in the local and regional area surrounding the plant), stack emissions from the Power Generation Plant (quantifying concentrations of emissions) and the most appropriate stack height to achieve adequate dispersion of these emissions. It will also assess localised air quality impacts caused during construction and decommissioning.

5.3.2 The main emissions associated with the combustion of natural gas at the proposed Power Generation Plant are NO_x and CO. Additionally, the construction and decommissioning phases of the project have the potential to impact on localised air quality, principally through the generation of dust and the release of NO_x and CO from exhaust fumes from increased traffic movements.

5.3.3 However, the concentrations of any pollutants released from the plant will meet the requirements of the IED. Furthermore, mitigation measures such as flue gas abatement (if deemed necessary) and damping down of stockpiles in dry and windy conditions will mean that any impacts are sufficiently limited.

Gas and Electrical Connections

5.3.4 This section of the ES will also assess the baseline conditions along each of the proposed gas and electrical routes. As there are no emissions associated with the operation of gas or Electrical

Connections, there will be no need to access the impacts of these elements during operation. However, this section will assess localised air quality impacts caused during construction and decommissioning.

Baseline

Power Generation Plant

5.3.5 Existing ambient air quality and baseline conditions will be reviewed using available air quality monitoring data and the most recent local authority publications under their duties under the Environment Act 1995, including particular consideration of designated Air Quality Management Areas, any relevant previous studies undertaken in the area, the location of sensitive receptors (including designated ecological sites) and other significant sources of emissions.

5.3.6 In the vicinity of the Power Generation Plant site, other significant sources of emissions are considered to be limited to the opencast quarry, approximately 2 km south of the site. Further consultation will be sought with RCT and the NRW to determine a definitive list of significant emissions sources to consider as part of the assessment of air quality.

5.3.7 The existing air quality concentrations at sensitive ecological sites will be obtained from the Welsh Air Quality Forum (http://www.welshairquality.co.uk). The existing acid and nutrient nitrogen deposition rates will be obtained from the UK Air Pollution Information System (UK APIS) (http://www.apis.ac.uk/).

5.3.8 The main ecological receptors that have the potential to be impacted by NO_x emissions (and ultimately nitrogen deposition) from the Power Generation Plant owing to their proximity are considered to be:

- Brecon Beacons Nations Park - 0.3km to the north of the site;
- Woodland Park and Pontpren - Site of Special Scientific Interest – 1.2 km to the northeast of the site;
- Cors Bryn – y – Gaer - Site of Special Scientific Interest – 0.4 km to the north of the site;
- Blaen Cynon Special Area of Conservation – 0.4 km to the north of the site;
- Coedydd Nedd a Melte Special Area of Conservation - 1.4 km to the north west of the site; and
- Dyffrynoedd Nedd a Melte Moel Penderyn - Site of Special Scientific Interest – 1.4 km to the north west of the site.

5.3.9 The closest residential receptors to the Power Generation Plant site that will also be potentially effected by pollutant dispersion and deposition include:

- Property on Rhigos Rd. – approximately 125m south of the site;
- Representative property on Hall Close, approximately 800m west of the site;
- Castell Farm – approximately 650m north west of the site;
- Willows Farm - Approximately 460m south east of the site; and
- Tai Cwplau – approximately 800m north of the site.

Gas Connection

5.3.10 As for the Power Generation Plant, ambient air quality and baseline conditions will be reviewed using available air quality monitoring data and the most recent local authority publications under their duties under the Environment Act 1995, including particular consideration of designated Air Quality Management Areas, any relevant previous studies undertaken in the area, the location of sensitive receptors (including designated ecological sites) and other significant sources of emissions.

5.3.11 Given that all proposed Gas Connection route corridors are within close proximity to the Power Generation Plant, no other significant sources of emissions have been identified and thus all potential sources are considered to be the same as for the Power Generation Plant.

5.3.12 As there would be no emissions from the Gas connections, there is no potential for NOx to impact upon local ecological or residential sites, and the only air quality implications will be associated with the potential creation of dust during construction and decommissioning.

Electrical Connection

5.3.13 The assessment methodology of baseline conditions for the Gas Connection routes would be appropriate to use for the Electrical Connections.

Assessment

Power Generation Plant

5.3.14 The magnitude and risk of emissions of dust during the construction and decommissioning phases will be assessed in accordance with

Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance (IAQM, 2012), as will the impact of emissions from the increased number of construction vehicles using the methodology prescribed in the Department for Transport "*Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3, Part 1: Air Quality*" and the associated *DMRB Screening Method*, developed by the Highways Agency. The significance of the potential impacts identified will be determined based on the sensitivity of the identified receptors within the potential zones of influence outlined in the IAQM Guidance.

5.3.15 The air quality assessment for the operational phase of the project will follow the EA documents Horizontal Guidance Note H1 – Annex (f): Air Emissions and the EA Air Quality Modelling and Assessment Unit (AQMAU) *"Air dispersion modelling report requirements (for detailed air dispersion modelling)"*. The conversion of NO_x to NO_2, as applicable for the protection of human health under the Air Quality Standards (Wales) Regulations 2010, will adopt the approach outlined in the AQMAU Guidance Note '*Conversion Ratios for NO_x and NO_2*' (2006).

5.3.16 The atmospheric emissions from the Power Generation Plant will be quantified by obtaining information from relevant plant suppliers. Where two or more suppliers are being considered, a realistic worst case scenario will be used to ensure flexibility. However, only plant that meets national emissions limits will be considered.

5.3.17 The atmospheric dispersion modelling will be performed using the Cambridge Environmental Research Consultants (CERC) Air Dispersion Modelling Software (ADMS 4.2). An air dispersion model will be set up that will consider the affects of terrain and buildings (as appropriate to the location of the plant), together with the most recent available meteorological data covering a consecutive five year period (e.g. 2008 to 2012, inclusive) in accordance with current guidance.

5.3.18 To assess a realistic worst case scenario, the plant will be modelled running at base load, continuously for 24 hours a day, 365 days a year, for a total of 5 years.

5.3.19 The exact study and detailed methodology will also be discussed with the relevant statutory consultees.

5.3.20 The modelling assessment will estimate the mass flow rates of NO_x and CO at sensitive receptors using the emission limits as specified in the Part 2 of Annex V to the IED. Initial screening runs will be undertaken to determine an acceptable stack height suitable for adequate dispersion based on maximum short term and long term ground level

concentrations predicted. Detailed atmospheric dispersion modelling will then be undertaken on the basis of the selected stack height.

5.3.21 The results of the detailed dispersion modelling will be presented as isopleths, and compared with background levels and relevant Standards / Guidelines (i.e. the Air Quality Standards (Wales) Regulations 2010). Direct comparison will be made between the long-term and short-term process contribution from the Power Generation Plant, the predicted environmental concentrations of relevant substances (i.e. process contribution plus background levels) and the limits and objectives within the relevant Air Quality Standards Regulations. Where appropriate, the significance of the potential impact will be determined using the criteria set out in the '*Development Control: Planning for Air Quality*' (EPUK, 2010) in conjunction with the EA Horizontal Guidance Note H1 – Annex (f). The abatement of emissions will be discussed in relation to application of Best Available Techniques, in accordance with the EA Sector Guidance Note for Combustion Activities (EPR 1.01) and the UK position with regards to the on-going review of the EU IPPC Reference Document on BAT for Large Combustion Plants. Should additional mitigation prove to be necessary, the severity of impact, frequency of emission and the resultant environmental risk associated with any residual impact will be examined.

5.3.22 Changes in air quality levels for NO_x will be assessed with respect to ecology for the European and nationally designated habitat sites within 10 km of the Power Generation Plant (including, not necessarily limited to, those identified above). The non-statutory habitat sites within 2 km of the Power Generation Plant will also be considered. An assessment of the increased deposition of both nutrient nitrogen and acid due to nitrogen will also be carried out at the statutory (both EU and UK) designated sites in accordance with the methodologies described in the EA AQMAU *AQTAG 06 Technical Guidance on detailed modelling approach for an appropriate assessment for emissions to air*.

5.3.23 It is considered that there will not be any noticeable odours associated with the operation of the Power Generation Plant at or beyond the boundary of the Power Generation Plant site and therefore it is not considered necessary to undertake a detailed assessment of odour.

5.3.24 The operation of the Gas and Electrical Connections are not anticipated to have any impacts on air quality. However, the methodology described above for assessing construction impacts for the Power Generation Plant will also be applied for the construction phase of the Gas and Electrical Connections.

Gas Connection

5.3.25 The operation of the Gas Connection will not produce any emissions to air. As stated above the only implication that this element of the project will have on air quality is the potential generation of dust during construction and decommissioning. This dust is unlikely to have any impact upon any local residential or ecological receptors.

5.3.26 Nonetheless, the assessment for this element of the work will follow the same methodology as that used for assessing construction impacts for the Power Generation Plant.

Electrical Connection

5.3.27 The operation of the Electrical Connection will not produce any emissions to air. As stated above, the only implication that this element of the project will have on air quality is the potential generation of dust during construction and decommissioning. This dust is unlikely to have any impact upon any local residential or ecological receptors.

5.3.28 Nonetheless, the assessment for this element of the work will follow the same methodology as that used for assessing construction impacts for the Power Generation Plant.

Potential Mitigation Measures

5.3.29 Embedded mitigation measures that will be employed as part of the construction phase of the project will incorporate standard best practice working methods and will include; for example, the covering / damping down of stockpiles during dry or windy conditions to limit dust generation and damping down of any demolition activities which have the potential to create large amounts of dust. A Construction Environmental Management Plan (CEMP) will also be drafted which will set out best practice methods of limiting dust on site during construction.

5.3.30 During operation, embedded mitigation measures to limit impacts from the Power Generation Plant will include incorporating a stack of sufficient height to achieve adequate dispersal of pollutants and flue gas cleaning equipment will be used to ensure that all emissions are within concentrations permitted by legislation and guidance.

5.3.31 The need or otherwise for further, project specific mitigation measures will be addressed during the EIA.

5.4 Noise and Vibration

Introduction

Power Generation Plant

5.4.1 In accordance with Section 5.11 of NPS EN-1, a noise and vibration assessment will be undertaken and reported in the ES. This will consider all of the potential noise and vibration impacts caused by the construction, operation and decommissioning of the Power Generation Plant on sensitive receptors in and around the vicinity of the site. It will be undertaken in accordance with the most relevant national and local standards and guidelines.

Gas Connection

5.4.2 Once operational, the Gas Connection will not generate any noise, and thus it will only be necessary to consider noise impacts during construction and decommissioning. This assessment will consider all potential noise and vibration impacts on sensitive receptors along each of the proposed route corridors, and will be undertaken in accordance with the most relevant national and local standards and guidelines.

Electrical Connection

5.4.3 If the Electrical Connection is via an underground, buried cable, it will not generate any noise during operation. Consequently, as above, it will only be necessary to consider noise impacts during construction and decommissioning. In this case, the assessment will consider all potential noise and vibration impacts on sensitive receptors along each of the proposed route corridors, and will be undertaken with reference to the same relevant national and local standards and guidelines.

5.4.4 In the case that the Electrical Connection is via an Overhead Line, there is potential that noise will emanate from the line during operation in the form of a low frequency 'hum'. In which case the noise assessment of the Electrical Connection will consider all of the potential noise and vibration impacts caused by the construction, operation and decommissioning of the line on sensitive receptors along the total length of the route corridor. It will be undertaken in accordance with the most relevant national and local standards and guidelines.

Baseline

Power Generation Plant

5.4.5 The Power Generation Plant will be sited within part of the Hirwaun Industrial Estate. The surrounding area is characterised by industrial

units. The A465 'Heads of the Valleys' Road lies to the north of the site and a large opencast mine lies to the south of the site. These are both significant sources of background noise.

5.4.6 The closest residential areas to the site are along Hall Close and Hall Road, approximately 800m to the west of the site boundary, and in Rhigos, approximately 1km south west of the site boundary. There are also numerous individual, isolated properties in the vicinity of the site, the closest of which is on Rhigos Road, approximately 125m from the southern site boundary.

Gas Connection

5.4.7 The Gas Connection route corridors identified on Figure 3 lie to the east of the Power Generation Plant site. Therefore, they are closer to residential properties. (e.g. Gas Connection Route Corridor 1 passes adjacent to a property on Rhigos Road).

5.4.8 The Electrical Connection route corridor options lie immediately west of the Power Generation Plant site. They are therefore situated marginally closer to Rhigos, Hall Close and Castell Farm than the Power Generation Plant. However, the closest residential property to the electrical connection route corridor options is still the property on Rhigos Road).

Assessment

Power Generation Plant

5.4.9 A construction noise and vibration assessment of the Power Generation Plant will be undertaken following the guidance in British Standard (BS) 5228: 2009.

5.4.10 The assessment of construction impacts will be undertaken as a desk study and shall involve:

- Identification of construction activities that produce significant noise and vibration;
- Identification of sensitive receptors within 100m of construction activities;
- Prediction of noise and vibration using the methodology contained within BS5228 2009.

5.4.11 The exact construction methodology is unlikely to be defined until the construction contractor is appointed, which is likely to be after the DCO application is submitted. However, in the absence of this data, an outline construction programme will be developed based on knowledge

and experience of other similar developments. Additionally, the typical make up of construction equipment at each stage of the project programme will be ascertained in the same way. Noise and vibration impacts from increased traffic movements as part of the construction phase would also be addressed. For ground improvement works (e.g. piling) the noise assessment will pay due regard to the ground conditions at the site. Where uncertainties exist, realistic worst case assumptions will be used.

5.4.12 The quantification of impacts shall be undertaken by comparison with agreed project criteria / limits either from previous schemes and relevant guidance / standards such as BS5228, BS6472 & BS7385, or local legislative requirements. The desk study shall outline suitable measures for the mitigation of construction impacts, and an assessment of residual impacts.

5.4.13 Operational noise will be assessed using the methodology set out in BS 4142:1997 *'Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'*. This method predicts the likelihood of complaints about noise from industrial developments. It uses the following criteria to predict the likelihood of complaints:

- The greater the difference the greater the likelihood of complaints;
- A difference of around +10 dB or more indicates that complaints are likely;
- A difference of around +5 dB is of marginal significance; and
- If the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely.

5.4.14 The noise assessment will also be undertaken in accordance with BS 7445: 2003 'Description and measurement of environmental noise' Parts 1 to 3. BSI. BS 7445 defines and prescribes best practice during recording and reporting of environmental noise. It is inherently applied in all instances when making environmental noise measurements.

5.4.15 It is proposed that the study area for the noise assessment of operational effects shall be defined as the region within 1000m of the Power Generation Plant. All sensitive receptors, such as residential properties, hospitals, schools, etc. within the study areas shall be identified in the assessment.

5.4.16 A Baseline Noise Survey would then be undertaken in the vicinity of the proposed site to establish the current baseline noise levels. The locations for the Baseline Noise Survey (i.e. locations of the Noise

Sensitive Receptors (NSR)) will be agreed in advance with the local Environmental Health Officer (EHO).

5.4.17 For the purposes of this Report, it is proposed that 5 NSR locations will be assessed, consistent with ESs for similar projects in the UK.

5.4.18 The closest NSRs to the Hirwaun site, and therefore suggested locations for undertaking baseline modelling are:

- Property on Rhigos Rd. – approximately 125m south of the site;
- Representative property on Hall Close - approximately 800m west of the site;
- Castell Farm – approximately 650m north west of the site;
- Willows Farm - Approximately 460m south east of the site; and
- Tai Cwplau – approximately 800m north of the site.

5.4.19 Noise monitoring will be undertaken during both daytime and night time periods.

5.4.20 Following baseline noise measurements, a noise model will be produced using Cadna software (3-dimensional noise propagation software) which will model the measured baseline levels at NSR, together with sound power levels of proposed plant (obtained from relevant suppliers). Where sound power levels for proposed plant are not available, suitable data will be substituted, although a realistic worst case scenario would always be considered. The noise model will highlight the main noise sources and the associated noise levels at the NSR locations.

5.4.21 Contour plots will be produced clearly showing noise levels at the site, NSR and surrounding areas.

5.4.22 If the model shows that there is potential for a significant effect to be generated by noise from any of the sensitive receptors, the level of noise mitigation that would be required would be specified, and measures that could be used to achieve this level of mitigation will be incorporated into the model, to provide a 'with mitigation' scenario.

5.4.23 The ES section would be compiled using the Institute of Acoustics (IOA) / Institute for Environmental Management (IEMA) draft document "Guidelines for Noise Impact Assessment". Reference would also be made to ensure that the project is compliant with TAN 11 'Planning and Noise'.

Gas Connection

5.4.24 The assessment methodology for the construction and decommissioning phase of the Power Generation Plant would be appropriate to use for the Gas Connection.

Electrical Connection

5.4.25 If the Electrical Connection is an underground cable, the assessment methodology for the construction and decommissioning phase of the Power Generation Plant would be appropriate to use for the Electrical Connection.

5.4.26 If an overhead line is considered, further assessment will be carried out to assess the impact of potential low frequency noise emitted during operation of the connection.

Potential Mitigation Measures

Power Generation Plant

5.4.27 During construction, potential mitigation measures would include the use of quietest possible construction equipment and only undertaking construction activities during certain hours. The CEMP will also set out best practice methods of limiting noise on site during construction.

5.4.28 During operation, mitigation measures would include the use of silencers on the loudest plant items, and, if necessary the provision of noise screens.

Gas Connection

5.4.29 The mitigation for the construction and decommissioning phase of the Power Generation Plant would be appropriate to use for the Gas Connection.

Electrical Connection

5.4.30 Assuming that the Electrical Connection is an underground cable, the mitigation methodology for the construction and decommissioning phase of the Power Generation Plant would be appropriate to use for the Electrical Connection.

5.4.31 If an overhead line is considered, mitigation measures could include the provision of noise screens.

5.5 Ecology

Introduction

Power Generation Plant

5.5.1 This Section of the ES will address the potential impacts of the Power Generation Plant on sensitive ecological receptors. It would summarise the results of Phase 1 extended habitat surveys and any Phase 2 protected species surveys. It would also outline any mitigation measures considered necessary to limit any identified impacts on ecological receptors.

Gas and Electrical Connections

5.5.2 These Sections of the ES will address the potential impacts of the gas and Electrical Connections on sensitive ecological receptors. They would summarise the results of Phase 1 extended habitat surveys and any Phase 2 protected species surveys that have been undertaken along the lengths of each proposed route corridor, and would also outline any mitigation measures considered necessary to limit any identified impacts on ecological receptors..

Baseline

Power Generation Plant

5.5.3 Currently, the area proposed for development of the Power Generation Plant is occupied by a large warehouse building surrounded by hardstanding and small patches of scrub, grassland and stands of trees. The industrial estate sits within semi-natural surroundings, characterised by a mixture of industrial buildings and amenity, scrub and semi-improved neutral grassland habitats, bordered by mixed plantation woodland and hedgerow / screen planting.

5.5.4 A DBA and Extended Phase 1 habitat survey was undertaken at the Power Generation Plant site in July 2012 (See Appendix A). The purpose of the assessment and survey were to:

- Identify the main habitats present at the site;
- Identify the sensitive ecological receptors (e.g. statutory designated sites) in the vicinity of the site;
- Assess the potential of the site to support protected species; and
- Provide recommendations for further assessment works (e.g. Phase 2 Protected Species Surveys).

5.5.5 The extended Phase 1 habitat survey identified a total of six statutory designated sites for nature conservation within a 2km radius of the site. These can be summarised as follows:

- BBNP - 0.3km to the north of the Power Generation Plant site;
- Woodland Park and Pontpren - Site of Special Scientific Interest – 1.2km to the northeast of the Power Generation Plant site;
- Cors Bryn – y – Gaer - Site of Special Scientific Interest – 0.4km to the north of the Power Generation Plant site;
- Blaen Cynon Special Area of Conservation – 0.4km to the north of the Power Generation Plant site;
- Coedydd Nedd a Melte Special Area of Conservation - 1.4km to the north west of the Power Generation Plant site; and
- Dyffrynoedd Nedd a Melte Moel Penderyn - Site of Special Scientific Interest – 1.4km to the north west of the Power Generation Plant site.

