The Hirwaun Power (Gas Fired Power Station) Order

5.2.0 Flood Risk Assessment

Planning Act 2008
The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009

PINS Reference Number:	EN010059
Document Reference:	5.2.0
Regulation Number:	r5(2)(e)
Author:	Parsons Brinckerhoff

Revision	Date	Description
0	March 2014	Submission version

CONTENTS

LIST OF ABBREVIATIONS

AEP	Annual Exceedance Probability
AGI	Above Ground Infrastructure/installation
AOD	Above Ordnance Datum
BGL	Below Ground Level
BGS	British Geological Survey
DCO	Development Consent Order
DCWW	Dwr Cymru Welsh Water
EN-1	Overarching National Policy Statement for Energy
ES	Environmental Statement
FCA	Flood Consequence Assessment
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
FWMA	Flood and Water Management Act 2010
Ha	Hectares
HPL	Hirwaun Power Limited
LLFA	Lead Local Flood Authorities
LFRMS	Local Flood Risk Management Strategy
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
NSRI	National Soils Resources Institute
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PFRA	Preliminary Flood Risk Assessment
RCTBC	Rhonda Cynon Taf Borough Council
SAB	SUDS Approving Body
SFCA	Strategic Flood Consequence Assessment
SINC	Site of Importance for Nature Conservation
SUDS	Sustainable Drainage Systems
TAN15	Technical Advice Note 15: Development
WAG	Welsh Government

GLOSSARY OF KEY TERMS

DCO Application	The application for a DCO made to the Secretary of State under section 37 PA 2008 in respect of the Project, required pursuant to section 31 PA 2008 because the Project constitutes a Nationally Significant Infrastructure Project under section 14 (1)(a) and section 15 PA 2008 by virtue of being an onshore generating station in England or Wales of 50 MWe capacity or more;
Development Consent Order	Consent by a UK Government Minister for a Nationally Significant Infrastructure Project. A DCO can incorporate or override the need for a variety of consents which would otherwise be required for a development, including planning permission. A DCO can also include rights of compulsory acquisition. A DCO is made in the form of a Statutory Instrument.
The Developer:	Means HPL;
Draft DCO:	The draft DCO which accompanies the DCO Application (Document Number: [3.1]);
Electrical Connection:	A new underground electrical cable connection to export electricity from the Power Generation Plant into the national electricity transmission system at the Rhigos Substation (Work No. 5 in the Draft DCO); [
Electrical Connection Route Corridor	The route of the Electrical Connection (Work No. 5 in the Works Plan);
Environmental Statement	The final document which provides a comprehensive discussion on the Environmental Impact Assessment.
Flood Risk Assessment	A site-specific flood risk assessment is carried out by, or on behalf of, a developer to assess the risk to a development site and demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now, and taking climate change into account.
Gas Connection:	A new underground gas pipeline connection to bring natural gas to the Power Generation Plant from the existing high pressure gas network NTS in the vicinity of the proposed Project Site including the above ground infrastructure (AGI) for the gas pipeline at the point of connection to the NTS, as well as a new permanent access to the AGI (Works No. 3 & 4 in the Draft DCO);
Gas Connection Route Corridor:	The route of the Gas Connection, including the site of the AGI and the new access to the AGI (Works No. 3 & 4 in the Works Plan); [Note: we don't have this definition in the ES – could PB please update the ES]
HPL:	A special purpose vehicle which has been set up to develop the proposed Project and 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. WPL is resourced through Stag Energy, a company founded in 2002;
Power Generation Plant	A SCGT gas fired 'peaking' power generating plant capable of providing up to 299 MWe (Work No. 2 in the Draft DCO);
Power Generation	The site of the Power Generation Plant (Work No. 2 in the Works Plan);

Plant Site:	
Project	The Power Generation Plant, the Electrical Connection and the Gas Connection together;
Project Site	The site of the Project corresponding to the Order Limits of the Draft DCO;
SCGT	Simple cycle gas turbine;
Works Plan	Plan showing the numbered works referred to in the Draft DCO (Document Number: [2.3]);

SUMMARY

Background	Parsons Brinckerhoff was commissioned by Hirwaun Power Limited to prepare a site specific Flood Risk Assessment (FRA) for a simple cycle gas turbine (SCGT) power station at Hirwaun Industrial Estate, near Aberdare, South Wales. The FRA was conducted in accordance with the Overarching National Policy Statement for Energy and other relevant planning guidance and provides a predominantly qualitative assessment of flood risk to the development proposals and people and property elsewhere as a result of the planned Project.
Existing flood risk	The existing flood risk to the site from fluvial, tidal, groundwater, overland flow and artificial sources has been assessed. The site is located in the low risk Flood Zone 1 / Development Zone A and is at low risk of fluvial flooding. Indicative Environment Agency mapping shows a raised risk of surface water flooding. This mapping does not take accurate account of surface water drainage or the culverted Nant Yr Ochain watercourse which flows around the outside of the site. As a result, the risk of surface water flooding is considered to be low. No significant risks have been identified from groundwater, overland flow or artificial sources and the risk of flooding at the site is assessed to be low.
Post development flood risk and surface water management proposals	The surface water management of the site will be designed to ensure no surface water flooding within the site for all storms up to the 1 in 30 year return period storm and no increased risk to people or property elsewhere in all events up to and including the 1 in 100 year return period storm and allowing for the predicted impacts of climate change over the life of the development. As a result of the proposed measures, the development will cause no increase to flood risk within the site or to people and property elsewhere.

