Cefn Mawr Emergency Standby Electricity Generation Facility

Environmental Report

On behalf of **Prime Energy Development Ltd.**

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1 Introduction

1.1 The Environmental Report

1.1.1 This Environmental Report (ER) has been prepared by Peter Brett Associates LLP (PBA) on behalf of Prime Energy Development Ltd. (PEDL), the applicant, to accompany a planning application to Wrexham County Borough Council (WCBC) under the Town and Country Planning Act to develop an emergency standby electricity generation facility (hereafter referred to as 'the proposed development') on agricultural land located to the north east of the village of Cefn Mawr, Wrexham.

1.1.2 This ER is provided voluntarily to assist in the understanding of environmental topics identified by the applicant in consultation with WCBC as being relevant to the determination of the planning application. It includes several environmental appraisal studies of the proposed development during its construction, operation and decommissioning phases, and describes any mitigation measures required to limit these environmental impacts to an acceptable level. Information is provided in section 1.4, below, in relation to the scope of studies undertaken and presented in this ER. This ER comprises the following documents:

i. Environmental Report - Main Report (this document);

ii. Figures (separate document);

iii. Appendices (separate document).

1.2 Overview of proposed development

1.2.1 The proposed development is an emergency standby electricity generation facility (the Generating Facility), with a new access connecting to Plas Bennion Road. The Generating Facility comprises modular diesel generator units (up to 14 in total), transformers, electrical switchgear, a control room, diesel storage tanks and boundary treatment.

1.2.2 The Generating Facility and access are together referred to as the proposed development. The site location and the Application Site (i.e. the land within the red line boundary) are shown on Figure 1.1. Site photos are contained in Appendix 1.1.

1.2.3 The total area of the Application Site is approximately 0.44 ha.

1.2.4 Figure 1.2 'Site Layout Plan' provides a likely configuration of the proposed development, although it is indicative for certain elements of the Generating Facility. It is advised that the final design and layout will be determined by the Engineering, Procurement and Construction (EPC) contractor (see paras 2.3.4 – 6) and will depend on, for example, the results of ground investigations and other site considerations, therefore a condition is invited from WCBC to confirm the final location of the indicative elements of the Generating Facility.

1.3 The Applicant

1.3.1 The applicant is PEDL, which is a subsidiary of Watt Power Limited (WPL). WPL has been established to develop flexible power generation assets in England and Wales.

1.3.2 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 has been delivered in the UK.

1.3.3 WPL is developing assets to support the UK Government drive to a low carbon economy. WPL is also committed to underpinning security of energy supply by delivering a range of power generation options which can be flexibly delivered to meet changing grid demands. WPL recognises the need to balance commercial considerations with environmental issues when developing energy projects and is confident that this can be responsibly delivered at a local level.

1.3.4 WPL is committed to acting in a socially and environmentally responsible manner. The proposed development would be designed and developed to high quality, safety and environmental standards.

1.3.5 Alongside this proposal, the Prime Energy team has successfully obtained planning permission for a similar diesel generator plant at Brampton, near Carlisle. WPL is also developing four larger gas-fired peaking plants (up to 299 MW) at Hirwaun, in south Wales; Eye, in Suffolk; Millbrook near Bedford; and Abergelli near Swansea. These larger plants are being developed to deliver peaking capacity to support the national need for security of energy supply.

1.4 Scope and purpose of environmental appraisal

EIA screening opinion

1.4.1 A request, under Regulation 5 of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999, was made to WCBC on 28 May 2015 to adopt a screening opinion to determine the need for an Environmental Impact Assessment (EIA) to be undertaken to accompany a planning application for the proposed development. A Screening Report, which accompanied the request for a screening opinion, set out the environmental studies which were proposed to appraise the potential environmental effects of the proposed development.

1.4.2 WCBC adopted its Screening Opinion on 18 June 2015, confirming that an EIA was not required. Both the Screening Report and the Screening Opinion are available on the planning pages of WCBC's website at:

(http://planning.wrexham.gov.uk/Planning/lg/plansearch.page?org.apache.shale.dialog.DIALOG_NAME=gfplanningsearch&Param=lg.Planning).

1.4.3 The Screening Opinion issued by WCBC is included as Appendix 1.2.

Environmental appraisal

1.4.4 The purpose of the environmental appraisal is to determine that the environmental effects of the proposed development are within acceptable limits. Additionally it serves to inform the project design to ensure that wherever possible, environmental effects are minimised.

1.4.5 The results of the environmental appraisal are presented in this ER which is structured as follows:

- **Chapter 1** provides an introduction to the proposed development, developer and environmental appraisal;
- **Chapter 2** describes the Application Site and proposed development in more detail;
- **Chapter 3** provides a brief review of planning policy and guidance, as well as highlighting the needs case for the proposed development in respect of planning and government guidance;

- **Chapter 4** summarises the relevant Development Plan policies as well as other material considerations and the impact of the proposed development on the purpose of the designated Green Barrier.

- **Chapter 5, sections 5.1-5.6** describe the results of the environmental assessments undertaken for the proposed development as follows:

  - 5.1 Air Quality;

  - 5.2 Noise;

  - 5.3 Ecology;

  - 5.4 Landscape and Visual Impacts Assessment (LVIA);

  - 5.5 Geology/Ground Conditions/Water Quality; and

  - 5.6 Traffic and Transport.

- In order to reflect the purpose of a Design and Access Statement, **Chapter 6** sets out a design assessment.

Appraisal methodology - overview

1.4.6 In undertaking the environmental appraisal, the baseline has first been established. It is important to identify the environmental baseline to allow potentially significant effects to be understood in the context of the existing environment and also to allow for better identification of the most appropriate mitigation strategies to be employed to minimise these effects.

1.4.7 Following establishment of the baseline, the potential environmental effects arising from the construction and decommissioning phases, together with the maintenance and operational activities of the proposed development, have been considered. The potential environmental effects relating to each topic listed above have been established using a methodology specific to that topic, as described in Chapter 5. For each environmental topic a consideration of any residual environmental effects remaining following the application of mitigation measures has been made. An assessment of any likely significant cumulative impacts caused by the proposed development in combination with other planned developments has also been made.

Environmental performance of proposed development

1.4.8 The proposed development will be engineered in the light of the findings of the environmental studies to ensure that the environmental effects will be no worse than predicted. The applicant will be content to discuss mechanisms (such as conditions on any planning approval) that would reasonably be necessary to ensure such performance.

2 The proposed development and site description

2.1 The proposed development

Overview

2.1.1 The purpose of the proposed development is to be available on standby to provide emergency backup to the electricity grid at times of peak demand. It would have a total generation capacity of up to 20 megawatts electrical output (MW). It would operate for a maximum of 500 hours per year (less than 6% of the time) which would typically be for up to 2 –3 hours in the evenings during times of peak energy demand, across the winter months.

2.1.2 The proposed development seeks to ensure that the local electricity distribution network benefits from additional capacity at peak times to maintain the position closer to existing operating margins, and hence contribute to the provision of the UK's energy needs.

2.1.3 The nature of providing backup capacity is that it must be available at all times and have a fast start-up capability. For these reasons, diesel powered generators are proposed. The generators will be European Union (EU) Stage 3A emission certified or similar and include high-tech fuel injection, air management and exhaust gas recirculation to provide high efficiency and low emissions.

2.1.4 The proposed development would be connected to the regional electricity grid at the existing substation which is adjacent to the Generating Facility Site, and it is anticipated that any consent for this element, as needed, would be obtained by the Distribution Network Operator (DNO) Northern Powergrid and sought separately.

2.1.5 It is intended that the proposed development would operate for up to 25 years whereupon it would be decommissioned and the land restored.

Generating Facility

2.1.6 The Generating Facility would include a maximum of 14 modular diesel generators each in an own acoustically insulated container with a cooling radiator, exhaust and air intakes, along with other associated plant and equipment. The exhausts provide dispersion of emissions.

2.1.7 A diesel generator comprises two separate devices that work together in order to produce power. A diesel engine burns diesel fuel in order to produce motion for the generator, which converts the motion into electricity by using electromagnets.

2.1.8 Other ancillary infrastructure needed at the Generating Facility would include:

- a control room – to monitor diagnostics;
- welfare facilities for visiting maintenance personnel;
- fuel storage tanks;
- security cameras and lighting;
- electrical transformers; and
- acoustic/security fencing and access gate.

2.1.9 The above plant items and their fencing/screen will form a compound which is laid to hardcore or concrete and will be accessed via a new dedicated access point off Plas Bennion Road. It is common for this type of plant to be left in the open (e.g. generators not placed in a building) given the enclosed nature of the engines and the cooling requirements. At the back of the engines will be fuel supply pipe work, together with the cabling and switch gear needed to control the engines.

2.1.10 The fuel will be diesel oil (distillate) with a sulphur content of less than 0.1%, in accordance with EU Directive 93/12/EEC 1993 relating to the sulphur content of certain liquid fuels. The fuel oil would be transported to the Generating Facility Site by road, via tankers. Approximately 165,000 litres of fuel would be stored on the Generating Facility Site at any one time in dedicated fuel storage tanks. Each diesel engine would be fitted with a 'saddle tank' situated across the generator, which would directly feed into each generator. There would also be 3 no. feeder storage tanks on the Generating Facility Site.

2.1.11 The fuel would be stored in secure tanks which are double-skinned and bunded to contain 110 per cent of the volume of tanks, in accordance with the Control of Pollution Oil Storage Regulations (2001). This will ensure that even in the event of a failure of a full tank, the entire contents would be contained and there would be no leaks. The storage of fuel on site would aid the plant in rapid start-up at any time of the day or night, and would allow up to two weeks of normal operation. Therefore, even in the event of severe adverse weather conditions where deliveries are not possible, the Generating Facility would remain operational.

2.1.12 It is anticipated that the Generating Facility would be under automatic, remote operation with visits by operators minimised. The Generating Facility Site would, however, be enclosed by a security fence and contain security lighting, CCTV and alarms.

2.1.13 The indicative maximum dimensions of the main plant items are provided in Table 2.1 below, although some detailed design elements would be subject to further submissions (once finalised) during the determination and conditions discharge phases of the development.

Table 2.1 – Maximum dimensions of main plant items

Plant Item	Max. Number	Max. Width(m)	Max. Length (m)	Max. Height (m)
Diesel Generator	14	3.6	12.8	4.7
Fuel Tanks	3	3	7	2.5
0.4/11KV Transformers @ 2MVa (1 per generator)	14	2.3	2.1	2.0
11/33KV Transformers @ 20 MVa	1	3.8	5.0	4.5
Welfare Unit	1	2.5	2.4	2.4
Combined control and switchroom	1	4	9	2.3
Acoustic / Security Fence	1	Enclosing Generating Facility		3

2.2 Site description

2.2.1 The Generating Facility Site comprises a small part of a large, roughly rectangular arable field approximately 135 m above Ordnance Datum (AOD). The field containing the Generating Facility Site is partially bounded by fragmented hedgerows which are generally concentrated on the western and eastern field edges. The Generating Facility Site would be located in the northern part of this field, immediately south of the existing DNO 33 kV substation, approximately 30 m from the junction of where Plas Bennion Road meets with the A539. The whole Application Site is within the jurisdiction of WCBC.

2.2.2 Photographs of the site are presented below in Inserts 2.1 and 2.2 and also in Appendix 1.1.

Insert 2.1 - View of the site looking south

Insert 2.2 - View of the site looking north

2.2.3 The immediate surrounding area is characterised by agricultural land, interspersed with gappy hedgerows, woodlands and drainage ditches. In the wider vicinity are isolated farmhouses, villages and towns, including Ruabon to the east and Cefn Mawr to the south west. Industrial development in the area comprises the existing DNO 33 kV substation, immediately to the north of the Generating Facility Site, the gas pressure reduction station to the north of that, off Plas Bennion Road, the A539 Llangollen Road which runs approximately 30 m south of the site, and the Wynnstay Technology Park approximately 240 m south of the site.

2.2.4 The closest residential properties to the Generating Facility Site are:

- Properties on Hampden Way, on the edge of Cefn Mawr, approximately 130 m south west, to the south of the A593; and
- The Grange Farmhouse approximately 180 m to the north.

2.2.5 The closest residential centres to the Generating Facility Site are:

- Rhosllanerchrugog – approximately 1.5 km north;
- Penycae – approximately 1.6 km north west;
- Ruabon - approximately 380 m east; and
- Acrefair – approximately 680 m west.

2.2.6 The closest public right of way, a footpath, passes 180 m to the north west of the site.

2.3 Construction, operation and decommissioning

Construction

2.3.1 The construction process for the proposed development is relatively low impact and would be completed within four months. In order to create a level platform on which to site the Generating Facility, there would be a requirement for some limited ground preparation including site levelling and general site clearance. This would be followed by the erection of perimeter formwork for the slab and installing a hardcore base for the concrete plinth.

2.3.2 The modular diesel generators would be placed by crane on top of the concrete plinths on areas of prepared ground (topsoil stripped away, ground levelled and covered with hardcore). Cable ducts would be installed as part of the site preparation, prior to installing foundations, for cables to connect the generators to the transformers and switchgear.

2.3.3 The construction joints would be formed within the slab and the perimeter kerb would be constructed to a height of 150 mm around the slab.

2.3.4 A 3 m high acoustic absorptive fence would be erected surrounding the proposed Generating Facility Site, including a 4 m wide, 3 m height double opening access gate.

2.3.5 Drainage pipework and road drainage gullies would be installed in the main plinth. A full retention separator would be supplied including cover, frame and alarm. This would be connected to the main slab road drains. Drainage sections would be back filled with previously excavated material.

2.3.6 Service ducts with sand surround would be formed for high voltage cabling.

2.3.7 Foundations would be installed for DNO connection equipment and metering housing will be supplied.

2.3.8 Radius kerbs would be installed on both sides of the entrance to the Generating Facility Site and a complete macadam roadway would be constructed serving the entrance.

2.3.9 The road would connect with Plas Bennion Road through a gap created in the hedgerow adjacent to the road. Further details of the access arrangements are included in section 5.6 and further details on the ecological baseline of the hedgerow are set out in section 5.2.

2.3.10 The EPC contract (which will also cover the commissioning and testing) for the Generating Facility will be awarded to one or more contractors who may in turn appoint specialist subcontractors. The EPC contractor and subcontractors will be responsible for all the detailed design, civil construction, manufacture, supply, delivery to site, offloading, erection, installation and commissioning. The selection of the EPC contractor will include an assessment of the contractor's record in dealing with health, safety and environmental issues and require evidence that it has incorporated these elements into its method statements.

2.3.11 The EPC contractor will be responsible for organising the site construction and installation works to the required safety standards and the programme.

2.3.12 Construction activities would be undertaken in accordance with a Construction Method Statement (CMS) that would be developed by the contractor and which would include details of minimising pollution potential from construction works. This would be agreed with WCBC prior to commencement of development. It is anticipated that additional procedures would be developed with WCBC, as appropriate, to cover other potential environmental effects from construction. Construction working hours would typically be from 08.00 - 18.00 Monday to Friday and 08.00 to 13.00 on Saturdays.

2.3.13 Operation

2.3.14 The Generating Facility would operate for a maximum of 500 hours per year (less than 6% of the time) which will typically be for up to 2 –3 hours in the evenings during times of peak energy demand, across the winter months.

2.3.15 It is envisaged that the proposed development would be operational for up to 25 years whereupon it would be decommissioned and the land re-instated.

2.3.16 It is anticipated that the Generating Facility would be unmanned. Its performance would be automatically monitored from a central control room, which would be off site.

2.3.17 Operating parameters would be monitored and recorded to ensure safe and efficient operation of the plant, with the capability of carrying out corrections and shut down remotely, as required.

2.3.18 During operation a programme of routine maintenance would be carried out. This would consist of: inspecting and testing safety systems; inspecting wear and tear on components such as seals and bearings; lubricating the mechanical systems; and performing electronic diagnostics. In addition, weekly visits for general site maintenance, and fuel filling if required, would also be carried out.

Decommissioning

2.3.19 Compared to other power generation technologies, diesel generators such as those proposed can be easily and economically decommissioned and removed from site at the end of their economic life and the site restored to its original use and condition.

2.3.20 Decommissioning would comprise the removal of all Generating Facility items and restoration of the site. This process would take approximately three months. It is likely that some underground structures, including the electrical connection would be capped and left in situ to avoid any adverse environmental effects associated with their removal.