5.5.6 These sites are described further in the Ecology Phase 1 survey, which is included in Appendix A to this Report.

5.5.7 Additionally, the following Sites of Importance for Nature Conservation (SINC) have been identified within 2km of the Power Generation Plant site:

- Coed Wernhir
- Werfa Farm
- Rhigos Tramway
- Hirwaun Industrial Estate
- Hirwaun Ponds
- Hirwaun Common
- Hirwaun Iron Works

5.5.8 There are records of the following protected species within 1km of the Power Generation Plant site:

- Marsh Fritillary butterfly;
- Small pearl bordered fritillary butterfly;
- Barn Owl;
- Peregrine Falcon;

- Hen harrier;
- Red Kite;
- Brambling;
- Merlin;
- Redwing; and
- Fieldfare.

5.5.9 The main ecological value of the Power Generation Plant site lies with the buildings and surrounding plantation woodland, which may provide potential roost sites for bats. An area of unimproved neutral grassland in the south of the site is also considered to be species rich and considered to be of ecological value. The woodland habitat on and immediately surrounding the site is considered to be of moderate potential for badgers and suitable habitat for breeding birds. Further areas of waterlogged grassland (e.g. in the north of the site) may provide habitat for reptiles and great crested newts.

Gas Connection

5.5.10 The Gas Connection would run to the east of the Power Generation Plant site and connect with Feeder 2. All of the gas pipeline would be undergrounded, albeit that there would be some minor above ground structures (as described in Section 3.4 of this Report). Any one of the four potential route corridors, as described in Section 3.4 of this Report, would encounter broadly similar conditions. They would run through the Hirwaun Industrial Estate and then across a series of agricultural fields. Two of the routes run alongside main roads and one of the routes runs through a stand of trees. Further details on the routes are provided in Section 3.4 of this Report.

5.5.11 No Phase 1 habitat survey has yet been undertaken for the Gas Connection route corridor. However, it can been assumed that there is the potential for impacts on similar protected species as has been identified for the Power Generation Plant site given the similar area and surroundings. Additionally, where a Gas Connection crosses watercourses there may be the potential to impact on aquatic species (e.g. water voles).

Electrical Connection

5.5.12 The Electrical Connection would run to the west of the Power Generation Plant site and would connect into the Rhigos substation. We are aware that the areas highlighted as potential route corridors for the electrical connection on Figure 3 and Inserts 9 and 10 cross areas designated as the Hirwaun Industrial Estate SINC and also have the

potential to support a range of species. However, this area would not be directly impacted by the electrical connection. If the area was crossed directly, it is likely that this would be via an overhead line, with very limited construction works within the SINC. If an underground cable was preferred, this would be routed to the north of Power Generation Plant and along the A465 or to the west of the Power Generation Plant site along Main Avenue and Fourteenth Avenue. In both instances direct impact on the SINC would be avoided.

Assessment

Power Generation Plant

5.5.13 NPS EN-1 requires that "*Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity*" (paragraph 5.3.3). Furthermore, that '*the applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests*' (paragraph 5.3.4) and demonstrate that '*opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats*' (paragraph 5.3.18).

5.5.14 NPS EN-1 also requires that lighting effects will be considered on sensitive ecological receptors.

5.5.15 Based on the results of the extended Phase 1 Habitat Survey, there is a recommendation to undertake the following Phase 2 protected species surveys at the Power Generation Plant site:

Bats

5.5.16 Within the extended Phase 1 Habitat survey, three buildings were identified with potential to be used by bats for roosting. One of these buildings is located within the footprint of the proposed Power Generation Plant, whilst the other two are within 50m of the proposed footprint of the Power Generation Plant. It is therefore recommended that all three buildings will be subject to internal and external surveys followed by three dusk emergence and one dawn re-entry survey.

5.5.17 The surveys would be carried out by a CCW licensed bat worker and would be undertaken following consultation with the RCT Ecologist. Surveys would be undertaken during optimal survey period for bats (April to September).

5.5.18 In addition, three bat activity transect surveys will be carried out across the entire Power Generation Plant site during optimal survey period for bats (April to September) to identify which bat species are using the site and to investigate how they are using the different habitats for roosting, feeding, foraging, commuting and socialising wherever possible. All surveys will be undertaken by licensed bat workers and experienced bat surveyors equipped with bat detectors and recording devices. The surveys will also be undertaken in accordance with best practice guidelines (Bat Conservation Trust, 2012).

Badgers

5.5.19 Suitable habitat for badgers was identified within 30m of the proposed footprint of the Power Generation Plant, although no evidence of badgers was observed within the site during the Phase 1 Habitat survey.

5.5.20 It is proposed that a presence/absence survey is undertaken at the site to further assess the potential of impacting on badgers. The survey will be based on the standard approach detailed in Surveying Badgers (Harris et al., 1989)[3] and used during the National Badger Survey (Cresswell et al., 1990)[4]. Particular emphasis will be placed on locating badger setts and signs of territorial activity. This will involve searching for field signs associated with badgers. Surveys will be undertaken during the optimal survey period, which runs between February and May.

Method Statement SINC

5.5.21 A method statement will be produced for all works that might impact on the neighbouring Hirwaun Industrial Estate SINC to protect the designating features of the SINC from adverse affects from the proposed development.

5.5.22 Based on the current Power Generation Plant layout (Figure 2), it is considered that there is not a requirement for Phase 2 protected species surveys for Great Crested Newts (GCN), National Vegetation Classification (NVC) or invertebrates. However, if there are any changes to the proposed layout that resulted in development areas encroaching into areas with the potential to support these species, further methodology would be provided to and discussed with statutory consultees.

3 Harris, S. Cresswell, P and Jefferies, D. (1989) Surveying Badgers. The Mammal Society Publication No. 9 Mammal Society
4 Cresswell, P., Harris, S. and Jefferies, D.J. (1990). The History, Distribution, Status and Habitat Requirements of the Badger in Britain. Nature Conservancy Council, Peterborough

Gas and Electrical Connections

5.5.23 Extended Phase 1 Habitat Surveys will be undertaken along potentially suitable Gas Connection route corridors and the proposed Electrical Connection route corridors. The corridors will encompass a suitable buffer either side of the proposed routes to account for small variations in the final route (micrositing) and to account for the 'working width' (i.e. the area required for vehicle movements and laydown of equipment). The surveys will be undertaken using the same methodology and aims as for the Power Generation Plant site and will help to define the final route corridor choices.

5.5.24 The results of the Phase 1 surveys would identify the requirement for Phase 2 protected Species Surveys. As yet, the need, or otherwise for specific surveys cannot be determined with any certainty.

5.5.25 Following the completion of the Phase 2 Protected Species Surveys, reports will be produced, detailing the extent to which the species are present, the likely impacts that the Hirwaun Power Project will have on species and habitats and the potential mitigation measures that could be employed to reduce impacts to an acceptable level.

5.5.26 Assessment and reporting will follow guidelines as set out in the Guidelines for Ecological Impact Assessment (EcIA) (IEEM, July 2006).

5.5.27 All results would be compiled and presented in an ES chapter.

Appropriate Assessment

5.5.28 If it is found that the development of the HPP will have a Likely Significant Effect (LSE) on the nearby ecologically designated sites (e.g Blaen Cynon SAC)), sufficient information will be provided in a 'Statement to Inform an Appropriate Assessment' of the impact of the project on these ecologically designated sites, in accordance with the Habitat Regulations.

Potential Mitigation Measures

5.5.29 Embedded mitigation measures to limit impacts on ecology and biodiversity could include ensuring that no construction takes place within breeding bird season or during other sensitive ecological seasons. If necessary, further, specific mitigation measures will include the consideration for provision of new habitat to suitably replace any habitat areas which are permanently lost through development of the Power Generation Plant, Gas Connection or Electrical Connection.

5.6 Water Resources

Introduction

Power Generation Plant

5.6.1 This section of the ES will describe the potential impacts resulting from the development of the Power Generation Plant on local water quality. The Section will also provide a brief summary of the main issues and risks posed to and from flooding. However, these will be assessed in detail through a separate Flood Risk Assessment, submitted as a separate dedicated document as part of the DCO application. Additionally, potential impacts on hydrogeology will be assessed as part of the section describing geology, contamination and ground conditions (outlined in Section 5.7 of this Report).

5.6.2 The supply of water for construction of the HPP will ultimately be the responsibility of the principal construction contractor. In addition, the discharge of any effluents during construction, including site drainage, will also be the responsibility of the principal construction contractor who will be required to reach agreement with NRW, Internal Drainage Board (IDB) and the local sewerage undertakers with regards to detailed methods of disposal. Standard good working practices should ensure that any impacts due to water discharging from the site would be insignificant.

5.6.3 At present, it is assumed that the Power Generation Plant will utilise air cooling, substantially reducing water intake, as described in Section 3.2 above. During natural gas firing, the only process water required on a day-to-day basis would be that for make-up to the HRSG system (should CCGT plant be chosen).

5.6.4 Small quantities of water (blowdown) will be discharged to avoid the build-up of impurities in the HRSG steam/water cycle. The blowdown is virtually pure water containing very small quantities of various chemicals that are used to prevent corrosion and scaling in the system.

Gas and Electrical Connections

5.6.5 Separate sections of the ES will describe the potential impacts resulting from the development of the Gas and Electrical Connections on local water quality. As above, any impact of Flood Risk and Ground Water will be assessed in separate sections.

5.6.6 As there is no requirement for water usage during the operation of the Gas and Electrical (buried or overhead) Connections, the only consideration of water resources will be during the construction period,

and will follow the same principles as those described for construction of the Power Generation Plant.

Baseline

Power Generation Plant

5.6.7 Surface water bodies in the vicinity of the Power Generation Plant will be identified and described along with their importance. Based on an initial, high level assessment, the main water bodies are considered to be:

- Penderyn Reservoir – approximately 800m north of the site;
- Numerous drainage ditches and several small ponds on agricultural land to the south of Rhigos Road – approximately 400-500m south of the site; and
- Hirwaun Ponds – approximately 1km to the east of the site.

Gas Connection

5.6.8 None of the proposed Gas Connection route corridors (as described in Section 3.3 of this Report) require crossing over a large watercourse. Two of the proposed route corridors (routes 1 and 3) require crossing 6 and 5 minor field drains respectively. These field drains are all located on agricultural land to the east of the Power Generation Plant site.

Electrical Connection

5.6.9 The Electrical Connection would not cross any watercourses. It may cross over a waterlogged area to the north and west of the Power Generation Plant site boundary. However, if this is the case, it is likely that an overhead line will be preferred.

Assessment

Power Generation Plant

5.6.10 NPS EN1 recognises the need for EIA to account for the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment (paragraph 5.15.2).

5.6.11 NPS EN1 Paragraph 5.2.7 also states that the ES should describe any potential eutrophication impacts.

5.6.12 The Water Resources ES chapter for the Power Generation Plant would be undertaken using a risk based approach to determine the

level of potential impacts but will also use a Source–Pathway-Receptor model to identify which receptors could realistically be impacted by a given action.

5.6.13 All aspects of supply, demand and disposal of water and process effluents will be addressed for the construction, operational and decommissioning phases of the project.

5.6.14 Any potential sources of pollution which have the potential to impact on surface water bodies will be identified.

5.6.15 The disposal of surface water drainage and the process effluents to the sewage system will be discussed with a view to maximising the opportunities for water recovery and re-use as far as is practicable.

5.6.16 Potential discharge locations for site surface waters and process waste waters will be identified and a site drainage plan incorporating a sustainable drainage system (SuDS) will be discussed at a high level.

5.6.17 In terms of the Power Generation Plant, there are not anticipated to be any impacts on the water bodies listed above. The majority of them are a significant distance from the site and therefore will not be directly impacted during construction. It is not anticipated to directly abstract or discharge water to or from any of these sources during construction, operation or decommissioning of the Power Generation Plant.

5.6.18 Where projects are away from, or unlikely to interact with any water courses, it is likely that a Water Framework Directive (WFD) Report will not be required and it may be scoped out. However, if NRW does state that a WFD Report is required, this will need to be incorporated. The assessment for the WFD Report will involve consideration of the WFD Status of surrounding water bodies. The WFD Report must be approved by NRW and would form an Appendix to the ES.

5.6.19 As part of further baseline assessment, abstraction points and licences in the area will be investigated and summarised, and the potential impact on these abstractions will be qualified.

5.6.20 Historical maps would be studied to identify the course of any former watercourses which may have been undergrounded or culverted in the past and which could be impacted.

Gas Connection

5.6.21 The assessment methodology for the Power Generation Plant would be appropriate to use for the Gas Connection.

5.6.22 During construction of the Gas Connection, best practice working methods will be utilised at all water crossings to ensure that there are no impacts on flow or drainage and that no contamination is allowed to enter the drainage ditches.

Electrical Connection

5.6.23 Neither of the electrical route corridor options (either overhead line or underground cable) require any water crossings or interaction with water bodies of any kind.

Potential Mitigation Measures

5.6.24 Potential embedded mitigation measures which will be included during the construction of the HPP to limit impacts on water quality include siting of stockpiles a minimal distance from watercourses to avoid pollution runoff and adhering to best practice working guidelines to avoid spillages near watercourses.

5.6.25 Additionally, during construction and operation, silt traps and oil interceptors would be placed in any drains on site. No untreated surface or waste waters would be allowed to drain to drainage ditches or watercourses during construction or operation.

5.6.26 Sustainable Urban Drainage Systems would be used if practical.

5.6.27 The British Standard Code of Practice for Earthworks BS 6031:1981 contains detailed methods that should be considered for the general control of drainage on construction sites. Further advice is also available in the British Standard Code of Practice for Foundations BS 8004: 1086. These will be taken into account.

5.6.28 All aqueous process effluents will be discharged via the plant drainage systems and will be in accordance with EA limits. The use of biocides will be optimised to ensure that the least amount possible is required.

5.6.29 All oil and chemical storage tanks and areas where drums are stored will be surrounded by an impermeable bund. Single tanks will be within bunds sized to contain 110% of capacity and multiple tanks or drums will be within bunds sized to contain the greater of 110 per cent of the capacity of the largest tank or 25 per cent of the total tanks contents.

5.6.30 During operation, NRW will set limits on the quality of water that is discharged from the site under the Environmental Permit. The need, or otherwise for further, specific mitigation measures will be determined through the EIA process.

5.7 Geology, Ground Conditions and Land Use

Introduction

Power Generation Plant

5.7.1 This section of the ES will detail the baseline geological and hydrogeological conditions of the Power Generation Plant site and outline the potential environmental impacts of the proposed Power Generation Plant on these resources. It will also detail the baseline conditions in terms of ground and ground water contamination and the risks posed to human health (particularly future site users). It will also consider any impacts that the project may have on the physical geological, soil or agricultural resource, through e.g. removal of rare geology, sterilisation of mineral assets, removal of good quality agricultural land or disturbance of sites designated for their geological importance and significance.

5.7.2 The main potential impact from the development of the Power Generation Plant in terms of geology and land quality is the mobilisation of existing contaminants which may be present at the site.

Gas and Electrical Connections

5.7.3 As above, the ES sections describing the geology, land use and hydrogeology of the gas and electrical route corridors will follow the same structure as described for the Power Generation Plant.

5.7.4 The main potential impact from the development of the Gas Connection is likely to be the potential sterilisation of good quality agricultural land.

Baseline

Power Generation Plant

5.7.5 It is understood that prior to the development of the Hirwaun Industrial Estate, the area proposed for the Power Generation Plant was open agricultural land. The site to be developed for the Power Generation Plant is currently occupied by a large distribution warehouse.

5.7.6 Key developments in the vicinity of the Power Generation Plant in terms of geology and contamination include:

- Former Armaments Factory, previously located in Hirwaun Industrial Estate;
- Tower Opencast Quarry - approximately 1km to the south of the Power Generation Plant site;

- Former Tower Colliery, Rhigos – approximately 1.5km south of the Power Generation plant site;
- Disused 'pits' which now form part of Hirwaun Ponds – approximately 800m west of the Power Generation Plant site; and
- Ironworks in Hirwaun – 2km east of the Power Generation Plant site.

5.7.7 The area in the vicinity of the Power Generation Plant is known to have been the subject of mining for coal, iron ore and limestone. The Tower Colliery was the oldest continuously worked deep coal mine in the UK which closed in 2008 and during its operational life, worked up to 14 underground seams.

5.7.8 Further deep mines are situated in the vicinity of the site and recently opencast mining has started at the Tower Colliery site.

5.7.9 British Geological Survey (BGS) maps indicate that the superficial geology of the area is a mixture of till (poorly sorted clay, sand and gravel) and waterlogged peat deposits.

5.7.10 Bedrock geology comprises the South Wales Lower coal measures formation – including a mixture of mudstone, siltstone and sandstone.

5.7.11 The Lower Coal Measures have been classed as a Secondary Aquifer B, meaning that they are moderately productive in terms of groundwater flow.

Gas Connection

5.7.12 The Gas Connection would run to the east of the Power Generation Plant site, mainly across agricultural fields and adjacent to roads.

5.7.13 British Geological Survey (BGS) maps indicate that the superficial and hard rock geology underlying the Gas Connection route corridors is the same as that underlying the Power Generation Plant.

5.7.14 Unlike the Power Generation Plant, the main impact of the Gas Connection is likely to be the sterilisation of agricultural land.

Electrical Connection

5.7.15 The Electrical Connection would run to the west of the Power Generation Plant site. if underground, it would run across land similar to that surrounding the Power Generation Plant site (e.g. hardstanding, scrub and adjacent to roads).

5.7.16 British Geological Survey (BGS) maps indicate that the superficial and hard rock geology underlying the Electrical Connection route corridors is the same as that underlying the Power Generation Plant.

5.7.17 Similar to the Power Generation Plant, the main impact of the Electrical Connection is likely to be the mobilisation of any existing contamination.

Assessment

Power Generation Plant

5.7.18 Assessment will be underpinned by the DEFRA/EA publication Contaminated Land Report 11, 2004, "Model Procedures for the Management of Land Contamination" and associated subsequent guidance.

5.7.19 The assessment approach will be undertaken with a clear understanding of the following:

- Previous land uses – through a review of historical maps;
- Underlying ground conditions – through a review of BGS maps, and a review of previous site investigations (where available) and a Coal Authority Report;
- Existing physical baseline conditions through a site walkover survey and review of a Landmark Envirocheck Report.

5.7.20 The Landmark Envirocheck Report for the site will identify groundwater vulnerability, sites designated for geological importance, details of any previous pollution events at the site or surrounding area, details of landfills, waste management sites and COMAH sites within the site and surrounding area and historical maps.

5.7.21 A conceptual site model approach will be used to assess the risks posed by contaminants to sensitive receptors using a source, pathway receptor model, based on the following:

- **Source** – potential source of contamination.
- **Pathway** – means by which contamination can reach and impact upon a receptor.
- **Receptor** – that which may be adversely affected by the presence of contamination.

5.7.22 Desk studies will identify potential environmental and geotechnical liabilities associated with the development of the site, including an assessment of potential impacts of previous uses of the site and

surrounding area. These desk studies are important if any potential environmental and geotechnical risks are to be identified, and a focussed and cost efficient intrusive investigation is to be designed (if required).

5.7.23 In undertaking the desk studies, all available information on the sites and surrounding areas will be reviewed to establish local ground conditions and the environmental settings. Furthermore, consultation will be held with the relevant Local Authorities and NRW to obtain any other environmental records available for the project sites and to further refine the assessment methodology.

