Appendix 8.4

Great Crested Newt Survey Report

Abergelli Power Project
Great Crested Newt Survey Report

Abergelli Power Limited
December 2017

Document Control	
Document Properties	
Organisation	AECOM
Author	Clare Morgans
Approved by (1st checker)	Ursula Jones
Approved by (2nd checker)	Kevin Webb
Title	Great Crested Newt Survey Report
Document Reference	N/A

Version History

Date	Version	Status	Description/Changes
01/12/2017	V1		Reformatted version

Prepared for:

Abergelli Power Limited

Prepared by:

AECOM Limited
3rd Floor
Portwall Place
Portwall Lane
Bristol
BS1 6NA
UK

T: +44 117 901 7000
aecom.com

© 2016 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited (“AECOM”) for sole use of our client (the “Client”) in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

CONTENTS

TABLES

1. Executive Summary

1.1.1 AECOM were commissioned to undertake Great Crested Newt Surveys on ponds identified as suitable to support GCN within the Project Site and within 500 m of the Project Site. The Project Site is approximately 30.66 ha and located near to the village of Felindre, Swansea.

1.1.2 The Abergelli Power Project development proposals are for a proposed 299MW Open Cycle Gas Turbine power station.

1.1.3 The Abergelli Power Project comprises the following principal elements:

- A new Power Generation Plant;
- A new integral Electrical Connection; and,
- A new integral Gas Connection.

1.1.4 The Power Generation Plant, Gas Connection and Electrical Connection together are referred to as the Project.

1.1.5 The Project will require the partial removal of terrestrial and aquatic habitat suitable to support GCN.

1.1.6 It is understood that construction is programmed to commence no sooner than 2020/2021

1.1.7 The GCN is protected under European law through Annexes II and IV of the EC Habitats Directive (Council Directive 92/43/EEC). Protection is given to all life stages (e.g. adults, sub-adults, larvae, and eggs). This is implemented into UK law under section 41 of the Conservation of Habitats and Species Regulations, 2010 where it is listed as a European protected species under Schedule 2. GCN is an Environment (Wales) Act 2016 Section 7 Priority Species.

1.1.8 A total of 26 ponds were identified within proximity of the Project Site.

1.1.9 A Habitat Suitability Index (HIS) Assessment was undertaken an all ponds within 500m of the Site and ponds outside of the 500 m but clustered with ponds within the 500m of the Project Site boundary. Further surveys were undertaken, where appropriate, following the results of the HSI Assessment.

1.1.10 Following the HSI Assessment, off the 26 ponds identified, two were classed as poor (a further survey was undertaken on one of these) nine were dry and seven were not accessible and therefore could not be surveyed. A combination of manual and eDNA surveys were undertaken on nine ponds.

1.1.11 No great crested newts were identified during the manual surveys and the eDNA surveys undertaken were all returned with a negative result. The manual surveys ceased once the results of the eDNA surveys had been received. Common amphibians were identified during the surveys.

1.1.12 Of the seven ponds that were not accessible. These are considered unlikely to support great crested newts given the lack of GCN records from the local records centre and the absence of GCN identified in other ponds during the surveys

1.1.13 No further surveys for great crested newts are required and there will be no impact on great crested newts as part of the Project.

1.1.14 The Project will require the removal of three ponds (Ponds 16, 22 and 23). Pond 22 currently supports palmate newts and is likely to support other amphibians including frogs and toads as well as a range of generalist aquatic invertebrates. Pond 16 was dry. Pond 23 could not be assessed but if it contains water has the potential to support generalist aquatic invertebrates and common amphibians.

1.1.15 Where the scheme design allows, ponds, swales or water bodies, should be considered to mitigate the loss of the ponds and enhance the Site for common amphibians.

1.1.16 Log piles and hibernacula could be created in suitable areas of habitat (such as grassland and scrub/woodland edges), to enhance the area for amphibians.

2. Introduction

2.1.1 AECOM were commissioned to undertake Great Crested Newt (GCN) Surveys on ponds identified as suitable to support GCN within the Abergelli site and within proximity of the Abergelli site (hereafter referred to as the 'Project Site'). An Habitat Suitability Index (HSI) Assessment was undertaken an all ponds, where access allowed, within 500 m of the Site and ponds outside of the 500m but clustered with ponds within the 500 m of the Project Site boundary. Further surveys were undertaken following the HSI Assessment.

2.2 The Project

2.2.1 The Project Site is located near to the village of Felindre, Swansea, as shown in Figure 1.1, and the central grid reference for the Project Site is SN65280143. A full description of the development is provided in **Chapter 3: Project and Site Description** of the PEIR.

2.3 Great Crested Newt Ecology

2.3.1 GCNs are one of the two European Protected Species of amphibian found in the UK.

2.3.2 GCNs, like all British amphibians, rely on water bodies for breeding but otherwise spend much of their lives on land. They are ectotherms and have permeable skins, so most movement occurs when the air temperature is above approximately 5ºC and there is, or has recently been rain.