1 INTRODUCTION

1.1 Project Background

1.1.1 Parsons Brinckerhoff Ltd has been appointed by Hirwaun Power Limited (HPL) to prepare a site specific Flood Risk Assessment (FRA) and Drainage Statement to support the Hirwaun Power Project.

1.1.2 The FRA will be conducted in accordance with the requirements of the Overarching National Policy Statement for Energy (EN-1) and Technical Advice Note (TAN) 15: Development and Flood Risk and will provide a predominantly qualitative analysis of flood risk to support the Environmental Statement. The assessment will include the following:

- Confirmation of the sources of flooding which may affect the site;
- A qualitative assessment of the risk of flooding to the site and to adjacent sites as a result of proposed Project;
- Review of the availability and adequacy of existing information; and
- Identification of possible measures which could reduce flood risk to acceptable levels.

1.1.3 The Project constitutes a Nationally Significant Infrastructure Project (NSIP) under Section 15 of the Planning Act 2008 and as such a Development Consent Order (DCO) is required. This FRA has been prepared to support the DCO application and forms an Appendix to the Environmental Statement (ES).

Nomenclature

1.1.4 This document has been titled a Flood Risk Assessment in accordance with the phrasing used in EN-1. This document also meets the requirements of a Flood Consequence Assessment in accordance with TAN15 and Planning Policy Wales.

1.2 Development Proposals

1.2.1 The Project comprises a new simple cycle gas turbine (SCGT) Power Station and integral connections on land at and near the Hirwaun Industrial Estate near Aberdare in South Wales.

1.2.2 The Project consists of three main elements: the Power Generation Plant, the Gas Connection and the Electrical Connection.

- The Power Generation Plant will be located entirely within the existing industrial estate, covering an area of 7.5 hectares (ha). The

footprint of the Plant is approximately 5 ha within wider site and is to be located within an area of existing impermeable surface;

- The Gas Connection comprises a new underground gas pipeline connection to bring natural gas to the Power Generation Plant from the existing high pressure gas network NTS in the vicinity of the proposed Project Site including the above ground infrastructure (AGI) for the gas pipeline at the point of connection to the NTS, as well as a new permanent access to the AGI (Works No. 3 & 4 in the Draft DCO);
- The Electrical Connection comprises a new underground electrical cable connection to export electricity from the Power Generation Plant into the national electricity transmission system at the Rhigos Substation (Work No. 5 in the Draft DCO); [

1.2.3 The Gas Connection and Electrical Connection are predominantly below ground and it is considered that they will not have a significant impact on flood risk. The AGI for the gas pipeline is less than 1 hectare and located in Flood Zone 1. As a result this assessment will focus on the Power Generation Plant.

1.3 Consultation

1.3.1 A Preliminary Environmental Information Report (PEIR) was submitted in May 2013 and statutory responses were received from key stakeholders including the Planning Inspectorate, Natural Resources Wales (NRW) and Dwr Cymru Welsh Water (DCWW). These responses are included in Appendix A of the ES.

Rhonda Cynon Taf Borough Council (RCTBC)

1.3.2 A meeting was held with RCTBC in January 2014 to discuss the culverted River Camnant / Nant yr Ochain watercourse and the requirements for surface water drainage. In summary, the guidance from RCTBC was as follows:

- Historical mapping and other records indicate there may be a culverted watercourse running beneath the site. RCTBC advise against building over the existing culvert due to the risk of damaging the culvert, the difficulty of inspecting the culvert and the residual flood risk should the culvert become blocked.
- RCTBC are aware that opening up the existing culvert or diverting the culvert may not be feasible for the Power Generation Project. RCTCBC would seek that regard is had to their culverting policy whether within the application or prior to construction through an appropriate strategy document.

- RCTBC require a drainage strategy setting out the proposals for surface water management for the Power Generation Project. Whilst RCTBC accept that the site is brownfield, they would expect to see the consideration of the use of SUDs and increased infiltration.

2 ASSESSMENT METHODOLOGY

2.1 Overview

2.1.1 The assessment has been prepared to meet the requirements of TAN15 and the flood risk requirements of EN-1.

2.1.2 The minimum requirements of a FRA under EN-1 are that it should:

- Be proportionate to the risk and appropriate to the scale, nature and location of the project;
- Consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
- Take the impacts of climate change into account, clearly stating the development lifetime over which the assessment has been made;
- Be undertaken by competent people, as early as possible in the process of preparing the proposal;
- Consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure;
- Consider the vulnerability of those using the site, including arrangements for safe access;
- Consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
- Consider the effects of a range of flooding events including extreme events on people, property, the natural and historical environment and river and coastal processes;
- Include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular project;
- Consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems;
- Consider if there is a need to be safe and remain operational during a worst case flood event over the development's lifetime; and
- Be supported by appropriate data and information, including historical information on previous events.

2.1.3 The methodology adopted in this FRA comprises:

- Review of available flood risk data to identify existing flood risk from fluvial, tidal, groundwater, overland flow and artificial sources;
- Consideration of existing ground conditions on-site to determine groundwater levels, soil permeability and contamination risks through review of previous land use and information available from NRW, the British Geological Survey (BGS) and National Soil Resources Institute (NSRI) Soils Site Report;
- Review of the development proposals in terms of flood risk vulnerability and flood zone compatibility, in accordance with the methodology defined in the TAN15;
- Consideration of how the development proposals may affect flood risk to the site and surrounding land; and
- Proposals for the appropriate management of flood risks to facilitate development whilst not increasing risks elsewhere.