5.7.24 A site walkover will be undertaken, covering the project site and immediate surrounding areas. This will ensure all potential source, pathway and receptor linkages for potential contamination issues have been identified.

5.7.25 Based on the findings of the desk studies, site walkovers and preliminary risk assessment, recommendations will be provided for any further intrusive investigation work thought to be necessary to satisfy current Standards / Guidance and fill any data gaps identified to fully inform the assessments of environmental and geotechnical risks / liabilities.

5.7.26 Using the information obtained suitable remediation strategies would be developed that could be implemented to render the site ready for development as appropriate.

5.7.27 These would include estimates of the types and volumes of waste material that will need to be removed from the sites prior to development.

Gas and Electrical Connections

5.7.28 The assessment methodology of the Power Generation Plant would be appropriate for use on both the gas and Electrical Connection route corridors and will be followed as described above.

5.7.29 Additionally, an assessment will be made of the amount of agricultural land, if any, that may become sterilised as a result of the development of the Gas Connection.

Potential Mitigation Measures

5.7.30 Embedded mitigation measures will include adherence to good practice guidelines and could involve, for example,

- Any additional soil materials that are to be imported to the sites will be required to have certification of their chemical concentrations to ensure that contaminative materials are not being introduced to the area.
- In order to further limit disturbance, the site access tracks will be constructed first to allow movement of vehicles around the site on areas of soft-standing.
- Any vegetation, topsoil and subsoil will be removed to expose a suitable sub-grade. Any soils, sub-soils or aggregate suitable for reuse will be stockpiled on impermeable liners.
- Soils which are to be reused onsite will be tested for contamination and geotechnical suitability. This will form part of a site waste management plan (SWMP) which will be drafted prior to construction and will focus on the re-use, recycling and reduction of waste spoil.
- Surface water, perched waters or groundwater from dewatering operations will not be discharged to surface water, foul or surface water drains without the appropriate consents from the local water or sewage company and / or NRW.
- The disposal of this effluent will be the responsibility of the contractor. If necessary, this water will be tanked off-site for disposal at a suitable facility.
- All foundations will be appropriately specified to resist chemical attack from soils or groundwater.
- Foundations will also be designed so as not to present a preferential pathway for contaminant migration, if present at the Power Generation Plant site.

5.7.31 Further, specific mitigation measures could include, for example, remediation of the site, removal of contamination hotspots or further site characterisation and will be determined during the EIA.

5.8 Landscape and Visual

Introduction

Power Generation Plant

5.8.1 This section of the ES will describe the potential impacts that the Power Generation Plant could have on landscape elements and sensitive visual receptors in the surrounding area.

5.8.2 This Section will establish the following:

- A clear understanding of the land affected by the HPP and its wider landscape setting, identifying its landscape character, resources, value and sensitivity to the proposed development;
- An assessment of the composition, character and aesthetic value of views from visual receptors including occupiers of residential properties and people using amenity landscapes, and the sensitivity of views;
- The nature of the different development scenarios and mitigation measures; and
- The likely significant direct and indirect effects of the proposal on the landscape resource (i.e. landscape elements and character) and on visual receptors.

5.8.3 The buildings of the Power Generation Plant will be finished in a manner which will have regard to the views of community and stakeholder consultation to minimise the impact with respect to the landscape. Attention will be paid at all times to aspects of good design that can be incorporated into the project to minimise visual impacts and identify reasonable mitigation where possible and appropriate in line with NPS EN-1. Consideration will also be given to the potential impacts of lighting arising from the Power Generation Plant and measures will be put forward to limit the amount of offsite light spill.

Gas Connection

5.8.4 It is not anticipated that the Gas Connection will give rise to significant visual impacts, as it will be undergrounded for the majority of its length. Nevertheless, assessment will be made of the potential impact of any above ground structures (e.g. substation and AGI).

Electrical Connection

5.8.5 As for the Gas Connection, is not anticipated that a buried Electrical Connection would give rise to any significant visual impacts, as it will be undergrounded for the majority of its length.

5.8.6 However, there is the potential that an overhead line may be used to export the electricity from the Power Generation Plant to the National Grid. If this is the case, a full landscape and visual impact assessment will be undertaken in line with EN-1 and the additional guidance set out in EN-5, ensuring that the assessment conforms to all of the 'Holford Rules' as far as possible.

5.8.7 Furthermore, whether the Electrical Connection takes the form of an underground cable or an overhead line, some element of above ground

infrastructure will be required where the connection joins the National Grid infrastructure.

5.8.8 Irrespective of the type of connection, a full visual impact assessment of this infrastructure will be carried out following the guide lines set out in EN-1 and EN-5

Baseline

Power Generation Plant

5.8.9 Land surrounding the Power Generation Plant site is characterised by a mixture of industrial units, scrub grassland and plantation woodland. The A465 'Heads of the Valleys' Road runs approximately 100m north of the site and the Tower Colliery is approximately 1km south of the site. The closest residential receptors to the site include

- Rhigos (1.3km south west);
- Hirwaun (1.4km east); and
- Penderyn (1.8km north).

5.8.10 Although the area immediately surrounding the proposed Power Generation Plant is characterised by industrial development, the wider landscape is made up of open countryside with rolling hills and agricultural landholdings. Furthermore, the BBNP is situated approximately 0.3km to the north of the Power Generation Plant site at its closest point. The Power Generation Plant will be viewed in the context of surrounding industrial developments and with the 46.8 sq.km Pen y Cymoedd wind farm on higher ground 5km beyond, although it is appreciated that there is the potential for the project to have impacts on the landscape character and visual amenity of wider surrounding area. As such, a great proportion of the assessment will focus on potential impacts to this more rural setting and the protected landscape of the BBNP.

Gas Connection

5.8.11 The Gas Connection will run to the east of the Power Generation Plant site, crossing a mixture of agricultural and urban land. The general land use pattern is as described above for the Power Generation Plant, although some of the route corridor options pass closer to residential receptors than the Power Generation Plant (e.g. Gas Connection Route Corridor 1 passes adjacent to a property on Rhigos Road.).

Electrical Connection

5.8.12 The Electrical Connection would run to the west of the Power Generation Plant site over a very short length. The general land use pattern and closest residential receptors are as described above for the Power Generation Plant.

5.8.13 Should an overhead line Electrical Connection be the preferred option, the visual impact would be considerably greater, and it would likely be visible from number of viewpoints.

Assessment

Power Generation Plant

5.8.14 NPS EN-1 states that National Parks, together with the Broads and Areas of Outstanding Natural Beauty (AONBs), have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. Where decisions may directly affect such areas, paragraph 5.9.9 requires the SoS to have regard to the statutory purposes of the potentially affected area/s. The statutory duties are provided for in Section 11A(2) of the National Parks and Access to the Countryside Act 1949 (National Parks), Section 17A of the Norfolk and Suffolk Broads Act 1988 (The Broads) and Section 85 of the Countryside and Rights of Way Act 2000 (AONBs).

5.8.15 NPS EN-1 confirms that the duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside the boundaries of these areas which may have impacts within them. EN-1 confirms "*That the aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints*" (paragraph 5.9.12).

5.8.16 Additionally, Paragraph 5.9.13 of EN-1 states that the fact that a proposed project is visible from within a designated area should not in itself be a reason for refusing consent.

5.8.17 With respect to the landscape and visual impacts '*of thermal combustion generating stations, the IPC [decision maker] should presume that the adverse impacts would be less if a hybrid or direct cooling system is used and that developers will use BAT [best available techniques]* (paragraph 5.9.4)' EN-2 notes that '*It is not possible to eliminate the visual impacts associated with a fossil fuel generating station*' and so mitigation will be reducing such impacts as practicable (paragraph 2.6.5).

5.8.18 The assessment will include:

- A desk review of all relevant documents and landscape planning policy and guidance;
- A field survey to assess baseline landscape character and visual amenity;
- A description of the key features associated with the development that has the potential to alter the characteristics of the landscape and visual baseline;
- Appropriate generic and site specific mitigation that is reasonable and possible;
- Assessment of the predicted significance of residual effects on the landscape resource / character and visual amenity and compliance with landscape policy; and
- An assessment of cumulative effects arising from the proposal, in combination with other proposed large scale industrial developments in the locality.

5.8.19 The landscape assessment will be undertaken using methodology set out in the Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Management and Assessment, 2nd Edition, 2002) ("Landscape Institute's Guidelines") and Countryside Council for Wales/Cadw (2007) Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process.

5.8.20 The following stages are undertaken in the assessment:

- Desk study and preliminary site survey;
- Baseline assessment (consisting of desk study, field survey and reporting);
- Assessment of effects on the perception of the landscape;
- Assessment of residual visual effects;
- Conclusions on overall landscape and visual amenity effects.

5.8.21 Initially, a Zone of Theoretical Visibility (ZTV) plan will be generated for the Power Generation Plant using specialist software. The ZTV will show a maximum theoretical visibility of the project across the surrounding area. The ZTV will be based solely on topography and proposed height of the plant envelope. No allowance will be made for intervening screening vegetation or buildings, although in practice this tends to have a substantial mitigating effect.

5.8.22 A desk top review of all relevant planning policy and LANDMAP (the national information system, devised by CCW, for taking landscape into account in decision-making) will be undertaken. Particular attention will be paid to the BBNP, Areas of Outstanding Natural Beauty, Areas of High Landscape Value, and popular tourist spots and viewpoints.

5.8.23 The Power Generation Plant will be discussed in detail including dimensions of the larger buildings, the stack heights, and any other ancillary infrastructure that may have an impact on the landscape.

5.8.24 To assist in the impact assessment, a site visit will be made by a qualified landscape architect, who will assess the study area in detail. Additionally, and following engagement with relevant stakeholders, a selection of photomontages will be taken from key sensitive viewpoints (e.g. residential receptors, designated ecological sites, cultural heritage assets, key rights of way).

5.8.25 Photomontages would be produced with reference to *'Photography and photomontage in landscape and visual impact assessment Landscape Institute Advice Note 01/11'.*

5.8.26 An appropriate number and choice of viewpoints will be selected for the actual assessment. It is proposed that up to six photomontages would be produced to illustrate the development from key views. Suggested viewpoint locations for photomontages are:

- Hall Road – (approximately 800m west) to represent Hall Road and Hall Close;
- Heol Y Graig Road - Rhigos (approximately 1km south west) to represent Rhigos, users of the main road out of Rhigos and Rhigos Primary School;
- Views from the A4059 - where it crosses over the Railway line near Hirwaun (1.2km east) to represent views from Hirwaun and the A4059;
- Pontbren Llwyd (2 km north) – to represent views of residential properties;
- Pendryn (2.5 km north) – to represent residential properties; and
- BBNP (0.3km north of the site) - to represent amenity users.

5.8.27 The photomontages will show a representation of how the proposed Power Generation Plant envelope would be viewed within the landscape and will be used to inform the assessment of the impact of the development.

Gas Connection

5.8.28 Given that the majority of the Gas Connection will be underground, the landscape and visual impact assessment for this element of the work will focus solely on the impact of the AGI.

5.8.29 This will follow the methodology described above and will be carried out in parallel, where possible, using the same view point locations and incorporating both elements of the project on photomontages where they will be visible in the same view.

Electrical Connection

5.8.30 As for the Gas Connection, if the underground Electrical Connection is carried forward, then the LVIA for this element of the work will focus solely on the cumulative impact of above ground structures (e.g. the substation).

5.8.31 If an overhead line is taken forward, the assessment will follow the standard LVIA methodology as described above, but will make reference to the Holford and Horlock rules and EN-5 where appropriate.

Potential Mitigation Measures

Power Generation Plant

5.8.32 During construction and decommissioning, embedded mitigation measures could include the careful consideration of siting of stockpiles and cranes to avoid detrimental impacts on the visual amenity of closest receptors.

5.8.33 During operation, the main embedded mitigation measures will be the careful siting and arrangement of plant. The final architectural design of the buildings will be carefully considered to provide a high standard of visual amenity, given practical and economic constraints.

5.8.34 The external structures will be designed such that there will be minimal deterioration in the appearance over time.

5.8.35 Further, detailed mitigation measures could include the consideration for on site or off-site screen planting to screen views of the Power Generation Plant.

5.8.36 Due regard will be paid to NPS EN-1 and EN-2 and the guidance they provide on ‘good design’.

Gas Connection

5.8.37 The mitigation for the Gas AGI is anticipated to be the same as that described above for the Power Generation Plant.

Electrical Connection

5.8.38 Regardless of if an underground or overhead electrical connection is progressed, mitigation will follow principles of good design as described in EN-5. For an overhead line this would include:

- Avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if total mileage is somewhat increased in consequence;
- Avoid smaller areas of high amenity value or scientific interest by deviation, provided this can be done without using too many angle towers, i.e. the bigger structures which are used when lines change direction;
- Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers;
- Choose tree and hill backgrounds in preference to sky backgrounds wherever possible. When a line has to cross a ridge, secure this opaque background as long as possible, cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees;
- Prefer moderately open valleys with woods where the apparent height of towers will be reduced, and views of the line will be broken by trees;
- Where country is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, so as to avoid a concentration of lines or “wirescape”; and
- Approach urban areas through industrial zones, where they exist; and when pleasant residential and recreational land intervenes between the approach line and the substation, carefully assess the comparative costs of undergrounding.

5.9 Waste Management

Introduction

Power Generation Plant

5.9.1 There are three main phases of the development of the Power Generation Plant where solid waste arisings will occur; these are: construction (including demolition of existing structures and site preparation), operation and decommissioning.

5.9.2 During construction and decommissioning, it is likely that wastes such as concrete, inert builders rubble, spoil and scrap metal will be produced.

5.9.3 Solid waste from the Power Generation Plant during operation is considered to be minimal and will be both non-hazardous and hazardous in nature. The wastes produced during the operational phase include used air filters, scrap metal, used insulation material, general office waste, and other miscellaneous wastes. Small quantities of water (blowdown) will be discharged to avoid the build-up of impurities in the HRSG steam/water cycle.

Gas and Electrical Connection

5.9.4 For the Gas and Electrical Connections, waste is only anticipated during the construction and decommissioning phases.

Baseline

Power Generation Plant

5.9.5 Currently the Power Generation Plant site is occupied by industrial buildings and hardstanding. The possible route of the Electrical Connection will be under scrub/waterlogged grassland and the Gas Connection through the Hirwaun Industrial Estate and along roads / across agricultural fields.

5.9.6 The main works associated with the development of the Power Generation Plant will be the demolition of existing buildings, levelling of the site, covering in hardstanding and the installation of modest foundations.

5.9.7 These activities will involve the generation of waste, some of which will need to be safely removed from site. Some of this waste may include asbestos (from existing buildings).

Gas Connection

5.9.8 The laying of the Gas Connection will primarily involve the excavation of a trench and backfilling with spoil (although drilling techniques will be used if the route crosses under watercourses / roads or railways.

5.9.9 These activities will involve the generation of waste, some of which will need to be safely removed from site.

Electrical Connection

5.9.10 The laying of the underground Electrical Connection will primarily involve the excavation of a trench and backfilling with spoil (although drilling techniques may be used where the route crosses under roads or watercourses).

5.9.11 If an overhead line is installed, the amount of earthworks would be reduced, although significant excavations would be required for the installation of foundations to support the overhead line towers.

5.9.12 These activities will involve the generation of waste, some of which will need to be safely removed from site.

Assessment (Power Generation Plant, Gas Connection and Electrical Connection)

5.9.13 The waste management assessment will involve a DBA including the following elements:

- Identification of relevant legislation, sources of information and local strategies and plans;
- Consideration of solid waste arising during the construction, operational and decommissioning phase of the power station; and
- Demonstrating compliance with the waste hierarchy (e.g. reduce, reuse, recycling, recovery and/or disposal) when managing all wastes.

5.9.14 The assessment of the impacts will include:

- Consideration of any relevant consultee responses / requirement;
- An estimation of the likely construction and operational waste arisings;
- An assessment of the potential impact of the estimated construction and operational waste arisings in the context of baseline conditions and local infrastructure capacity;
- Identification and consideration of any best practice measures (to minimise or eliminate waste and the adverse effects caused by waste) that will be adopted as mitigation. Also looking at where reprocessed materials could be used on site;
- An assessment of the significance of projected waste arisings following mitigation. Demonstrating how mitigation will reduce the impacts/effects of the waste arisings;
- An assessment of the cumulative impacts with other proposed and operational schemes.

Potential Mitigation Measures (Power Generation Plant, Gas Connection and Electrical Connection)

5.9.15 The main embedded mitigation measure which will be employed during the construction, operational and decommissioning phases will be to minimise the production of waste where practical. Wherever possible, waste materials will be re-used or re-cycled, this will be achieved partly through the SWMP.

5.9.16 Further, specific mitigation measures, if necessary, will be determined through the EIA.

5.10 Traffic, Transport and Access

Introduction (Power Generation Plant, Gas Connection and Electrical Connection)

5.10.1 The main impacts of the HPP on traffic, transport and access will occur during construction. The construction traffic is expected to consist mainly of vehicles for the transport of construction personnel to and from the site. The construction period (as stated in Section 3.3 of this Report) is likely to be between 12 and 36 months depending on the final choice of technology.

5.10.2 There will also be a number of other transport movements during construction including civil works traffic, mechanical works traffic and heavy/abnormal loads. Total vehicles (heavy goods vehicles, light goods vehicles, cars) peak movements will vary depending on the phase of construction and the activities which are being undertaken on site.

5.10.3 The transport of abnormal loads, which may lead to delays and cause inconvenience to other road users, would be timed following consultation with the relevant authorities to minimise disruption to the other road users.

5.10.4 Normal operation will naturally result in fewer traffic movements than those associated with construction and will be associated with personnel required for operation and maintenance of the plant. As such, during operation no significant increase in traffic in the area of the site is expected, and no effect on local traffic patterns and infrastructure would therefore be anticipated.

Baseline (Power Generation Plant and Electrical Connection)

5.10.5 It is likely that access to the site for construction and operation of the Power Generation Plant and Electrical Connection would be via the M4,

accessed from junction 43 via the A465, A4061 (Rhigos Road), Fifth Avenue and Main Avenue.

Gas Connection

5.10.6 For the Gas Connection, access may also be required from the A4061 (Rhigos Road).

Assessment (Power Generation Plant, Gas Connection and Electrical Connection)

5.10.7 NPS EN 1 states that in relation to transport impacts, following full assessment, the need for travel plans or other demand management or other mitigation should be considered particularly for the construction phase (5.13.6), and the decision maker should consider the feasibility and cost effectiveness of such measures (paragraph 5.13.8, EN-1).

5.10.8 The assessment will be undertaken in accordance with the *"Guidance on Transport Assessment*" published by the Department for Transport and will gauge the likely impact of the proposed HPP on the local road network.

5.10.9 Comparisons between existing traffic flows and estimates of likely future traffic flows on potentially affected roads will be made. It will then be established whether significant effects are likely. This will take into account: the sensitivity of receptors; the resources likely to be affected; any potential for disruption to local routes; and, any changes in the composition of traffic. If considered necessary, traffic surveys would be undertaken which would further quantify the number of vehicle movements on the existing road network in the vicinity of the site.

5.10.10 The majority of the proposed access routes are 'main roads' that do not have pavements for pedestrian use. Nonetheless, the traffic assessment will also take full account of the potential impact on pedestrians, and will ensure that pedestrians and other road users (cyclists) are not cut off from amenity areas as a result of the works.

5.10.11 The proposed assessment requires consideration of the following: access and construction routes and the types of vehicles used; local highway and rail networks; existing traffic flows; current traffic generation; road traffic accident information; predicted traffic trends; local highway improvements and planned works; and, potential receptors. The full appraisal would be presented in a Transport Assessment which would be accompanied with a Construction Traffic Management Plan.