2.3.3 Adults and immature newts spend the winter in places where they will be protected from frost and flooding. Whilst on land outside of the hibernation period, GCNs will also take refuge to shelter from extremes of weather; hence during the day they will often rest in dense vegetation, under refuges or underground. Adult GCNs normally begin moving from their over-wintering land sites between February and April, with some adult newts not reaching the desired water body until May, but this is very weather dependant. Not all life-stages enter water over the course of a year; immature newts (or efts) may spend all year on land until they reach breeding condition.

2.3.4 Upon reaching the pond, the peak courtship and egg-laying period is normally from mid-March to mid-May. The larvae hatch out after about three weeks, and then take another two to three months to complete larval development. The larvae emerge from the pond upon completion of metamorphosis and enter the eft land stage. This move usually begins in early August and lasts for about two months. Adult newts generally leave the breeding ponds from late May onwards, a movement which occurs gradually with most newts having left by August but some staying until October or even remaining over winter.

2.3.5 GCNs in a given area often form a metapopulation (a series of sub-populations that are linked by dispersal of individuals). Newt populations function in this way since they depend on habitats which vary in quality over time, and where the distribution of suitable habitats often changes. This metapopulation concept complicates the study and conservation of this species, since impacts to a single pond may have knock-on effects on newts in nearby ponds. GCNs commonly move between ponds that are up to 250 m from each other but are known to range up to 500 m from breeding ponds in some cases.

2.3.6 English Nature (Ref. 1) lists the following pond characteristics as being favourable for GCN populations:

- Surface area between 100 and 300 m^2;
- Variable depth, but preferably not so deep that aquatic and emergent vegetation is unable to take root. A maximum depth around 4 m is acceptable;
- Substantial cover of submerged and marginal vegetation;
- Open areas to facilitate courtship behaviour;
- Good populations of invertebrates and other amphibians as prey;
- Ponds in clusters rather than in isolation;
- Absence of shading on the south side;
- Absence of fish; and
- Absence of waterfowl.

2.4 Great Crested Newt Legislation

2.4.1 The GCN is protected under European law through Annexes II and IV of the EC Habitats Directive (Council Directive 92/43/EEC). Protection is given to all life stages (e.g. adults, sub-adults, larvae, and eggs). This is implemented into UK law under section 41 of the Conservation of Habitats and Species Regulations, 2010 where it is listed as a European protected species under Schedule 2, which in summary makes it an offence to:

- Deliberately take (capture), injure or kill a GCN. (In a court, 'deliberately' would probably be interpreted as someone who, although not intending to take, injure or kill a GCN, performed the relevant action, being sufficiently informed and aware of the consequence his/her action will most likely have.);
- Deliberately disturb a GCN in a way that would affect its ability to survive, breed or rear young, hibernate or migrate or significantly affect the local distribution or abundance of the species;
- Damage or destroy a breeding site or resting place of a GCN;
- Possess or control any live or dead specimen or anything derived from a GCN; and,
- Intentionally take or destroy the eggs of a GCN.

2.4.2 The GCN is also given full protection under Section 9 of the Wildlife and Countryside Act 1981 (as amended) through its inclusion on Schedule 5. In summary, the legislation makes it an offence to:

- Intentionally or recklessly take (capture), injure or kill a GCN;
- Intentionally or recklessly disturb a GCN;

- Intentionally or recklessly damage or destroy, or obstruct access to, any structure or place which a GCN uses for shelter or protection or intentionally or recklessly disturb a GCN while it uses such a place; and,
- Possess or advertise/sell/exchange a GCN (dead or alive) or any part of a GCN.

2.4.3 The inclusion of this species on Annex II of the Habitats Directive also means that a Special Area of Conservation (SAC) can be designated as a protected area due to a significant presence of this species.

2.4.4 The Natural Environment and Rural Communities (NERC) Act (2006), as amended, puts an obligation on public bodies to have regard, so far as is consistent with the proper exercise of their functions, to the purpose of conserving biodiversity. Under the terms of the Act, conserving biodiversity includes restoring or enhancing populations and/or habitats. The local planning authority (LPA) or other determining authority must therefore consider the effects of planning applications upon biodiversity and how it can be mitigated for or enhanced.

2.4.5 In addition, Government Circular ODPM 06/2005: “Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System” sets out further detail on how species and habitats should be considered during planning applications.

2.4.6 GCN is an Environment (Wales) Act 2016 Section 7 Priority Species. These are the species found in Wales which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. As such, it is targeted for measures necessary to support its conservation status in the UK.

2.5 Quality Assurance

2.5.1 The surveys and subsequent report was undertaken in line with AECOM’s Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

2.5.2 All AECOM Ecologists who led surveys and completed the reporting for this project are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and all follow their code of professional conduct (CIEEM, 2013) when undertaking ecological work.

3. Methodology

3.1 Desk Study

3.1.1 A full desk study was not undertaken to establish the number of ponds within the Project Site and within 500 m of the Project Site as the client provided AECOM with the location and number of ponds identified by WSP/PB in March 2017 (Appendix 8.18).

Previous Surveys

3.1.2 The client provided AECOM with a copy of GCN surveys undertaken at the Project Site by BSG Ecology in 2014 (PEIR Appendix 8.18).