2.1.4 Data regarding flood risk relevant to the Project and surrounding area has been obtained from the following sources:

- EA indicative flood risk maps and groundwater maps;
- NRW / TAN15 Development Advice Map;
- Rhonda Cynon Taff Strategic Flood Consequence Assessment (SFCA), October 2008;
- Rhonda Cynon Taff Preliminary Flood Risk Assessment (PFRA), October 2011;
- Rhonda Cynon Taff Local Flood Risk Management Strategy (LFRMS), October 2012 (draft for consultation);
- Direct consultation with NRW, RCTBC and DCWW as discussed in Section 1.3.

2.2 Definition of Flood Risk

2.2.1 Flood risk is the product of the likelihood or chance of a flood occurring (flood frequency) and the consequence or impact of the flooding (flood consequence).

Flood Frequency

2.2.2 Flood frequency is identified in terms of the return period and annual probability. For example, a 1 in 100 year flood event has a 1% annual probability of occurring. Table 1 below provides a conversion between return periods and annual flood probabilities.

Table 1 – Flood probability conversion table

Return Period (years)	2	5	10	20	50	100	200	1000
Annual Flood Probability (%)	50	20	10	5	2	1	0.5	0.1

2.2.3 TAN15 identifies Development Advice Zones to aid planning decisions relating to flood risk. Table 2 below describes the composition and use of these zones to control and manage development.

Table 2 – Development Advice Zones

Description of Zone		Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding.	A	Used to indicate that justification test is not applicable and no need to consider flood risk further.
Area known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1% annual probability) flood level. If site levels are greater that the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
Environment Agency extreme flood outline, equal to or greater than 0.1% annual probability of flooding.	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly

		vulnerable development should not be considered.

Flood Consequences

2.2.4 The consequence of a flood event describes the potential damage, danger and disruption caused by flooding. This is dependent on the mechanism and characteristics of the flood event and the vulnerability of the affected land and land use.

2.2.5 TAN15 identifies three classifications of flood risk vulnerability and provides recommendations on the compatibility of each vulnerability classification with the Development Advice Zones, as shown in Table 3.

Table 3 – Flood risk vulnerability and flood zone compatibility

Development Advice Zone	Emergency Services	Highly Vulnerable	Less vulnerable
A	✓	✓	✓
B	Justification test required if within 0.1% AEP event	Justification test required if within 0.1% AEP event	Justification test required if within 0.1% AEP event
C	Justification test required	Justification test required	Justification test required
C1	Justification test required	Justification test required	Justification test required
C2	×	×	Justification test required

✓ Development considered acceptable

× Development not considered acceptable

2.3 Potential Sources of Flooding

2.3.1 The following sources of flooding will be considered in this assessment:

- Fluvial flood risk from nearby watercourses;
- Overland surface water flooding from adjacent sites;
- Site generated surface water runoff;
- Surcharging of sewers;
- Groundwater flooding; and

- Tidal flooding.

2.4 Potential Effects of Climate Change

2.4.1 Scientific consensus is that the global climate is changing as a result of human activity. While there remain uncertainties in how a changing climate will affect areas already vulnerable to flooding, it is expected to increase risk significantly over time.

2.4.2 As highlighted in TAN15, the UK Climate Impacts Programme (UKCIP02) climate change scenarios for the UK suggest that winters will become wetter by as much as 20% by 2050. Rainfall patterns are also predicted to change, with summers and autumn becoming much drier, but the number of rain-days and average intensity of rainfall is expected to increase.

2.4.3 In accordance with TAN15, the potential impact of climate change will be assessed by increasing rainfall intensity by 20% in the 100 year event.

2.5 The Flood and Water Management Act 2010

2.5.1 The Flood and Water Management Act 2010 (FWMA) introduces new responsibilities for flood risk management for local authorities and sets out new requirements for the management of sustainable drainage.

2.5.2 The FWMA Act is still being implemented and this report provides guidance on how its implementation will impact on the management of surface water and flood risk for the Project.

Lead Local Flood Authorities

2.5.3 Under the FWMA the unitary authority or county council for an area is designated the 'Lead Local Flood Authority' (LLFA), with responsibility for managing flood risk from surface water, ground water and ordinary watercourses within their area. The LLFA are also the consenting authority for works near or within ordinary watercourses. Rhonda Cynon Taff Borough Council is the LLFA for the Project area.

Sustainable Drainage

2.5.4 Schedule 3 of the FWMA introduces new National Standards for Sustainable Drainage Systems (SUDS) against which proposed drainage systems should comply. Under Schedule 3 of the FWMA, LLFAs will become the SUDS Approving Body (SAB) for surface water drainage systems for new development. Approval from the SAB for drainage proposals must be agreed prior to construction. For drainage systems that serve more than one property, the SAB will have

responsibility for maintenance of adopted SUDS schemes that meet SAB requirements.

2.5.5 These standards are currently in draft and will be implemented following consultation.

2.5.6 The draft standards introduce the SUDS hierarchy that states that the following methods of surface water disposal must be considered in order of preference:

- Discharge into the ground;
- Discharge to a surface water body;
- Discharge to a surface water sewer;
- Discharge to a combined sewer.

2.5.7 The draft standards also promote the management of surface water runoff at source, on the surface and integrated with public open space where it is reasonably practicable to do so.

3 SITE DESCRIPTION

3.1 Power Generation Plant Site Description and Location

3.1.1 The Power Generation Plant site is located at Hirwaun Industrial Estate, approximately 2km west of Hirwaun and 5km west of Aberdare at National Grid Reference (NGR) SN938061.