5.10.12 Discussions will be held with the Highways Agency and RCT to identify any existing issues relating to traffic in the area and to scope the extent and detail required for the Transport Assessment. Information will also be sought on future projects in the area which could give rise to a significant cumulative impact when considered in conjunction with the Power Generation Plant, Gas and Electrical Connections.

5.10.13 The A465 dualling scheme is part of the National Transport Plan and will improve the length between Abergavenny and Hirwaun to dual 2-lane standard by 2020. The improved road will upgrade links to businesses and communities, ease traffic congestion and improve safety. The scheme comprises widening of some 40km of the existing A465 between the Hardwick Roundabout at Abergavenny and the existing roundabout to the west of Hirwaun.

5.10.14 For construction, the road development project has been divided into six sections. The A465 / A470 Junction to Hirwaun is the last of the six sections to be completed for the scheme and as such, the section does not yet have a programme date but will be commenced in time for completion by 2020.

Potential Mitigation Measures (Power Generation Plant, Gas Connection and Electrical Connection)

5.10.15 The main potential impacts on traffic movements are likely to be associated with the construction phase of the HPP. During construction, opportunities for reducing traffic movements will be explored, such as car share schemes, shift working (i.e. not all construction traffic arriving at site at once) or the use of minibuses through the production of a Travel Plan for the construction and operational phases of the Project.

5.11 Cultural Heritage and Archaeology

Introduction

Power Generation Plant

5.11.1 This Section of the ES will provide an assessment of the significance of the archaeological and cultural heritage assets of the Power Generation Plant site and its immediate environs, and the potential impact that the development may have on these resources.

Gas and Electrical Connection

5.11.2 Separate Sections of the ES will be produced which describe the likely significant effects that the Gas and Electrical Connections may have on

the archaeological resource present along the connection route corridors.

5.11.3 The objectives of these assessments are to:

- Describe the survival and extent of any archaeological features which may be disturbed by the proposed development;
- Provide an assessment of the importance of these assets;
- Assess the likely scale of any impacts on the archaeological and cultural heritage resource posed by the development;
- Outline suitable mitigation measures to avoid, reduce or remedy significant adverse effects; and
- Provide an assessment of any residual effects remaining after mitigation.

Baseline

Power Generation Plant

5.11.4 The site of the proposed Power Generation Plant is an industrial estate and is currently occupied by a mixture of modern industrial buildings and hardstanding, although there are also small areas of scrub, grassland and woodland. The main works associated with the development of the Power Generation Plant will be the demolition of existing buildings, levelling of the site, covering in hardstanding and the installation of foundations.

5.11.5 A search of the Historic Wales online database[5] has revealed that the only Scheduled Ancient Monument in the vicinity of the Power Generation Plant site is the remains of Hirwaun Iron Works.

5.11.6 There are very few listed buildings with 2km of the Power Generation Plant site. These include:

- Colliery Buildings at the former Tower Colliery, Rhigos – approximately 1.5km south;
- War Memorial and Clock Tower, Tramroad Causeway and Bridge and Nebo Independent Chapel, Hirwaun – approximately 2km east; and
- Old house, with attached byre and barn at Trebanog Fach – approximately 1km north.

[5] http://jura.rcahms.gov.uk/NMW/Map

5.11.7 All of these buildings are Grade 2 listed.

5.11.8 In the wider vicinity of the Power Generation Plant site, there are larger clusters of listed buildings in:

- Pentreclwydau – 2.5km west;
- Aberdare – 5km east; and
- Penderyn – 3km north.

5.11.9 There are likely to be some large structures associated with the development of the Power Generation Plant which may be visible from these listed buildings. However, the development of the Power Generation Plant would not alter the already industrial make up of the site and surrounding area, and it is not anticipated that the project would impact on the immediate setting or appreciation of these buildings.

5.11.10 One entry on the National Monuments Record of Wales is recorded approximately 50m to the north of the Power Generation Plant, which relates to the former Hirwaun Royal Armaments Factory.

5.11.11 The National Monuments Record of Wales records a few isolated remains within the immediate vicinity of the site, including a Bronze Age Cairnfield approximately 200m to the north west, and a post-medieval colliery approximately 200m to the south west of the site.

5.11.12 During construction, the main potential impacts on any archaeological and cultural heritage assets, will be the potential disturbance of buried archaeological remains, both known and unknown.

5.11.13 Given the current site use, the Power Generation Plant is not anticipated to have any significant impacts on buried archaeology as previous development of the site is likely to have removed or destroyed any archaeological remains. Although it is considered unlikely that significant archaeological remains will be present on site, the presence of previously unknown archaeological sites should not be ruled out due to the possible shallow nature of previous ground disturbance, and areas of undisturbed ground.

5.11.14 There are likely to be large items of plant involved in the construction of the Power Generation Plant (e.g. cranes). However, these would be temporary structures, and given the distance from sensitive receptors (e.g. listed buildings) they are not anticipated to impact on the setting of these assets.

5.11.15 The main potential impacts during operation are those on the setting of above ground assets resulting from the Power Generation Plant.

Gas Connection

5.11.16 Connection through the Hirwaun Industrial Estate and along roads / across agricultural fields.

5.11.17 There remains the potential for the Gas Connection to impact on the buried archaeological resource, as it is likely that it will be constructed in previously un-developed agricultural land.

Electrical Connection

5.11.18 The possible routes of the Electrical Connection are to the west of the site either alongside roads or over scrub/waterlogged grassland areas.

5.11.19 The main potential impacts arising from the electrical connection would be on the setting of upstanding heritage assets (e.g. listed buildings) should an overhead line be considered as the preferred connection option.

5.11.20 Given the close proximity of the electrical connection to the Power Generation Plant site, those assets listed above as potentially impacted by the Power Generation Plant may also be impacted by an overhead line.

Assessment

Power Generation Plant

5.11.21 NPS EN 1 states that in relation to the setting of heritage assets, the decision maker '*should treat favourably applications that preserve those elements of the setting that make a positive contribution to, or better reveal the significance of, the asset. When considering applications that do not do this, the IPC [decision maker] should weigh any negative effects against the wider benefits of the application*' (paragraph 5.8.18, EN-1).

5.11.22 Initially, a DBA will be undertaken, and will include the following detailed searches:

- The Royal Commission on Ancient and Historical Monuments Wales is the investigative body and national archive for the historic environment of Wales and hosts an online search facility (Coflein);
- Glamorgan and Gwent Archaeological Trust (GGAT) Historic Environment Record (HER) (which includes records of any previous archaeological interventions within the Scheme Area). The HER will also include details of Registered Parks and Gardens, Listed Buildings and Registered Battlefields;

- Aberdare Local Reference Library;
- Historic Mapping; and
- Conservation Areas and Historic Landscape Characterisation.

5.11.23 The DBA will be undertaken in accordance with 'Standard and Guidance for Archaeological Assessments' (Institute for Archaeologists, 2011).

5.11.24 It is proposed that initially, searches are limited to 1km for HER entries.

5.11.25 As part of the DBA, an inspection of the Power Generation Plant site would be undertaken to identify any previously unknown archaeological features and their condition. During the site inspection a detailed photographic record would be maintained.

5.11.26 At this stage, no intrusive investigations are proposed for cultural heritage or archaeological purposes, although this will be confirmed (or otherwise) based on the findings of the DBA, and in consultation with the GGAT Planning Archaeologist and representative of CADW. Should intrusive investigations be necessary, their scope would be agreed with the Planning Archaeologist through a Written Scheme of Investigation (WSI).

5.11.27 In order to gather baseline setting data, and to undertake an assessment of the potential impacts which the development may have on the setting of any above ground remains, selected heritage assets will be visited. This will follow an initial study making reference to the results of desk-based research, and the ZTV including searches of the records listed above. Assets will be visited where this initial study indicated potential for significant impacts. Both the asset and its surrounding area will be visited to identify third locations that might be relevant to the asset's setting.

5.11.28 For the purposes of the setting study, the following assets will be considered:

- Scheduled Monuments;
- Listed Buildings;
- Registered Parks and Gardens;
- Registered Battlefields;
- World Heritage Sites;

- Any other non-scheduled building which is considered to be important in terms of cultural heritage and archaeological significance.

5.11.29 It is proposed that the search area for these assets will be limited to 5km from the centre of the proposed Power Generation Plant, as, based on experience of similar developments, significant impacts on setting are unlikely to occur beyond 5km. However, should significant impacts be identified, then the search area would be expanded accordingly.

5.11.30 NPS EN-1 states in relation to the setting of heritage assets that the decision maker '*should treat favourably applications that preserve those elements of the setting that make a positive contribution to, or better reveal the significance of, the asset.* When considering applications that do not do this, the IPC [decision maker] should weigh any negative effects against the wider benefits of the application' (paragraph 5.8.18, EN-1).

5.11.31 The setting studies will reference Welsh Office Circular 61/96, which sets out guidance for Historic Buildings and Conservation Areas[6].

5.11.32 Circular 61/96 states that "*Setting is often an essential part of a buildings character.....Also, the character of listed buildings may suffer and they may be robbed of much of their interest and the contribution they make to townscape or countryside if they become isolated from their surroundings*" (paragraph 11).

5.11.33 There is no Specific TAN detailing planning guidance for archaeology and cultural heritage. However, TAN 12 *'Design'* sets out principles which should be followed in the design of a new development. Paragraph 5.6.2 states that in considering the design of a new development, a key aspect is likely to be the setting and views of key buildings, landscape, parks and gardens, archaeology and skylines within, to and from the [development] area.

5.11.34 The following factors are also considered to be relevant when assessing impacts upon setting (Taken from English Heritage (2011 and CADW 'Conservation Principles for the Sustainable Management of the Historic Environment in Wales').

- Visual Dominance;
- Scale;
- Intervisibility;

[6] http://www.cpat.org.uk/resource/circular/woc61-96.pdf

- Vistas and Sight Lines;
- Movement and Light; and
- Unaltered settings

5.11.35 The DBA will form the baseline data for the Cultural Heritage and Archaeology Section of the ES. The ES Section will discuss the nature and location of all cultural heritage and archaeological sites within the Scheme Area. Further to this, the ES will provide an assessment of the significance of any impacts to the cultural heritage and archaeology sites. Where necessary, recommendations will be made for a mitigation strategy to preserve in-situ any significant archaeological assets. The ES will also include a mitigation strategy for any significant impacts to listed buildings and other above – ground assets.

Gas and Electrical Connections

5.11.36 It is proposed that the same assessment methodology is used for assessing potential impacts of the Gas and Electrical Connections.

Potential Mitigation Measures (Power Generation Plant, Gas Connection and Electrical Connection)

5.11.37 Prior to construction, the nature and extent of known/recorded archaeology present at the site and surrounding areas will have been established. However, should any unrecorded archaeological remains be found during construction, work will be halted and advice sought from the RCT archaeologist.

5.11.38 During operation, further mitigation measures could include the opportunity to provide screen planting, should the development give rise to any adverse impacts on above ground heritage assets.

5.12 Socio-economics

Introduction (Power Generation Plant, Gas Connection and Electrical Connection)

5.12.1 At its peak, the construction workforce is expected to employ between 150 and 250 personnel. Whilst subject to procurement rules, it is anticipated that as much as possible of this workforce will be recruited locally.

5.12.2 Operation of the Power Generation Plant would require a maximum of up to 30 full time staff (for CCGT operation) although for other technology choices this number would be of the order of 10 to 15. There would be further indirect jobs for contracted engineering staff

during regular maintenance shutdowns and regular maintenance of the Gas and Electrical Connections.

5.12.3 A recent Report by Ernst and Young entitled "Powering the UK – Investing for the future of the Energy Sector and the UK" has estimated that direct employment in the energy sector *".....grew from 83,000 to 137,000 between 2008 and 2011, with growth of 6% between 2010 and 2011. The indirect employment benefit is over three times the direct benefit bringing the total number of jobs supported by the sector to around 655,000".*

5.12.4 Local companies will likely provide further unskilled and semi-skilled services to the development during operations and it is anticipated that new jobs may be created on the basis of the levels of permanent staff in these local service industries. There would also be periodic requirements for ground maintenance, ad hoc plant maintenance and annual plant maintenance creating additional economic activity.

5.12.5 The total capital cost of the Power Generation Plant is anticipated to be of the order of £200million. Up to approximately 35% of this will be construction, civils and fabrication work which would be open to tender from Welsh companies (if CCGT technology is chosen).

5.12.6 During construction, those workers from outside the local area would require places to stay, and regular sustenance, therefore having knock on benefits to local businesses and services.

5.12.7 In addition, the HPP would also represent an additional income source to the local economy during the operational phase in terms of local employment and the use of local services and suppliers.

5.12.8 HPL will investigate, with key stakeholders, a method for providing benefits to the local community beyond the direct creation of jobs.

Baseline (Power Generation Plant, Gas Connection and Electrical Connection)

5.12.9 The area surrounding the site has a long history of both mining and agriculture. Historically, the Hirwaun Industrial Estate housed a large Armaments Factory as well as a metal recycling facility, construction plant supplier and large supply and distribution warehouse.

5.12.10 Rhondda Cynon Taf is the second largest Local Authority in Wales, formed in 1996 from the former Boroughs of Rhondda, Cynon Valley and Taff Ely (part). The County Borough covers an area of 424 square kilometres with a population of 231,946 (2001). The area has 75 electoral wards, of which 22 are Communities First Areas. Strategic

highway links with the wider region are provided by the M4, A470 and A465.

5.12.11 The resident population of Rhondda Cynon Taf mid-2007 is 233,734 persons. This population is projected to increase by 20,900 or 9% by mid-2030 (Office for National Statistics).

5.12.12 73% of residents in Rhondda Cynon Taf are economically active compared with a Welsh average of 75% (Employment Land Review, 2008).

5.12.13 The central and northern valleys have above average levels of people claiming Job Seekers Allowance (JSA) in Wales and the highest level of claimants in Rhondda Cynon Taf at 3.1% (Employment Land Review, 2008).

5.12.14 The employment structure of Rhondda Cynon Taf is dominated by three sectors 'public administration', 'manufacturing' and 'distribution, hotels and restaurants'. Together, these three account for 74% of all available jobs in Rhondda Cynon Taf (Employment Land Review, 2008).

5.12.15 The aim of the Rhondda Cynon Taf Local Development Plan is to create a land use framework which will:

- Build sustainable communities that ensure everyone has access to housing, jobs and essential services and that all new development is supported by necessary social and physical infrastructure. This will be achieved by focussing new growth in principal towns and key settlements;
- Ensure that Rhondda Cynon Taf achieves its potential by maximizing the advantages of its strategic location, both in terms of the Capital Region and global economy. It will also maximise opportunities for inward investment in Hirwaun and Llantrisant / Talbot Green;
- Deliver a better quality of life by ensuring our communities are vibrant, healthy and safe, provide access to a range of cultural, commercial and leisure activities and protect our natural heritage and built environment;
- Develop and protect the County Borough for future generations so that physical and natural resources are protected, the challenges of climate change are met and new development is in sustainable locations and of the highest environmental standards.

Assessment Methodology (Power Generation Plant, Gas Connection and Electrical Connection)

5.12.16 NPS EN-1 states that In relation to socio-economic impacts '*the assessment should consider all relevant socio-economic impacts*' (paragraph 5.12.3, EN-1) such as tourism, influxes of workers, and cumulative effects.

5.12.17 There is currently no established EIA methodology for the assessment of socio-economic impacts. To assess the socio-economic impacts the "Guidelines and Principles for Social Impact Assessment" (May 1994) produced by the Interorganizational Committee on Guidelines and Principles for Social Impact Assessment will be used.

5.12.18 The socio-economic impact of the HPP will be addressed for the construction, operational and decommissioning phases. The socio-economic make-up of the area surrounding the Comprehensive Development will be described and the likely impacts on this baseline will be assessed.

5.12.19 The study area will extend to cover the immediate area of Rhondda Cynon Taf and the wider area of South Wales in general, in order to assess the likely effects that may be experienced within the local community.

5.12.20 The methodology for the socio-economic impact assessment will be based on the collection of a wide range of data and information from published materials, plus consultation with the local authority and key stakeholders. Key information to be consulted will include:

- Population characteristics (population dynamics);
- Community and institutional structures (employment, training, skills and qualifications, economic investment, business development and equal opportunities);
- Individual and family changes (perceptions of risk, attitudes towards the project, social well-being); and
- Community resources (security, access to local amenities including Public Rights of Way (PRoWs)).

Potential Project Enhancements

5.12.21 During construction, operation and decommissioning, an effort will be made to use local goods and services, wherever possible.

5.13 Electromagnetic Fields (EMF)

5.13.1 The potential effects of EMF will only be considered should the decision be taken to use an overhead line to export electricity from the Power Generation Plant to the National Grid.

5.13.2 EMF are generated when a current is passed through a conductor. For most purposes EMFs can be considered as an electric field and a magnetic field although the two are not completely separable. These fields consist of lines of force that affect charged objects in their vicinity. EMFs occur naturally in the human body from nerve and muscle activity and are present, at background levels, at all times in the wider environment. This background level can vary greatly depending upon factors such as atmospheric conditions.

5.13.3 All overhead power lines produce EMFs, and these tend to be highest directly under a line, and decrease to the sides at increasing distance.

5.13.4 The forces generated by external EMFs can have effects on the human body, but at significantly higher levels than the average exposure. It is possible for EMFs to induce currents in the body and can lead to a spark discharge when a person comes into contact with a grounded object.

5.13.5 There is an increasing public concern regarding the possible adverse health effects associated with electromagnetic fields generated by power transmission lines. Various studies have been conducted around the world investigating the link between exposure to power frequency EMFs and serious illnesses.

5.13.6 Most of the evidence that indicates a direct causal link to EMFs is statistical in nature and the correlations are small. There are concerns regarding the lack of reproducible results from these studies and there is no known, or theoretical, biological mechanism for the triggering of these illnesses with power frequency EMFs.

5.13.7 Electrical equipment operating within an electromagnetic field can also be affected. The magnetic forces can cause interference with visual display units (VDU) resulting in image vibration. The magnitude is dependant upon the difference between the refresh rate of the screen and the frequency of the field, and the strength of the field.

5.13.8 The National Radiological Protection Board (NRPB) were given a remit from the UK Government to provide advice on EMFs and safe exposure thresholds. In 1993 they published guidelines designed to limit the induced current effect of electromagnetic fields on the human body. These comprised of: a basic restriction of current density, being the maximum induced current that the central nervous system should be exposed to, and reference levels for the strength of the electric and magnetic fields that were not suggested as limits but as guides for investigating the basic restriction.

5.13.9 No mitigation measures are deemed to be necessary as the exposure levels generated by the transmission line are below the values cited in all professional advice given on electromagnetic fields and the thresholds set within the EU Directive.

5.13.10 The Section will also pay due regard to NPS EN-5, which sets out technology-specific considerations for the impact of EMFs, which is not an impact considered in EN-1.

5.13.11 Section 2.10 of NPS EN-5 states that *'To prevent these known effects, the International Commission on Non- Ionizing Radiation Protection (ICNIRP21) developed health protection guidelines in 1998 for both public and occupational exposure. These are expressed in terms of the induced current density in affected tissues of the body, "basic restrictions", and in terms of measurable "reference levels" of electric field strength (for electric fields), and magnetic flux density (for magnetic fields). The relationship between the (measurable) electric field strength or magnetic flux density and induced current density in body tissues requires complex dosimetric modelling. The reference levels are such that compliance with them will ensure that the basic restrictions are not reached or exceeded. However, exceeding the reference levels does not necessarily mean that the basic restrictions will not be met; this would be a trigger for further investigation into the specific circumstances. For protecting against indirect effects, the ICNIRP 1998 guidelines give an electric field reference of 5kV m-1 for the general public, and keeping electric fields below this level would reduce the occurrence of adverse indirect effects for most individuals to acceptable levels. When this level is exceeded, there is a suite of measures that may be called upon in particular situations, including provision of information, earthing and screening, alongside limiting the field. In some situations there may be no reasonable way of eliminating indirect effects'.*

5.14 Cumulative Assessment

5.14.1 In line with the EIA Regulations, the EIA will take into account other existing and planned developments (currently within the planning system) in the area of the proposed Power Generation Plant site and connection corridors, and will consider the cumulative impacts associated with these developments in conjunction with the HPP.