3.2 Habitat Suitability Assessment

3.2.1 The client provided AECOM with a list of 23 ponds, 19 of these had been subject to a HSI assessment undertaken by WSP/PB in March 2017. Where access allowed, these ponds were visited by AECOM in May 2017 to check the assessment score.

3.2.2 HSI is a tool used to assess the likelihood that a water body will support GCN. It incorporates ten suitability indices (SI), all of which are factors thought to affect the suitability of a water body to support GCN, such as the quality of the water and the presence / absence of different predators (particularly fish and waterfowl). Each variable is assessed separately and then mathematically combined to provide a numerical index, between 0 and 1 (Ref. 3). The HSI Categorisations is described in Table 3-1 below.

3.2.3 The following equation is used (Ref. 3):

HSI = (SI1*SI2*SI3*SI4*SI5*SI6*SI7*SI8*SI9*SI10).

Table 3-1. Categorisation of HSI Scores

HSI Score	Pond Suitability
< 0.5	Poor
0.5 - 0.59	Below Average
0.6 - 0.69	Average
0.7 - 0.79	Good
> 0.8	Excellent

3.3 Manual Surveys

3.3.1 Manual GCN surveys were undertaken on ponds (where access allowed) with a score of below average or above. GCN surveys were undertaken paying due regard to Natural England's Great Crested Newt Standing Advice (Ref. 3) and Froglife's Great Crested Newt Conservation Handbook (Ref. 1). GCN Surveys were undertaken by an appropriately licenced ecologist and in suitable weather conditions. Manual surveys ceased once a negative eDNA sampling result had been received. The manual surveys that were undertaken were carried out within the Natural Resources Wales (NRW) approved survey season window.

3.3.2 Four GCN manual survey visits are required to establish GCN presence/ absence within the period mid-March to mid-June (with at least two surveys during mid-April to mid-May). An additional two surveys (six in total) are required to estimate GCN population. Three out of five survey techniques are required on each of the ponds surveyed. A combination of four survey techniques were utilised as appropriate. Torchlight searching, bottle trapping, egg searching and netting. All manual survey methods were undertaken by at least one NRW GCN licence holder. A description of the survey techniques used is as follows:

a) Torching

3.3.3 The water body was thoroughly searched using torch light between dusk and midnight. The surveyor walked slowly around the perimeter of the water body once (where access was possible), checking for newts in the torch beam every 2 – 3 m, paying particular attention to marginal vegetation and potential display areas on the pond bottom. Care was taken with the torch to minimise disturbance to the newts and other wildlife which may have been present (e.g. nesting birds). To allow comparison between ponds, the same power of torch (between 100,000 – 1,000,000 candlepower) was used on every occasion.

b) Bottle Trapping

3.3.4 Bottle traps were set around the margin of the water body in the evening and left overnight to catch adults during the breeding season. Traps were set at an appropriate density of one trap per two metres of shoreline dependent upon individual site variations. The guidelines set out by Natural England, Froglife, and the Herpetofauna Workers Manual was followed strictly to ensure the welfare of trapped newts and other aquatic organisms.

c) Egg Searching

3.3.5 Submerged and floating aquatic vegetation was checked by the surveyor in order to locate great crested newt eggs. Egg searches are terminated when presence of great crested newt eggs is confirmed. This method is unreliable for population estimates. Terminated egg searches where great crested newt eggs have been identified avoids excess damage to the eggs by minimising impacts of predation and UV light.

d) Netting

3.3.6 A sturdy dip-net with a 2 – 4 mm mesh was used for netting for fifteen minutes per 50m of pond shoreline.

3.4 eDNA Sampling

3.4.1 eDNA sampling was undertaken following the methodologies provided in Biggs et al (Ref. 5). eDNA kits were purchased from SureScreen. Water sampling was undertaken by at least one NRW GCN licenced surveyor per pond. Water samples were taken from 20 locations around each pond as described in the instructions provided by SureScreen and in Ref. 5. Samples were stored in accordance with the instructions provided by SureScreen and returned to SureScreen for analysis. Care was taken at all steps in the procedure to avoid contamination of samples.

3.4.2 The following NRW GCN licenced surveyors were used to undertake the manual and eDNA surveys:

3.4.3 Clare Morgans GradCIEEM, Ben Walsh ACIEEM and Jack Muskett GradCIEEM.

3.5 Limitations

a) Pond Access

3.5.1 Of the 26 ponds identified, seven were not accessible. Six of these were not accessible due to land access restrictions (Ponds 12-14, 18, 23 and 24) and one was surrounded by a large, tall area of dense bramble vegetation (Pond 10) and therefore could not be surveyed. (see Section 4.1.2, Table 4-1).

3.5.2 Ponds 12-14 and 18 are located close to each other approximately 400-500 m east of the Project Site boundary. There is the possibility that these ponds may support GCN, although this is considered unlikely given the lack of GCN records from the local records centre and the absence of GCN identified in other ponds during the surveys.

3.5.3 Pond 10 is not considered likely to support GCN. It has previously been surveyed and no evidence of GCN was found (PEIR Appendix 8.18). No records of GCN were returned from the local records centre. Ponds 9 and 21 which are within close proximity were deemed not suitable to support GCN and no evidence of GCN was found in Pond 19a.