2.3.21 Due regard will be paid to all best practice guidelines and legislation which are relevant at the time of the decommissioning activities.

2.4 Proposed mitigation

2.4.1 Embedded mitigation is mitigation which is either implicit in the design of the proposed development or its operation (through standard control measures, such as working within best practice guidance) either of which would routinely be incorporated for the proposed development or for any similar project constructed in the UK. This embedded mitigation has been assumed in this ER to be in place from the outset, as it is mitigation without which the proposed development would be unlikely to be granted consent or allowed to commence. This ER has therefore considered the likely significant effects of the proposed development assuming that embedded mitigation is in place.

2.4.2 The embedded mitigation included within the proposed development is set out below.

Construction Method Statement / General

2.4.3 During construction a CMS would be followed. The CMS would set out best practice construction methods and safe working practices to be followed so as to limit construction impacts on the environment.

2.4.4 Good site practices would be followed during construction, for example as set out in Environment Agency Pollution Prevention Guidelines (PPG) and the Construction Research

and Information Association (CIRIA) PPG. This would minimise the risk of accidental releases of materials that could affect on-site and off-site receptors.

2.4.5 The role of the EPC contractor, described in paras 2.3.4 - 6 above, would also include:

- Supervise all traffic on-site and off-site
- Implement a programme of works and provide a schedule for deliveries, and
- Coordinate all construction and commissioning activities.

Air Quality

2.4.6 Best practice measures to limit dust during construction would be set out in the CMS. This includes e.g. damping down of stockpiles during dry and windy conditions, and sheeting materials to prevent dust migration.

Ecology

2.4.7 Pre-construction constraints checks would be undertaken. These would take the form of a walkover survey, to be carried out no later than three months prior to the start of site clearance and construction operations (if works are delayed beyond July 2016), with a further check immediately prior to site clearance commencing. Further details are given in section 5.2 of this report.

Noise

2.4.8 All construction activities will be undertaken in accordance with the recommendations of BS 5228 'Noise and Vibration Control on Construction and Open Sites' Part 1 Noise and Part 2 Vibration.

2.4.9 Only plant conforming to relevant national or international standards, directives or recommendations on noise or vibrations emissions will be used.

2.4.10 Construction plant would be operated and maintained appropriately, having regard to the manufacturer's written recommendations or using other appropriate operation and maintenance programmes which reduce noise and vibration emissions.

Ground Conditions

2.4.11 The following measures would be implemented to ensure that there are no likely significant effects on ground conditions as a result of the proposed development:

- Any soils excavated which are considered to be potentially contaminated (e.g. visual or olfactory evidence) would be reported to site management and left alone until their appropriate treatment. Suitable training would be provided to site personnel to ensure the correct identification of potentially contaminated soils by olfactory means;

- Water inflows to excavated areas would be minimised by the use of lining materials, good housekeeping techniques, and by the control of drainage and construction materials in order to prevent the contamination of ground water. Site personnel would be made aware of the potential impact on ground and surface water associated with certain aspects of the construction works to further reduce the incidence of accidental impacts;

- Measures would be taken to avoid/minimise the potential for fuel and chemical spills. A spill response procedure will also apply on-site;

- Method statements to deal with safe dewatering;

- Personal Protective Equipment (PPE) would be used;
- Oil retention separators including cover, frame and alarm would be used for site drainage; and
- Fuel would be stored in rectangular bunded fuel oil tanks with overfill prevention and level sensors, manufactured from 5 mm mild steel plate to BS 799 type J. This would ensure that even in the event of a failure of a full tank, the entire contents would be contained and there would be no leaks.

Landscape and Visual Impacts

2.4.12 To limit views of the proposed development from the south, new native species hedgerows containing trees would be planted along the southern boundary of the Generating Facility Site adjacent to the acoustic / security fence and adjoining existing hedgerows where practical. Appropriate management of the existing boundary hedgerows to the west would provide some additional visual mitigation.

2.4.13 The selection of materials to be used for the proposed development takes into account necessary operational requirements whilst also seeking to minimise potential visual impacts. It is recognised that there are inherent limitations as to how far the appearance of plant items can enhance the visual interest of the surrounding landscape, however consideration is given to mitigating any adverse visual impacts as far as possible. The final details of any boundary treatments would be agreed with WCBC.

Traffic and Transport

2.4.14 To ensure that construction vehicles safely access and leave the site and cause minimal impact on the surrounding road network during construction, a Construction Traffic Management Plan (CTMP) would be implemented. The following measures would be included in the CTMP:

- Subject to consultation and agreement with WMDC, temporary construction works signage will be provided at the access point and at the A539 (Fford Llangollen)/ Plas Bennion Road priority junction. If required, signage will also be provided along the designation construction traffic route to aid route navigation;
- Banksmen to coordinate all construction traffic at the site access, to avoid conflict with local traffic and to hold traffic for sensitive users such as pedestrians, cyclists and horse riders, providing priority to local traffic on Plas Bennion Road;
- Site visits would be timed and managed, particularly in respect of deliveries by HGVs, to ensure the access is in use by only one vehicle at a time to avoid traffic conflict;
- Vehicle parking facilities would be provided on the Generating Facility site to prevent any overspill parking to Plas Bennion Road. This would be enforced by the Site Manager and all suppliers to the site would have to comply with this by signing up to the CTMP;
- A suitably sized construction compound, as shown in Figure 5.6.1 would be provided within the site boundary which will provide adequate room for loading / unloading vehicles and for the lay down of transported items and storage;
- If requested by WCBC, a dilapidation survey would be carried out along Plas Bennion Road within the immediate vicinity of the Application Site. The existing carriageway condition would be recorded and agreed prior to the construction commencing and resurveyed post construction in order to ascertain any damage to the highway caused as a direct result of the construction vehicles. This will allow all parties to agree the scope of

any issues related directly to the site construction activities. It is accepted that the responsibility for any subsequent maintenance requirements identified and shown to be as a direct result of the construction traffic on the immediate network, would lie with the developer;

- A log would also be maintained on-site of all construction vehicles arriving and departing the site as a record of the timings of all movements;
- Sustainable travel to site by construction staff to reduce the number of vehicles to/from the site. Where travel by car is required, car-sharing (and vehicle-sharing) would be encouraged; and
- Loads would be transported securely and safely. Where these are not within a container, tarpaulin and ties would be used to secure the loads and cover them, preventing dust generation.

2.5 Site selection and consideration of alternatives

2.5.1 PEDL has assessed numerous sites around the UK for suitability to support a development of this nature. The site at Cefn Mawr is deemed suitable as PEDL considers that the proposed development could be responsibly delivered without significant environmental impacts and with many advantages over other sites, including proximity to a suitable substation. The factors taken into consideration by PEDL in coming to this conclusion are set out below.

- Proximity to electrical infrastructure;
- Remoteness from residential areas;
- Existing land use;
- Accessibility;
- Sufficient site area and landowner support; and
- Fuel choice.

Proximity to a substation

2.5.2 The main factor in selecting a site for this type of plant is the need to be within close proximity of a suitable substation. The substation must be sized appropriately to be connected into the regional distribution network and must also have spare capacity to be able to take the power from the Generating Facility. The 33 kV substation to the north of the Generating Facility Site is suitable both from the perspective that it has spare capacity to take an additional 20 MW at times of peak demand and from the fact that it supplies power directly to the regional network.

2.5.3 The site location also offers the opportunity to gain access to the local electricity grid without the need for significant additional infrastructure and cost. Other substation types are available in the vicinity of the site. However, these are either too large (rated at 132 or 400 kV) (e.g. the Legacy 400 kV substation) and supply large amounts of power nationally or they are too small to accept 20 MW of electrical capacity (for example rated at 11 kV).

2.5.4 Proximity to suitable electrical infrastructure also means that the requirement for a large electrical transmission cable is avoided. This, in turn, significantly reduces the potential environmental impacts of the proposed development, for example visual impacts typically associated with long overhead lines or extensive excavation of agricultural land associated with underground cables. Remoteness from a suitable connection point requiring the construction of a lengthy transmission line can also make a project unviable in economic

terms. Additionally, the fact that the Generating Facility would be 'embedded' into the regional grid means that there are less transmission losses than are typically associated with long cable connections.

2.5.5 As well as being in close proximity to a substation, the following factors must also be considered when selecting a suitable site.

Proximity to residential areas

2.5.6 The closest residential properties to the Generating Facility Site are on Hampden Way, on the edge of Cefn Mawr, approximately 130 m south west, to the south of the A593; and the Grange Farmhouse approximately 180 m to the north.

2.5.7 The site of both the Generating Facility and the existing substation are largely screened from these properties, mainly because of the intervening vegetation and the A539 main road. There are therefore not anticipated to be any significant visual or noise impacts on these properties. Further discussion of this is provided in Sections 5.3 and 5.4.

Existing land use

2.5.8 The Application Site and surrounding land are currently used for agricultural grazing and have been for as long as the owner and developer are aware and from evidence of historical mapping dating back to 1847. The land is typical to the surrounding area and although it is agricultural, it is not the best quality land (Grade 3 as defined by the Agricultural Land Classification).

2.5.9 The proposed development would involve modest construction and would not permanently sterilise the agricultural land on which it is situated. Therefore no significant impacts on agricultural land are anticipated as a result of the proposed development.

Visual impacts

2.5.10 The proposed development would be designed to blend in as much as possible with the adjacent substation by using e.g. similar materials and boundary treatments where possible, as well as being of a similar scale and mass.

Accessibility

2.5.11 The Generating Facility Site can be accessed directly from Plas Bennion Road. The diesel generator units will be built elsewhere and brought in to site on the back of low loader lorries in single deliveries. The generator units will then be placed into position by crane. Other construction traffic would include site workers (of the order of 20 personnel); earth moving equipment (bulldozers and excavators); as well as aggregates for foundations and access tracks.

Sufficient site area and landowner support;

2.5.12 The Application Site as shown in Figure 1.1 is sufficient to accommodate an emergency standby electricity generation facility of this size, as shown in Figure 1.2. The proposed development also has the support of the landowner.

Fuel Choice

2.5.13 Diesel has been selected as the most appropriate fuel choice for the Generating Facility as it is a technically viable and economical solution, giving value to UK consumers

2.5.14 Biodiesel was also considered as a fuel choice for the Generating Facility. However, the limited number of hours of operation means that any carbon or emissions savings are limited. The same is true for gas. Deliveries of biodiesel are also typically constrained by availability of suitable supply depots, meaning that any carbon emissions which are saved during operation can often be replaced by longer delivery routes taken by delivery vehicles. Biodiesel also has a typically higher freezing point than regular diesel oil, meaning that large quantities of fuel stored outside in tanks such as those proposed could become crystallised and cloudy, causing mechanical problems with the generators.

2.6 Planning History

2.6.1 There is no planning history relating to the Application Site. The earliest available OS map (1874) shows that the site lies in a largely agricultural setting with fields surrounding the site on all sides. Plan Bennion Road forms the sites western boundary. A coal mine/shaft is present some 200 m to the southwest of the site boundary, with a further coal mine/shaft located 250 m to the north of the site boundary. Plas Madoc Village lies some 220 m to the southwest of the site boundary, with a railway line some 100 m to the southwest of the site boundary.

2.6.2 No off-site land use changes are marked on the OS maps until 1912, where the coal mine to the south of the Generating Facility Site appears to have undergone expansion with numerous spoil heaps located around the mine shaft location. The closest spoil heap is now marked some 50 m to the south of the Generating Facility Site boundary. A small building is also noted to be present adjacent to the northern site boundary.

2.6.3 The coal mine to the southeast of the Generating Facility Site is noted to be abandoned in around 1953, with the spoil heaps becoming vegetated with woodlands by 1963. The railway line to the southwest of the Generating Facility Site is marked as being dismantled.

2.6.4 The electrical substation adjacent to the northern boundary is first marked on the OS maps on the 1963 edition.

2.6.5 The 1972 OS map shows significant residential development 120 m to the southwest of the Generating Facility Site around Hampden Way. The site of the former coal mine and spoil heaps appears to have been levelled and is noted to be undeveloped land.

2.6.6 Between 1989 and 1991 the coal mine to the southwest of the Generating Facility Site is shown to have been developed into Wynnstay Technology Park, comprising several large warehouse/commercial units.

2.6.7 No notable off-site land use changes were noted on the OS maps between 1991 and the present day.

2.6.8 Available historical OS maps from 1874 to the present day show the site area as wholly undeveloped and assumed agricultural land. The field boundaries remain unchanged throughout the published map dates.

2.7 Nearby Development Proposals

2.7.1 A planning application was submitted in July 2015 for the development of a 5 MW photovoltaic farm on land to the east and west of The Grange, Plas Bennion Road, Penycae, LL14 6RL (Application Ref: P/2015/0546). The site is located approximately 160 m north east of the Application Site.

2.7.2 An outline planning application was submitted in March 2015 for the development of 36 dwellings on land at Pont Adam Crescent, LL14 6EG. The site is located approximately 390 m east of the Application Site.

3 National Policy and Need

3.1 National Policy

3.1.1 This chapter summarises the main national planning policy in relation to the proposed development.

Planning Policy Wales (Edition 7, July 2014) (PPW)

3.1.2 The Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government (WG) 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 Town and Country Planning Act (TCPA) regime.

3.1.3 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.

3.1.4 PPW paragraph 4.8.10 states that: "*Local designations such as green wedges may be justified where land is required to serve the same purpose to a Green Belt, but these designations do not convey the permanence of a Green Belt.*"

3.1.5 PPW paragraph 7.1.1 advises that economic land uses include the traditional employment uses (Class B in the Use Classes Order) as well as retail, tourism and public services. It is also stated in 7.1.1 that the construction and energy sectors are important to the economy and sensitive to planning policies.

3.1.6 PPW adds in paragraph 7.1.2 that it is essential that the planning system considers, and makes provision for, the needs of the entire economy and not just those uses defined under parts B1-B8 of the Town and Country Planning Use Classes Order.

Technical Advice Notes (TANs)

3.1.7 Potentially relevant TANs to the proposed development are:

- TAN 5: Nature Conservation and Planning;
- TAN 6: Planning for Sustainable Rural Communities;
- TAN 11: Noise; and
- TAN 12: Design.

3.2 Need for and Benefits of the Project

National Level

3.2.1 With coal and oil power stations closing due to EU legislation, old nuclear power stations closing and new nuclear being substantially delayed, combined with a high level of intermittent renewable energy coming onto the grid, there is an urgent need for more, and reliable, backup capacity. This is recognised in National Government Policy on energy and planning, and demonstrated in particular by the launch by the Department of Energy and Climate Change (DECC) of the Capacity Market to "*encourage the investment we need to replace older power stations and provide backup for more intermittent and inflexible low carbon generation sources*". The Capacity Mechanism will provide 15 year contracts to maintain reliable, available capacity that can respond within set timescales at any time.

3.2.2 Energy policy is not a devolved matter, nonetheless, 'Energy Wales – A Low Carbon Transition' (2012) envisages "*the widespread deployment of a diverse range of low carbon technologies which will help to generate low carbon electricity, bringing about a steady decarbonisation of energy supply*". It also acknowledges that fossil fuels will provide flexible power in a transitional role. Thus whilst the proposed development would not itself generate renewable energy, it would provide a balancing role to support the substantial increase in capacity (and output) of intermittent renewables on the grid, in line with Welsh government policy.

3.2.3 The overarching National Policy Statement for Energy (NPS EN-1) 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 coal plants. Paragraph 3.6.1 of NPS EN-1 states "*Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix*".

3.2.4 Ofgem (the electricity and gas regulatory body) prepares an annual report entitled 'Electricity Capacity Assessment' which 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.

3.2.5 One of the key findings of the Ofgem report is that electricity 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 powered generation plants, which are due to close under European environmental legislation.

3.2.6 Given the above, there is therefore a clear and unambiguous national requirement for further capacity to meet the projected demand for standby generation capacity. A dedicated generator at the Cefn Mawr site would be required to start up and connect to the grid within minutes of being called up, thus helping stabilise the national and local network providing some of this essential additional capacity.

Regional level

3.2.7 Smaller generators outputting into the local distribution network reduce the need for the DNO to draw supply from the National Electricity Transmission System (NETS), helping to increase security of supply in the local network and reduce the risk of blackouts.

3.2.8 An emergency standby electrical generation facility represents the most flexible type of generation as it can be turned on exactly when needed (e.g. when the wind stops blowing), something which few other forms of power generation offer.