5.14.2 The EIA for the Power Generation Plant will consider the cumulative impacts of the construction, operation and decommissioning of the Power Generation Plant, Gas and Electrical Connections, noting that the Gas and Electrical Connections may or may not be consented under the Planning Act 2008 regime.

5.14.3 At present, we foresee that the following developments will be considered as part of the cumulative assessment:

- Tower Colliery;
- Enviroparks Energy from Waste Plant;
- Pen Y Cymoedd Wind Farm; and
- Rhigos Substation.

5.14.4 During the EIA, HPL would expect to identify any other developments in the area which should be considered in consultation with the relevant local planning authorities.

APPENDIX A – PHASE 1 HABITAT SURVEY REPORT

Watt Power Limited

Hirwaun Industrial Estate

Extended Phase 1 Habitat Survey Report

AMEC Environment & Infrastructure UK Limited

Final Report - July 2012

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Document Revisions

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Watt Power Limited

Hirwaun Industrial Estate

Extended Phase 1 Habitat Survey Report

AMEC Environment & Infrastructure UK Limited

Final Report

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Executive Summary

Purpose of this Report

This report has been produced for the purpose of providing an ecological desk study and Extended Phase 1 Habitat survey of a section of Hirwaun Industrial Estate Site (located at NGR SN38061), to inform proposals to develop the site and identify any ecological constraints present across the site. It is understood that the site is being reviewed for the proposed location of a new gas fired power generation plant with associated pipeline and electricity cables infrastructure. Maps provided by Watt Power Limited were used to obtain background site and project information. This ecological assessment has therefore been based upon the assumption that any proposed works will be restricted to the site perimeter as provided, and indicated on Figure 1, with no disturbance to surrounding areas other than that required for access.

The main ecological value of the site lies in the potential use of the site by bats in particular the roosting opportunities presented by a number of the buildings, as well as the potential for bats and badgers to be using the woodland habitat. The botanical interest of the unimproved grassland area is also of ecological value, including the potential to support a diversity of invertebrate species and potential larval food plants for invertebrates of potential significance. The habitats present on site may also present opportunities for use by great crested newts, breeding birds and to a lesser extent, common reptiles.

It is recommended that the following surveys are undertaken to gain more detailed ecological information on the use of the site by protected flora and fauna:

- Further bat scoping survey of the buildings identified on site; inspection of potential access points using an endoscope, along with dusk and dawn emergence/re-entry surveys will determine the presence/likely absence of roosting bats at these sites. Robust dusk/dawn bat surveys can be undertaken from approximately April to September, depending on weather conditions;
- If the proposed development works are likely to encroach into fringing woodland areas it is recommended that further surveys are undertaken to assess the use of the woodland by bats and identify any suitable trees which may provide roosting habitat for bats;
- Further badger survey of the woodland areas in the south of the site and bordering the north of the site;
- Botanical survey of the site to establish presence/absence of any protected or notable plants or potential larval food plants for invertebrates of potential significance;
- Invertebrate survey to establish presence/absence of any protected or notable invertebrate species; and
- Further assessment and great crested newt survey of the ponds identified as lying on/just beyond the site boundary and those lying within 500m.

Whilst the assessment was limited to the area shown (etched yellow) on Figure 1 it is understood that the proposed development may include the installation of pipelines and cables off site. In view of this and given the close proximity of the study site to a number of European Protected Sites, it is possible that a Habitat Regulations Assessment may be required.

The above recommendations are based on the development details available to date. Once further details are made available further detailed surveys may be required and it is recommended that CCW and the local County Ecologist are consulted to confirm the scope and extent of required surveys and assessments.

Contents

1. Introduction

1.1 Terms of Reference

AMEC Environment and Infrastructure UK Ltd were commissioned by Watt Power Limited in July 2012 to undertake an ecological desk study and extended Phase 1 Habitat Survey of a site within Hirwaun Industrial Estate (grid ref: SN938061), located in the borough of Rhondda Cynan Taff in South east Wales. The survey was required to assess the potential for protected species and/or their habitats to be present at the site.

It is understood that the site is being reviewed for the proposed location of a new gas fired power generating plant and will require associated gas pipeline and electrical cable infrastructure (offsite elements are not considered within this assessment).

This report encompasses our findings and recommendations for further ecological input where necessary.

1.2 Objectives

The objectives of the study were to:

- assess the general ecological value of the site and identify features of particular ecological interest;
- assess the potential of the site to support protected species; and outline the potential impacts from any future works; and
- identify potential ecological constraints to the scope of works and outline recommendations in relation to appropriate mitigation measures or further specialist surveys as appropriate.

To achieve these objectives a desk-based study and an ecological scoping survey were undertaken.

2. Legislation and Planning Policy Context

2.1 National Planning Policy and Legislation

Guidance on nature conservation planning policy is provided in the National Assembly for Wales Planning Division Technical Advice Note 5 (TAN 5 Nature Conservation and Planning (2009). This is concerned both with the protection of statutorily designated sites and habitats, the conservation of protected and priority species and protecting and enhancing biodiversity and nature conservation in the wider countryside.

TAN 5 paragraph. 1.6.1 states:

"Biodiversity conservation and enhancement is an integral part of planning for sustainable development. The planning system has an important part to play in nature conservation. The use and development of land can pose threats to the conservation of natural features and wildlife. Past changes have contributed to the loss of integrity of habitat networks through land-take, fragmentation, severance, disturbance, hydrological changes and other adverse impacts. But development can also present significant opportunities to enhance wildlife habitats and the enjoyment and understanding of the natural heritage".

TAN 5 paragraph. 3.2.2 states:

"Statutory sites and non-statutory sites, together with features which provide wildlife corridors, links or stepping stones from one habitat to another, all contribute to the network necessary to ensure the maintenance of the current range and diversity of our flora, fauna, geological and landform features and the survival of important species. Sensitive landscaping and planting, the creation, maintenance and management of landscape features important to wildlife, and the skilled adaptation of derelict areas can provide extended habitats".

These paragraphs recognise the vital role of the planning system in nature conservation and that careful planning can be used to reconcile nature conservation and development.

Planning Policy Wales (March 2002), to which local authorities must have regard when preparing Unitary Development Plans, sets out policies for the conservation of biodiversity. Planning Policy Wales identifies protected species as "a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat."

National legislation for the special protection of selected species is provided in the Wildlife and Countryside Act 1981, as amended.

Under Section 1(1) and 1(2), all British bird species, their nests and eggs (excluding some pest and game species) are protected from intentional killing, injury or damage. Under Sections 1(4) and 1(5), special

penalties are applied to bird species included in Schedule 1 of the Act and protection is extended for these species to disturbance to birds whilst building, in or near a nest and disturbance to dependant young.

Schedule 5 provides special protection to selected animal species other than birds, such as great crested newts through paragraph 9(4) of the Act, against damage to "any structure or place which any wild animal (included in the schedule) uses for shelter and protection" and against disturbance whilst in such places. The CRoW Act 2000 amends Section 1(5) of the Wildlife and Countryside Act 1981 by introducing a new offence of "reckless" disturbance to protected wildlife and making certain offences punishable by imprisonment.

The great crested newt, along with a number of other animal species such as otter are provided additional protection through inclusion on Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (which consolidates all amendments to, and replaces, the Conservation of Natural Habitats, &c.) Regulations 1994, as amended). These transpose into British law the European Community's Habitats Directive (92/43/EEC). The Regulations, commonly referred to as the "Habitats Regulations", extend protection against deliberate disturbance to those animals wherever they are present, and provides tests against which the permission for a development that may have an effect on a Schedule 2 protected species must be assessed before permission can be given.

Each of the 6 native reptile species of Britain receive some level of protection under the Wildlife and Countryside Act 1981 (as amended) as amended. Under section 9 (parts 1 & 5), schedule 5 of this act all species are protected from being intentionally killed, injured or taken or from being traded. The four most commonly occurring species are adder *Vipera berus*, grass snake *Natrix natrix*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara* and these species are protected against killing and injury

The marsh fritillary butterfly *Eurodryas aurinia* is listed on Annex II of the EC Habitats Directive and Appendix II of the Bern Convention. It is also fully protected under Section 9 of the Wildlife and Countryside Act 1981 (as amended) and is listed as a priority species in the UK Biodiversity Action Plan (BAP).

The Protection of Badgers Act 1992 provides protection to badgers and their setts.

Bats are offered special protection under The Wildlife and Countryside Act 1981 (as amended) Schedule 5, Section 9. This Act transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (commonly referred to as the "Bern Convention". The Wildlife and Countryside Act was amended by the Countryside and Rights of Way [CroW] Act 2000. This makes it is an offence to:

- Intentionally kill, injure or take any species of bat [Section 9(1)];
- Possess or control any live or dead specimens or anything derived from a bat [Section 9(2)];
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat [Section 9(4)(a)]; and

- Intentionally or recklessly disturb a bat while it is occupying a place or structure which it uses for that purpose [Section 9(4)(b)].

Bats receive additional protection under The Conservation of Habitats and Species Regulations 2010 (formerly the Conservation (Natural Habitats &c) Regulations 1994), which transposes into UK law Council Directive 92/43/eec on the Conservation of Natural Habitats of Wild Fauna and Flora (referred to as the Habitats [and Species] Directive). Bats are listed on Annex II and Annex IV of the Directive. Inclusion in Annex II serves to underline their (the bats') conservation significance; inclusion in Annex IV (European Protected Species) means that member states are required to put into place a system of strict protection as outlined in Article 12. This makes it an offence to:

- Deliberately capture or kill a bat;
- Deliberately disturb a bat; and
- Deliberately damage or destroy a breeding site or resting place of a bat.

There are several exceptions to the provisions listed above. Licenses permit unlawful activities and are granted for certain purposes by Natural England for scientific, education and/or conservation purposes (including survey). Natural England issue licences for the purposes of "preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment".

2.2 Biodiversity Action Plans

Biodiversity Action Plans (BAPs) are part of the UK government's strategy for the implementation of the 1992 Convention on Biological Diversity, to which it is a signatory. BAPs have been developed for the UK and devolved to local levels (LBAPs), to protect a number of rare species and habitats and reverse the declines of more widespread, but declining, species and habitats. Under the CRoW Act 2000, the UK Government has a duty to have due regard to the purpose of conserving biodiversity, so it is good practice for BAP and LBAP species and habitats to be taken into consideration in the planning of a works schedule.

In addition to the overall UK BAP, the site is covered by the Local BAP (LBAP), in this case this is the Rhondda Cynan Taf LBAP.

Appendix A details the habitats and species listed within the Rhondda Cynan Taf LBAP.

3. Methodology

3.1 Desk-based Assessment

Upon commissioning, a consultation and data collation exercise was undertaken to check for records of protected species, statutory designated sites and important habitat features within and surrounding the study site (to a radius of 2km). The following organisations and websites were consulted:

- South East Wales Biodiversity Records Centre (SEWBRC)
- Countryside Council for Wales' interactive mapping service http://www.ccw.gov.uk/interactive-maps/protected-sites-map.aspx
- Rhondda Cynan Taf County Borough Council Ecologist – Richard Wistow
- Ordnance Survey and satellite mapping service - http://wtp2.appspot.com/wheresthepath.htm

3.2 Ecological Scoping Survey

An initial daytime visit was made to the site on July 10th 2012 by two suitably experienced ecologists, to carry out an extended Phase I Habitat Survey. The aim of this was to record the habitats and features of the site (Figure 1 Phase I Habitat Map), evaluate the ecological interest of these features and the likely impacts of any re-development works on protected habitats or species. Although the extent of any proposed works are as yet unknown, the survey covered all built structures and landscaping within the site perimeter indicated on the maps provided, and as shown in Figure 1. It does not cover the extent of proposals for any off-site infrastructure.

This level of survey is not a full protected species or botanical survey, but instead is a tool for determining the requirement for more detailed protected species surveys on the basis of field signs and habitat quality. This method of survey enables professional ecologists to obtain an understanding of the ecology of a site such that either:

- the conservation significance of the site can be confirmed and the potential for impacts on habitats/species likely to represent a material consideration prior to and during works can be assessed; or,
- it can be ascertained that further surveys of certain aspects of the site's ecology will be required before such confirmation can be made.

The report provides a description of the habitats present at the site, along with accompanying target notes and descriptive photographic plates highlighting the main ecological constraints identified (Appendix B&C).

4. Results

4.1 Desk-based Assessment

Statutory Designated Sites

The proposed development site does not lie within a statutory designated site. Interrogation of the interactive mapping service provided by Countryside Council for Wales (CCW) found there to be six Statutory Designated Sites for nature conservation within a 2km radius of the study site, the closest being the Brecon Beacons National Park which lies approximately 0.3km to the north of the site and covers and area of 134,954 ha.

Woodland Park and Pontpren Site of Special Scientific Interest (SSSI)

Woodland Park and Pontpren SSSI consists of three separate blocks of land, encompassing an area of 14.5ha in total. The nearest extent of this site lies approximately 1.2km to the northeast of the study site. This site is of special interest for the marsh fritillary butterfly *Eurodryas aurina*, which requires the diverse mosaic of marshy grassland, neutral grassland, heathland and woodland habitats and is the primary reason for this sites designation. This site and the nearby Cors Bryn-y-gaer SSSI (as described below) supports one of the largest metapopulations of marsh fritillary in south Wales.

Cors Bryn - y – Gaer Site of Special Scientific Interest (SSSI)

Cors Bryn –y- Gaer SSSI lies approximately 0.4km to the north of the study site, just on the northern side of the A461. It encompasses an area of 421ha and is noted as being of special interest due to its lowland bog and areas of soligenous flush, as well as the diversity of grassland habitats which occur in a complex with wet heath and swamp. This mosaic of habitats are of importance for marsh fritillary butterfly, for which the site is also designated.

Blaen Cynon Special Area of Conservation (SAC)

Blaen Cynon SAC is comprised of both Woodland Park and Pontpren SSSI and Cors Bryn - y – Gaer SSSI, covering a total area of 66ha, and lies approximately 0.4km to the north of the study site. This reason for the designation of this site is for the Annex II species marsh fritillary butterfly.

Coedydd Nedd a Mellte Special Area of Conservation (SAC)

Coedydd Nedd a Mellte SAC lies approximately 1.4km to the northwest of the study site, covering an area of 378ha. The primary reasons for designation are the Annex 1 habitats; mixed woodland on alkaline –rich soils associated with rocky slopes, and Western acidic oak woodland.

Dyffrynoedd Nedd a Mellte Moel Penderyn Site of Special Scientific Interest (SSSI)

Dyffrynoedd Nedd a Mellte Moel Penderyn SSSI encompasses a large area of 420ha, the nearest extent of which is located approximately 1.4km northwest of the study site. A proportion of this site also lies within the Brecon Beacons National Park. This area is of particular special interest for its extensive semi-natural woodland and botanical diversity, in particular the important populations of flowering plants and the diverse assemblage of mosses, liverworts and lichens.

Non-statutory Designated Sites

The search area lies within the administrative area of Rhondda Cynan Taf County Borough Council, who have identified a series of Sites of Importance for Nature Conservation (SINCs). The following SINCs lie within 2km of the site:

- Coed Wernhir SINC
- Werfa Farm SINC
- Rhigos Tramway SINC
- Hirwaun Industrial Estate SINC
- Hirwaun Ponds SINC
- Hirwaun Common SINC
- Hirwaun Ponds (North) SINC
- Hirwaun Iron Works SINC

None of the SINCs listed above form part of the development area. However, Hirwaun Industrial Estate SINC is located immediately adjacent to the north and northwest of the study site, bordering the site boundary. This site supports a large mosaic of habitats centred around an ancient lowland peat bog, and provides excellent habitat for a diversity of invertebrate, reptile, amphibian and bird species.

Protected Species Records

Records of protected species were obtained from the South East Wales Biodiversity Records Centre SEWBReC. The following notable species and UK or European Protected Species were recorded within 1km of the proposed development site:

- Marsh fritillary (200m north)
- Small pearl bordered fritillary (200m north)
- Barn owl (290m northwest)
- Peregrine falcon (200m northwest)
- Hen harrier (approximately 700m northwest)
- Red kite (240m north)

- Brambling (900m southeast)
- Merlin
- Redwing (800m east)
- Fieldfare (600m southwest)

4.2 Site Description

The site forms part of the Hirwaun Industrial Estate, which is located just on the outskirts of the town of Hirwaun, northwest of Aberdare in South Wales (NGR SN 938061) and south of the Brecon Beacons National Park. The study site is split into two areas, divided by Main Avenue road through the centre of the industrial estate. It lies in semi-rural surrounds, comprising a number of industrial buildings (some of which are in current use) and associated amenity, scrub and semi-improved neutral grassland habitats bordered by mixed plantation woodland and hedgerow/screen planting. Off site to the north is a large area of marshy grassland. One part of the site appears to comprise a former industrial area which has been disused for a considerable period.

4.3 Habitats and Vegetation

The site supports the following habitats:

- structures and hardstanding;
- poor semi-improved grassland;
- semi-improved neutral grassland;
- Unimproved grassland;
- hedgerows and scattered trees;
- tall ruderal and scrub;
- plantation woodland;
- watercourses;
- ephemeral/short perennial; and
- introduced shrub.

Structures and Hardstanding

There are a number of buildings across the site, some of which are currently in use as industrial or office facilities and others which are now redundant. These comprise a mix of new and old industrial warehouse

units, some of brick construction and others of corrugated metal, as well as smaller brick-built outbuildings and associated office facilities.

A large proportion of the site is made up of hardstanding areas, forming the access roads, associated car parking facilities and road system throughout the units.

Poor semi-improved grassland

The grassland on site is primarily used for amenity purposes, providing landscaping to the surrounding buildings. However these areas are not closely mown and contain a more diverse sward of species than amenity grassland and as such these smaller pockets of grassland have been categorised as species poor semi improved grassland (TN1). Species present include perennial rye grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, creeping buttercup *Ranunculus repens*, daisy *Bellis perennis*, broad-leaved dock *Rumex obtusifolius* and selfheal *Prunella vulgaris*.

Semi-improved neutral grassland

The larger, less enclosed areas of grassland, particularly in the north of the site (TN2) are more characteristic of semi-improved neutral grassland, with a greater diversity of grasses and herbaceous species including cocksfoot *Dactylis glomerata*, black medic *Medicago lupulina*, ribwort plantain *Plantago lanceolata*, tormentil *Potentilla erecta* and cinquefoil *Potentilla reptens*. Occasional patches of soft rush *Juncus sp*. are also present throughout.

Unimproved neutral grassland

The area of rank grassland habitat in the southeast of the site appears to have been left undeveloped for a considerable period of time (TN3). Grasses present include Yorkshire Fog *Holcus lanatus* and cocksfoot *Dactylis Glomerata*, with a rich diversity of herbaceous species and wildflowers, including red clover *Trifolium pratense*, birds foot trefoil *Lotus corniculatus*, black medic *Medicago lupulina*, oxeye daisy *Leucanthemum vulgare*, selfheal *Prunella vulgaris*, meadowsweet *Filipendula ulmaria*, tormentil *Potentilla erecta*, and ragged-robin *Lychnis flos-cuculi*. Occasional patches of common spotted orchid *Dactylorhiza fuchsii* was also observed to be present in this part of the site.

Hedgerows and Scattered Trees

Occasional hedgerows are present within the site, however the majority appear to be of a denser and taller nature, forming more of a boundary screening to adjacent roads and land (as at TN5).