3.5.4 Pond 23 is not considered likely to support GCN given the lack of GCN records from the local records centre and the absence of GCN in other ponds within a 500 m radius.

3.5.5 Pond 24 is located to the west of the Project Site and may support GCN, although this is considered unlikely given the lack of GCN records from the local records centre and the absence of GCN identified in other ponds during the surveys.

b) Manual Surveys

3.5.6 The three required manual survey methods were not undertaken on Ponds 1b, 4, 11 and 19b (see Section 4.1.2, Table 4-1 and Section 4.2, Table 4-4) due to a combination of health and safety issues and dense vegetation.

3.5.7 Ponds 1b and 4 are within a cluster of ponds to the north west of the Project Site. No evidence of GCN was identified for Pond 7 and Pond 8 which is within this cluster of ponds and therefore the manual survey limitation is not deemed significant.

3.5.8 Pond 11 has previously been surveyed and no evidence of GCN was found (PEIR Appendix 8.18). Therefore the manual survey limitation is not deemed significant.

3.5.9 On the first survey visit to Pond 19b, the water level had dropped making it impossible to bottle trap. Torching was attempted but not possible due to the low water level and vegetation cover. Egg searching was not possible as the access was restricted to the vegetation due to deep soft mud. Pond 19b is connected to Pond 19a. Pond 19a was deemed poor as part of the HSI assessment. However, due to the limitation to the surveys on Pond 19b, manual surveys and an eDNA survey were undertaken on Pond 19a. No evidence of GCN was returned for Pond 19a and therefore the manual survey limitation on Pond 19b is not deemed significant.

3.5.10 Manual surveys were not undertaken on Pond 17, as AECOM did not gain land access permission to the pond within the required survey season time. However, once granted it was possible to eDNA sample Pond 17 within the approved survey season window.

3.5.11 A summary of the manual survey and eDNA limitations is given in Table 3-2.

c) eDNA Sampling

3.5.12 eDNA surveys were undertaken on all ponds, where access allowed, of below average category and above, with the exception of Ponds 19a and 19b. On the first manual survey visit to Pond 19b, the water level had dropped and deep soft mud was exposed on the edges making it unsuitable for eDNA sampling. As Pond 19b is connected to Pond 19a, the decision was taken to proceed with an eDNA survey on Pond 19a despite it being categorised as Poor. As the GCN eDNA result returned for Pond 19a was negative, it was assumed that Pond 19b was also negative as the two ponds are connected.

3.5.13 The eDNA sampling was restricted due to accessibility on Ponds 1b, 4 and 11 caused by dense vegetation and soft, deep mud. Approximately only 5% of the perimeter of the pond was accessible to sample (see Table 3-2 and Table 4-5). Usually a GCN eDNA water sample which has been taken from such a restricted area reduces the confidence in any negative result returned as GCN eDNA can be patchy depending upon where the animals have been in the pond.

3.5.14 However on this occasion, given the lack of evidence of GCN within other ponds in close proximity of Ponds 1b, 4 and 11 and the previous survey undertaken on Pond 11 which returned no results for GCN (PEIR Appendix 8.18). The eDNA limitation on Ponds 1b, 4 and 11 is not deemed significant.

3.6 Survey Limitations Summary

Table 3-2: Survey Limitation Summary Table

Pond Number	Manual Survey Limitation	eDNA Survey Limitation
1b	Not possible to bottle trap or net due to deep and soft mud surrounding the waterbody. Torched only from limited accessible areas.	Only 5% of pond perimeter accessible to sample.
4	Not possible to bottle trap or net due to deep and soft mud surrounding the waterbody. Torched only from limited accessible areas.	Only 5% of pond perimeter accessible to sample.
7	A dead water shrew was found in one of the bottle traps during the first survey visit in Pond 7, therefore bottle trapping ceased for Pond 7 and the netting technique was used for future surveys.	None
8	A dead water shrew was found in one of the bottle traps during the first survey visit in Pond 7. Due to the proximity of Pond 8 to Pond 7 and the risk of trapping water shrews, bottle trapping ceased for Pond 8 and the netting technique was used for future surveys.	None
11	Only approximately 5% of edge is accessible. Low water level and steep sides, not suitable for bottle trapping and dense vegetation will restrict torching. Small area was torched on 1st survey visit but ineffective. No further manual surveys were undertaken.	Only 5% of pond perimeter accessible to sample.
17	No manual surveys undertaken as access not granted within the required survey season time.	None
19b	Low water level, dense vegetation and soft mud. Not be suitable for bottle trapping, torching or egg searching. Access restricted by soft mud. Small area was torched on 1st survey visit but ineffective. No further manual surveys were undertaken on 19b. Manual surveys undertaken on Pond 19a	No eDNA sample undertaken on Pond 19b. Pond 19a was sampled instead.

	undertaken as connected to Pond 19b.	

4. Results

4.1 Desk Study

4.1.1 WSP/PB identified a total of 23 ponds within 500 m of the previous Project Site boundary and undertook a HSI assessment on 19 of these, 16 of which were considered suitable to support GCN (see Table 4-1).