3.2.9 The proposed development would supply power directly into the regional grid, which could be distributed with minimal losses. The generation facility would be able to reach full power within minutes of being started up

4 Development Plan and Other Material Considerations

4.1 The Development Plan

4.1.1 The adopted Development Plan comprises the WCBC Unitary Development Plan (UDP), which was adopted in February 2005. The UDP sets out a range of policies and proposals relating to future development, and deals with the use and conservation of land and buildings in the County.

4.1.2 The Application Site and its immediate surroundings are designated within the UDP as Green Barrier land, and will therefore be subject to assessment against UDP Policy EC 1 (Green Barriers) (as well as Section 4 of PPW) and justification provided for the proposed site location will be provided as part of any planning application.

4.1.3 WCBC consulted on its draft Local Development Plan 2013-2028 (Vision, Objectives and Strategic Growth and Spatial Options for consultation with key stakeholders) from March to April 2015. The document is the first stage of the preparation of WCBC's new local development plan, setting out a range of policy options which will be refined and amended in subsequent drafts prior to its anticipated adoption in March 2018.

4.1.4 Extracts of policies relevant to the proposed development are set out in the table below.

Table 4.1 – Extracts from relevant Unitary Development Plan Policies

Ref	Policy Title/Wording	Relevance to Proposed development
PS2	Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.	The proposed development is located within the countryside
PS3	Development should use previously developed brownfield land comprising vacant, derelict or underused land in preference to the use of greenfield land, wherever possible, particularly so where greenfield land is of ecological, landscape or amenity value, or comprises agricultural land of grades 1, 2 or 3a quality.	The proposed development is located on greenfield land
PS4	Development should maintain the existing settlement pattern and character and be integrated with the existing transport network to help reduce the overall need to travel and encourage the use of alternatives to the car.	The proposed development requires access from the public highway
PS8	Transport: The transport network will be developed by providing an integrated range of travel options to and from principal residential, commercial, employment and education centres by making the best use of the existing road and rail network, including, where necessary, the provision of facilities for both passenger and freight interchange and by the encouragement of public transport, cycling and walking.	The proposed development requires access from the public highway
PS11	Development Objectives: Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature	Impacts of the proposed development on biodiversity must be

Ref	Policy Title/Wording	Relevance to Proposed development
	conservation and landscape interest of the land will be protected and enhanced.	considered.
GDP1	**Development Objectives:** All new development should:- a) Ensure that built development in its scale, design and layout, and in its use of materials and landscaping, accords with the character of the site and makes a positive contribution to the appearance of the nearby locality. b) Take account of personal and community safety and security in the design and layout of development and public / private spaces. c) Make the best use of design techniques, siting and orientation in order to conserve energy and water resources. d) Ensure safe and convenient pedestrian and vehicular access to and from development sites, both on site and in the nearby locality. e) Ensure that built development is located where it has convenient access to public transport facilities, and is well related to pedestrian and cycle routes wherever possible. f) Ensure the safety and amenity of the public and safeguard the environment from the adverse effects of pollution of water, land or air, hazards from industry and quarrying, and associated noise, odour or vibration arising from development. g) Secure public services (e.g. gas, water, electricity) to development at minimum public cost. h) Safeguard sites and areas of nature conservation and wildlife interest, and to provide new habitats where there is an unavoidable loss of existing habitats and areas of wildlife interest. i) Ensure that development does not result in, or is subject to, flooding, soil erosion, landslides or contamination, either on or off the site. j) Have regard to the need to safeguard those areas that possess a strong Welsh cultural and/or linguistic identity from development that could harm this identity. k) Secure the development of sustainable communities, through the promotion of the economic, social and environmental well-being of the area.	Relevant to all new development.
EC1	**Green Barriers:** Within Green Barriers, development will only be granted planning permission if it is for agriculture, forestry, essential facilities for outdoor sport and recreation, cemeteries and other uses of land which maintain the openness of the Green Barrier and do not conflict with the purpose of including land within it.	The proposed development is located within the designated Green Barrier
EC2	**Agricultural Land:** Development on agricultural land of grades 1, 2 or 3a will only be permitted if it does not lead to the irreversible loss of that land.	The proposed development is located on agricultural land
EC4	**Hedgerows, Trees and Woodland:** Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to	The proposed development will affect existing hedgerows and landscape character

Ref	Policy Title/Wording	Relevance to Proposed development
	valuable trees, important hedgerows or ancient woodland sites will not be permitted.	
EC5	**Special Landscape Areas:** Within Special Landscape Areas, priority will be given to the conservation and enhancement of the landscape. Development, other than for agriculture, small-scale farm-based and other rural enterprises, and essential operational development by utility service providers will be strictly controlled. Development will be required to conform to a high standard of design and landscaping, and special attention will be paid to minimising its visual impact both from nearby and distant viewpoints.	Potential impacts on distant Special Landscape Areas need to be considered
EC6	**Biodiversity Conservation:** Development either within or close to sites of biodiversity interest will only be permitted where it can be clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve the biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves, will be supported.	Potential impacts on biodiversity need to be considered
EC11	**Archaeology:** Development which would adversely affect the site or setting of a Scheduled Ancient Monument or archaeological site of national significance will not be permitted. Development that directly affects non-scheduled sites of archaeological importance will only be permitted if an archaeological investigation has been carried out to determine the nature, extent and significance of the remains, and this investigation indicates that in-situ preservation is not justified, and a programme of excavation and recording has been agreed. Development will also be carefully controlled to ensure that the setting of non-scheduled sites of archaeological importance is not harmed where appropriate.	Potential impacts on archaeology need to be considered
EC12	**Development and Flood Risk:** Development (including the raising of land) within defined flood plains will only be permitted if it:- a) would not be subject to an unacceptable risk of flooding on-site; and/or b) does not result in an unacceptable risk of flooding on or off-site; and/or c) does not adversely affect flood management or maintenance schemes	Potential flood risks arising as a result of the proposed development should be assessed
EC13	**Surface Water Run-Off:** Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted.	Potential surface water run-off should be considered and managed
EC14	**Protection of Controlled Waters:** Development which would have an unacceptable adverse impact upon the capacity, flow, quality or availability of controlled waters and associated land will	Impacts on controlled waters should be considered and

Ref	Policy Title/Wording	Relevance to Proposed development
	not be permitted.	managed
CLF6	**Informal Recreation:** The existing pattern of public rights of way will be protected, maintained and improved and any potential new routes will be identified and safeguarded.	Impacts on public rights of way and other forms of recreation should be considered
T8	**Parking:** Development granted planning permission will be required to provide vehicle parking spaces either on site or nearby, in accordance with the Council's current parking standards. Special regard will be paid to the following factors, as appropriate:- a) the availability of public transport nearby, b) proximity to public car parking, c) proximity to local services and facilities, d) road safety hazards and amenity considerations arising from on-street parking in the vicinity of the site. Where implementation difficulties arise in making parking provision on-site or nearby, the Council will require a developer to make financial contributions for measures to assist public transport, or walking and cycling as appropriate.	The need for parking should be considered and managed
T9	**Walking, Cycling and Horse Riding Routes:** Development proposals will be required to provide walking and cycling routes, where feasible and appropriate, that link with existing or proposed walking and cycling routes, and integrate with the public transport system. Opportunities for horse riding along these routes will be secured where appropriate.	Impacts on existing routes should be considered

4.2 Other Material Considerations

Draft Wrexham Local Development Plan 2013-2028: Vision, Objectives and Strategic Growth and Spatial Options for consultation with key stakeholders (March 2015)

4.2.1 The above document was issued for consultation by the Council in March 2015. It forms one of the early stages of consultation on the Council's next Local Development Plan Document.

4.2.2 Given the early status of the plan, its contents are of limited weight and relevance to the assessment of the proposed development.

4.3 Impact of the Proposed Development on the Green Barrier

4.3.1 The Application Site lies within designated Green Barrier land. It is therefore necessary to consider the impact of the proposed development on the purposes of the designated Green Barrier.

4.4 Green Barrier Policy Background

4.4.1 PPW paragraph 4.8.10 states that: "*Local designations such as green wedges may be justified where land is required to serve the same purpose to a Green Belt, but these designations do not convey the permanence of a Green Belt.*"

4.4.2 WCBC UDP Policy EC1 (Green Barriers) states that: "*Within Green Barriers, development will only be granted planning permission if it is for agriculture, forestry, essential facilities for outdoor sport and recreation, cemeteries and other uses of land which maintain the openness of the Green Barrier and do not conflict with the purpose of including land within it.*"

4.4.3 Paragraph 5.2 of the UDP goes on to set out the purposes of the Green Barrier, which include:

i) to prevent the coalescence of urban areas and villages with other settlements;
ii) to assist in safeguarding the countryside from encroachment
iii) to protect the setting of urban areas and villages
iv) to assist in urban regeneration by encouraging the recycling of derelict and other urban land

4.4.4 Paragraph 5.2 then adds: "…*Predominantly urban uses involving substantial built development or night-time lighting are not considered suitable uses in a green barrier*."

4.5 Locational Criteria

4.5.1 The Application Site has been identified following both a national and a local search for sites. The PEDL site search considered over 100 substation locations and their surrounding areas across England and Wales. Chosen sites required the following characteristics:

1) Demand for electricity: land allocated in areas with large amounts of electricity imported from the National Electricity Transmission System during times of peak demand.

2) Grid capacity: only areas with capacity to connect into the local (typically 33 kV) substation are feasible.

3) A commercially feasible grid connection i.e. Distribution Network Operator (DNO) agreement and a suitable and adjacent/near grid connection point. In addition, the Applicant has been advised through the DNO Networks that an application to connect a 20 MW emergency standby electricity generation facility to the regional electricity grid at a point north of Preston (to be understood as an electrical watershed and not a straight longitudinal line) the application would trigger an automatic Statement of Works (SOW) request from National Grid. The SOW implies that a 20 MW load would possibly affect the 400 kV National Electricity Transmission System and as such National Grid would require the Applicant to pay for a study to determine the impact on their systems. This would not only incur costs for the study but would also have adverse time and risk implications in undertaking the study.

4) Suitable construction characteristics: a reasonably level site (including land for the connection and access) not within flood plain or environmentally sensitive designations, capable of being accessed by construction lorries.

5) Proximity to electrical infrastructure: it is necessary and environmentally beneficial to position the proposed development sites within close proximity of a substation or associated distribution lines, reducing visual sprawl and costs.

6) Suitable access: sites are required to be accessible by road, with the local road network suitable for typical operational access (occasional delivery of fuel by HGV tanker), and operational access.

7) Land availability: suitable sites must be available for purchase or long lease.

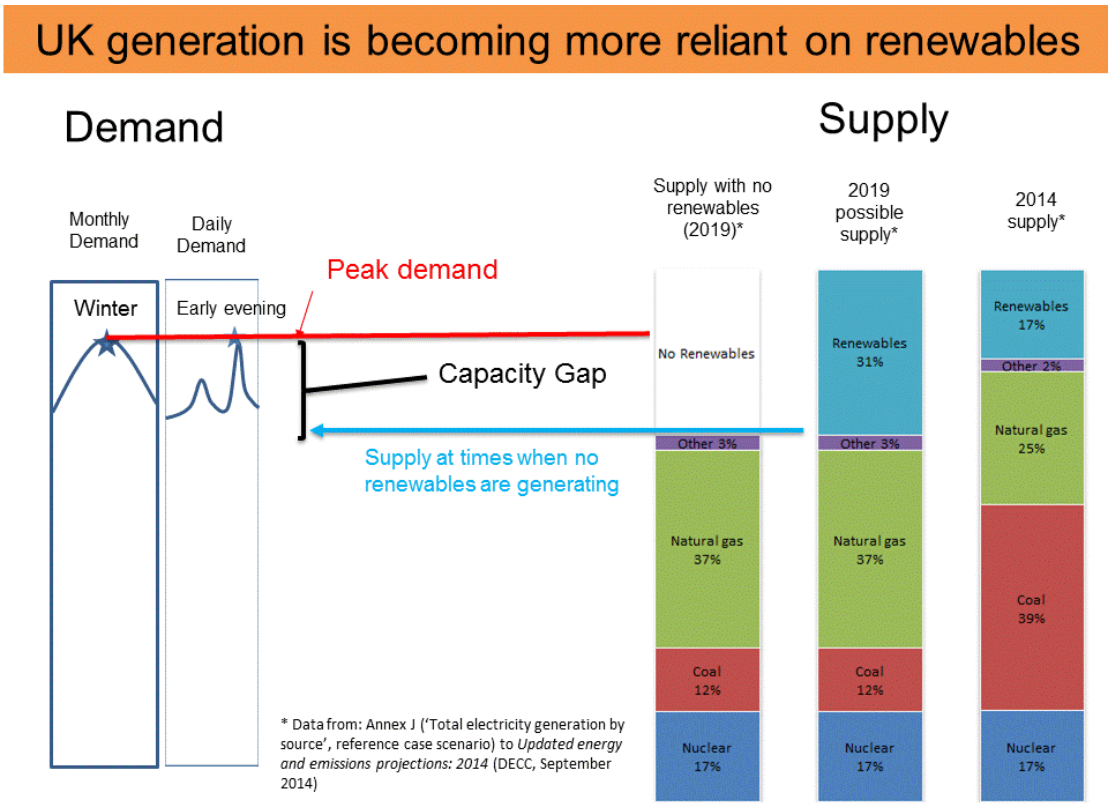
4.5.2 Using the search criteria explained above, it has been established that there is a demand for additional electricity supply in this area and that the local DNO substation (the existing substation to the immediate north of the Application Site) has available capacity. Following appraisal of land proximate to the substation, the proposed Application Site has been identified as being suitable for the Generating Facility.

4.6 National Need and Benefits of the proposed development

4.6.1 Section 3.2 above sets out the national and regional need for the proposed development.

4.6.2 Whilst the proposal would not itself generate renewable energy, the need for it arises from the huge increase in capacity (and output) of intermittent renewables on the grid. Intermittent supply leads to a greater risk of power shortages at times of high demand and low output, unless there are other sources of short-term and rapid-response energy supply to overcome the intermittent nature of some renewable sources of energy generation.

4.6.3 At the national scale, the increase in capacity of flexible back-up electricity generation is already supporting the shift from older coal-fired base load plant to new renewable energy installations. Insert 1.1 below shows the sources of UK energy generation, using data from DECC relating to energy and emission projections, which clearly shows the dramatic projected reduction in electricity generation from coal from 2014 to 2019, and the substantial increase in electricity generation from renewables and gas (gas being one of the most flexible power sources).



Insert 1.1: Existing and forecast energy supply mix: Source: Annex J ('Total electricity generation by source', reference case scenario) to Updated energy and emissions projections: 2014 (DECC, September 2014). *NB 'Demand' side of figure is an illustration and the 'Supply' side is DECC data.*

4.6.4 ***The installed capacity of wind and solar power is substantial and increasing rapidly.*** There is a total of 12.4 GW installed wind capacity (May 2015, http://www.ref.org.uk/publications/327-2015-update-on-progress-towards-2020-renewables-target) UK-wide and a further 20.2 GW consented and under or awaiting construction (ibid). If all is built this would be higher than present installed gas (CCGT) capacity. For solar power the corresponding figures are 3.8 GW and 3.1 GW (ibid).

4.6.5 The substantial wind and solar capacity equates to a contribution of 10.6% of electricity generation (Provisional figures for 2014 in Table 5.1 of Energy trends section 5, DECC, 25th June 2015 edition), itself an increase on the previous year of 18.6%. The 10.6% of electricity generation provided by wind and solar capacity represents approximately half of the total contribution of all renewable energy sources which equates to 19.1% of the total energy mix. These statistics demonstrate the scale of the challenge in transitioning to a low carbon energy network: a substantial increase in capacity of the intermittent renewables, and the backup supplies for them, is required, as their load factors are much lower than, and not as dependable as, traditional base load plant such as coal, nuclear, and gas.

4.6.6 ***Peaking power plants are an integral part of the UK's National Grid and distribution networks***. They help to maintain a secure and reliable supply of electricity at all times, being the most flexible source of power to be called upon when the now substantial volume of intermittent renewable sources are not generating (e.g. during still or cloudy days, whereby wind and solar farms respectively would not generate), and/or when there is a peak in demand from consumers, or when conventional power plant break down. One example of a mechanism by which this is managed is Short Term Operating Reserve (STOR), by which National Grid accesses sources of non-synchronised power generation (as well as demand reduction) to be able to deal with actual demand being greater than forecast demand and/or unforeseen generation unavailability. The need for STOR varies depending on the time of year, the time of week and time of day, being a function of the system demand profile at that time. Another example is the Capacity Mechanism (CM), which the government has introduced to help ensure security of electricity supply in the coming decades. The Capacity Mechanism is compatible with other, open market, uses of the generation capacity and helps provide a cost effective solution to the bill payer to maintain security of electricity supply.