Scattered trees are also present throughout the areas of semi improved grassland, these vary widely in age and consist of a mixture of native and introduced ornamental species. Species present include Sycamore *Acer pseudoplatanus*, willow *Salix sp*., hawthorn *Crataegus monogyna*, silver birch *Betula pendula*, birch *Betula sp*. and cherry *Prunus sp*.

Tall Ruderal and Scrub

Tall ruderal and scrub habitat on the site is primarily associated with the woodland edge habitats, forming a continuation of the understorey onto the more disturbed areas of ground, notable at TN6 adjacent to the woodland, as well as a further stand in the northwest of the site. Species present in these areas include rosebay willowherb *Chamerion angustifolium*, great willowherb *Epilobium hirsutum*, bramble *Rubus fruticosus*, common nettle *Urtica dioica*, black knapweed *Centuarea nigra* and ragwort *Senecio jacobaea.* There are small stands of dense gorse *Ulex europaeus* and bramble within the unimproved grassland in the southeast at TN4.

Plantation Woodland

Mixed plantation woodland forms much of the habitat in the southernmost part of the site, bordering the site and forming a large strip which extends along the length of the south of the site and beyond the boundary (TN7 and TN8). Species present include, but are not limited to, pine species *Pinus sp.*, sycamore *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, ash *Fraxinus excelsior*, birch *Betula sp.*, field maple *Acer campestre* and oak *Quercus sp.*. Understorey and ground flora species include common nettle, bramble, rosebay willowherb, elder, willow, butterfly bush*Buddleia davidii*, herb Robert *Geranium robertianum* and harts tongue fern *Asplenium scolopendrium*. A further strip of plantation woodland is present beyond the northern boundary of the site.

A further strip is present in the north of the site, again forming the majority of the northernmost site boundary and extending beyond the site. This narrows out to the west, to form more of a screen planting with less mature trees. This area is dominated by alder *Alnus glutinosa*, willow *Salix sp*. and birch species *Betula sp*. (TN9).

Watercourses

There is one ditch on the site (TN10), in the north west corner, which flows through the area of semi-improved grassland. At the time of survey it was holding only a very small amount of water, with species including bulrush *Typha latifolia*, horsetail *Equesetum arvense* and soft rush *Juncus effusus* dominating.

Ephemeral/short perennial

In the north and northwest corner of the site are two patches of ephemeral/short perennial vegetation that have colonised the more disturbed, stony areas of ground (TN14), with species including greater plantain *Plantago major*, ribwort plantain *Plantago lanceolata*, cat's ear *Hypochaeris radicata*, coltsfoot *Tussilago farfara* and occasional grasses. Occasional patches of common spotted orchid *Dactylorhiza fuchsii* were also observed to be present alongside these areas.

Introduced Shrub

Occasional stands of introduced shrub are present across the site although primarily associated with the areas of poor semi-improved grassland and further amenity areas around the buildings and car parks.

4.4 Fauna

Bats

Potential Roosting Habitat

A small number of the older buildings across the site support gaps and features within the building structure which could be considered as potential access points, or present suitable roosting habitat for bat species. In particular the two buildings in the southern section of the site, at target notes TN11 and TN12 were noted to support such features, as well as the larger building in the far northwest of the site at TN13:

The building at TN11 is brick built with a pitched tile roof, which appears to support an enclosed internal loft space. A number of the windows are currently boarded up. Features in the form of raised and gappy roof tiles, rotten fascia boards and cladding may provide suitable access points for roosting opportunities. This building is considered to support moderate bat roosting potential.

The adjacent building at TN12 is also brick-built with a flat felt roof and protruding skylights. The brickwork is in a particularly poor state of repair in places, with significantly cracked brickwork and gaps around the window frames which may provide opportunities for roosting within the cavity walls. This building is considered to support moderate bat roosting potential.

The further building at TN13 is of brick construction with a pitched corrugated roof. Similarly the brickwork appears to be in a poor state of repair, with a large number of cracks, crevices and holes which may provide opportunities for roosting within the cavity walls. This building is considered to support moderate bat roosting potential.

There are no mature trees throughout the site that support features of potential for roosting bats, however it is possible that some of the trees within the woodland areas on the fringes of the site, particularly along the southern boundary, are suitable for use by bats.

Potential Commuting and Foraging Habitat

Bats tend to commute between roosting/foraging habitats by using linear features, such as hedgerows/river corridors etc as flight lines.

The plantation woodland in the south of the site (TN7 &TN8), and the area also lying just to the north, off site, may be used as a commuting feature and provide edge habitat for foraging. Further suitable foraging habitat is provided on and around the site by the hedgerows, scattered trees and scrub, although is

primarily limited to the fringing areas, all of which provide habitat for invertebrates which are the prey of UK bat species.

The site is in a semi-rural location, and is well connected to expanses of open habitat and woodland providing foraging and roosting opportunities in the wider countryside, largely via a network of trees and hedgerows. The Hirwaun railway line and sidings that lies to the north of the industrial estate is an ideal linear feature which further connects the study area to areas of natural/semi-natural habitat in the wider area.

Great Crested Newts

There are no ponds that were identified on the study site which could provide potential breeding habitat for amphibians such as the European Protected great-crested newt. The wet ditch on site held very little water at the time of survey and could provide some, albeit limited potential breeding habitat for this species. However, there is one small pond identified just beyond the southern site boundary within the woodland area which may provide suitable habitat, although access to assess this was not possible at the time of the survey to be able to assess its suitability.

Examination of Ordnance Survey and aerial maps show there to be further clusters of ponds to the east and south of the site (eleven ponds in total lying within 500m) which may provide breeding habitat for this species. During their terrestrial phase, this mobile species may range up to 500 metres (per year) from a breeding pond; therefore it is considered that there is potential for this species to occur on the study site.

The areas of habitat around the fringes of the site, in particular the expanses of woodland as well as the area of rank grassland and scrub in the southeast of the site, may provide suitable terrestrial habitat and opportunities for foraging, shelter and protection for great crested newts.

Reptiles

The areas of habitat around the fringes of the site, including the expanses of woodland and particularly the area of rank grassland and scrub in the southeast of the site, may also provide suitable basking, foraging and sheltering habitat for reptiles. With connectivity to other surrounding habitats it is possible that species such as slow worms and common lizards could be encountered. The remainder of the site area, being primarily built structures, hardstanding and amenity areas however, is not considered to offer any opportunities to be utilised for reptiles.

Badgers

The areas of plantation woodland habitat around the study site, in particular the denser area in the south of the site, provides suitable habitat for badgers. These areas were searched for signs of setts or evidence of badgers, however it was not possible to access all areas of the woodland to survey. No evidence of badgers was recorded at the time of the survey, although their presence on site cannot be ruled out due to the inaccessibility of some areas.

Invertebrates

Large numbers of Marsh fritillary butterfly have been recorded in close proximity to the site boundary, just to the northeast. Records of small pearl-bordered fritillary, which is a LBAP species have also been recorded nearby.

The natural pattern of the marsh fritillary's existence is in metapopulations whose survival is dependent upon having a network of nearby patches within which there is periodic extinction and re-colonisation i.e. areas where not all the habitat is occupied by the butterfly all of the time (Warren, 1994). Across the UK, the marsh fritillary butterfly breeds in two main agriculturally unimproved habitats, damp neutral or acid grasslands (often described as "rhôs pastures" in Wales) and dry chalk and limestone grasslands. Its larval foodplant is devil's-bit scabious *Succisa pratensis*. In Wales, the butterfly is present in networks of unimproved, but extensively cattle or pony grazed, marshy pastures and drier neutral grasslands. Habitats require a degree of light grazing to maintain them in suitable condition for the butterfly to breed and the presence of a network of such sites are required for the long-term maintenance of the species.

The fringe habitats on the site, in particular the mosaic of species-rich grassland and scrub in the southeast section of the site, support a fairly rich diversity of botanical species which have the potential to support a variety of invertebrate species. Several common butterfly and moth species were noted to be using the areas of grassland. Although the larval food plant of the marsh fritillary has not been recorded on site, it is possible that these grassland areas may be used for nectaring or as a stepping stone to facilitate movement with a metapopulation.

Other Species

Common breeding birds are likely to be using the plantation woodland, hedgerows and scrub as nesting and foraging sites. Ground nesting birds such as skylark and meadow pipit may use the unimproved grassland on site. It is also possible that the buildings on site may be used for breeding/nesting during the breeding season. A number of Schedule 1 bird species have been recorded using parts of the Industrial Estate, beyond the study site boundary, including Barn Owl, Peregrine Falcon and Red Kite.

5. Limitations

These scoping surveys were undertaken during an optimal period (June to October); as such it was possible to undertake a suitable evaluation of the habitats present on site, their potential to support protected species and to draw suitable conclusions.

The lack of evidence of a protected species does not preclude their possible presence at a later date. This is particularly true of bats; their use of a particular tree/building/structure/etc. can significantly vary, not only on a seasonal basis, but also from day to day.

Whilst every effort was made to survey all parts of the site, access was restricted to a small part of the site due to demolition and construction works already being underway, making the habitats in this area inaccessible for close up inspection. Access to survey the woodland habitat to the south of the site was also restricted given the tall security fence around the perimeter of the industrial units. This also carried some implications for inspecting this habitat for suitability for/signs of protected species, such as badgers and bats.

However, in spite of these limitations, it is considered that this scoping study will allow a robust and professional judgement to be made on the broad ecological value of the site and will adequately inform recommendations for further survey and/or mitigation.

6. Conclusions and Summary of Ecological Value

Designated Sites

There are no designated sites within the proposed development boundary. There are, however, six Statutory Designated sites within 2km of the site; The Brecon Beacons National Park, Woodland Park and Pontpren SSSI, Cors Bryn - y – Gaer SSSI, Blaen Cynon SAC, Coedydd Nedd a Mellte SAC and Dyffrynoedd Nedd a Mellte Moel Penderyn SSSI. With the exception of the National Park, the nearest of these lies 0.4km from the study site boundary. Whilst the assessment was limited to the area shown (etched yellow) on Figure 1 it is understood that the proposed development may include the installation of pipelines and cables off site. In view of this and given the close proximity to these sites, some of which are European Protected sites, it is possible that a Habitat Regulations Assessment may be required.

In view of the possible requirement for off-site infrastructure and the extremely close proximity of the study site to a non-statutory designated Site of Importance for Nature Conservation, consideration may also need to be given to any potential impacts to this locally important area of conservation interest.

Habitats and Vegetation

The main ecological value of the site lies within the buildings and mixed plantation woodland which provide possible roost sites for bats. The woodland may also be used by bats as flight lines and foraging habitat. The area of unimproved neutral grassland which provides a mosaic of grassland and scrub, species rich in places is also considered to be of ecological value. Although not extensive, it is botanically rich and provides good habitat for a range of common moth and butterfly species, with the potential to support larval food plants for invertebrates of potential significance. This may include marsh fritillary, which have been recorded in the nearby area and is afforded full protection in the UK. The woodland habitat on and bordering the site is further considered to be of moderate value for badgers, providing suitable habitat for foraging and the construction of setts. The wider site provides further, albeit low opportunities for foraging. This woodland also provides habitat for a range of common breeding birds. The areas of habitat around the fringes of the site, in particular the expanses of woodland as well as the area of rank grassland and scrub in the southeast and northwest of the site, may provide suitable habitat for great crested newts and, to a lesser extent, common reptiles.

The habitats on site comprise ‘Industrial Estates’ and ‘Roadside Verges’ which are both included in the Rhondda Cynan Taf LBAP .

Protected/Notable Species

Bats

The site presents potential roosting, commuting and foraging habitat for a range of species. Some of the old buildings on site support gaps and features within the building structure which could be considered as potential access points, or present suitable roosting habitat for bat species. It is possible that some of the trees within the woodland areas on and bordering the site are suitable for use by bats.

Badgers

No badger setts or signs of badgers were identified during survey, however not all areas of woodland could be accessed and one survey is not sufficient to confirm absence of this species.

Breeding Birds

A range of common breeding birds are likely to use the woodland and scrub areas as nesting, foraging and refuge habitat. Ground nesting birds such as skylark and meadow pipit may use the unimproved grassland on site. The buildings on site may be used for breeding/nesting during the breeding season.

Great Crested Newts

There are no ponds present on site. The ditch on site held very little water at the time of survey and is considered unlikely to support great crested newts. However, there is one small pond identified just beyond the southern site boundary within the woodland area, to which access was not possible to be able to assess its suitability for this species. A number of further ponds have been identified within 500m of the site (to the south, and to the east) which may provide further suitable breeding habitat. The proposed development site does provide potential foraging, shelter and hibernation habitat for this species.

Invertebrates

The botanically rich unimproved grassland habitat on the proposed development site provides suitable habitat for a range of invertebrate species. There are a larger number of records of the fully protected marsh fritillary butterfly in close proximity to the site, including within nearby statutory sites, for which this species is the primary reason for their designation.

Reptiles

There are no records of reptile species in proximity to the site, however the habitats present on site present suitable habitat for use by common reptile species and it is possible that they are using the site for basking foraging and possibly hibernation.

6.1 Summary of Ecological Value

The main ecological value of the site lies in the potential use of the site by bats in particular the roosting opportunities presented by a number of the buildings, as well as the potential for bats and badgers to be using the woodland habitat. The botanical interest of the unimproved grassland area is also of ecological value, including the potential to support a diversity of invertebrate species and potential larval food plants for invertebrates of potential significance. The habitats present on site may also present opportunities for use by great crested newts, breeding birds and to a lesser extent, common reptiles.

7. Recommendations

It is recommended that the following surveys are undertaken to gain more detailed ecological information on the use of the site by protected flora and fauna:

- Further bat scoping survey of the buildings identified on site; inspection of potential access points using an endoscope, along with dusk and dawn emergence/re-entry surveys will determine the presence/likely absence of roosting bats at these sites. Robust dusk/dawn bat surveys can be undertaken from approximately April to September, depending on weather conditions;
- If the proposed development works are likely to encroach into fringing woodland areas it is recommended that further surveys are undertaken to assess the use of the woodland by bats and to identify any suitable trees which may provide roosting habitat for bats;
- Further badger survey of the woodland areas in the south of the site and bordering the north of the site;
- Botanical survey of the site to establish presence/absence of any protected or notable plants or potential larval food plants for invertebrates of potential significance;
- Invertebrate survey to establish presence/absence of any protected or notable invertebrate species. Given that there are nearby records of the marsh fritillary and that this species is the primary reason for the designation of nearby statutory sites, should a Habitat Regulations Assessment (HRA) be required it may be necessary to review the position of this site in relation to other known marsh fritillary sites in the wider area; and
- Further assessment and great crested newt survey of the ponds identified as lying on/just beyond the site boundary and those lying within 500m

The above recommendations are based on the development details available to date. Once further details are made available further detailed surveys may be required and it is recommended that CCW and the local County Ecologist are consulted to confirm the scope and extent of required surveys and assessments.

Figure 1: Development Boundary Plan

Hirwaun Industrial Estate, South Wales

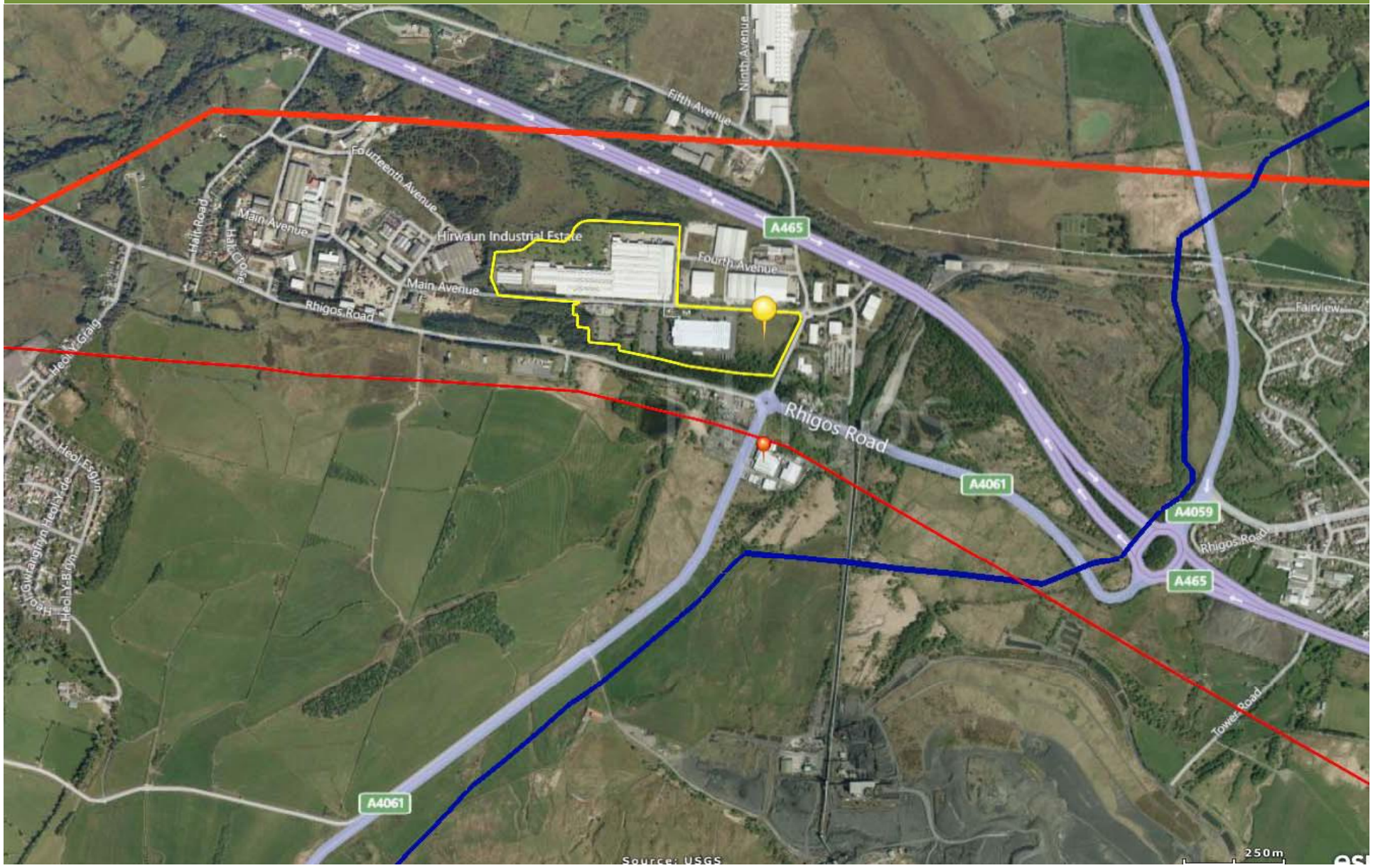

Figure 2: Phase 1 Habitat Survey Map

Legend

- Approximate study site boundary
- Building
- Hardstanding
- Unimproved neutral grassland
- SI Semi-improved neutral grassland
- SI Poor semi-improved grassland
- Bare ground
- Mixed plantation woodland
- Dense/continuous scrub
- Introduced shrub
- Ephemeral/short perennial
- Tall ruderal
- Scattered trees
- Hedgerows
- Drainage ditch
- 1 Target notes

Rev	Date	Description	By	Des

Overview

N W E S

Client: Watt Power Limited

amec

AMEC Environmental & Infrastructure UK Ltd
Wilmslow House, Gadbrook Business Centre, Gadbrook Road
Northwich, Cheshire, CW9 7TH

Project: Figure 2 Phase 1 Habitat Map

Title: Hirwaun Industrial Estate

Drawn	Checked	Approved
SH	LB	AW
Date: July 2012		Sheet size: A3
Drawing Number: 32820-01-F2	Rev: 0	Scale: Not to Scale

Appendix A List of UK and Rhondda Cynan Taf BAP Habitats and Rhondda Cynan Taf BAP Species