4.1.2 The Preliminary Ecological Appraisal (PEA) undertaken by AECOM in May 2017 (PEIR Appendix 8.1) identified a further two ponds within 500 m of the Project Site (See Table 4-1 Pond 23 and 24).

4.1.3 The WSP/PB (PEIR Appendix 8.13) and the AECOM PEA (PEIR Appendix 8.1) desk study highlighted that no GCN records were returned within 2 km of the Project Site from the local records centre.

a) Previous Surveys

4.1.4 The GCN surveys undertaken by BSG Ecology in 2014 did not identify any GCN from the ponds surveyed (PEIR Appendix 8.18). Palmate newts Lissotriton helveticus and smooth newts Lissotriton vulgaris were identified.

b) Habitat Suitability Assessment

4.1.5 During the pond scoping survey to check the HSI categorisation AECOM identified an additional pond, Pond 1b.

4.1.6 Table 4-1 shows the number of ponds identified, the pond category given by WSP/PB, the updated AECOM pond category and change in conditions/ limitations identified by AECOM in May 2017and the approximate distance and direction to the pond from the Project Site boundary. Figure 1 shows the location of the ponds and the AECOM pond category.

Table 4-1: HSI Assessment Pond Category and Change in Conditions

Pond Number	WSP/PB HSI Assessment Pond Category	AECOM HSI Assessment Pond Category	Change in Conditions/ Limitations	Approximate Distance and Direction from the Project Site boundary
1	Below average	Dry	Unable to survey, pond is dry.	650 m west
1b	Not assessed	Below average	Not possible to bottle trap or net due to deep and soft mud surrounding the waterbody. Torched only from limited accessible areas.	670 m west
2	Below average	Dry	Unable to survey pond is dry.	600 m west
3	Average	Dry	Unable to survey pond is dry.	580 m west
4	Average	Average	Not possible to bottle trap or net due to deep and soft mud surrounding the waterbody. Torched only from limited accessible areas	560 m west
5	Below average	Dry	Unable to survey pond is dry	500 m west
6	Average	Dry	Unable to survey pond is dry	460 m west
7	Excellent	Excellent	N/A	400 m west
8	Good	Good	N/A	380 m west
9	Average	Dry	Unable to survey pond is dry.	160 m north east
10	Average	Not assessed	Could not access pond due to dense bramble.	215 m north east
11	Good	Good	Only approximately 5% of edge is accessible. Low water level and steep sides, not suitable for bottle trapping. Torching may be possible but vegetation is dense.	150 m west
12	Not assessed, no	Not assessed, no	N/A	400 m east

Pond Number	WSP/PB HSI Assessment Pond Category	AECOM HSI Assessment Pond Category	Change in Conditions/ Limitations	Approximate Distance and Direction from the Project Site boundary
	access	access		
13	Not assessed, no access	Not assessed, no access	N/A	450 m east
14	Not assessed, no access	Not assessed, no access	N/A	490 m east
15	Pond not present during March 2017.	Dry	N/A	25 m east
16	Average	Dry	Unable to survey pond is dry.	Within Project Site boundary
17	Average	Average	N/A	190 m west
18	Not assessed, no access	Not assessed, no access	N/A	415 m east
19a	Poor	Poor	N/A	440 m north
19b	Below average	Below average	Low water level, dense vegetation and soft mud. May not be suitable for bottle trapping, torching or egg searching. Access restricted by soft mud.	540 m north
20	Poor	Dry	Unable to survey pond is dry.	460 m west
21	Below average	Poor	Pond recently cleared of all vegetation.	170 m north east
22	Below average	Below average	N/A	Within Project Site boundary
23	Not assessed	Not assessed, no access	N/A	Within Project Site boundary

Pond Number	WSP/PB HSI Assessment Pond Category	AECOM HSI Assessment Pond Category	Change in Conditions/ Limitations	Approximate Distance and Direction from the Project Site boundary
24	Not assessed	Not assessed, no access	N/A	150 north west

4.2 Manual Surveys

4.2.1 Following the AECOM updated HSI assessment, manual surveys were undertaken on all ponds, where access allowed, of below average category and above (with the exception of Pond 19a see Section 3.5). Access to Pond 17 was granted at a later stage than the other ponds and part of the manual survey season was missed. Therefore manual surveys were not undertaken on this pond. eDNA sampling was undertaken on Pond 17 (see Section 4.3).

4.2.2 The results of the surveys are shown in Table 4-2 and the weather conditions are shown in Table 4-3. No GCN were recorded during any of the manual surveys. Other amphibians were present in the ponds including palmate newts, frogs and toads and a range of aquatic invertebrates including diving beetle, dragonfly nymphs and pond skaters.

4.2.3 Weather conditions were considered favourable during all of the surveys as shown in Table 4-3. The manual surveys ceased once the results of the eDNA surveys had been received.

4.2.4 In 2014 manual surveys were undertaken by BSG Ecology on Ponds 10, 11 and 15-17 and no GCN were identified (PEIR Appendix 8.18).