4.6.7 ***A substantial array of national Government policy supports and requires the development and maintenance of reliable, flexible generation capacity*** on the grid as part of a balanced, secure and low carbon economy.

4.6.8 NPS EN-1 was published in 2011 and is the principal statement as to government policy for new energy developments under the Planning Act 2008 regime, and "*is likely to be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990 (as amended)*" (Paragraph 1.2.1). Paragraph 3.6.1 of NPS EN-1 confirms that flexible fossil fuel generation has a particular, vital role in the UK's energy mix, stating:

"*Fossil fuel power stations play a vital role in providing reliable electricity supplies: they can be operated flexibly in response to changes in supply and demand, and provide diversity in our energy mix. They will continue to play an important role in our energy mix as the UK makes the transition to a low carbon economy*..."

Similarly Paragraph 1.1.1 of the National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2) states:

"*Fossil fuel generating stations play a vital role in providing reliable electricity supplies and a secure and diverse energy mix as the UK makes the transition to a low carbon economy*."

4.6.9 NPS EN-1 paragraph 3.3.11 states:

"*An increase in renewable electricity is essential to enable the UK to meet its commitments under the EU Renewable Energy Directive. It will also help improve our energy security by reducing our dependence on imported fossil fuels, decrease greenhouse gas emissions and provide economic opportunities. However, some renewable sources (such as wind, solar and tidal) are intermittent and cannot be adjusted to meet demand. As a result, the more renewable generating capacity we have the more generation capacity we will require overall, to provide back-up at times when the availability of intermittent renewable sources is low. If fossil fuel plant remains the most cost-effective means of providing such back-up, particularly at short notice, it is possible that even when the UK's electricity supply is almost entirely*

decarbonised we may still need fossil fuel power stations for short periods when renewable output is too low to meet demand, for example when there is little wind."

4.6.10 In addition, NPS EN-1 paragraph 3.3.12 states:

"*There are a number of other technologies which can be used to compensate for the intermittency of renewable generation, such as electricity storage, interconnection and demand-side response, without building additional generation capacity. Although Government believes these technologies will play important roles in a low carbon electricity system, the development and deployment of these technologies at the necessary scale has yet to be achieved. The Government does not therefore consider it prudent to solely rely on these technologies to meet demand without the additional back-up capacity…* ***It is therefore likely that increasing reliance on renewables will mean that we need more total electricity capacity than we have now, with a larger proportion being built only or mainly to perform back-up functions.***"

4.6.11 The development of demand-side (embedded) peaking plant operating on fossil fuels is a recognised and relatively low carbon approach to providing back-up supply. The technology proposed would have an efficiency of around 40%, which is similar to the efficiency of the largest Combined Cycle Gas Turbine power stations (50-59% before accounting for the national grid's transmission losses, which accounted for 8% in 2012, the most recent year for which data is available at http://www.iea.org/statistics/statisticssearch).

4.6.12 ***The need for more back-up fossil fuel generation operating flexibly at low load factors is set out in a number of other government policy documents:***

- The **Electricity Market Reform White Paper** 'Planning our electric future: a White Paper for secure, affordable and low-carbon electricity' (DECC, 2011) "*sets out the Government's commitment to transform the UK's electricity system to ensure that our future electricity supply is secure, low-carbon and affordable*". A key part of this wide ranging reform was the introduction of a 'Capacity Mechanism' in order "*to guarantee future security of electricity supply as a quarter of ageing plant closes during this decade and the proportion of intermittent or less flexible low-carbon generation rises*" (paragraph 1.35). The White Paper sets out, at page 24, a vision for the Electricity System following reform, in which it is stated "*The electricity grid has evolved to accommodate more localised and intermittent sources of generation, as well as being smarter and more responsive*". The challenge continues as intermittent sources increase, and "*should continue to be addressed by the System Operator (SO), National Grid, through the current approach, including the procurement and operation of Short-Term Operating Reserve*". This is extended to the Capacity Mechanism which is intended to run in parallel.

- 'The **Carbon Plan** - delivering our low carbon future' (HM Government, 2011) sets out the Coalition Government's policies for how the UK will achieve decarbonisation within the framework of its energy policy; making the transition to low carbon economy while maintaining energy security, and minimising costs to customers. Paragraph 2.146 of the Plan recognises that the nature of the electricity network will need to change so that it becomes smarter at balancing demand and supply as generation/supply become more intermittent and demand increases. In light of this the Plan states that on the way to 2050, some flexible fossil fuel plant is likely to be needed to ensure security of supply. Paragraph 2.147 states that over the next decade, the UK will need to invest in new generation capacity to replace the coal and nuclear power stations that are set to close by the early 2020s in order to maintain our energy security, while meeting our legal commitments to reduce carbon emissions and increase renewable electricity generation.

- 'Electricity System: Assessment of Future Challenges – Annex (DECC, August 2012)' seeks to fully understand the implications of the challenges posed by moving to an

energy mix with a greater proportion of intermittent and less flexible generation and identify means of addressing them. The overall aim is to ensure that the electricity system can facilitate future low carbon generation and expected increases in electricity demand in the most secure and affordable way, with the most efficient use of assets.

- The 'Electricity Capacity Assessment' (Ofgem, submitted to the Secretary of State in October 2012) 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. One of the key findings of the Ofgem report is that electricity supply will decrease significantly from the current historically high levels due to the expected closures of coal plants.

- The **National Infrastructure Plan** (HM Treasury, December 2014 & updated July 2015) provides that since 2011 8% of generating capacity has closed and a further 10-12% of current power generating capacity is due to close over the coming decade which will lead to an increase in the probability of a supply disruption. It is stated at paragraph 1.36 that "*Large scale investment in gas and low carbon generation technologies is therefore vital in order to replace our ageing energy infrastructure and maintain secure energy supplies. It is also essential to meeting the UK's legally binding targets to cut emissions by at least 80 per cent by 2050 and to source 15 per cent of its energy from renewable sources by 2020*."

- In the fifth **Annual Energy Statement** (AES) (2014), DECC reiterated the need to build new power generation infrastructure and acknowledged the need for demand-side capacity to continue to feature strongly in the energy mix.

4.7 Local Need and Benefits of the proposed development

4.7.1 It is standard energy industry practice that developers identify substations with spare capacity, whether for flexible peaking plants or intermittent solar/wind developments. The proposed development would deliver electricity directly into the regional grid via the existing network. Smaller generators outputting into the local distribution network reduce the need for the DNO to draw supply from the NETS, helping to increase security of supply in the local network and reduce the risk of blackouts.

4.7.2 In addition, a more secure and responsive local electricity supply will provide current and future local power users, including the nearby Wynngstay Technology Park and essential local services, with additional confidence that local electricity supply infrastructure is sufficiently robust.

4.7.3 Local employment will benefit during the construction of the proposed development, with the use of the local workforce during the construction phase.

4.7.4 The proposed development is for a 25 year period, after which the site will be restored for agricultural use. The proposed development will be designed to ensure that the land remains suitable for agricultural use until it is restored as such and control of the site returned to the landowner.

4.8 Minimisation of harm to Green Barrier Purposes

4.8.1 Whilst it is acknowledged that the proposed development would have an impact on the openness of the designated Green Barrier, by virtue of its location within the open countryside, it is noted that its proximity to the existing substation and gas pressure reduction station and their associated infrastructure, as well as its distance from local receptors, means that views of the proposed development would be seen in the context of existing energy infrastructure. The impact on the purpose of the Green Barrier must also be balanced against the identified benefits and other impacts of the proposed development when considering whether sufficient justification exists to permit the proposed development.

4.8.2 As outlined above in the summary of locational criteria, the Generating Facility is proposed in this location due to its suitability against a number of locational criteria. Regarding the countryside location in particular, the proposed development needs to be a sufficient distance from sensitive receptors, including residential properties.

4.8.3 It should also be noted that the proposed development is for a period of 25 years, and therefore its lack of permanence would ensure that the development does not act as a permanent feature in the landscape between existing built up areas.

4.8.4 The siting, design and layout of the proposed development is intended to have minimum visual impact whilst ensuring that the plant functions as intended.

4.8.5 Plant height will be kept as low as practically possible, minimising long-distance views of the site.

4.8.6 Whilst the proposed development will temporarily utilise agricultural land, it is not the best quality land (Grade 3 as defined by the Agricultural Land Classification) and is located at the very edge of the field and adjacent existing electricity infrastructure. This enables the remainder of the field to continue to be utilised for agriculture.

4.8.7 On the basis of the above considerations regarding the national and local need for the proposed development, as well as the locational criteria for site selection and its non-permanent nature, it is considered that the proposed development on balance is acceptable and would not have an unacceptable impact on the purposes of the designated Green Barrier, in accordance with PPW Chapter 4 and WCBC UDP Policy EC1 (Green Barriers).

5 Appraisal of environmental effects

5.1 Air Quality

Introduction

5.1.1 This appraisal describes baseline air quality within the study area, and considers the likelihood of significant air quality effects at sensitive locations for human health and ecosystems arising as a result of the operation of the Generating Facility. Atmospheric dispersion modelling of emissions from the generators has been undertaken in order to predict the effects of these emissions.

5.1.2 The effects of emissions of oxides of nitrogen (NOx), carbon monoxide (CO), particulate matter (PM10) and sulphur dioxide (SO_2) have been considered.

Policy context

The Air Quality Strategy

5.1.3 The Air Quality Strategy (2007) establishes the policy framework for ambient air quality management and assessment in the UK. The primary objective is to ensure that everyone can enjoy a level of ambient air quality which poses no significant risk to health or quality of life. The strategy sets out the National Air Quality Objectives (NAQOs) and Government policy on achieving these objectives.

5.1.4 Part IV of the Environment Act 1995 introduced a system of Local Air Quality Management (LAQM). This requires local authorities to regularly and systematically review and assess air quality within their boundary, and appraise development and transport plans against these assessments.

5.1.5 Where an objective is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) setting out the measures it intends to introduce in pursuit of the objectives within its AQMA.

5.1.6 The Local Air Quality Management Technical Guidance 2009 (LAQM.TG(09); Defra, 2009) issued by the Department for Environment, Food and Rural Affairs (Defra) for local authorities provides advice as to where the NAQOs apply. These include outdoor locations where members of the public are likely to be regularly present for the averaging period of the objective (which vary from 15 minutes to a year). Thus, for example, annual mean objectives apply at the façades of residential properties, whilst the 24-hour objective (for PM_{10}) would also apply within the garden. They do not apply to occupational, indoor or in-vehicle exposure.

EU Limit Values

5.1.7 The Air Quality Standards Regulations 2010 implement the European Union's Directive on ambient air quality and cleaner air for Europe (2008/50/EC), and include limit values for NO_2. These limit values are numerically the same as the NAQO values but differ in terms of compliance dates, locations where they apply and the legal responsibility for ensuring that they are complied with. The compliance date for the NO_2 EU Limit Value was 1 January 2010, five years later than the date for the NAQO.

5.1.8 Directive 2008/50/EC consolidated the previous framework directive on ambient air quality assessment and management and its first three daughter directives. The limit values remained unchanged, but it now allows Member States a time extension for compliance, subject to European Commission (EC) approval.

5.1.9 Despite many areas of the UK not being compliant with the annual average NO_2 limit value, the UK has decided not to seek an extension to the compliance date for this pollutant. This was on the basis that it could not be guaranteed that the UK would be compliant by the latest date allowable under the Directive (1 January 2015).

5.1.10 The Directive limit values are applicable at all locations except:

- where members of the public do not have access and there is no fixed habitation;
- on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply; and
- on the carriageway of roads; and on the central reservations of roads except where there is normally pedestrian access.

Habitats

5.1.11 European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive) requires member states to introduce a range of measures for the protection of habitats and species. The Conservation of Habitats and Species Regulations (2010) (Stationery Office, 2010), transposes the Directive into law in England and Wales. The Regulations require the Secretary of State to provide the European Commission with a list of sites which are important for the habitats or species listed in the Directive. The Commission then designates worthy sites as Special Areas of Conservation (SACs). The Regulations also require the compilation and maintenance of a register of European sites, to include SACs and Special Protection Areas (SPAs); with these classified under the Council Directive 79/409/EEC on the Conservation of Wild Birds. These sites form a network termed 'Natura 2000'.

5.1.12 The Regulations primarily provide measures for the protection of European Sites and European Protected Species, but also require local planning authorities to encourage the management of other features that are of major importance for wild flora and fauna.

5.1.13 In addition to SACs and SPAs, some internationally important UK sites are designated under the Ramsar Convention. Originally intended to protect waterfowl habitat, the Convention has broadened its scope to cover all aspects of wetland conservation.

5.1.14 The Habitats Directive (as implemented by the Regulations) requires the competent authority, which in this case will be the planning authority, to firstly evaluate whether the development is likely to give rise to a significant effect on the European site. Where this is the case, it has to carry out an 'appropriate assessment' in order to determine whether the development will adversely affect the integrity of the site.

5.1.15 Sites of national importance may be designated as Sites of Special Scientific Interest (SSSIs). Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs (in England and Wales) were introduced by the Countryside and Rights of Way (CROW) act 2000. If a development is 'likely to damage' a SSSI, the CROW act requires that a relevant conservation body (i.e. Natural Resources Wales) is consulted. The CROW act also provides protection to local nature conservation sites, which can be particularly important in providing 'stepping stones' or 'buffers' to SSSIs and European sites. In addition, the Environment Act (1995) and the Natural Environment and Rural Communities Act (2006) both require the conservation of biodiversity.

Methodology

Existing conditions

5.1.16 Information on existing air quality has been obtained by collating the results of monitoring carried out by WCBC. Background concentrations for the Generating Facility Site have been defined using the national pollution maps published by Defra. These cover the whole country on a 1x1 km grid (Defra, 2015).

5.1.17 Existing nitrogen and acid deposition rates within the study area were determined from the Air Pollution Information System website (APIS)[1].

Human health impacts

5.1.18 Relevant sensitive locations are places where members of the public might be expected to be regularly present over the averaging period of the objectives. For the annual mean and daily mean objectives that are the focus of this assessment, sensitive receptors will generally be residential properties, schools, nursing homes, etc.

5.1.19 Five locations on the façades of the nearest residential buildings to the Generating Facility Site have been chosen as receptors and are shown on Figure 5.1.1 Receptors were modelled at a height of 1.5 m, representing residential exposure at ground level.

5.1.20 The criteria for assessing human health impacts as result of emissions from the Generating Facility are shown in Table 5.1.1. Environmental Assessment Levels (EALs) are based on either national or international standards, or information provided by the Environment Agency[2].

Table 5.1.1: Air quality criteria for the protection of human health

Pollutant	Time Period	Objective
NO_2	1-hour mean	200µg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 µg/m^3
PM_{10}	24-hour mean	50µg/m^3 not to be exceeded more than 35 times a year
	Annual mean	40 µg/m^3
CO	8-hour running daily mean	10 mg/m^3
SO_2	15-minute mean	266 µg/m^3 not to be exceeded more than 35 times a year
	1-hour mean	350 µg/m^3 not to be exceeded more than 24 times a year
	24-hour mean	125 µg/m^3 not to be exceeded more than 3 times a year

5.1.21 The appraisal of the impact of emissions on human health receptors has been considered in line with criteria in the Environment Agency H1 guidance. The contribution of the Generating Facility (the process contribution) has been added to an estimate of the background concentration to provide the predicted environmental concentration (PEC). Process contributions of more than 1% of the annual and 10% of the short term level are potentially significant.

[1] www.apis.ac.uk

[2] H1 Annex F. Air Emissions. Issue 2.2. December 2011

5.1.22 In all cases, the PEC should be below the relevant level from Table 5.1.1. Where the contribution from a process causes a breach of the level, and is a significant proportion of the breach then it is unlikely to be acceptable, with further controls likely to be required on the operation of the installation to mitigate the impact.

Ecological Receptors

5.1.23 The nearest ecological receptor to the Generating Facility Site are Plas Bennion, Gadden Wood/Rocky Wood and Acrefair Railway Cutting.