Action Plan	UK BAP	Rhondda Cynon Taff LBAP
HABITATS		✓
Upland oakwood	✓	✓
Lowland beech and yew woods	✓	✓
Upland ash woodland	✓	✓
Lowland wood pastures and parklands	✓	✓
Planted coniferous		✓
Ancient and/or species-rich hedgerow	✓	✓
Disused railway lines		✓
Coastal and floodplain grazing marsh	✓	✓
Lowland meadows	✓	✓
Calcareous grassland	✓	✓
Lowland dry acid grassland	✓	✓
Heathland (upland and lowland)	✓	✓
Coal spoil		✓
Ffridd / bracken slopes		✓
Purple moor grass and rush pasture (Rhos pasture)	✓	✓
Fens / Swamp	✓	✓
Reedbeds	✓	✓
Raised bog and Blanket bog	✓	✓

Action Plan	UK BAP	Rhondda Cynon Taff LBAP
Standing open water / Ponds	✓	✓
Canals	✓	✓
Rivers and streams	✓	✓
Crags and scree	✓	✓
Urban		✓
Industrial estates		✓
Road verges		✓
SPECIES	**UK BAP**	**Rhondda Cynon Taff LBAP**
Lichens	✓	✓
Mosses and Liverworts	✓	✓
Ferns		✓
Deptford pink	✓	✓
Monk's-hood		✓
Cornish moneywort		✓
Ivy-leaved bellflower	✓	✓
Black knapweed		✓
Bluebell		✓
Heath spotted-orchid		✓
Green-winged orchid		✓
Medicinal leech		✓

Southern damselfly	✓	✓
Silver-studded blue	✓	✓
Small pearl-bordered fritillary	✓	✓
Pearl-bordered fritillary	✓	✓
High brown fritillary	✓	✓
Marsh fritillary	✓	✓
Grayling	✓	✓
Narrow-bordered bee hawk-moth	✓	✓
Double line moth		✓
Hornet robber-fly	✓	✓
Brown-banded carder bee	✓	✓
Twaite shad		✓
Salmon and Brown trout	✓	✓
Great crested newt	✓	✓
Heron		✓
Buzzard		✓
Peregrine		✓
Grey partridge	✓	✓
Lapwing		✓
Barn owl		✓
Nightjar	✓	✓
Swift		✓
Kingfisher		✓

Skylark	✓	✓
House martin		✓
Dipper		✓
Spotted flycatcher	✓	✓
Whinchat		✓
Stonechat		✓
Ring ouzel	✓	✓
Song thrush	✓	✓
Tree sparrow		✓
Bullfinch	✓	✓
Linnet		✓
Reed bunting	✓	✓
Hedgehog	✓	✓
Pipistrelle bat / all bats	✓	✓
brown hare	✓	✓
red squirrel	✓	✓
Dormouse	✓	✓
Water vole	✓	✓
Otter	✓	✓
Badger		✓

Appendix B Phase 1 Habitat Survey Target Notes

Target Note	Description
TN1	Poor semi-improved grassland, comprising the smaller pockets associated with amenity areas. However these areas are not closely mown and contain a more diverse sward of species than amenity grassland. Species present include perennial rye grass *Lolium perenne*, Yorkshire fog *Holcus lanatus*, creeping buttercup *Ranunculus repens*, daisy *Bellis perennis*, broad-leaved dock *Rumex obtusifolius* and selfheal *Prunella vulgaris*.
TN2	The larger, less enclosed areas of grassland, particularly in the north of the site are more characteristic of semi-improved neutral grassland, with a greater diversity of grasses and herbaceous species including cocksfoot *Dactylis glomerata*, black medic *Medicago lupulina*, ribwort plantain *Plantago lanceolata*, tormentil *Potentilla erecta*,and cinquefoil *Potentilla repten*, with occasional soft rush *Juncus effusus* and common spotted orchid *Dactylorhiza fuchsii* .
TN3	Area of unimproved neutral grassland. Grasses include Yorkshire Fog *Holcus lanatus* and cocksfoot *Dactylis Glomerata*, with a rich diversity of herbaceous species and wildflowers, including red clover *Trifolium pratense*, birds foot trefoil *Lotus corniculatus*, cinquefoil *Potentilla reptens* black medic *Medicago lupulina*, oxeye daisy *Leucanthemum vulgare*, selfheal *Prunella vulgaris*, meadowsweet *Filipendula ulmaria*, tormentil *Potentilla erecta* and ragged-robin *Lychnis flos-cuculi*. Occasional patches of common spotted orchid *Dactylorhiza fuchsii* also observed to be present.
TN4	Several small stands of dense gorse *Ulex europaeus* and bramble *Rubus fruticosus* within the area of unimproved grassland in the southeast of the site, adjacent to the road. A further stand is present in the northwest of the site.
TN5	Tall hedgerow forming a boundary screening to adjacent roads and land, with species including field maple *Acer campestre*, Sycamore *Acer pseudoplatanus*, willow *Salix sp*., dogwood *Cornus sanguinea*, birch *Betula sp.*, dog rose *Rosa canina* and cherry *Prunus sp*.
TN6	Tall ruderal and scrub associated with the woodland edge habitats, forming a continuation of the understorey onto the more disturbed areas of ground. Species present in these areas include rosebay willowherb *Chamerion angustifolium*, great willowherb *Epilobium hirsutum*, bramble *Rubus fruticosus*, common nettle *Urtica dioica*,black knapweed *Centuarea nigra* and ragwort *Senecio jacobaea*.

TN7 & TN8	Mixed plantation woodland forming much of the habitat in the southernmost part of the site, forming a large strip which extends along the length of the south of the site and beyond the boundary. Species present include pine species *Pinus sp.*, sycamore *Acer pseudoplatanus*, rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, ash *Fraxinus excelsior*, birch *Betula sp.*, field maple *Acer campestre* and oak *Quercus sp.*. Understorey and ground flora species include common nettle *Urtica dioica*, bramble *Rubus fruticosus*, rosebay willowherb *Epilobium angustifolium*, elder *Sambucus nigra*, willow *Salix sp*, butterfly bush *Buddleia davidii*, herb robert *Geranium robertianum* and harts tongue fern *Asplenium scolopendrium*. This woodland has the potential to provide suitable habitat for bats and badgers, and may provide suitable terrestrial habitat for great crested newts.
TN9	A further strip of plantation woodland just beyond the northern boundary which narrows out to the west to form more of a screen planting with less mature trees. This area is dominated by alder *Alnus glutinosa*, willow *Salix sp*. and birch species *Betula sp*.
TN10	Small ditch which flows through the area of semi-improved grassland. At the time of survey it was holding only a very small amount of water, with species including bulrush *Typha latifolia*, horsetail *Equesetum arvense* and soft rush *Juncus effusus* dominating.
TN11	The building at TN11 is brick built with a pitched tile roof, which appears to support an enclosed internal loft space. The windows are currently boarded up. Features in the form of raised and gappy roof tiles, rotten fascia boards and cladding may provide suitable access points for roosting opportunities – moderate bat roosting potential.
TN12	Adjacent building at TN12 is also brick-built with a flat felt roof and protruding skylights. The brickwork is in a particularly poor state of repair in places, with significantly cracked brickwork and gaps around the window frames which may provide opportunities for roosting within the cavity walls – moderate bat roosting potential.
TN13	The further building at TN13 is of brick construction with a pitched corrugated roof. Similarly the brickwork appears to be in a poor state of repair, with a large number of cracks, crevices and holes which may provide opportunities for roosting within the cavity walls. This building is considered to support moderate bat roosting potential – moderate bat roosting potential.
TN14	Area of ephemeral/short perennial on the more shallow/stony soil. Species include greater plantain *Plantago major*, ribwort plantain *Plantago lanceolata*, cat's ear *Hypochaeris radicata*, coltsfoot *Tussilago farfara* and occasional grasses.

Appendix C Photographic Appendix

Plate 2: unimproved neutral grassland with scrub in the southeast corner of the site

Plate 2: semi-improved neutral grassland and adjacent and woodland strip forming the northernmost site boundary.

Plate 3: Large extent of mixed plantation woodland in the south of the site

Plate 4: building at TN11 in the southern section of the site with moderate bat roosting potential

Plate 5: building at TN12 in the southern section of the site with moderate bat roosting potential

Plate 6: building at TN13 in the northwest of the site with moderate bat roosting potential

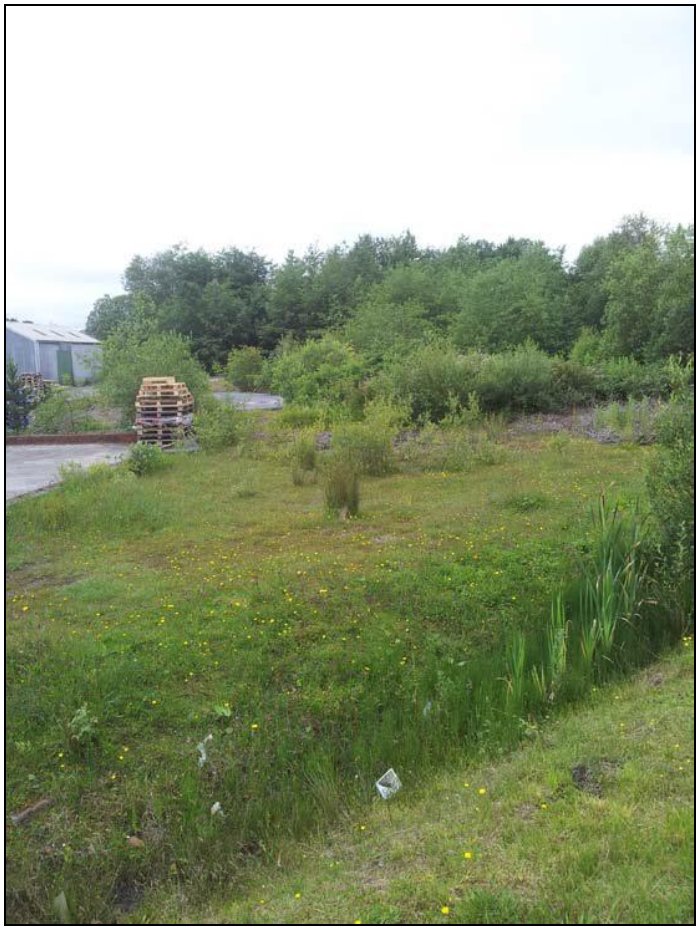

Plate 7: drainage ditch and surrounding species rich semi-improved grassland in the north of the site.

Appendix D Statutorily Designated Site Citations

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

POWYS
NEATH PORT TALBOT
RHONDDA CYNON TAFF

DYFFRYNNOEDD NEDD A MELLTE, A MOEL PENDERYN

Date of Notification: 1954, 1965, 1978, 1979, 1999

National Grid Reference: SN 907100, SN 921090, SN 937088

O.S. Maps: 1:50,000 Sheet number: 160
1:10,000 Sheet number: SN 80 NE, SN 90 NW, SN 91 SW

Site Area: 421.1 ha

Description:

Dyffrynnoedd Nedd a Mellte, a Moel Penderyn is of special interest for its extensive and diverse semi-natural woodland, important populations of several flowering plants and supporting outstanding assemblages of mosses, liverworts and lichens. The site includes a range of geological features, well-exposed in the cliffs and rocky river beds. These include exposures at Moel Penderyn, Craig y Ddinas and Bwa Maen and geomorphological features within parts of the valleys of the Hepste and Mellte are also of special interest.

This site includes the wooded valleys of the rivers Nedd and Mellte, and their tributaries above Pontneddfechan, as they pass through a Millstone Grit and limestone plateau, and Moel Penderyn, which lies to the east. The plateau lies at about 300 m, the rivers having eroded deep, narrow valleys with gorges, river cliffs, block scree and waterfalls.

GEOLOGY

The old quarry faces and rock outcrops at Craig y Ddinas and Moel Penderyn provide important exposures of geological structures formed during the Variscan Orogeny, late in the Carboniferous and early in the Permian periods of geological history. The Carboniferous Limestone layers are steeply tilted on Craig y Ddinas, as a result of folding, and small tight folds can be seen in the banks of the River Sychryd. The exposed Dinas fault, a major dislocation of the crust, is marked by a belt of shattered limestone associated with several minor fractures. Numerous other small structures occur, including faults, fractures, veins and folds. This complex assemblage of structures makes up a narrow belt called the Neath Disturbance, which extends from the Welsh Borders to the Gower Peninsula. The Disturbance probably lies above an ancient line of weakness in the deep crust reactivated during the Variscan Orogeny. These localities provide the best exposures of this important feature of the geological structure of South Wales.

The best exposure in South Wales of the rock strata of the *Gastrioceras subcrenatum* Marine Band (below the Farewell Rock) in its full development occurs in the valley of the Nedd Fechan. The full range of environment types is represented in the marine band section, including

brackish water with a restricted fauna and off-shore marine environments with a goniatite-rich fauna. The site is important in understanding how this brief marine incursion occurred, which, in turn, is important because the marine band, the expression of this event in the rocks, is taken to indicate the start of the Westphalian Epoch of Carboniferous time.

The Nedd, Mellte and Sychryd, forming the headwaters of the Afon Nedd, provide key exposures of Carboniferous rocks. These include extensive and spectacular exposures of the whole Namurian of the North Crop. In particular, the Basal Grits are well exposed and present the best available section in the Main South Wales Basin. The predominantly shaley sequences of the higher Namurian are also well exposed here and their study has been of great importance in the elucidation of the stratigraphy of the Namurian. Additional importance attaches to the presence of a varied and abundant Basal Grit flora. These are outstanding, nationally important sections of the Carboniferous.

The river system is exceptional in showing the combined effects of geological controls and changing sea levels in river landform development. Faulting has juxtaposed rocks of varying resistance and influenced the form and evolution of waterfalls. Thus the landforms of this area reflect a variety of interacting controls, and both the total assemblage as well as the individual features are important.

BIOLOGY

This site supports one of the most extensive and diverse areas of semi-natural woodland in Wales. The predominant woodland vegetation communities are characteristic of the uplands of north and western Britain, with extensive areas of oak *Quercus spp*. woodland, and smaller areas of ash *Fraxinus excelsior* woodland. The distribution of the particular communities reflects the distribution of soils of low, moderate and high base status, respectively. More locally, however, the aspects and microclimate have allowed the development of the southern and eastern lowland counterparts of these free-draining oak, birch *Betula spp*. and ash-dominated woodlands.

Large areas of the site have a woodland canopy dominated by oak intermediate in character between the sessile oak *Quercus petraea* and the pedunculate oak *Q. robur*, with a little downy birch *Betula pubescens* and small-leaved lime *Tilia cordata* in places. Here, the shrub layer is absent or sparse with a little hazel *Corylus avellana* or rowan *Sorbus aucuparia*. The field layer is typically dominated by wavy hair-grass *Deschampsia flexuosa*, with bilberry *Vaccinium myrtillus* present and, where grazing is relatively light, quite abundant. The ground layer has a very high cover of mosses, including *Rhytidiadelphus loreus, Polytrichum formosum, Dicranum majus, Plagiothecium undulatum, Hypnum cupressiforme, Mnium hornum* and *Sphagnum quinquefarium*. Elsewhere, large stands of similar canopy and shrub layer composition have a ground layer typically dominated by wavy hair-grass with common bent *Agrostis capillaris* and some sweet vernal-grass *Anthoxanthum odoratum.* Purple moor-grass *Molinia caerulea* is present occasionally and is sometimes abundant, while bilberry is absent or very rare except on inaccessible ledges and cliffs. The ground layer often has carpets of the bryophytes mentioned above.

Another woodland community that occurs extensively in some parts of the site is dominated by sessile oak and forms intermediate with pedunculate oak, or downy birch, or a mixture. Other canopy trees are rare and the shrub layer is typically sparse, but in some areas dense hazel and scattered hawthorn *Crataegus monogyna* are present. The field layer is grassy, with common bent, sweet vernal-grass and creeping soft-grass *Holcus mollis* often abundant with patchy wavy

hair-grass. Other species that occur here are wood-sorrel *Oxalis acetosella*, bluebell *Hyacinthoides non-scripta*, bracken *Pteridium aquilinum* and heath bedstraw *Galium saxatile* and the mosses *Rhytidiadelphus squarrosus* and *Polytrichum formosum*.

Small stands of woodland, particularly along steep tributary stream valleys are dominated by ash with a dense shrub layer of hazel, a little hawthorn and locally frequent rowan. No single species is dominant in the field layer, but wood-sorrel, false brome *Brachypodium sylvaticum*, common bent, lady-fern *Athyrium filix-femina* and rough meadow-grass *Poa trivialis* are all locally frequent. In the ground layer, mosses and liverworts are prominent, with *Plagiomnium undulatum*, *Mnium hornum*, *Atrichum undulatum*, *Pellia* sp., and *Ctenidium molluscum* all frequent and often abundant. The ground flora in these areas can be extremely rich and includes species that are scarce in mid and south Wales, such as wood fescue *Festuca altissima*.

The canopy in one area of the site is composed mainly of intermediate oak, with a little downy birch in places. The shrub layer is sparse, with only scattered hazel and holly *Ilex aquifolium*. The field layer is a carpet of wavy hair-grass with few other species present, although bracken occurs in places. Mosses are sometimes quite prominent in scattered tufts, especially *Polytrichum formosum* and *Mnium hornum*.

In another area, the canopy mostly comprises intermediate oak and occasional ash with a relatively dense shrub layer, primarily of hazel, but with scattered holly and rowan. The field layer is dominated by three species: bramble *Rubus fruticosus*, bracken and creeping soft-grass with frequent wavy hair-grass.

Small patches of woodland on open, steep cliffs and screes, particularly of limestone, are dominated by ash and are relatively species-rich, with many calcicoles. On shadier steep cliffs, similarly ash-dominated patches are relatively species-poor, with abundant ivy *Hedera helix* and some calcicoles. In small areas of woodland at the base of shadier steep cliffs, scattered field maple *Acer campestre* occurs in the shrub layer, beneath a canopy of ash. The field layer includes species such as dog's mercury *Mercurialis perennis*, herb-Robert *Geranium robertianum*, common nettle *Urtica dioica*, cleavers *Galium aparine* and, where bouldery, hart's-tongue *Phyllitis scolopendrium*.

Elsewhere, soils with impeded drainage or flushing support an extensive area of alder *Alnus glutinosa*-dominated woodland, in a range of topographical situations. Wet flushes within this type of woodland provide the most southerly known locality in Britain for marsh hawk's-beard *Crepis paludosa*. There are small patches of woodland where alder is dominant, with a little ash and downy birch over a shrub layer of hazel. Here, the field layer is generally dominated by remote sedge *Carex remota* with many other species present in small amounts. Elsewhere, extensive stands of alder-dominated woodland have a relatively dense shrub layer, primarily composed of hazel but often with ash saplings, hawthorn and downy birch saplings. The ground layer is dominated by tufted hair-grass *Deschampsia cespitosa*, with wood-sorrel and lady-fern. Further areas have a canopy mostly of alder with occasional downy birch and little of a shrub layer except scattered ash saplings. The field layer is a mixture of meadowsweet *Filipendula vulgaris*, creeping buttercup *Ranunculus repens*, false brome, soft-rush, great horsetail *Equisetum telmateia* and bramble. In the ground layer, the mosses *Eurhynchium praelongum* and *Thuidium tamariscinum* are frequent.

Locally, where woodland extends onto the drift-covered plateau, stands of a community dominated by alder with occasional downy birch, rowan and ash are present. There is no shrub

layer and the field layer is dominated by purple moor-grass, with frequent bramble, soft-rush *Juncus effusus* and broad buckler-fern *Dryopteris dilatata*. Scattered, relatively small patches of a similar type of woodland have the same canopy trees and a typically sparse or absent shrub layer. The field layer here is always dominated by purple moor-grass, with soft-rush, tormentil *Potentilla erecta*, creeping soft-grass, tufted hair-grass and common bent typically present. In the ground layer, bog moss *Sphagnum recurvum* and hair moss *Polytrichum commune* are usually present.