Table 4-2: Survey Results

Pond No.	Survey No.	Date	Survey Method	Great Crested Newt				Palmate Newt				Smooth Newt				Smooth/Palmate			Newt Total
				F	M	U	Total	F	M	U	Total	F	M	U	Total	F	J	Total	
1b#	1	10/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	**3**	**3**
	2	16/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	**0**
4#	1	10/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	**5**	**5**
	2	16/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	**0**
	3	17/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	**1**	**1**
7	1	10/05/17	Torching	0	0	0	**0**	0	5	0	**5**	0	0	0	**0**	3	0	**3**	**8**
		11/05/17	Bottle Trapping**	0	0	0	0	0	3	0	**3**	0	0	0	0	0	0	0	**3**
		11/05/17	Egg Searching	No Eggs or leaf folds seen															
	2	16/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	5	0	**5**	5
		17/05/17	Netting	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0
		17/05/17	Egg Searching	No Eggs or leaf folds seen															
8	1	10/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	1	0	**1**	35	0	**35**	36
		11/05/17	Bottle Trapping**	0	0	0	**0**	5	2	0	**7**	0	0	0	**0**	0	0	**0**	7
		11/05/17	Egg Searching	No Eggs or leaf folds seen															
	2	16/05/17	Torching	0	0	0	**0**	0	2	0	**2**	0	0	0	**0**	17	0	**17**	19

Pond No.	Survey No.	Date	Survey Method	Great Crested Newt				Palmate Newt				Smooth Newt				Smooth/Palmate			Newt Total
				F	M	U	Total	F	M	U	Total	F	M	U	Total	F	J	Total	
		17/05/17	Netting	0	0	0	**0**	1	0	0	**1**	0	0	0	**0**	0	0	**0**	1
		17/05/17	Egg Searching	No Eggs or leaf folds seen															
11[#] (see Table 4-4)	1	08/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0
				F	**M**	**U**	**Total**	**F**	**M**	**U**	**Total**	**F**	**M**	**U**	**Total**	**F**	**J**	**Total**	
19a (see Table 4-4)	1	11/05/17	Torching	0	0	0	**0**	0	3	0	**3**	0	0	0	0	12	0	12	**15**
		12/05/17	Netting	0	0	0	**0**	0	0	0	**0**	0	0	0	0	0	0	0	**0**
		12/05/17	Egg Searching	No Eggs or leaf folds seen															
19a (see Table 4-4)	2	16/05/17	Torching	0	0	0	**0**	0	3	0	**3**	0	0	0	**0**	17	0	**17**	**20**
		17/05/17	Netting	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	1	**1**	**1**
		17/05/17	Egg Searching	No Eggs or leaf folds seen															
19b[#] (see Table 4-4)	1	09/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	1
22	1	08/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	2	**3**	3

Pond No.	Survey No.	Date	Survey Method	Great Crested Newt				Palmate Newt				Smooth Newt				Smooth/Palmate			Newt Total
				F	M	U	Total	F	M	U	Total	F	M	U	Total	F	J	Total	
		09/05/17	Bottle Trapping	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0
		09/05/17	Egg Searching	No Eggs or leaf folds seen															
	2	10/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	1	0	**1**	1
		11/05/17	Bottle Trapping	0	0	0	**0**	0	1	0	**1**	0	0	0	**0**	0	0	**0**	1
		11/05/17	Egg Searching	No Eggs or leaf folds seen															
	3	16/05/17	Torching	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	3	0	**3**	3
		17/05/17	Bottle Trapping	0	0	0	**0**	0	0	0	**0**	0	0	0	**0**	0	0	**0**	0
		17/05/17	Egg Searching	No Eggs or leaf folds seen															

Table 4-3: Survey Weather Conditions

Pond No.	Survey No.	Date	Survey Method	Air Temperature °C	Water Temperature °C	Conditions
1b	1	10/05/17	Torching	10.8	Gauge not working.	Dry and mild
	2	16/05/17	Torching	14.7	14	Very light rain during survey and mild
4	1	10/05/17	Torching	10.8	Gauge not working.	Dry and mild
	2	16/05/17	Torching	13.9	14.4	Very light rain during survey and mild
	3	17/05/17	Torching	11.6	12.0	Dry and mild
7	1	10/05/17	Torching	11	12.6	Dry and mild
		11/05/17	Bottle Trapping and Egg Searching	In: 16.0 Out:8.9	In:13.5 Out: 12.8	Dry and mild
	2	16/05/17	Torching	13.5	13.1	Very light rain during survey and mild
		17/05/17	Netting and Egg Searching	14.7	12.4	Dry and mild
8	1	10/05/17	Torching	11	14	Dry and mild
		11/05/17	Bottle Trapping and Egg Searching	In: 20.1 Out: 9.6	In: 15.7 Out: 12.8	Dry and mild
	2	16/05/17	Torching	13.5	13.6	Very light rain during survey and mild
		17/05/17	Netting and Egg Searching	12.8	13.5	Dry and mild