3.1.2 The site location is shown in *Figure 1*.

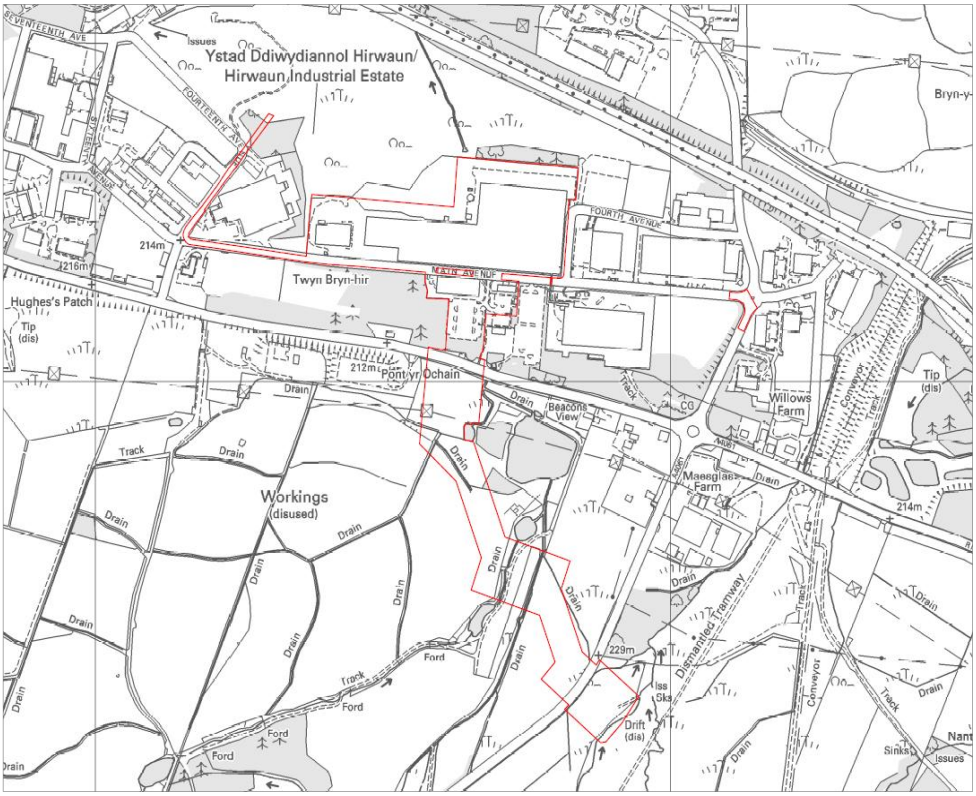

Figure 1 – Site location showing project redline boundary

3.1.3 The site covers an area of approximately 7.5 hectares (ha), with the footprint covering approximately 5 ha of the site.

3.1.4 The site is at approximately 210m AOD, with a shallow gradient from south to north across the site and comprises an area of land currently occupied by a large industrial building used for storage and distribution.

3.1.5 The A465 trunk road lies runs near to the northern boundary of the site.

Hydrology and Surface Water Features

3.1.6 The site lies at the watershed of two major river catchments. The land to the west of the site drains to the River Neath, which flows south-west

to discharge to the Bristol Channel in Swansea Bay. The land to the east of the site drains to the River Cynon, which flows south-east and joins the River Taff at Abercynon. The River Cynon flows through the centre of Hirwaun approximately 1km to the east of the Project Site.

3.1.7 Review of OS mapping and the Flood Estimation Handbook (FEH) database indicates that the site is in the hydraulic catchment of the River Camnant. The upstream reaches of this watercourse are labelled on OS mapping and historical maps as the Nant yr Ochain and the distinction between these two watercourses is not clear. Downstream of the site the River Camnant passes beneath the A465 and flows in a westerly direction to join the Afon Sychryd which flows north-west to join the Afon Melte, discharging to the River Neath at Pontneddfechan.

3.1.8 Historical mapping indicates that the Nant yr Ochain / River Camnant historically flowed through the site and has been subject to numerous diversions, as detailed below:

Year	Details
1921 (Figure 2)	Nant yr Ochain and River Camnant shown in their natural alignment. No development at the Hirwaun Industrial Estate. A small tributary of the River Camnant is shown flowing south-north through the west of the site.
1951-1953 (Figure 3)	Western section of Nant yr Ochain watercourse shown culverted through site, emerging at north-east of the site to connect back into Nant yr Ochain. Eastern section of Nant yr Ochain shown rerouted to north along road.
1981 (Figure 4)	The 1981 map shows the site following the construction of the A465 and extension of the industrial estate. The eastern section of the Nant yr Ochain is no longer shown, and the connection from the culvert beneath the site to the watercourse downstream is no longer shown.