5.1.24 Objectives for the protection of vegetation and ecosystems have been set by the UK Government and were to have been achieved by 2000. NRW also publishes critical levels for the protection of vegetation and ecosystems and these are summarised in Table 5.1.2.

5.1.25 The objectives only strictly apply a) more than 20 km from an agglomeration (about 250,000 people), and b) more than 5 km from Part A industrial sources, motorways and built up areas of more than 5,000 people. However, NRW has adopted a more precautionary approach and applies the objective to all internationally designated conservation sites, SSSIs and National Nature Reserves (NNRs).

Table 5.2.2: Vegetation and ecosystem critical levels

Pollutant	Time Period	Assessment Criteria	Source
Nitrogen oxides (expressed as NO_2)	Annual mean	30 µg/m^3	UK Air Quality Strategy
	Daily mean	75 µg/m^3	H1 Annex F
SO_2	Annual mean Winter mean	20 µg/m^3	UK Air Quality Strategy
	Annual mean	10 µg/m^3 (sensitive lichen and bryophytes)	H1 Annex F

5.1.26 Critical loads for nitrogen deposition onto sensitive ecosystems have been specified by United Nations Economic Commission for Europe (UNECE). They are defined as the amount of pollutant deposited to a given area over a year, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge.

5.1.27 The critical loads for the Plas Bennion, Gadden Wood/Rocky Wood and Acrefair Railway Cutting – nearest sensitive ecological receptor are set out below in Table 5.1.3.

Table 5.1.3 Critical Loads

Designated Site	Habitat	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)*	Acid Deposition (keqS/ha/yr)**
Plas Bennion	Low and medium altitude hay meadows (coastal and	20 – 30	No data	No data

Designated Site	Habitat	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)*	Acid Deposition (keqS/ha/yr)**
	floodplain grazing marsh)			
Gardden Wood/Rocky Wood	Broadleaved, Mixed and Yew Woodland	10 - 20	0.14 – 1.87	1.73
Acrefair Railway Cutting	Low and medium altitude hay meadows (neutral grassland)	20 - 30	0.85 – 4.78	3.92

* Minimum critical load minimum nitrogen – minimum critical load maximum nitrogen
** Minimum critical load maximum sulphur

5.1.28 In a similar way to human health impacts, pollutant deposition should not exceed the relevant critical load, with an increase of more than 1% of the critical load being potentially significant. With regard to impacts on vegetation and ecosystems, air quality is just one factor that needs to be taken into account and may not be the most important factor in the health of the ecosystem.

Modelling methodology

5.1.29 Predictions of the contribution to pollutant concentrations have been carried out using ADMS 5 dispersion model. The model requires the user to provide various input data, including stack parameters (height, diameter), emission rates, and dimensions of buildings. The model has been run using 5 years of meteorological data (2009-2013) from the Hawarden weather station, approximately 22 km from the Generating Facility Site. A surface roughness of 0.3 m was assumed for the site.

5.1.30 The deposition rates in the SSSI have been estimated from the predicted ground level concentrations. The dry deposition rate of nitrogen has been estimated from the predicted nitrogen dioxide concentration assuming a deposition velocity of 1.5 mm/s. This is the default deposition velocity within the ADMS model for nitrogen dioxide and is the velocity specified in the agreement between the Environment Agency and the Electricity Supply Industry for assessing acid deposition.

5.1.31 The dry deposition rate of sulphur has been estimated from the predicted sulphur dioxide concentration assuming a deposition velocity of 12 mm/s. This is the default deposition velocity within the ADMS model for nitrogen dioxide and is the velocity specified in the agreement between the Environment Agency and the Electricity Supply Industry for assessing acid deposition.

5.1.32 The acid deposition rates have been estimated from the predicted nitrogen and sulphur deposition rates using the following conversion factors:

- 1 keqN/ha/year = 14 kgN/ha/year
- 1 keqS/ha/year = 16 kgS/ha/year

5.1.33 Model input parameters are summarised in Table 5.1.4, 5.1.5 and 5.1.6.

Table 5.1.4: Summary of stack parameters used

Parameter	Stack height (m)	Stack diameter (mm)	Exhaust gas flow rate (m^3/s)	Exhaust Temperature (ºC)
Stack	2.63	0.359	5.43	490

Table 5.1.5: Grid references of stacks

Grid References	X	Y
Stack 1 – Stack 14*	329132	343753

*Coordinates for the centre of the site

Table 5.1.6: Pollutant emission rates used per stack (g/s)

Pollutant	NO_x	CO	PM_{10}	SO_2
Stack	1.23	0.21	0.03	0.18

5.1.34 Emissions data have been taken from manufacturer's data sheets for engines in the size range of those being considered for the development. Emissions are assumed to be at the maximum emission rate quoted.

5.1.35 The Generating Facility would operate for a maximum of 500 hours per year, although this is understood to be a likely upper range. The times when the generators would be operating cannot be predicted, but when they do operate, it is likely to be during the winter, at periods of peak electricity demand in the morning or evening. The modelling has therefore assumed that the generators operate at maximum capacity for four hours per day, seven days per week from November to February inclusive. The modelled hours during this period amount to 480, with an additional 20 hours in March. The modelled hours were between 4pm to 8pm daily. This is considered to be a reasonable approximation for modelling purposes in order that a range of meteorological conditions can be modelled during each of the five years' worth of meteorological data that have been used for the assessment.

5.1.36 Entrainment of the plume into the wake of nearby buildings (the so-called building downwash effect) has been taken into account in the model by including the surrounding existing and proposed buildings within the model. Building dimensions are presented in Table 2.1**.**

Baseline Conditions

Local Air Quality Management (LAQM)

5.1.37 WCBC has investigated air quality within its area as part of its responsibilities under the LAQM regime. There is no Air Quality Management Areas (AQMA) in WCBC.

Monitoring

5.1.38 WCBC operates two automatic monitoring stations within its area, which are not located in the vicinity of the site. The Council also deploys nitrogen dioxide diffusion tubes at a number of locations. Data for the monitoring sites located within 2.0 km from the proposed site are presented in **Table 5.1.7.**

Table 5.1.7: Measured nitrogen dioxide concentrations, 2010 – 2014

Site ID	Site Type	Annual Mean (µg/m^3)				
		2010	2011	2012	2013	2014
WBC-036	R	22.4	24.3	24.2	22.5	21.6
Objective		**40**				

R= Roadside
2010 – 2014 Data taken from the USA 2015 WCBC

5.1.39 Nitrogen dioxide measured concentrations were well below the objective at the closest monitoring sites over the 2010 – 2014 time period.

5.1.40 There are no PM10 monitoring sites in the vicinity of the Application Site.

5.1.41 In addition to these measured concentrations, estimated background concentrations for the study area around the Application Site have been obtained from the national maps provided by Defra (Defra, 2015) and are shown in Table 5.1.8.

Table 5.1.8: Estimated annual mean background concentrations (µg/m^3)

Year	SO_2	CO	NO_x	NO_2	PM_{10}
2001	2.97 – 3.57	213 – 229	-	-	-
2015	-	-	8.9 – 15.6	7.0 – 11.9	12.0 – 13.3
Objectives	**10 - 20**	**-**	**30**[a]	**40**	**40**

[a] Objective applies for ecological receptors

5.1.42 The national maps for sulphur dioxide and carbon monoxide have not been updated since 2001 on the basis that there was very little risk of the objectives being exceeded in the future. The background concentrations for these pollutants are likely to be below the values stated.

5.1.43 The background concentrations of NO_2 and PM_{10} for the year 2015 at residential and ecological receptors are well below the relevant objectives.

Deposition Rates

5.1.44 In addition to these measured concentrations, estimated background concentrations for the study area around the site have been obtained from the national maps provided by Defra (Table 5.1.7; Defra, 2014).

Table 5.1.9: Background deposition rates

Designated Site	Habitat	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)	Acid Deposition (keqS/ha/yr)
Plas Bennion	Low and medium altitude hay meadows	21.98	-	-
	Critical Loads	**20 - 30**	**-**	**-**
Gardden Wood/Rocky	Broadleaved deciduous woodland	36.54	2.61	0.26

Designated Site	Habitat	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)	Acid Deposition (keqS/ha/yr)
Wood	**Critical Loads**	**10 - 20**	**0.14 – 1.87**	**1.73**
Acrefair Railway cutting	Low and medium altitude hay meadows	21.98	1.57	0.22
	Critical Loads	**20 - 30**	**0.85 – 4.78**	**3.92**

5.1.45 The acid deposition critical load is not currently being exceeded within the Acrefair Railway Cutting, but it is exceeded within the Garden Wood/Rocky Wood habitat.

Potential Effects

Construction

5.1.46 There is the potential for some dust to be emitted during construction works depending on the time of year, for example during excavations in dry and windy weather.

5.1.47 In addition there would be emissions associated with the construction machinery and vehicles e.g. exhausts from petrol/diesel powered equipment, however this would be minor and local in nature and would be easily dispersed by the prevailing winds at the site. With suitable techniques employed and a short construction time, the effect on local air quality is expected to be negligible.

5.1.48 To ensure that construction vehicles safely access and leave the site and cause minimal impact on the surrounding road network during construction, a CTMP would be implemented. Further details of this are provided in Section 2.4 above.

Operation

Human Receptors

5.1.49 Tables 5.1.10 and 5.1.11 present the highest predicted concentrations at any of the specific human health receptors considered for the five years' worth of meteorological data modelled. The receptor with the highest predicted concentration is receptor R4. All of the predicted environmental concentrations are below the assessment levels. At all other receptors the predicted impacts are smaller.

Table 5.1.10: Maximum predicted Process Contribution (PC) at worst-case human health receptors (R4)

Pollutant	Averaging Period	Units	PC	EAL	%EAL
PM_{10}	Annual	µg/m^3	0.12	40	0.3
	Daily		0.41	50	0.8
NO_2	Annual	µg/m^3	3.5	40	8.6

Pollutant	Averaging Period	Units	PC	EAL	%EAL
	Hourly		124.7	200	62.4
SO_2	15 minute	µg/m^3	86.2	266	32.4
	Hourly		45.3	73.0	20.9
	Daily		15.5	125	12.4
CO	Maximum daily running 8-hour	mg/m^3	0.12	10	1.2

5.1.50 Of the predicted process contributions, only the annual and hourly average nitrogen dioxide concentrations are effectively significant. Whilst potentially significant sulphur dioxide concentrations are predicted, these result from the assumed sulphur content in the fuel being at the maximum potential level of 0.1%. The actual sulphur content of the fuel will be lower and therefore the predicted impact is considered to be conservative.

5.1.51 There are no predicted exceedances of the relevant assessment levels as a result of emissions from the Generation Facility at locations of relevant exposure. Figures 5.1.2 and 5.1.3 show the contour plots of the predicted nitrogen dioxide process contributions.

Table 5.1.11: Maximum Predicted Environmental Concentration (PEC) at worst-case human health receptors (R4)

Pollutant	Averaging Period	Units	Background	PEC	EAL	%EAL
PM_{10}	Annual	µg/m^3	13.3	13.4	40	33.5
	Daily		13.3	13.7	50	27.4
NO_2	Annual	µg/m^3	10.3	13.8	40	34.4
	Hourly		20.6	145.3	200	72.6
SO_2	15 minute	µg/m^3	6.4	92.6	266	34.8
	Hourly		6.4	79.4	350	22.7
	Daily		3.2	18.7	125	14.9
CO	Maximum daily running 8-hour	mg/m^3	0.23	0.35	10	3.5

5.1.52 None of the PECs are predicted to exceed the relevant objectives.

Ecological Receptors

5.1.53 The maximum predicted concentrations within the habitats are shown in **Table 5.1.12.**

Table 5.1.12: Maximum PC within the habitats (E1 to E3)

Pollutant	Averaging Period	Units	PC	EAL	%EAL
E1 – Plas Bennion					
NO_x	Annual	NO_x	0.33	30	1.1
	Daily		35.26	75	47.0
SO_2	Annual	SO_2	0.05	20	0.25
E2 – Gardden Wood/Rocky Wood					
NO_x	Annual	NO_x	0.49	30	1.6
	Daily		24.0	75	32.0
SO_2	Annual	SO_2	0.08	20	0.40
E3 – Acrefair Railway Cutting					
NO_x	Annual	NO_x	0.09	30	0.3
	Daily		11.5	75	15.3
SO_2	Annual	SO_2	0.01	20	0.05

5.1.54 Only the predicted NO_x concentrations are significant at E1 and E2. The maximum PECs are shown in Table 5.1.13.

Table 5.1.13: Maximum PEC's within the habitats (E1 to E3)

Pollutant	Averaging Period	Units	Background	PEC	EAL	%EAL
E1 – Plas Bennion						
NO_x	Annual	µg/m^3	13.3	13.6	30	45.3
	Daily		13.3	48.6	75	64.8
SO_2	Annual	µg/m^3	3.6	3.7	20	18.5
E2 – Gardden Wood/Rocky Wood						
NO_x	Annual	µg/m^3	11.4	11.9	30	39.7
	Daily		11.4	35.4	75	47.2

Pollutant	Averaging Period	Units	Background	PEC	EAL	%EAL
SO_2	Annual	µg/m^3	3.4	3.5	20	17.5
E3 – Acrefair Railway Cutting						
NO_x	Annual	µg/m^3	10.9	11.0	30	36.7
	Daily		10.9	22.4	75	29.9
SO_2	Annual	µg/m^3	3.0	3.0	20	15.0

5.1.55 The maximum PECs are all significantly below the assessment levels.

5.1.56 The predicted nitrogen and acid deposition from the proposed development at the nearest points in the habitats are shown in Table 5.1.14.

Table 5.1.14: Maximum predicted deposition rates within the habitats (E1 – E3)

	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)	Acid Deposition (keqS/ha/yr)
E1 – Plas Bennion			
Process Contribution	0.03	-	-
Baseline Deposition	**21.98**	-	-
Total Deposition	**22.0**	-	-
PC as % of Critical Load	0.2	**-**	
E2 – Gardden Wood/Rocky Wood			
Process Contribution	0.10	**0.01**	**0.02**
Baseline Deposition	**36.54**	**2.61**	**0.26**
Total Deposition	**36.6**	**2.62**	**0.28**
PC as % of Critical Load	1.0	**1.6**	
E3 – Acrefair Railway Cutting			
Process Contribution	0.01	0.001	0.001
Baseline Deposition	**21.98**	1.57	0.22

	Nitrogen Deposition (kgN/ha/yr)	Acid Deposition (keqN/ha/yr)	Acid Deposition (keqS/ha/yr)
Total Deposition	**22.0**	1.57	0.22
PC as % of Critical Load	0.1	0.0	

The percentage of the acid deposition critical load has been determined by using the Critical Load Function tool on the APIS website.

5.1.57 Only the predicted acid deposition within Gardden Wood/Rocky Wood is potentially significant, but the maximum additional deposition is only 1.6% of the critical load. The acid deposition in the habitat is dominated by the existing background deposition.

Mitigation and Enhancement

5.1.58 No additional mitigation is proposed other than that which is set out in section 2.4 of this report.

Residual Effects

5.1.59 Based on the results above, no additional mitigation is proposed and no residual effects are anticipated on air quality.

Cumulative Effects

5.1.60 In taking account of the land use allocation of the site, the planning history of the wider area (as set out in section 2.5 and 2.6) and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts likely to have any likely significant effects on the environment.

Summary

5.1.1 The air quality impacts associated with the proposed Emergency Standby Electricity Generation Facility have been considered.

5.1.2 For human health receptors there are no predicted exceedances of assessment levels.

5.1.3 The predicted nitrogen deposition from the development onto ecological receptors is insignificant. The predicted acid deposition is marginally above 1% of the critical load and therefore potentially significant within the Gardden Wood/Rocky Wood locally designated sites.

5.1.4 With the overall predicted acidification dominated by the background deposition rate, and with the process contribution only marginally above the 1% potential significance criteria, significant effects to the habitats present are unlikely to occur.

5.1.5 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW as well as WCBC UDP Policy GDP1 (Development Objectives).

5.2 Ecology

Introduction

5.2.1 This section sets out the ecological matters associated with the proposed development and the surrounding area, and identifies how these would be addressed through scheme design and mitigation or compensation in order to accord with local and national planning policy and legal requirements relating to protected sites and species.

5.2.2 The EIA Screening Report for the proposed development identified a number of designated nature conservation sites within 5 km of the proposed development. It also highlighted the need to gather information on designated nature conservation sites and existing records of protected and notable species. The need to undertake a site walkover survey to identify any features of ecological value at and around the Application Site, which could pose a constraint to the proposals, was also identified.