Pond No.	Survey No.	Date	Survey Method	Air Temperature °C	Water Temperature °C	Conditions
11	1	08/05/17	Torching	11.7	Gauge not working.	Dry and mild
19a	1	11/05/17	Torching	15.6	17.4	Dry and mild
		12/05/17	Netting and Egg Searching	13.5	16.0	Very light rain during survey and mild
	2	16/05/17	Torching	11.9	14.4	Very light rain during survey and mild
		17/05/17	Netting and Egg Searching	13.8	14.0	Dry and mild
19b	1	09/05/17	Torching	7.5	Gauge not working.	Dry
22	1	08/05/17	Torching	11.3	Gauge not working.	Dry and mild
		09/05/17	Bottle Trapping and Egg Searching	In:15.0 Out:8.0	Gauge not working.	Dry and mild
	2	10/05/17	Torching	13.0	9.6	Dry and mild
		11/05/17	Bottle Trapping and Egg Searching	In:15.3 Out: 12.0	In: 12.0 Out: 1.0	Dry and mild
	3	16/05/17	Torching	12.7	11.8	Very light rain during survey and mild
		17/05/17	Bottle Trapping and Egg Searching	In: 15.6 Out: 13.9	In:11.5 Out:11.6	Very light rain during survey and mild

[#]Details for ponds which had less than the three required manual survey methods are given in Section 3.5 and in the limitations section in Table 4-1.

***A dead water shrew was found in one of the bottle traps in Pond 7, therefore bottle trapping ceased for Ponds 7 and 8 and the netting technique was used for future surveys (see Section 3.5)*

Key: M = Male, F = Female, J = Juvenile, U = Unknown sex.

4.3 eDNA Sampling

4.3.1 Following the AECOM updated HSI assessment eDNA surveys were undertaken on all ponds, where access allowed, of below average category and above, with the exception of Pond 19a (see Section 3.5).

4.3.2 Table 4-4 lists the ponds that were sampled for GCN eDNA, the weather conditions when collecting the samples, any limitations noted during sample collection and the results returned by SureScreen.

4.3.3 All the ponds sampled for GCN eDNA came back with a negative result.

Table 4-4: eDNA Sampling Results

Pond Number	Sample Date	Air Temp °C	Limitations (see Section 3.5)	GCN Result Returned
1b	11/05/17	16.0	Only 5% of pond perimeter accessible to sample.	Negative
4	11/05/17	16.0	Only 5% of pond perimeter accessible to sample.	Negative
7	11/05/17	13.0	None	Negative
8	11/05/17	12.0	None	Negative
11	11/05/17	16.0	Only 5% of pond perimeter accessible to sample.	Negative
17	25/05/17	26.0	None	Negative
19a	11/05/17	15.0	None	Negative
22	11/05/17	15.3	None	Negative

.

5. Ecological Constraints and Indicative Potential Impacts

5.1.1 The indicative potential impacts of the Project on habitats and protected species are outlined below; potential impacts will be assessed fully during the Ecology Impact Assessment (EcIA).

5.1.2 No GCN were identified within nine ponds surveyed (Ponds 1b, 4, 7, 8, 11, 17, 19a, 19b and 22). The local records centre did not return any records of GCN within 2 km of the Project Site. Previous surveys of ponds 10, 11, 15, 16 and 17 by BSG Ecology in 2014 did not identify the presence of GCN (PEIR Appendix 8.18). Therefore, it is considered unlikely that any GCN will be present within any of the ponds that were not surveyed or within 500 m of these ponds in surrounding habitat given the absence of GCN from all nearby ponds, and it is considered that there will be no impacts on GCN.

5.1.3 The Project will require the removal of three ponds (Ponds 16, 22 and 23). Pond 22 currently supports palmate newts and is likely to support other amphibians including frogs and toads, as well as a range of generalist aquatic invertebrates. Pond 16 was dry. Pond 23 could not be assessed but if it contains water has the potential to support generalist aquatic invertebrates and common amphibians. Removal of the ponds will result in loss of habitat for a small number of common amphibians and common aquatic invertebrates.

6. Further Surveys and Recommendations

6.1 Further Surveys

6.1.1 No further surveys are recommended.

6.2 Recommendations for Mitigation and Enhancement

6.2.1 The Project will require the removal of three ponds (Ponds 16, 22 and 23). Pond 22 currently supports palmate newts and is likely to support other amphibians including frogs and toads as well as a range of generalist aquatic invertebrates. Pond 16 was dry. Pond 23 could not be assessed but if it contains water has the potential to support generalist aquatic invertebrates and common amphibians.

6.2.2 Where the scheme design allows, ponds, swales or water bodies, should be considered to mitigate the loss of the ponds and enhance the Project Site for common amphibians.

6.2.3 If a waterbody is included in the scheme design this should be managed specifically for amphibians and not stocked with fish. The waterbody could include planting of marginal and floating vegetation. The waterbody and any bankside vegetation should be managed to control over shading.

6.2.4 Log piles and hibernacula could be created in suitable areas of habitat (such as grassland and scrub/woodland edges), to enhance the area for amphibians.

7. References

Ref. 1 Langton T.E.S., Beckett, C.L. and Foster, J.P. 2001. Great Crested Newt Conservation Handbook. Froglife, Halesworth.