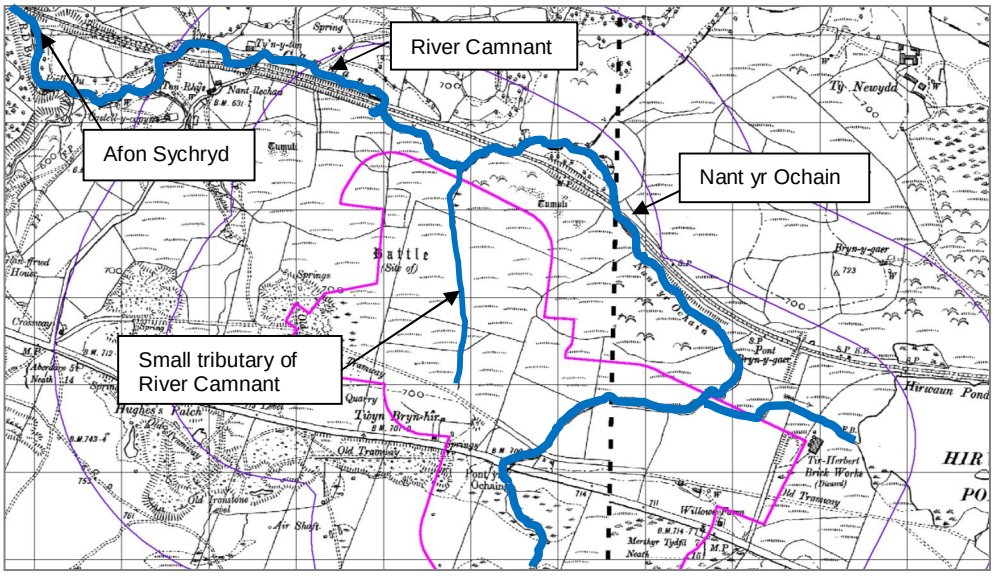

Figure 2 – Historical mapping of the site, 1921 (PEIR red line boundary site boundary shown in pink)

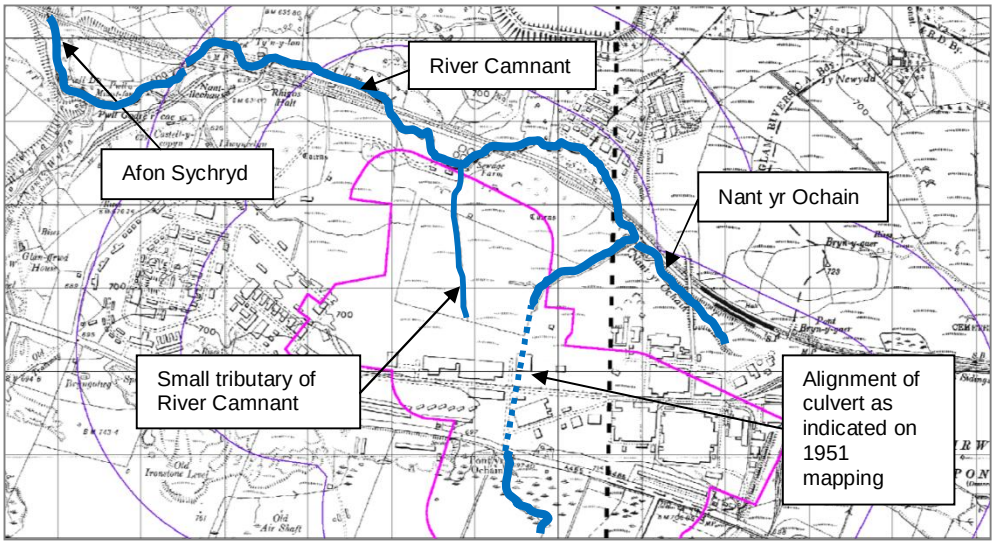

Figure 3 – Historical mapping of the site, 1951-1953

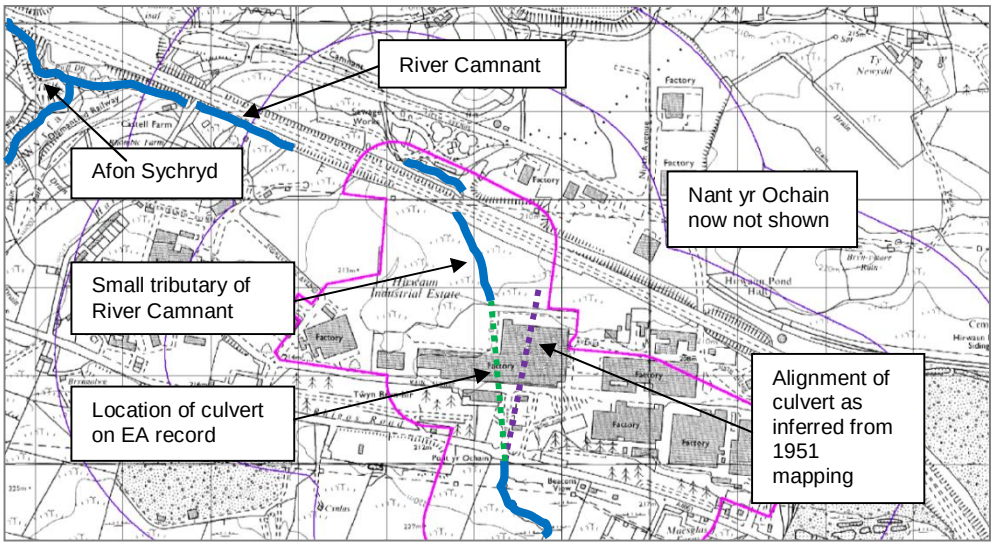

Figure 4 - Historical mapping of the site, 1981

3.1.9 Review of Dwr Cymru asset records and the current detailed OS mapping shows a culvert running around the boundary of site, as shown in Figure 5. It is unclear whether this culvert is separate to the potential culvert running north-south through the site.