Policy Context

5.2.3 The following items of policy, legislation and guidance have been considered in preparing this assessment:

- The Conservation of Habitats and Species Regulations 2010 (as amended) (Habitat Regulations)
- The Wildlife and Countryside Act 1981(as amended) (WCA);
- The Countryside and Rights of Way Act 2000 (CRoW);
- The Natural Environment and Rural Communities Act 2006 (NERC); and
- The Hedgerow Regulations 1997.

Methodology

Overview

5.2.4 This appraisal is informed by a desk study and field survey in order to determine the presence of or potential for, ecologically sensitive receptors in or near the Application Site. This information is used to determine the approach necessary to ensure that effects on these ecologically sensitive receptors are avoided or ameliorated such that the proposed development will be acceptable with reference to the planning and legal framework relating to ecological resources.

Survey area

5.2.5 The survey area includes the whole of the Application Site extended with an additional 50 m boundary.

Desk Study

5.2.6 A desk study was undertaken to gather existing biological information relevant to the Application Site. This included a data request to North Wales Environmental Information Service.

5.2.7 A search for information on statutory and non-statutory designated nature conservation sites within a 2 km radius of the Application Site was undertaken, as was a search for existing records of protected and notable habitats and species within a 1 km radius of the Application Site.

5.2.8 In addition, the Multi-Agency Geographic Information for the Countryside (MAGIC) website was consulted for summary information on Natura 2000 sites within 5 km of the Application Site. Aerial photography and OS mapping of the Application Site and surrounds was reviewed, to check for evidence of waterbodies within 250 m of the proposed development.

Field Survey

5.2.9 An extended Phase 1 Habitat survey was undertaken on the 16th June 2015. This covered all land within the survey area, with the exception of the existing DNO substation which could not be accessed for safety reasons.

5.2.10 The purpose of the survey was to assess the ecological value of the survey area, recording the habitats present, and any evidence/potential for notable or protected species.

5.2.11 The survey followed the Guidelines for Preliminary Ecological Appraisal, comprising an Extended Phase 1 Habitat survey (Joint Nature Conservation Committee (JNCC), 2010). The habitat types present were recorded on a Phase 1 Habitat map. Dominant plant species observed within each habitat type were recorded in accordance with plant species nomenclature[3].

5.2.12 Any features of particular note were recorded by use of Target Notes (TN). The Phase 1 Habitat map and TN are shown on Figure 5.2.1.

5.2.13 In addition to mapping the habitats present, the potential value of the Application Site for protected or otherwise notable species was recorded. Accessible locations within the survey area were thoroughly checked for evidence of badgers, including a check for setts, latrines, and badger paths.

5.2.14 The ecological features of the survey area have been evaluated in accordance with guidelines provided within the Institute of Ecology and Environmental Management (IEEM) 'Guidelines for Ecological Impact Assessment' (EcIA). This uses a geographic frame of reference for assigning value to features of ecological importance, as set out in Table 5.2.1. It should be noted that the table provides examples only, and a degree of professional judgement is necessary when determining value.

Table 5.2.1 Geographical scale for the assessment of nature conservation features

Geographical valuation	Feature
International	Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites. Populations of protected or otherwise notable species comprising 1% or more of
National	Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs). Populations of protected or otherwise notable species comprising 1% or greater of the national population
Regional	County designated wildlife sites supporting a regionally significant area of a UK priority habitat; or population of species in the UKBAP or of national nature conservation concern/protected species level comprising 1% or more of the regional population.

[3] New Flora of the British Isles, third edition, Stace, 2010

Geographical valuation	Feature
County	Non-statutory sites designated at county level. Ancient woodlands, large areas of priority BAP habitat offering a significant wildlife resource at county level. Populations of protected or otherwise notable species comprising 1% or greater of the county population.
District	Non-statutory sites designated at district level, Local Nature Reserves (LNRs). Populations of protected or notable species significant in the context of the District.
Local	Old hedges, woodlands, ponds, significant areas of species rich grassland or other habitat, small scale examples of Section 41 habitats or areas supporting small populations of protected or otherwise notable species.
Of value within the context of the survey area	Woodland plantations, structure planting, small areas of species rich grassland or other species rich habitat that is not included in the UK or Local BAP. Populations of protected or otherwise notable species that are of negligible significance in terms of their populations in the local context

5.2.15 In addition to the Extended Phase 1 Habitat survey, a great crested newt pond scoping exercise was carried out. Publicly accessible land within 250 m of the Application Site was visited, in order to search for ponds and other waterbodies potentially suitable for use by breeding great crested newts.

Limitations

5.2.16 It was not possible to access the existing substation, although the majority of the substation could be viewed from adjacent land. This area would also be unaffected by the proposed development. As such, the lack of access to the substation is not considered to be a significant limitation to the survey.

5.2.17 Much of the grassland within the survey area had been recently mown at the time of the survey. As such, it was not possible to identify the majority of plant species occurring within the central field areas. A 2 – 5 m margin had been left uncut. It was possible to identify many of the grassland plant species in the margins of the fields, and as such this is not considered a significant limitation to the assessment.

Baseline Conditions

Designated Sites and Important Habitats

5.2.18 The desk study confirmed the presence of a number of statutory designated nature conservation sites within 5 km of the Application Site. A description of the sites identified, their designations, and a summary of the reasons for their designation are identified in Table 5.2.2 below.

Table 5.2.2 Statutory designated nature conservation sites within 5 km of the Application Site

Designated Site	Distance from Application Site	Designating features
The River Dee SSSI and SAC	1.75 km north	Riparian habitats, aquatic plants including floating water-plantain (Luronium natans), several fish species including Atlantic salmon (Salmo salar) and lampreys, and otter (Lutra lutra).
Johnstown Newt Sites SAC	2 km north	Designated for supporting one of the largest UK populations of great crested newts
Stryt Las A' R Hafod SSSI	2 km north	Part of the Johnston Newt Sites SAC. No additional information on designating interests available.

5.2.19 Several non-statutory designated nature conservation sites were identified within 1 km of the Application site. Details of these are provided below in Table 5.2.2:

Table 5.2.2 Non-statutory designated nature conservation sites within 1 km of the site

Designated Site	Distance	Designating features
Plas Bennion	420 m north-west	Eight ha site formed around several embankments of coal spoil. The spoil heaps are gradually being colonised by a range of flora, including birch and willow scrub, with patches of semi-improved and marshy grassland.
Gardden Wood/Rocky Wood	625 m north-east	Semi-natural woodland, with areas of boulders and cliffs following historic use of the site for quarrying.
Acrefair Railway cutting	884 m south-west	Coarse neutral grassland on cutting of disused railway line.

5.2.20 The desk study also identified the presence of several blocks of ancient woodland[4] within 2 km of the Application Site. The closest of these is located approximately 575 m from the Application Site.

[4] As per the Natural Resources Wales Ancient Woodland Inventory (www.naturalresources.wales/forestry, accessed 16th June 2015)

Habitat Description

5.2.21 The survey area is dominated by semi-improved species poor grassland. This occurs across one field unit with a narrow band of grassland connecting areas to the north and south of the substation. The majority of the grassland had been recently cut at the time of the survey. Plant species present were assessed largely via inspection of the margins of the field unit.

5.2.22 Grass species noted included Yorkshire fog (*Holcus lanatus*), rough meadow-grass (*Poa trivialis*), cocks foot (*Dactylis glomerata*) and timothy (*Phleum pratense*). Other plant species noted included ribwort plantain (*Plantago lanceolata*), rosebay willowherb (*Chamerion augustifolia*), dock (*Rumex obtusifolius*), nettle (*Urtica dioica*), and occasional bindweed (*Convolvulus arvensis*).

5.2.23 Most of the survey area was bounded by tall, overgrown hedgerows, many of these with standard trees. The eastern boundary of the field (outside of the Application Site), in particular, included a number of mature and semi-mature trees, and in places the hedgerow had overgrown to the extent that the field boundary was in effect functioning as a narrow band of woodland.

5.2.24 The species diversity of hedgerows varied within the survey area. Only one species-rich hedgerow[5] was noted, forming the eastern boundary in the south-east of the survey area. Dominant woody species in this hedgerow included hawthorn (Craataegus monogyna), dogwood (*Cornus sanguinea*), elder (*Sambucus nigra*), hazel (*Coryllus avellana*), sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*) and field maple (*Acer campestre*). The remainder of hedgerows were recorded as species-poor, with many sections dominated by hawthorn and blackthorn (*Prunus spinosa*).

5.2.25 As noted above a number of the hedgerows were interspersed with semi-mature and mature trees. Species identified included pedunculate oak (*Quercus robur*), alder (*Alnus glutinosa*), grey willlow (*Salix cinerea*), blackthorn, hazel and ash.

5.2.26 The ground flora at the bases of hedgerows was similar in composition to the semi-improved grassland recorded across much of the survey area, although with ruderal species such as rosebay willowherb, nettle, cow parsley (*Anthriscus sylvestris*) and hogweed (*Heracleum sphondylium*) more dominant.

5.2.27 A small block of broadleaved woodland was recorded in the east of the survey area, approximately 10 m north-east of the Generating Facility Site. This was dominated by grey willow and alder, with the understorey dominated by nettles, with occasional hazel shrubs, bramble and rosebay willowherb.

5.2.28 A further narrow band of woodland was present along the southern boundary of the survey area, with pedunculate oak, ash and hawthorn present. This included a mature pedunculate oak.

5.2.29 A minor watercourse was recorded flowing from north to south along the eastern survey area boundary. In the south of the survey area the channel was choked with dense stands of rosebay willowherb. Where it flowed through the woodland mentioned above (see TN 1 on Figure 5.1), the water was approximately 10 cm deep, with a 50 cm wide channel. The substrate of the stream was dominated by pebbles and cobbles, with some larger boulders and limited areas of gravel and silts noted.

5.2.30 The centre of the survey area was comprised of the existing electricity substation. The majority of this area comprised a small number of flat-roofed buildings, electrical equipment and areas of hard-standing. A small patch of bramble (*Rubus fruticosus agg.*) scrub, was present along the eastern boundary of the substation.

[5] Defined as hedgerows supporting more than 5 woody species per 30 m stretch

5.2.31 All of the habitats recorded are generally common and widespread, representative of habitats in the wider locality. No rare or otherwise notable habitats were noted. The grassland habitats recorded were evidently subject to regular management and a degree of agricultural improvement, and as such were considered of value only in the context of the survey area.

5.2.32 The most valuable habitats recorded were considered to be the hedgerow and tree-line boundary features and the limited extents of woodland habitat present. These supported semi-mature and mature standard trees and provided suitable habitat for a number of protected and notable species. These habitats are listed on Section 42 of the NERC Act (2006).

5.2.33 The south-eastern boundary hedge (east and south of the proposed diesel generating plant) see TN3 was recorded as species rich. This ~30 m stretch of hedgerow therefore qualifies as an 'Important' hedgerow under The Hedgerow Regulations (1997).

5.2.34 In light of the above, woodland and hedgerow habitats within the survey area are considered to be of 'Local' ecological value.

Protected and Notable Species

5.2.35 Records of protected and notable species were provided by North Wales Environmental Information Service, with a summary of key field study findings below.

Invertebrates

5.2.36 The habitats within the Application Site are common and widespread in the locality and are unlikely to support significant populations of protected or otherwise notable invertebrates. The habitats present with the greatest potential value for invertebrates were the field boundaries which included hedgerows and/or semi-mature and mature trees. The stream along the eastern boundary of the survey area was limited in size and heavily shaded. As such it was considered unsuitable to support valuable aquatic invertebrate fauna or white-clawed crayfish.

5.2.37 No further consideration will therefore be given to these species groups in this appraisal.

Amphibians

5.2.38 No ponds were identified within 250 m of the Application Site during the field survey. An analysis of aerial photography and OS survey mapping indicates that the nearest pond is located approximately 380 m to the west of the survey area, in a large improved grassland field. Native British amphibians including great crested newts require water to breed, usually entering ponds and other waterbodies in the spring to breed.

5.2.39 Although great crested newts may travel up to 500 m between ponds, and exceptionally to 1 km or more, the majority of a population usually occurs within 250 m of the breeding pond(s)[6].

5.2.40 The Plas Bennion Road, situated between the survey area and this pond, is also likely to pose a partial barrier to the movement of great crested newts and other amphibians.

5.2.41 In light of the above, the risk of great crested newts or populations of other amphibians of conservation significance being present within the survey area is considered to be negligible. This species group are not considered any further in this report.

[6] Beebee and Griffiths (2000). Reptiles and Amphibians, Collins New Naturalist Series, London.

Reptiles

5.2.42 The grassland, scrub and woodland and hedgerow margins provided potentially suitable habitat for native British amphibians. The areas of grassland that had been recently mown were not suitable for use by reptiles at the time of survey.

5.2.43 The Surrounding landscape included hedgerows and other linear features that could connect to suitable extents of reptile habitat in the wider landscape. As such it is considered likely that populations of reptiles could be present within the survey area, most likely limited to slow-worms (*Anguis fragilis*) and grass snake (*Natrix natrix*).

5.2.44 If the mowing that was observed during the survey occurs regularly, this is likely to restrict the number of reptiles using the site. The small size of the site means that any reptile population, if present, would be of, at most, 'Local' value.

5.2.45 As Britain's native reptiles are protected under the Wildlife and Countryside Act (1981), as amended, and are also listed under Section 42 of the NERC Act, they are considered further in this report.

Breeding Birds

5.2.46 The hedgerow, woodland and scrub habitats present within the survey area were identified as suitable for use by a range of farmland and suburban bird species. It is likely that these habitats are used for breeding by a range of species. Taking into account the location adjacent to the urban fringe of Cefn Mawr, with roads on the southern and western boundary and the existing substation in the centre of the survey area, it is unlikely that any especially rare or otherwise notable species breed at the site.

5.2.47 Species incidentally noted during the survey included blackbird (*Turdus merula*), coal tit (*Periparus ater*), blue tit (*Parus caeruleus*), song thrush (*Turdus philomelos*), willow warbler (*Phylloscopus trochillus*), dunnock (*Prunella modularis*), wren (*Troglodytes troglodytes*), nuthatch (*Sitta europaea*), and greater spotted woodpecker (*Dendrocopos major*).

5.2.48 Breeding birds and their nests receive specific protection during the breeding season, via the Wildlife and Countryside Act (1981), as amended. Many species are also listed under Section 42 of the NERC Act, and/or are identified as being birds of conservation concern[7] a number of which could potentially occur within the survey area. The survey area could potentially support breeding bird populations of up to Local value.

5.2.49 Given the potential for the Application Site to be used by a range of breeding bird species they are considered further in this report.

Badgers

5.2.50 No evidence of badgers was recorded during the Extended Phase 1 habitat survey. The habitats that could not be accessed within the central portion of the survey area (the electrical substation) were of limited suitability for sett construction comprising almost entirely buildings and hard standing, with no spoil heaps visible from adjacent areas. As such, the lack of access to this area is considered no impairment to the badger survey.

5.2.51 In light of the lack of evidence recorded during the survey, any use of the Application Site by badgers is likely to be limited, and they are not considered a key ecological consideration at the present time.

[7] As specified in Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102,pp296–341.

Bats

5.2.52 The oak tree at Target Note 2 (see Figure 5.2.1) contained features potentially suitable for use by roosting bats. No other trees within the survey area with features suitable for use by roosting bats were recorded.

5.2.53 Buildings and other structures within the electrical substation in the centre of the survey area were considered to be of negligible value for use by roosting bats.

5.2.54 The survey area and surrounding rural and suburban habitats provide suitable habitat for commuting and foraging bats. The hedgerows and treelines along the site boundaries are likely to be used by the local bat population, as these provide strong linear features which many species of bats will preferentially use compared to more open habitats.

5.2.55 Given the presence of potentially good quality foraging and commuting habitat around the boundaries of the survey area, it is considered the survey area could be of up to 'Local' value for bats.

5.2.56 All British bats are fully protected under the Conservation of Habitats and Species Regulations (2010 as amended) and receive partial protection under the Wildlife and Countryside Act. Many species are also listed under Section 42 of the NERC Act.

5.2.57 In light of the above, further consideration is given to this species group in this appraisal.

Dormouse

5.2.58 The hedgerows and treelines within the survey area provided potentially suitable habitat for dormice (*Muscardinus avellanarius*). Several food plants, including hazel were present across the hedgerows within the survey area. The structure of the hedgerows, which were up to several metres in width, also provided abundant opportunities for dormice to nest, if present.