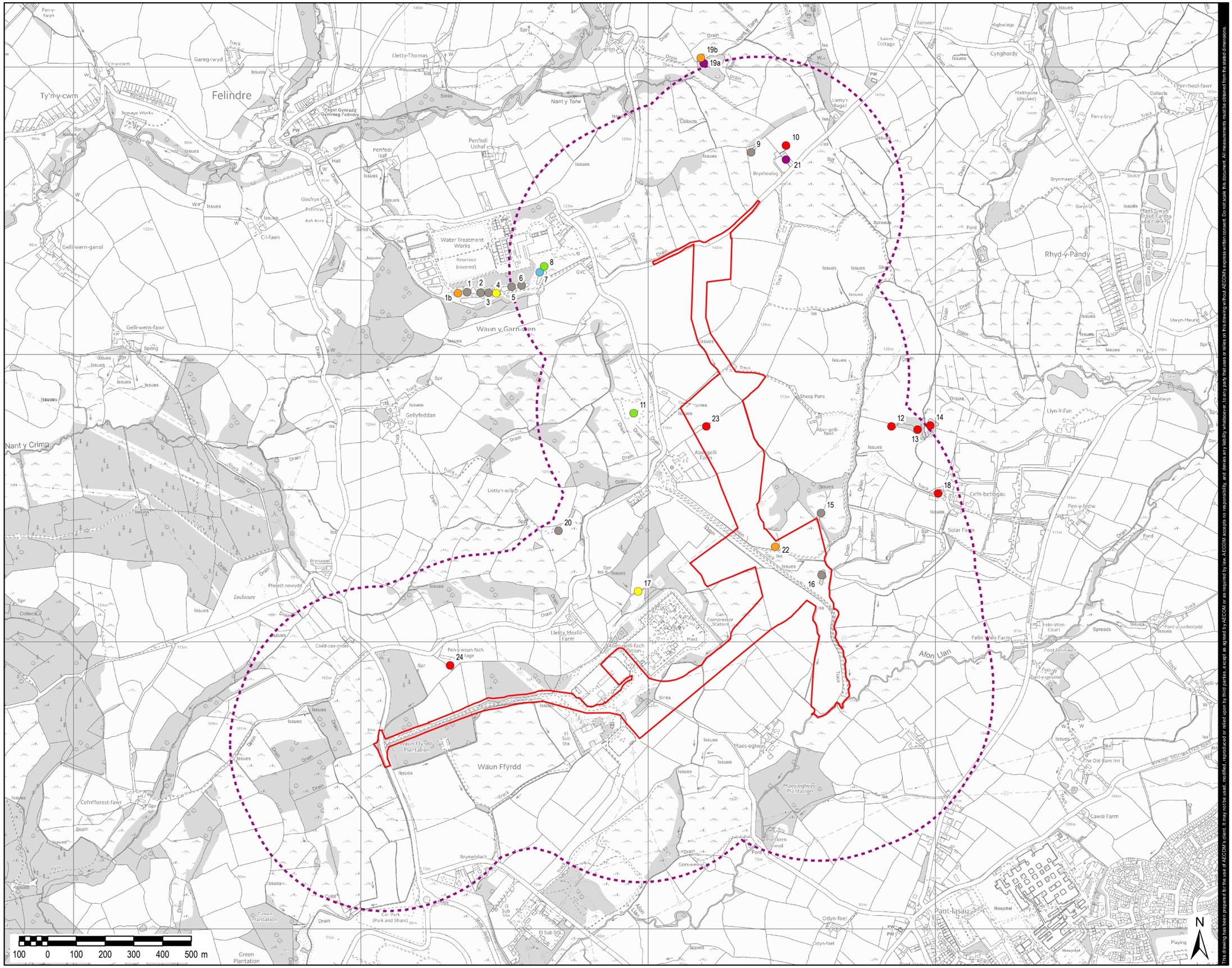
Ref. 2 CIEEM. 2013. Professional Code of Conduct. Chartered Institute of Ecology and Environmental Management (CIEEM) June 2013

Ref. 3 Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. 2000. Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10(4), 143-155.

Ref. 4 Natural England. 2013. Great Crested Newt Standing Advice

Ref. 5 Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F. 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust, Oxford.

Figure 1: AECOM 2017 Habitat Suitability Index for Pond



Filename: P:\UKCDF1-IE\Projects\Environmental\Jobs - Potential\2017 Q1\Abergelli Power Station\010 GIS\02_Maps\EC - Ecology\F1_GCN_Survey_v2.mxd

This drawing has been prepared for the use of AECOM's client. It may not be used, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.

AECOM Limited
1 Callaghan Square
Cardiff, CF10 5BT
+44 (0)29 2067 4600 tel
www.aecom.com

Project Title:

ABERGELLI POWER STATION

Client:

STAG ENERGY

LEGEND

- Site Boundary
- 500m Study Area

GCN 2017 Pond HSI Assessment

- Poor
- Below Average
- Average
- Good
- Excellent
- Dry
- Not Assessed, No Access

Copyright:

© Crown copyright and database rights [2017] Ordnance Survey 0100031673

© Local Government Information House Limited copyright and database rights [2017] 0100031673

AECOM Internal Project No:

60542910

Drawing Title:

GCN 2017 POND HSI ASSESSMENT

Scale at A3: 1:12,000

Drawing No:			Rev:
FIGURE 1			002
Drawn:	**Chk'd:**	**App'd:**	**Date:**
GM	CC	CA	29/11/17