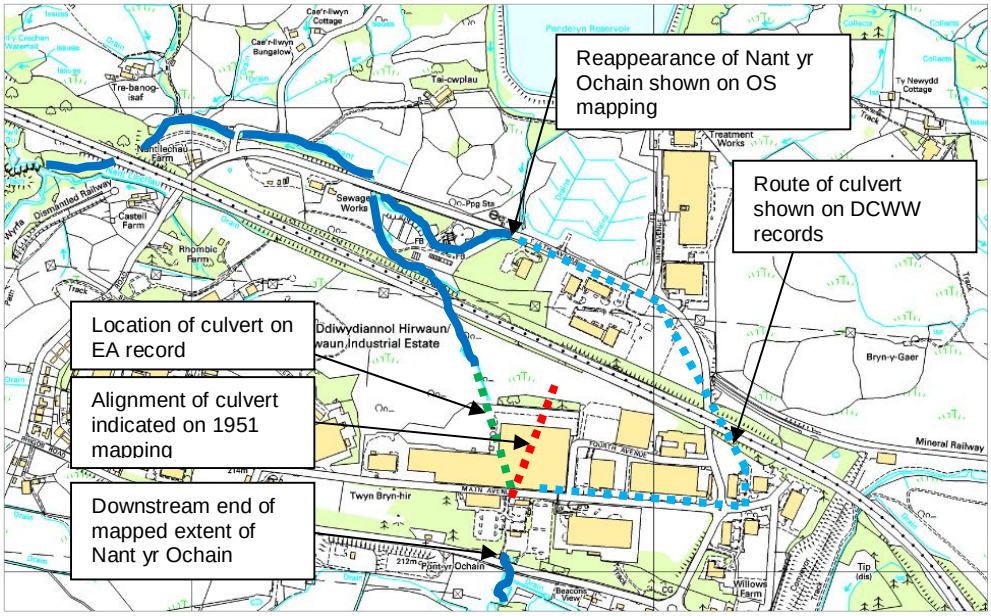

Figure 5 – Current 1:10,000 OS Mapping

3.1.10 Other small water bodies within the vicinity of the Project Site are:

- An area of bog / marshy grassland is located approximately 1km to the east of the Power Generation Plant Site. This area incorporates

the shallow Hirwaun Ponds and forms part of the Hirwaun Industrial Estate Site of Importance for Nature Conservation (SINC);

- A small fishing pond is located approximately 200m south of the site;
- The agricultural land to the south of the site is drained by a network of small ditches and land drains.

3.1.11 The DCWW drinking water reservoir Penderyn Reservoir is approximately 250m to north of site.

Geology and Hydrogeology

3.1.12 With reference to Table 10.5 from Section 10 of the Environmental Statement, the bedrock and superficial geology underlying the site is summarised in Table 4.

Table 4 – Geological make-up at the site

Geological Deposit	Description
Topsoil	Brown Sandy Clay. Range in depth from 0.15-0.61 m below ground level (BGL)
Peat	Soft, dark brown / black fibrous peat ranging in depth from 1.37 – 5.33m BGL.
Glacial Till	Mixture of sand, silt, gravel, cobbles and boulders. Ranging in depth from 7-9m BGL.
Coal Measures	Not proven by boreholes

3.1.13 The coal measures are classified as Secondary A aquifer, described as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;

3.1.14 The Cranfield University / National Soils Resources Institute *Soilscape* website (www.landis.org.uk) identifies that the soil across the majority of the Project Site is a slowly permeable wet and very acid upland soil with a peaty surface. The soil is described as having impeded drainage.

3.2 Existing Drainage

3.2.1 The following existing foul and surface water drainage has been identified within the Project Site and immediate surrounding area:

Public Infrastructure

3.2.2 Public sewer records for the site have been supplied by DCWW and show:

- Surface water drains to a culvert which runs in an anti-clockwise direction before discharging into the Nant yr Ochain watercourse downstream. This culvert appears to collect flows from the Nant yr Ochain upstream of the site;
- A combined foul and surface water sewer network is shown, ultimately discharging to the DCWW Hirwaun Sewage Treatment Works immediately to the north of the site.

3.2.3 It is unclear from the sewer records or from site records where the existing infrastructure on the Power Generation Plant Site connects into the public sewer network.

4 EXISTING FLOOD RISK

4.1 Tidal and Fluvial Flooding

4.1.1 Figure 6 is an extract from the TAN15 Development Advice Map, showing flood risk from tidal and fluvial sources. The mapping shows the site to be Zone A, with a low risk of fluvial and tidal flooding.

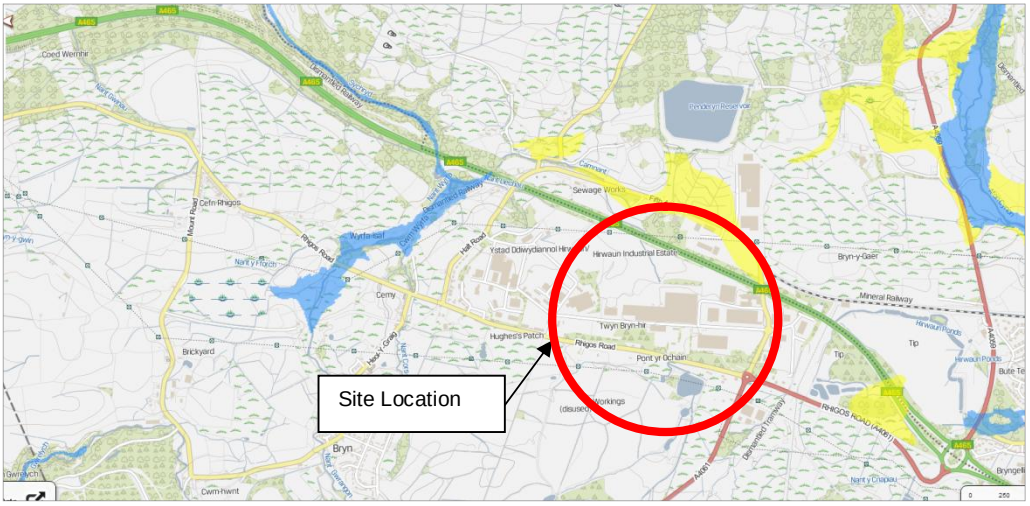

Figure 6- Extract from TAN15 Development Advice Map (Green = Zone C1, Blue = Zone C2, Yellow = Zone B)

Flood Risk from Nant yr Ochain Culvert

4.1.2 The indicative mapping from the EA and NRW shows no raised flood risk from the culverted Nant yr Ochain. However, the indicative mapping does not take into account the risk from potential blockage of the culvert. This risk is considered further in the section below on flood risk from overland flow.