5.2.59 Although habitats within the survey area were potentially suitable for the species, the site has limited connectivity to potentially suitable habitat within the wider local landscape. An analysis of aerial photography indicates the site is not well connected to any blocks of larger woodland which could provide a core dormouse population.

5.2.60 Given this lack of connectivity, it is considered unlikely that dormice regularly occur within the survey area, and this species are not considered further in this appraisal.

Otters and water voles

5.2.61 Otters (*Lutra lutra*) and water voles (*Arvicola amphibious*) are commonly associated with wetland habitats, including rivers, lakes, and larger ponds and streams. The minor watercourse in the east of the survey area, with a depth of approximately 10 cm and a width of 50 cm was considered highly sub-optimal habitat for these species.

5.2.62 In the case of otter, the watercourse does not provide any significant foraging resource, as it was too small to support fish that could be predated by the species. In the case of water voles, the watercourse was too small to provide any refuge from predators, and the heavy shading of the watercourse also reduced its suitability.

5.2.63 In light of the above, it is considered highly unlikely that water voles or otters will make any use of the survey area or surrounding habitats and they are not therefore considered any further in this appraisal.

Potential effects

5.2.64 Construction of the proposed development would result in the loss of semi-improved species-poor grassland from the southern field unit. Adjacent areas of grassland may also be subject to disturbance and damage during construction. There would also be a loss of approximately 10 m of hawthorn-dominated hedge from the boundary with Plas Bennion Road.

5.2.65 Given the ecological value of these habitats, and the relatively small extents affected, any impacts are expected to be limited in nature with resulting negligible effects.

5.2.66 If undertaken during the breeding bird season (commonly accepted to extend between March and August inclusive) vegetation clearance could result in damage or destruction of bird nests. Construction operations could also lead to disturbance of nesting birds in adjacent habitats, not directly affected by construction.

5.2.67 Vegetation and site clearance may also result in the killing or injury of common and widespread reptile species, if present in the survey area. Based on the proposed site layout, no impacts on areas suitable for use by hibernating reptiles are expected to occur.

5.2.68 In the context of the likely value of the survey area for these species groups and the proposed layout of the Generating Facility, any such impacts are likely to have negligible effects on their conservation status.

5.2.69 It is however necessary to also consider the legal protection that is afforded to nesting birds and reptiles, which could be breached if vegetation and site clearance operations are carried out at an inappropriate time of year, or to an inappropriate methodology. Mitigation measures are provided below to avoid this.

5.2.70 Hedgerows at the site are likely to be used by foraging and commuting bats, and as set out above approximately 10 m of the hedgerow adjacent to Plas Bennion Road will be removed. However, the section of hedgerow being removed has gaps at either end (see Figure 5.2.1) and therefore does not provide a continuous corridor for foraging or commuting; the removal of this hedge is considered unlikely to alter the use of the site by the local bat population.

5.2.71 Operation of the proposed development would lead to emissions to air, including nitrous oxides. Deposition of nitrous oxides onto habitats can result in nutrient enrichment, encouraging more vigorous plant species, often to the detriment of less competitive species. The air quality assessment (see section 5.1) considers potential effects on designated sites, in accordance with best practice guidance. This has determined that operational emissions from the proposed development would not lead to any significant effects on designated sites.

5.2.72 No further ecological surveys are considered necessary to inform the determination of a planning application for the proposed development. The desk study work and Extended Phase 1 Habitat Survey has identified that habitats and species within the survey area are of ‘Local’ or lower ecological value.

5.2.73 The Extended Phase 1 Habitat Survey has also confirmed that suitable habitat for a number of protected or otherwise notable species was absent. Therefore, those species/species groups have not required further consideration beyond the Extended Phase 1 Habitat Survey.

Mitigation and Enhancement

5.2.74 Although no further surveys are considered necessary to inform the submission of the planning application, pre-construction constraints checks are proposed.

5.2.75 These would take the form of a walkover survey, to be carried out no later than three months prior to the start of site clearance and construction operations (if works are delayed beyond July 2016), with a further check immediately prior to site clearance commencing.

5.2.76 This survey would reconfirm the ecological condition of the survey area, focussing on the areas to be affected by site clearance and construction operations. The survey would reassess the condition of habitats present; reconfirm the suitability of the survey area to support protected and notable species; and specifically confirm that there are no additional potential impacts on protected species beyond those assessed in this report.

5.2.77 The results of the pre-construction surveys would be used to confirm the mitigation recommendations set out below remain valid, with no additional mitigation measures required.

Design and construction considerations

5.2.78 As set out on Figure 1.2 the proposed site layout would occupy the southern portion of the field unit, being situated almost entirely in areas of semi-improved grassland. Access into the site would be provided from the adjacent Plas Bennion Road to the west. As such the layout of the plant already avoids the majority of the more valuable habitats within the survey area.

5.2.79 It is envisaged that the detailed design for the proposed development would minimise the loss of hedgerow along the western boundary of the survey area. Any hedgerow loss would be compensated for by replacement hedgerow planting. Any changes to the proposed layout of the plant would seek to avoid impacting other hedgerows and tree-lines around the boundary of the site, and minimise the construction and operation footprints.

5.2.80 Significant impacts on the tree at TN 2 (shown on Figure 5.2.1) would be avoided, as this has the potential to be used by roosting bats. This tree is currently in excess of 20 m from the boundary of the proposed development and as such it is not expected to be impacted by the proposals.

5.2.81 The construction footprint would be set out to seek to avoid impacts on the Root Protection Areas of other trees present around the survey area boundaries. In addition, the construction footprint would be fenced to prevent plant and personnel from straying outside this area.

5.2.82 Good site practices would be followed during construction, for example as set out in Environment Agency Pollution Prevention Guidelines (PPG) and CIRIA PPG. This would minimise the risk of accidental releases of materials that could affect on-site and off-site ecological receptors.

Mitigation

5.2.83 The potential ecological effects of the proposals are limited. The proposed development is located in one of the less ecologically valuable parts of the site, with negligible effects on the site's boundary features, or on protected or otherwise notable species. As such, potential ecological mitigation requirements are also limited.

5.2.84 Construction of the proposed development would have limited ecological impacts. The majority of the habitats affected are of value only in the context of the site, with negligible effects on the site's boundary features. With suitable timing of vegetation clearance and/or an ecological watching brief, potential impacts on protected species would be minimised, and the risk of infringing wildlife legislation avoided.

5.2.85 There are nevertheless some mitigation measures that are required, in order to ensure compliance with wildlife legislation and best practice guidance. These recommendations are made on the basis of the currently proposed layout of the peaking plant, as set out on Figure 1.2.

5.2.86 Any hedgerow, scrub and tree clearance required would be carried out between September and February inclusive. This will mean clearance takes place outside the core nesting bird season, and hence there will be minimal risk of damaging or destroying active nests and the associated eggs/young.

5.2.87 Areas of grassland required for construction would be mown to ground level between November and February inclusive in the winter prior to construction. These areas would then be maintained as a short sward (maximum height at any time of 20 cm) until construction commences. This would discourage reptiles from using these areas, minimising the risk of them being killed or injured during construction.

5.2.88 If it is not possible to adhere to the above timing, an ecological watching brief would be provided during vegetation clearance at the site. This would include a check for nesting birds in advance of removal of any trees, shrubs and scrub. Any active nests found would be protected from clearance until any young have fledged and left the next.

5.2.89 Should vegetation clearance take place between March and October (inclusive), the ecological watching brief would also include measures to avoid killing or injuring reptiles which may be using the areas of grassland. Areas of grassland to be cleared should be subject to a two stage cut, with the first cut reducing the grass height to approximately 15 cm (with arisings removed). Following a 48 hr delay, a further cut to ground level should then be made. This would encourage any reptiles present to leave the construction footprint prior to works commencing.

5.2.90 Any significant hedgerow loss would be compensated for by replacement planting around the periphery of the proposed peaking plant. Over time this would provide replacement habitat for nesting bird, foraging and commuting bats, and reptiles.

Residual effects

5.2.91 With the implementation of the mitigation measures set out above, no significant residual effects on habitats or species resulting from construction, operation or decommissioning of the proposed development are anticipated.

Cumulative effects

5.2.92 In taking account of the land use allocation of the site, the planning history of the wider area (as set out in section 2.5 and 2.6), and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts which would be likely to have any likely significant effects on the environment.

Summary

5.2.93 The desk study and field surveys conducted have demonstrated that the Application Site supports habitats and species of limited ecological value. The most valuable habitats present are the hedgerow and tree-line boundary features that make up the margins of the survey area. These have been assessed as being of ‘Local’ value for nature conservation, and are also one of the more important features within the site in terms of potential value for protected species such as nesting birds and foraging / commuting bats.

5.2.94 Construction of the proposed development would have limited ecological impacts. The majority of the habitats affected are of value only in the context of the site, with negligible effects on the site’s boundary features. With suitable timing of vegetation clearance and/or an ecological watching brief, potential impacts on protected species would be minimised, and the risk of infringing wildlife legislation avoided.

5.2.95 Operation of the proposed development would lead to emissions to air including nitrous oxides, which can negatively affect the vegetation composition of habitats through nutrient enrichment. As set out in the air quality assessment in section 5.1, no significant effects are expected as a result of emissions to air.

5.2.96 In summary, ecological considerations are not considered to pose a constraint to the siting or operation of the proposed development.

5.2.97 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW, TAN 5 (Nature Conservation and Planning), and WCBC UDP Policies PS11, GDP1 (Development Objectives) and EC6 (Biodiversity Conservation).

5.3 Noise

Introduction

5.3.1 This section considers the noise impact (in general accordance with BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound) associated with the operation of the proposed development. It presents the baseline noise conditions, a summary of policy and guidance used, the survey methodology, and the results of the appraisal of noise impacts.

Policy and guidance context

National Policy

5.3.2 The Welsh Technical Advice Note 11 (TAN 11) provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. It outlines some of the main considerations which local planning authorities should take into account when determining planning applications for development which will either generate noise or be exposed to existing noise sources. These include:

- Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions.
- The significance of noise from industrial development can be assessed, where the Standard is appropriate, using guidance in British Standard (BS) 4142: 2014.
- The likelihood of complaints is indicated by the difference between the noise from the new development (expressed in terms of the rating level) and the existing background noise.
- In addition, general guidance on acceptable noise levels within buildings can be found in BS 8233: 2014.

5.3.3 The Noise Action Plan for Wales explains how noise is managed in Wales and by whom. It provides evidence to support noise policy and examples of positive initiatives. The Noise Action Plan for Wales summarises the overarching national policy framework in relation to noise, planning and new development in Wales. The document focuses on local development plans, local decision making and a demonstration of commitment to the 'involvement' component of sustainable development principles. The noise plan discusses the planning process, which seeks to ensure that the right development is built in the right place, in the right way. It allows authorities to prevent or minimise noise exposure from the start. The noise plan also identifies the potential risk of creeping background noise from new industrial development.

BS4142:2014 Methods for rating and assessing industrial and commercial sound

5.3.4 BS4142: 2014 *'Methods for rating and assessing industrial and commercial sound'* (BS4142) describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

5.3.5 The standard is used to determine the rating levels for sources of sound of an industrial and/or commercial nature and the ambient, background and residual sound levels at outdoor locations. These levels could be used for the purposes of investigating complaints; assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and assessing sound at proposed new dwellings or premises used for residential purposes. However the determination of noise amounting to a nuisance is beyond the scope of the standard.

5.3.6 The standard should not be used to assess sound from the passage of vehicles on public roads and railway systems; recreational activities; music and other entertainment; shooting grounds; construction and demolition; domestic animals; people; public address systems for speech and other sources falling within the scopes of other standards or guidance. The standard cannot be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

5.3.7 The procedure contained in BS4142 assesses the significance of sound which depends upon the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs/will occur.

5.3.8 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level and considering the following:

- Typically, the greater this difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

5.3.9 There is no specific guidance on the definition of SOAEL and LOAEL within BS4142.

5.3.10 With reference to BS4142**,** Table 5.3.1 defines the proposed *preliminary* SOAEL and LOAEL levels. It should be noted that the SOAEL and LOAEL levels can be modified due to the context of the sound and the environment in which it is located.

Table 5.3.1: Proposed Impact Level and Equivalent BS4142 rating

Impact Level	BS4142 Rating
SOAEL	A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
LOAEL	A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;

5.3.11 Where the initial estimate of the impact needs to be modified due to the context, the following factors should be considered:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:
  - Façade insulation treatment;
  - Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and
  - Acoustic screening.

Methodology

Baseline Noise Survey

5.3.12 A baseline environmental sound survey was undertaken over a 24 hour period on 8 June 2015 to establish the existing environmental sound levels at a location considered representative of the nearest noise sensitive receptors for subsequent use in the modelling and assessment.

5.3.13 Noise measurements were taken at a single location as shown in Insert 5.3.1 and described in Table 5.3.2.

Insert 5.3.1: Satellite Image Showing the Measurement Position and Nearest Noise Sensitive Receptors

(© 2015 Getmapping plc, © 2015 Google. Aerial Photo Images Reproduced from a Licenced Copy of Google Pro)

Table 5.3.2: Measurement Position

Position	Description	Dominant Source
A	The microphone was located at an approximate height of 1.8 m in a free field position on the northern boundary of the Generating Facility Site. The measurement position was approximately 100 m from the A539 and 50 m from Plas Bennion Road.	Vehicular movements on Llangollen Road, Distant road traffic.

5.3.14 The A-weighted $L_{Aeq,T}$, $L_{A90,T}$ and L_{AFMax} were measured at both measurement positions over 15 minute periods.

5.3.15 Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire survey period. However at the beginning of the survey period the temperature was 15°C and weather conditions dry and sunny, with some cloud cover (2 Oktas). The wind speed was observed to be between 0.5 and 1 m/s. These weather conditions are considered suitable for obtaining representative sound measurements.

5.3.16 Table 5.3.3 provides details of the instrumentation used during the survey. Field calibrations were performed before and after the measurements with no significant fluctuation recorded (<0.5 dB). Calibration certificates are available upon request.

Table 5.3.3: Instrumentation Used for the Baseline Noise Survey

Item	Type	Manufacturer	Serial Number	Laboratory Calibration Date
Hand-Held Analyser	2250	Bruel & Kjær	2626232	30/08/2013
½ ” Microphone	4189	Bruel & Kjær	26212111	30/08/2013
Pre-Amplifier	ZC0032	Bruel & Kjær	11992	30/08/2013
B&K Sound Calibrator	4231	Bruel & Kjær	2619575	21/01/2015

Acoustic Modelling

5.3.17 Calculations have been undertaken in general accordance with ISO 9613-2 ‘Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation’.

5.3.18 Each diesel generator and transformer has been modelled as a separate sound source with distance and screening losses considered for each unit. Contributions from each unit have then been combined at the nearest noise sensitive receptors to establish the specific sound level.

Appraisal Scenarios

5.3.19 Table 5.3.4 sets out the two appraisal scenarios. The scenarios represent typical operation and worst case operation.

Table 5.3.4 Appraisal Scenarios

Scenario 1	Scenario 2
Generating Facility operates as anticipated during peak energy demand between 17:00 and 19:00 hours during the winter months.	Generating Facility operates anytime during the year in any given 24 hour period.

5.3.20 Noise impacts have been assessed at two noise sensitive receptors as detailed in Table 5.3.5 and highlighted on Insert 5.3.1.

Table 5.3.5 Noise Sensitive Receptors

Receptor	Description
1	Residential properties located approximately 130 m to the south of the Generating Facility Site off Hampden Way
2	Residential property located approximately 180 m to the north of the Generating Facility Site.

5.3.21 Table 5.3.6 details the maximum and minimum distances and attenuation due to distance used in the appraisal.

5.3.22 A conformal area calculation has been used to determine the distance attenuation associated with each item of plant to the NSRs.

Table 5.3.6 Distance attenuation from plant to receptor

Receptor	Plant	Minimum Distance (m)	Maximum Distance (m)	Minimum Attenuation (dB)	Maximum Attenuation (dB)
1	Generator	156	197	-58	-60
	Transformer 2MVa	156	186	-58	-59
	Transformer 20 mVa	168		-59	
2	Generator	213	234	-61	-61
	Transformer 2MVa	242	246	-62	-62
	Transformer 20 mVa	247		-62	

Calculation of Screening Attenuation

5.3.23 A variety of different acoustic screening affects noise emissions from the Generating Facility Site. These include the arrangement of plant items and additional acoustic screening enclosing the Generating Facility.