The overall botanical diversity is outstanding, with more than 600 species of plant having been recorded from the site. This includes a very large proportion of the bryophyte flora of mid and south Wales.

The high humidity of much of the woodland has a strong influence on its botanical diversity. Trees and rocks support a diverse assemblage of plant species largely confined in their distribution to the Atlantic Seaboard of Europe. These Atlantic species include green spleenwort *Asplenium viride*, Tunbridge filmy-fern *H. tunbridgense*, hay-scented buckler-fern *Dryopteris aemula*, all of which are rare in south Wales, liverworts, such as *Bazzania trilobata*, *Jubula hutchinsiae* and the scarce *Anastrophyllum hellerianum*, *Colura calyptrifolia*, *Jamesoniella autumnalis* and *Sphenolobopsis pearsonii*, mosses, such as *Isothecium holtii*, *Dichodontium denudatum* and the scarce *Bartramia hallerana* and *Seligera acutifolius*, lichens, such as *Enterographa hutchinsii*, *Micarea alabastrites*, the rare *Micarea hedlundii*, and the scarce *Micarea stipitata* and *Phyllopsora roseii*. These contrast with the local abundance of more continental species such as, on logs, the scarce moss *Dicranum flagellare*, on gritstone cliffs, the scarce lichen *Chrysothrix chlorina* and, on bark, the scarce lichen *Micarea pycnidiophora*.

Boulder screes, cliff faces, springs, seepages, decaying logs and mature and overmature trees provide some of the specific habitats required by several scarce lower plants demanding conditions that are subject to little change with time, including the lichens *Leptogium plicatile* and *L. subtile*, and the liverwort *Cephalozia catenulata*. Despite recent high levels of atmospheric pollution, the epiphytic *Lobarion* lichen community persists in these sheltered valleys and includes species such as *Lecanactis premnea*, *Biatora sphaeroides*, *Parmeliella triptophylla* and *Dimerella lutea*.

The rivers, with their fine waterfalls, are an integral part of the site with the splash zones and spray providing wetness and humidity necessary for many species. River courses support a notable riparian flora dominated by liverworts, and mosses, including the nationally scarce *Fissidens rufulus* and *F. rivularis*, and *Tetrodontium brownianum*, which is threatened in Europe.

The woodland in the valleys is interspersed with several more open habitats that provide additional interest. As well as the cliffs, screes and rivers there are extensive areas of grassland dominated by common bent and sheep's fescue *Festuca ovina*. There are also patches of less acidic grassland in the valley bottoms and, at Craig y Ddinas and Moel Penderyn, the limestone supports calcareous grassland. Wet grassland dominated by purple moor-grass or rushes (*Juncus* spp.) occurs in a series of flushes along the valley sides and bracken-dominated glades are widespread. Patches of dry heath and wet heath characterised by deergrass *Scirpus cespitosus* and cross-leaved heath *Erica tetralix* can be found in Hepste valley.

Other habitats of interest include areas of beech *Fagus sylvatica* plantation, grey willow *Salix cinerea* and bramble scrub and nutrient-rich ponds.

The fauna of these valleys is well developed, and includes birds such as breeding dipper, grey wagtail, goosander, pied flycatcher, redstart, wood warbler, woodcock, buzzard and sparrowhawk.

Remarks:

Part of this site lies within the Brecon Beacons National Park.

The Forestry Commission and the Brecon Beacons National Park Authority own parts of this site.

Conservation (Natural Habitats, &c.) Regulations 1994 (SI 1994 No. 2716),
fel y'u diwygiwyd / as amended.

COFNOD YN Y GOFRESTR O SAFLEOEDD EWROPEAIDD I GYMRU

ENTRY IN THE REGISTER OF EUROPEAN SITES FOR WALES

(Rheoliad / Regulation 11.2)

***ENW'R SAFLE*:**
***SITE NAME*:** Coedydd Nedd a Mellte

***MATH O SAFLE*:** Ardal Cadwraeth Arbennig (ACA)
***SITE TYPE*:** Special Area of Conservation (SAC)

***CÔD Y SAFLE*:**
***SITE CODE*:** UK0030141

HANES DYNODIAD:

***Dyddiad y trosglwyddwyd i'r Comisiwn Ewropeaidd (Rheoliad 7.4)*:**
Mawrth 2003

***Dyddiad y mabwysiadwyd fel safle o bwysigrwydd cymunedol (Council Directive 92/42/EEC, Erthygl 4.2)*:**
7 Rhagfyr 2004

***Dyddiad dynodi*:**
13 Rhagfyr 2004

***Dynodwyd gan (Rheoliad 8.1)*:**
Cynulliad Cenedlaethol Cymru

LLEOLIAD:

Awdurdod unedol:
Castell-Nedd Port Talbot, Powys, Rhondda Cynon Taff

***Cyfesurynnau*:**
Hydred 03 34 02 Gor, Lledred 51 46 20 Gog
Cyfeirnod Grid Cenedlaethol Arolwg Ordnans: SN919093

Gweler hefyd y map(iau) amgaeëdig, nad ydynt yn ffurfio rhan o'r cofnod hwn.

DESIGNATION HISTORY:

***Date transmitted to the European Commission (Regulation 7.4)*:**
March 2003

Date adopted as a site of community importance (Council Directive 92/42/EEC, Article 4.2):
7 December 2004

***Date designated*:**
13 December 2004

Designated by (Regulation 8.1):
National Assembly for Wales

LOCATION:

Unitary authority:
Neath Port Talbot, Powys, Rhondda Cynon Taf

***Coordinates*:**
Longitude 03 34 02 W, Latitude 51 46 20 N
Ordnance Survey National Grid Reference: SN919093

See also the accompanying map(s), which do not form part of this entry.

MATHAU O GYNEFIN A/NEU RYWOGAETHAU Y DYNODIR Y SAFLE O'U PLEGID:
HABITAT TYPES AND/OR SPECIES FOR WHICH THE SITE IS DESIGNATED:

		Enw cyffredin	**Common name**	**Term Gwyddonol**	**Scientific term**
1	*	Coetir cymysg ar briddoedd tra-fasig sy'n gysylltiedig â llethrau creigiog	Mixed woodland on base-rich soils associated with rocky slopes	Fforestydd *Tilio-Acerion* ar lethrau, sgrïau ac mewn ceunentydd	*Tilio-Acerion* forests of slopes, screes and ravines
2		Coetir derw asidaidd gorllewinol	Western acidic oak woodland	Hen goedwigoedd y dderwen ddigoes gydag *Ilex* a *Blechnum* yn Ynysoedd Prydain	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

*Mae'n dynodi mathau o gynefin neu rywogaeth y rhoddir blaenoriaeth iddynt (a ddiffinnir yn Erthyglau 1(d) ac 1(h) o Council Directive 92/43/EEC).

*Denotes a priority habitat type or species (defined in Articles 1(d) and 1(h) of Council Directive 92/43/EEC).

***GWNAED Y COFNOD HWN*:**
14 Mehefin 2005

***THIS ENTRY MADE*:**
14 June 2005

***GAN*:**
Trish Fretten, ar ran Gweinidog dros yr Amgylchedd, Cynllunio a Chefn Gwlad, Cynulliad Cenedlaethol Cymru

***BY*:**
Trish Fretten, on behalf of the Minister for Environment, Planning and Countryside, National Assembly for Wales

***LLOFNOD*:**

***SIGNATURE*:**

DYDDIAD(AU) COFNODION BLAENOROL AR GYFER Y SAFLE HWN:
Dim

DATE(S) OF PREVIOUS ENTRIES FOR THIS SITE:
None

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

RHONDDA CYNON TAFF **CORS BRYN-Y-GAER**

Date of Notification: 2002

National Grid Reference: SN 945065

O.S. Maps: 1:50,000 Sheet number: 160
1:10,000 Sheet number: SN 90NE and NW

Site Area: 52.1 ha

Description:

Cors Bryn-y-gaer is of special interest for its lowland bog and for areas of soligenous flush, marshy grassland, dry neutral grassland and lowland acid grassland. These habitats occur in a complex with wet heath, swamp and semi-improved grassland. The site is also of special interest for the marsh fritillary butterfly *Eurodryas aurinia*.

The site is located immediately north-west of Hirwaun and south of the Brecon Beacons National Park. Cors Bryn-y-gaer is situated at the northern edge of the South Wales Coalfield, on glacial boulder clay, with areas of deep peat on lower ground. Several small water courses and springs are associated with the site, which is in the catchment of the Afon Cynon. The altitude varies from 205 to 220m. The main part of the site comprises several drumlins (smooth oval hills of glacial drift) interspersed with lower lying flat ground. A series of enclosed fields form the northern margin. Also included within the site are two small level fields situated 500 m to the south of the main block of land; these fields are bisected by the A4059 Hirwaun-Penderyn road.

The lowland bog at Cors Bryn-y-gaer is actively peat forming. The vegetation is characterised by a carpet of bog moss *Sphagnum cuspidatum*, together with species such as deergrass *Trichophorum cespitosum*, hare's tail cottongrass *Eriophorum vaginatum* and round-leaved sundew *Drosera rotundifolia*. In slightly drier areas cross-leaved heath *Erica tetralix* becomes more abundant and there is a greater range of bog moss species *Sphagnum spp*., whilst in the wettest areas common cottongrass *Eriophorum angustifolium* is frequent.

Areas of acidic soligenous flush (under the influence of slow flowing mineral-rich ground or surface waters) cover most of the remaining deep peat between the drumlins. Here the vegetation is dominated by sharp-flowered rush *Juncus acutiflorus* over a carpet of bog moss. Associated species include purple moor-grass *Molinia caerulea*, heath wood-rush *Luzula multiflora* and tormentil *Potentilla erecta*. More sedge-rich flushes, with abundant carnation sedge *Carex panicea*, frequent bog asphodel *Narthecium ossifragum* and common cottongrass occur locally.

Marshy grassland is common on sloping ground on drumlins throughout Cors Bryn-y-gaer. Much of this grassland is dominated by purple moor-grass together with species such as sheep's

fescue *Festuca ovina* and tormentil. In places, this grassland is slightly heathy with frequent heath rush *Juncus squarrosus* and occasional cross-leaved heath. Elsewhere grasses are more prominent, including sweet vernal-grass *Anthoxanthum oderatum* and heath grass *Danthonia decumbens*. Small patches where the soil is slightly less acidic are distinguished by the presence of meadow thistle *Cirsium dissectum*.

Areas of marshy grassland dominated by rushes such as soft rush *Juncus effusus* and sharp-flowered rush are also present throughout Cors Bryn-y-gaer. Associated species include frequent marsh bedstraw *Galium palustre*, devil's-bit scabious *Succisa pratensis* and greater bird's-foot-trefoil *Lotus pedunculatus*.

Other habitats found at Cors Bryn-y-gaer include dry acid and neutral grassland. The neutral grassland is characterised by a range of grasses including common bent *Agrostis capillaris*, red fescue *Festuca rubra* and crested dog's tail *Cynosurus cristatus*, together with common knapweed *Centaurea nigra* and common bird's-foot trefoil *Lotus corniculatus*. On the lower slopes of the drumlins this community often grades into the more extensive acid grassland community, containing frequent sheep's fescue *Festuca ovina* and bird's-foot trefoil. Several small areas of wet heath also occur in association with marshy grassland and acid flush. These typically include frequent purple moor-grass, along with deergrass, cross-leaved heath and a range of mosses.

Many of the plant communities are closely juxtaposed, with well displayed transitions between them. Other habitats present on the site include small patches of swamp, inundation vegetation and scrub which add to the ecological and structural diversity of the site.

The nationally scarce marsh fritillary butterfly is associated with the marshy grassland, in which its larval food plant, devil's bit scabious, is frequent and widespread.

Cors Bryn-y-gaer also supports a population of cruet collar moss *Splachnum ampullaceum*, a nationally declining species, scarce in south Wales. This moss occurs mainly in lowland wet pastures, where it grows on decaying cattle and sheep dung.

Remarks:

Cors Bryn-y-gaer SSSI and the nearby Woodland Park/Pontpren SSSI support one of the largest metapopulations of marsh fritillary in South Wales. These two sites comprise the Blaen Cynon candidate Special Area of Conservation (cSAC).

Cors Bryn-y-gaer supports the following UK Biodiversity Action Plan priority habitats: lowland raised bog, purple moor-grass and rush pasture, fen, lowland acid grassland and lowland meadow.

The marsh fritillary is included on Annex IIa of the EC Habitats and Species Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is a Biodiversity Action Plan species.

Conservation (Natural Habitats, &c.) Regulations 1994 (SI 1994 No. 2716),
fel y'u diwygiwyd / as amended.

COFNOD YN Y GOFRESTR O SAFLEOEDD EWROPEAIDD I GYMRU

ENTRY IN THE REGISTER OF EUROPEAN SITES FOR WALES

(Rheoliad / Regulation 11.2)

***ENW'R SAFLE*:**
***SITE NAME*:** Blaen Cynon

***MATH O SAFLE*:** Ardal Cadwraeth Arbennig (ACA)
***SITE TYPE*:** Special Area of Conservation (SAC)

***CÔD Y SAFLE*:**
***SITE CODE*:** UK0030092

HANES DYNODIAD:

***Dyddiad y trosglwyddwyd i'r Comisiwn Ewropeaidd (Rheoliad 7.4)*:**
Ionawr 2003

***Dyddiad y mabwysiadwyd fel safle o bwysigrwydd cymunedol (Council Directive 92/42/EEC, Erthygl 4.2)*:**
7 Rhagfyr 2004

***Dyddiad dynodi*:**
13 Rhagfyr 2004

***Dynodwyd gan (Rheoliad 8.1)*:**
Cynulliad Cenedlaethol Cymru

LLEOLIAD:

Awdurdod unedol:
Rhondda Cynon Taff

***Cyfesurynnau*:**
Hydred 03 31 41 Gor, Lledred 51 44 54 Gog
Cyfeirnod Grid Cenedlaethol Arolwg Ordnans: SN946066

Gweler hefyd y map(iau) amgaeëdig, nad ydynt yn ffurfio rhan o'r cofnod hwn.

DESIGNATION HISTORY:

***Date transmitted to the European Commission (Regulation 7.4)*:**
January 2003

Date adopted as a site of community importance (Council Directive 92/42/EEC, Article 4.2):
7 December 2004

***Date designated*:**
13 December 2004

Designated by (Regulation 8.1):
National Assembly for Wales

LOCATION:

Unitary authority:
Rhondda Cynon Taf

***Coordinates*:**
Longitude 03 31 41 W, Latitude 51 44 54 N
Ordnance Survey National Grid Reference: SN946066

See also the accompanying map(s), which do not form part of this entry.

MATHAU O GYNEFIN A/NEU RYWOGAETHAU Y DYNODIR Y SAFLE O'U PLEGID:
HABITAT TYPES AND/OR SPECIES FOR WHICH THE SITE IS DESIGNATED:

		Enw cyffredin	Common name	Term Gwyddonol	Scientific term
1		Glöyn byw britheg y gors	Marsh fritillary butterfly	*Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia*	

*Mae'n dynodi mathau o gynefin neu rywogaeth y rhoddir blaenoriaeth iddynt (a ddiffinnir yn Erthyglau 1(d) ac 1(h) o Council Directive 92/43/EEC).

*Denotes a priority habitat type or species (defined in Articles 1(d) and 1(h) of Council Directive 92/43/EEC).

***GWNAED Y COFNOD HWN*:**
14 Mehefin 2005

***THIS ENTRY MADE*:**
14 June 2005

***GAN*:**
Trish Fretten, ar ran Gweinidog dros yr Amgylchedd, Cynllunio a Chefn Gwlad, Cynulliad Cenedlaethol Cymru

***BY*:**
Trish Fretten, on behalf of the Minister for Environment, Planning and Countryside, National Assembly for Wales

***LLOFNOD*:**

***SIGNATURE*:**

DYDDIAD(AU) COFNODION BLAENOROL AR GYFER Y SAFLE HWN:
Dim

DATE(S) OF PREVIOUS ENTRIES FOR THIS SITE:
None

CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

RHONDDA CYNON TAFF **WOODLAND PARK AND PONTPREN**

Date of Notification: 2000, 2002

National Grid Reference: SN 946077, SN 952075, SN 948071

O.S. Maps: 1:50,000 Sheet number: 160
1:10,000 Sheet number: SN90NW, SN90NE

Site Area: 14.5 ha

Description:

Woodland Park and Pontpren is of special for the interest for the marsh fritillary butterfly *Eurodryas aurinia*. Additional special interest is provided by its mixture of habitat types, including marshy grassland, dry acid and neutral grassland, heathland and woodland, which add to the ecological and biodiversity interest of the site and which also provide food and shelter necessary for the survival of the marsh fritillary.

This site consists of three separate blocks of land, approximately 1km south of the village of Penderyn. The underlying geology is of Namurian and Westphalian sandstones, overlain by stagnohumic gleyed soils. Drainage is impeded across most of the site. The altitude ranges from 210 to 265m.

A variety of purple moor-grass *Molinia caerulea*-dominated communities are present at the site. The largest stands, in the north-western block, were planted with trees in 1995 and are rather tussocky and species-poor. Smaller areas of tussocky vegetation with an abundance of tall herbs such as wild angelica *Angelica sylvestris*, are present in the southern block. Scattered throughout the site are small, grassier stands, with species such as sheep's-fescue *Festuca ovina*, sweet vernal-grass *Anthoxanthum odoratum*, small sedges *Carex spp.* and tormentil *Potentilla erecta*. Heathier areas have cross-leaved heath *Erica tetralix* and bog mosses *Sphagnum spp.*.

Small patches of fen-meadow, with abundant meadow thistle *Cirsium dissectum*, tawny sedge *Carex hostiana* and flea sedge *C. pulicaris*, occur scattered in all three blocks of land and, more locally, there are base-enriched flushes with a high cover of bryophytes such as *Bryum pseudotriquetrum* and *Campylium stellatum*.

Marshy grassland with a high cover of sharp-flowered rush *Juncus acutiflorus* and soft-rush *J. effusus* occurs in the eastern and southern blocks, where it sometimes grades into tall-herb fen dominated by meadowsweet *Filipendula ulmaria* or damp grassland dominated by tufted hair-grass *Deschampsia cespitosa*.

On better drained soils there are small areas of acid and neutral grassland and bracken. The acid grassland is characterised by species such as common bent *Agrostis capillaris*, sheep's-fescue,

heath bedstraw *Galium saxatile* and tormentil. Common species in the neutral grassland include crested dog's-tail *Cynosurus cristatus*, common bird's-foot-trefoil *Lotus corniculatus* and red clover *Trifolium pratense*.

Devil's-bit scabious *Succisa pratensis*, the larval food plant of the marsh fritillary, is widespread and abundant in most of the wet and dry pasture at the site. It is also common in ditches in planted areas in the north-west of the site. Flowers of plants such as meadow thistle, provide a nectar source for the adult marsh fritillary.

Stands of broadleaved woodland and scrub occur throughout the site. On wetter ground, the main species are alder *Alnus glutinosa* and willow *Salix spp*., with oak *Quercus spp*. and birch *Betula pubescens* common on more free-draining soils.

Remarks:

Woodland Park and Pontpren SSSI and the nearby Cors Bryn-y-gaer SSSI support one of the largest metapopulations of marsh fritillary in south Wales. These two sites comprise the Blaen Cynon Special Area of Conservation (cSAC).

The marsh fritillary is included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Annex IIa of the EC Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) and is a priority Biodiversity Action Plan species.

The site, apart from the most southerly field, lies within the Brecon Beacons National Park.