4.2 Other Sources of Flooding

Groundwater Flood Risk

4.2.2 Groundwater flooding occurs when water stored below ground reaches the surface. It is commonly associated with porous underlying geology, such as chalk, limestone and gravels.

4.2.3 The BGS Susceptibility to Groundwater map was obtained for the site by Argyll Environmental. This map (shown in Figure 7) shows areas of High and Very High risk of groundwater flooding at the Power Generation Plant site.

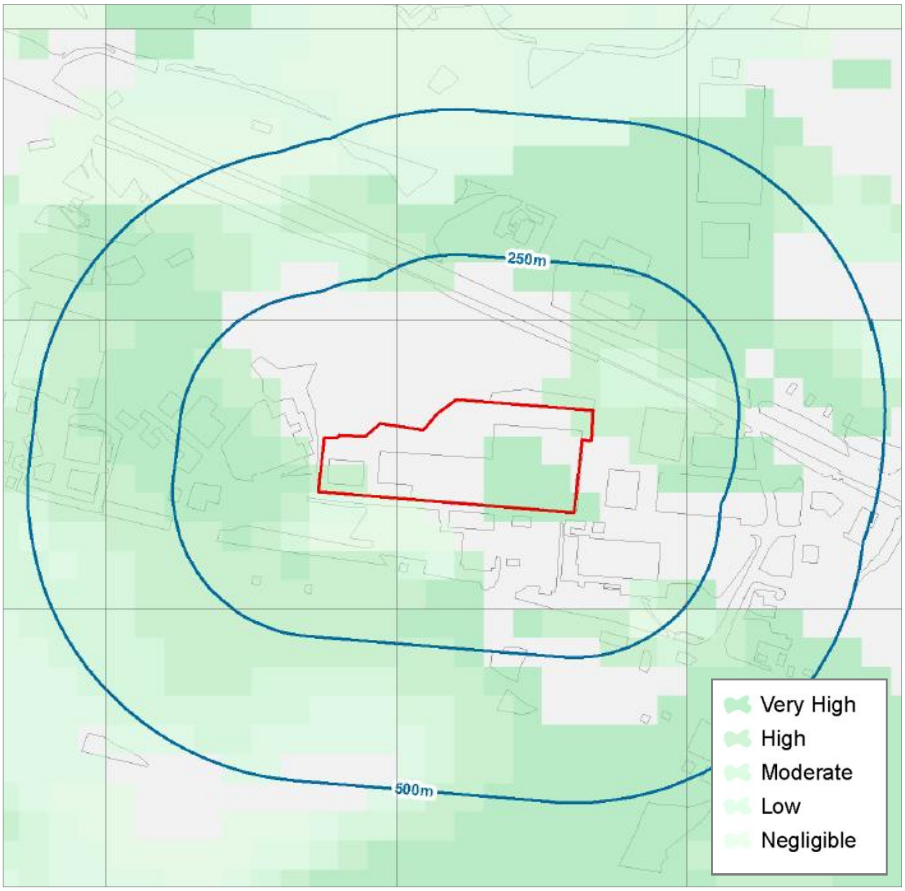

Figure 7 – Extract of BGS Susceptibility to Groundwater Flooding map

4.2.4 However, while the bedrock geology beneath the site is classified as a Secondary Aquifer and will contain groundwater, the bedrock is overlain by a layer of low permeability glacial till and peat, which would impede the emergence of groundwater at the site. The risk of significant groundwater emergence at the site is therefore considered to be low.

4.2.5 There are no known incidents of groundwater flooding at the site and the risk of groundwater flooding is assessed to be low.

Overland Flow

4.2.6 For the purpose of this FRA, flood risk from overland flow includes flooding from surface water runoff, surcharging of the sewerage network and overland flow from artificial sources such as canals or reservoirs.

4.2.7 Figure 8 shows the EA surface water flood risk map for the Project Site. As discussed in paragraph 4.1.2, the map shows surface water flooding following the route of the Nant yr Ochain culvert. Areas of the Project

Site are shown to be at risk in a Medium Risk (1 in 100 yr) and High Risk (1 in 30 year) flood extent. This mapping does not take full account of existing drainage or culverts, so can be considered to represent the flooding of the Project Site in the event of complete blockage of the Nant yr Ochain culvert. This culvert is indicated on the DCWW asset plan, and it is assumed that DCWW hold responsibility for its maintenance. If this is the case, the risk of blockage and subsequent risk of surface water flooding would be greatly reduced. There are no known incidents of surface water flooding at the site.

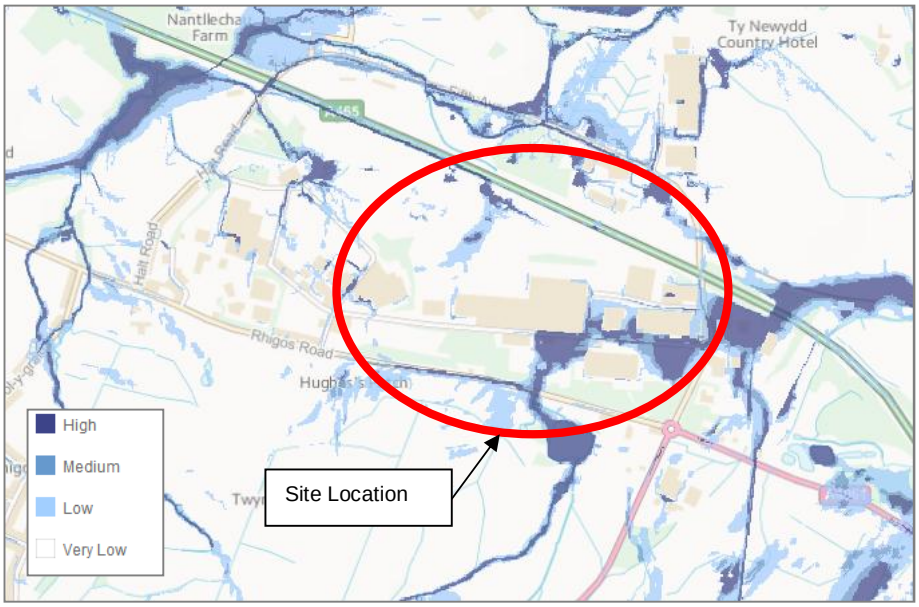

Figure 8 – Extract of EA Flooding from Surface Water map. High risk = 1 in 30 yr, Medium risk = 1 in 100 yr, Low risk = 1 in 1000 yr. Very low = less than 1 in 1000 yr.

4.2.8 As shown in Figure 9, the Project Site is not assessed to be at risk of flooding from the Penderyn Reservoir.

Figure 9 – Extract from EA Flood Risk from Reservoir indicative mapping

4.3 Summary of Existing Flood Risk

4.3.1 The site is assessed to be at low risk of flooding from all sources.

5 POST DEVELOPMENT FLOOD RISK & DRAINAGE STATEMENT

5.1 Post Development Flood Risk

5.1.1 The Project is located entirely within the low risk Zone A on the TAN15 Development Advice Map and the low risk Flood Zone 1 on the EA indicative flood zone mapping. The Project will have no impact on fluvial flood risk at the Project Site or to people and property downstream.

5.2 Surface Water Drainage Proposals

5.2.1 The Project is being constructed on a brownfield site, which remains in economic use by International Greetings UK and comprises of large areas of impermeable concrete surface. The development does not increase the impermeable area of the site and as a result will not result in an increase in surface water run-off from the site.

5.2.2 Detailed proposals for the surface water drainage of the new buildings and hardstanding are yet to be confirmed, however the proposed approach is to utilise the existing drainage infrastructure serving the existing site. Review of DCWW mapping indicates that surface water from the site is likely to discharge to the culverted Nant yr Ochain which flows around the outside of the site to join the River Camnant downstream.

5.2.3 It is proposed that the site will continue to discharge surface water to the culverted Nant yr Ochain watercourse at an unattenuated rate. Review of the downstream catchment shows no raised flood risk in the downstream River Camnant up to its confluence with the Afon Melte, which has a large and steep catchment. Surface water falling on the Project site forms a very small part of this catchment and attenuating surface water flows would have no impact on flood risk.

5.2.4 Surface water drainage will be designed to ensure no surface water flooding within the site up to the 1 in 30 year event. Site levels will be designed to ensure no increased risk of flooding to people and properties elsewhere in the event of rainfall events greater than the 1 in 30 year event up to the 100 year plus 20% climate change event.

5.3 Summary of Post Development Flood Risk

5.3.1 The Project will result in no increased flood risk to the site or people and properties outside of the site. Surface water drainage will be designed to ensure no surface water flooding within the site up to the 1 in 30 year event and no increased risk of flooding to people and

property elsewhere in events up to the 100 year plus 20% climate change event.

6 SEQUENTIAL / JUSTIFICATION TEST

6.1 Sequential Test / Justification Test

6.1.1 The site is located within TAN15 Zone A / EA Flood Zone 1 and is therefore considered to meet the requirements of the Sequential Test / Justification Test.

6.2 The Exception Test

6.2.1 Due to the low flood risk the Exception Test does not need to be applied to this development.

7 CONCLUSION

7.1 Introduction

7.1.1 Proposals have been prepared for the development of a new SCGT Power Station and integral connections on land at and near Hirwaun Industrial Estate. The Project proposals comprise three elements: the Power Generation Plant, a new Gas Connection and a new Electricity Connection. This FRA focuses on the Power Generation Plant due to the small extent of above ground permanent works for the Gas Connection and Electrical Connections.

7.1.2 This FRA has been prepared to consider the flood risk to the Power Generation Plant from external sources and the impact that the Project will have on flood risk within the site and elsewhere.

7.2 Summary of Existing Flood Risk

7.2.1 Through review of indicative flood maps and the SFCA it was identified that the site is located within the low risk EA Flood Zone 1 / TAN15 Zone A with an annual probability of tidal and fluvial flooding of less than 0.1% (1 in 1000).

7.2.2 The EA indicative surface water flood map shows a raised risk of surface water flooding at the site. However, this mapping does not fully take into account surface water drainage or the culverted Nant yr Ochain which flows around the eastern boundary of the Project Site.

7.2.3 There are no known significant flood risks to the site from groundwater or overland flow and no known records of historical flooding within the site.

7.2.4 The Project Site is assessed to be at low risk of flooding.

7.3 Summary of Post Development Flood Risk

7.3.1 The Project will be designed to ensure there will be no increase in the volume or rate of surface water discharge from the site and hence will have no significant impact on flood risk either within the site or to people and property elsewhere.