5.3.24 Combined with the fall in ground height between the Generating Facility and Receptor 1, and the height of the acoustic screen, line of sight screening (5 dB) to each source has been allowed for.

5.3.25 Receptor 2 is located at a higher ground height than the Generating Facility and is likely to have line of sight to the majority of the Generating Facility. As such no attenuation due to screening has been allowed for.

Acoustic Feature Correction

5.3.26 It has been assumed that the proposed plant items will be designed so as to not exhibit any tonal qualities.

5.3.27 The Generating Facility is not likely to exhibit sound which is highly impulsive.

5.3.28 Whilst not exhibiting impulsive or tonal characteristics the generators are likely to be readily distinctive against the residual acoustic environment. A penalty of +3 dB has therefore been applied.

5.3.29 Whilst the Generating Facility is likely to have identifiable on/off conditions it is not likely to cycle on and off. As such no correction for intermittency has been applied.

Assumptions/Limitations

5.3.30 The surveys were undertaken on a weekday over a 24 hour period, where typical traffic flows are expected.

5.3.31 The site engineer noticed nothing unusual in terms of the noise climate at the time of the survey. This appraisal refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

5.3.32 For the purposes of this appraisal, it has been assumed that there will be 14 generators arranged as per Figure 1.2.

5.3.33 Table 5.3.7 sets out the preliminary specification for the Generating Equipment. The switchgear is not anticipated to generate significant sound levels when compared to the Generating Equipment and transformers and has therefore been excluded from the appraisal.

Table 5.3.7 – Specification of generating equipment

Plant Item	Number of Units	Maximum Dimensions (m)	Sound Pressure Level at 1 m* (dBA)	Sound Power Level (dBA)
Diesel Generator	14	12.8 x 3.6 x 4.7	65	73
Transformers 0.4/11KV at 2MVa	14	2.1 x 2.3 x 2.0	60	68
Transformers 11/33KV at 20 MVa	1	5.8 x 9.0 x 5.0	80	88

*when measured at any point around the plant item.

5.3.34 The proposed development would operate for a maximum of 500 hours per year (less than 6% of the time) which will typically be for up to 2 –3 hours in the evenings (17:30 – 19:30 hours) during times of peak energy demand, across the winter months.

5.3.35 An acoustically absorbent, 3 m high acoustic screen is proposed around the perimeter of the Generating Facility Site providing line of sight screening to the nearest noise sensitive receptors to the south.

5.3.36 It is assumed that all diesel generators have been designed so as to achieve 65 dBA $L_{Aeq,T}$ when measured at 1 m from any point of the generator set, including exhaust.

Baseline conditions

5.3.37 There are no discernible noise receptors in close vicinity to the east or west of the Application Site however a residential housing development is located to the south west. A residential dwelling also lies to the north. Insert 5.3.1 shows an aerial image of the Application Site and noise sensitive receptors.

5.3.38 The environmental sound climate was observed to be relatively quiet, typical to that of a rural area. Traffic on Llangollen Road was dominant. Traffic on Plas Bennion Road was noticeable/dominant, however there was relatively little traffic compared to that of Llangollen Road.

Environmental Sound Survey Results

5.3.39 The minimum and average measured background sound levels (LA90,15 mins) at Position A are presented in Table 5.3.8 below.

Table 5.3.8: Measured Background Sound Levels (dB $L_{A90,15\ mins}$)

Period		Background Sound Level $L_{A90,15\ mins}$ (dB)
Daytime (07:00 – 23:00 hours)	Minimum	32
	Average Typical	42
Night-time (23:00 – 07:00 hours)	Minimum	29
	Average	32
Typical Operating Period (17:30 – 19:30 hours)	Minimum	41
	Average	42

Potential effects

5.3.40 Table 5.3.9 and 5.3.10 present the results of the BS4142 assessment. Full calculations are available upon request.

Table 5.3.9 Scenario 1 BS4142 Assessment Summary

Scenario 1	Receptor 1	Receptor 2
Cumulative Specific Noise Level at Receptor ($L_{Aeq,1hour}$) dB	32	29
Acoustic Feature Corrections dB	+3	+3
Rating Level dB	35	32
Background Sound Level ($L_{A90,T}$)	42	
Excess of Rating over Background Sound Level	-7	-10
Assessment of Impact	Indication of having a low impact, depending on the context	

Table 5.3.10 Scenario 2 BS4142 Assessment Summary

Scenario 2	Receptor 1	Receptor 2
Cumulative Specific Noise Level at Receptor ($L_{Aeq,1hour}$) dB	32	29
Acoustic Feature Corrections dB	+3	+3
Rating Level dB	35	32
Background Sound Level ($L_{A90,T}$)	32	
Excess of Rating over Background Sound Level	+3	0
Assessment of Impact	Indication of having a low impact, depending on the context	

Context and Mitigating Factors

5.3.41 The results of the initial numerical assessment of sound levels at the nearest noise sensitive receptors are set out above. However, it is important to note that BS4142:2014 states that the numerical assessment of impact is influenced by the context of the proposed development including the surrounding environment and the operating characteristics.

5.3.42 It should be noted that sound levels are around 10 dB below the prevailing background sound level during the likely period of operation and approximately equal to the prevailing background sound level during a 'worst' case operational period. It should also be recognised that operation of the plant is most likely to occur during the evening in the winter months. As such, nearby residents can be expected to be inside their properties with windows and doors closed, thus providing maximum protection from external sound levels. Furthermore, weather conditions (i.e. levels of wind and rain) are likely to increase background sound levels at the noise sensitive receptors further reducing the likely impact.

5.3.43 Given the context and mitigating factors outlined above it is likely that the associated noise impact of the proposed development on the nearby noise sensitive receptors would be reduced.

Mitigation and Enhancement

5.3.44 No further mitigation is proposed above what has been outlined in section 2.4.

Residual effects

5.3.45 With the implementation of the measures set out in section 2.4, no significant residual effects are anticipated on nearest sensitive receptors resulting from construction, operation or decommissioning noise from the proposed development.

Cumulative effects

5.3.46 In taking account of the land use allocation of the site, the planning history of the wider area (as set out in section 2.5 and 2.6), and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts, with existing or proposed land allocations or development within the surrounding area, which would be likely to have any likely significant effect on the environment.

Summary

5.3.47 A detailed 24-hour daytime and night-time fully automated environmental noise survey was undertaken in order to establish the prevailing environmental sound climate at a location considered representative of the nearest noise sensitive receptors.

5.3.48 An assessment in general accordance with BS4142:2014 has been undertaken to determine the likely effects associated with the proposed development at the nearest noise sensitive receptor.

5.3.49 The initial assessment indicates that the level of impact associated with the proposed development is likely to be of a level that is 'likely to be an indication of having a low impact, depending on the context'.

5.3.50 It is important to note that the numerical assessment of impact is influenced by the context of the proposals including the surrounding environment and the operating characteristics.

5.3.51 Given the context and mitigating factors outlined herein it is likely that the associated noise impact of the proposed emergency standby electricity generation facility on the nearby noise

sensitive receptors would be reduced below the level likely to indicate a significant adverse impact.

5.3.52 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW, TAN 11 (Noise) and WCBC UDP Policy GDP1 (Development Objectives).

5.4 Landscape and Visual Appraisal

Introduction

5.4.1 This section considers:

- the features of the Application Site and its context;
- landscape character, the character of the Application Site, and its relationship to its surroundings;
- landscape-related planning designations;
- views towards the Generating Facility Site; and
- changes to landscape features, landscape character and views arising as a result of the development proposals.

5.4.2 Due to the nature of the proposed development, which is relatively small scale, this appraisal is a broad overview of the landscape and visual context and likely effects of the proposals. This approach is considered appropriate to the scale of development proposed.

5.4.3 Accordingly, photographs are included in Appendix 1.1, for the purpose of illustrating the context of the site only, and have not been prepared to accord with the Landscape Institute Advice Note 01/11.

Policy Context

Planning Policy Wales, July 2014

5.4.4 Land use planning policies of the Welsh Government are set out in Planning Policy Wales (PPW), Edition 7, July 2014 (Welsh Assembly Government, 2014).

5.4.5 Chapter 4: Planning for Sustainability, states in paragraph 4.11.9 that:

'*The visual appearance of proposed development, its scale and its relationship to its surroundings and context are material planning considerations.*'

WCBC UDP

5.4.6 Current policies for planning decisions are contained with the WCBC UDP, adopted February 2005. Landscape planning policies relevant to this appraisal are summarised below:

5.4.7 Strategic Policy PS2, states:

'Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.'

5.4.8 Policy EC4 Hedgerows, Trees and Woodlands, states:

'Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.'

Green Barrier

5.4.9 The Application Site is located within the Green Barrier. WCBC UDP Policy EC1 states:

'Within Green Barriers, development will only be granted planning permission if it is for agriculture, forestry, essential facilities for outdoor sport and recreation, cemeteries and other uses of land which maintain the openness of the Green Barrier and do not conflict with the purpose of including land within it.'

Special Landscape Area

5.4.10 A Special Landscape Area (SLA) is located 0.6km to the north-east of the site. WCBC UDP Policy EC5 states:

'*Within Special Landscape Areas, priority will be given to the conservation and enhancement of the landscape. Development, other than for agriculture, small-scale farm-based and other rural enterprises, and essential operational development by utility service providers, will be strictly controlled. Development will be required to conform to a high standard of design and landscaping, and special attention will be paid to minimising its visual impact both from nearby and distant viewpoints.*'

Area of Outstanding Natural Beauty

5.4.11 The Application Site is not within or adjacent to an Area of Outstanding Natural Beauty (AONB). The closest AONB is Bryniau Clwyd a Dyffryn Dyfrdw, approximately 2km west of the Application Site.

Methodology

5.4.12 The landscape and visual appraisal comprises a desktop study together with a visit to the site and surroundings to assess the general site setting and take photographs.

5.4.13 The desktop study included a data trawl in order to obtain background information on the proposed development site and surrounding landscape context. This included matters relating to landscape planning policy and landscape character.

5.4.14 The sources of baseline data utilised for the desktop analysis are summarised in Table 5.4.1 below:

Table 5.4.1: Data Sources

Baseline Topic	Data Source
Local Landscape Planning Policy	Wrexham County Borough Council, 2015. [online] Available at: http://www.wrexham.gov.uk [Accessed 11.06.2015]
Designations	UNESCO, 2015. '*World Heritage List*' [online] Available at: http://whc.unesco.org/en/list/ [Accessed 11.06.2015] Historic Wales, 2015. '*Historic Wales Portal*' [online]

Baseline Topic	Data Source
	Available at: http://historicwales.gov.uk/ [Accessed 11.06.2015] Forestry Commission, 2015. '*Forestry Commission Wales Map Viewer*' [online] Available at: http://maps.forestry.gov.uk/imf/imf.jsp?site=fcwales_ext& [Accessed 11.06.2015]
Landscape Character	Countryside Council for Wales, 2002. '*Interactive Maps – LANDMAP*' [online] Available at http://test.landmap.ccw.gov.uk/ [Accessed 11.06.2015]

5.4.15 The purpose of the desktop study was to:

- gain an understanding of the landscape character of the Application Site and its context;
- determine the likely extent of visibility of the Application Site, and adjacent built structures, and the likely visibility of proposed development on the Generating Facility Site (the actual extent of which will be determined by landform, vegetation and existing and proposed built development); and
- carry out the outline landscape and visual appraisal.

Baseline conditions

5.4.16 The Application Site and general setting are described in Section 2.2 of this report.

Register of Parks and Gardens

5.4.17 The Application Site is not listed in Cadw's Register of Parks and Gardens.

5.4.18 Wynnstay Registered Park and Garden is located approximately 1 km south-east of the Application Site.

Conservation Areas

5.4.19 The Application Site does not lie within a Conservation Area.

5.4.20 Ruabon Conservation Area is located 0.8 km to the east of the Application Site.

Listed Buildings

5.4.21 There are no Listed Buildings within the Application Site; the nearest is Walker Fan House at the former Wynnstay Colliery located 0.4 km to the south-east of the Application Site.

Scheduled Monuments

5.4.22 There are no Scheduled Monuments within, or adjacent to the Application Site. The closest Scheduled Monument is Wynnstay Colliery Walker Fan House, 0.4 km to the south-east of the Application Site.

Ancient Woodland

5.4.23 There are no Ancient Woodlands within, or adjacent to the Application Site. The nearest is located adjacent to the B5605 approximately 0.5 km to the south-east of the Application Site.

Public Rights of Way

5.4.24 There are no public rights of way across the Application Site. The closest public right of way (Footpath 15) is located 180 m north-west of the Application Site.

5.4.25 A public right of way (Footpath 18) following a section of Offa's Dyke is located approximately 320 m to the east of the Application Site. This however does not form part of the Offa's Dyke Long Distance Path.

Landscape Character

5.4.26 LANDMAP (Countryside Council for Wales, 2002) provides a published source of landscape assessment for Wales. LANDMAP consists of five spatial dataset layers: Cultural Landscape, Geological Landscape, Historic Landscape, Landscape Habitats, and Visual and Sensory.

5.4.27 The Application Site is within the Visual and Sensory aspect area 'North, West and South of Rhos', aspect area code WRXHMVS020. This is classified as Upland (Level 1), Hills, Lower Plateau & Scarp Slopes (Level 2), Hill and Lower Plateau Grazing (Level 3). The Visual and Sensory evaluation is classed as moderate.

5.4.28 The aspect area is described within the LANDMAP summary as:

'A broad aspect area forming the middle upper to mid slopes of the area rising up to Ruabon Mountain. The area predominantly comprises of small to medium scale agricultural field pattern with a bias to pasture and livestock farming largely dictated by the undulating and sloping nature of the topography. Field boundaries are defined by mature but sparse hedgerows with limited hedgerow trees and supplemented with fences'.

5.4.29 The aspect area is perceived as 'sheltered and settled', the aesthetic quality is 'diverse' and the physical form of the boundary types are noted as 'managed'. The sense of place is described as 'weak', as there is "*no specific focus or character for the area due to the short distance availability of the views and overall lack or common or distinctive characteristics*". The aspect area containing the site is described under the Visual and Sensory classification as 'enclosed'.

Landscape Character of the Application Site

5.4.30 The Application Site has an open and rural character, forming part of a larger field. Views towards the site include the adjacent substation, which appears as infrastructure within the countryside, tucked next to hedgerows to the east and west, and some trees to the south. The Application Site lies within an enclosed landscape with other infrastructure elements including electricity pylons, roads and dwellings.

Potential Effects

Visual Analysis

5.4.31 The extent of visibility is limited due to landform and vegetation within the local area and the existing DNO substation to the north of the Generating Facility Site. The Generating Facility Site is moderately enclosed with boundary vegetation preventing open views across the landscape. Vegetation and landform intervene in views towards the Generating Facility Site but glimpsed and partial views within 1 km are likely from the south.

5.4.32 The Application Site is within an enclosed landscape, due to the undulating landform, with hedgerows along field boundaries. There are some local views available from nearby footpaths. However it is seen in the context of the existing substation.

5.4.33 As the Generating Facility Site is adjacent to an existing electrical substation, close to a gas pressure reduction facility and seen within the context of other industrial development such as the A539 road and overhead lines, the perception of the additional infrastructure would be limited. Furthermore, the Application Site is located within a landscape of medium quality. Although Bryniau Clwyd a Dyffryn Dyfrdw AONB is approximately 2 km from the Application Site and Wynnstay Registered Park and Garden is within 1 km of the Application Site, views are likely to be prevented due to intervening vegetation and/or landform. Visual amenity from nearby public rights of way would not be significantly affected, and views to the wider countryside will remain largely uninterrupted.

5.4.34 Changes to views from those public rights of way closest to the Application Site would be limited to partial and glimpsed views from local footpaths.

Landscape Appraisal

5.4.35 The proposed development complies with the guidance set out in PPW in that it would not materially detrimentally affect the countryside or landscape character. It is situated adjacent to existing infrastructure, with minimal use of agricultural land and is accessed via an existing access track. Any mitigation planting proposed would be in keeping with the existing character of the area, and comprise mixed native species where appropriate. The proposal will not affect the key characteristics of published landscape character areas, and effects are limited to local effects with minimal changes to landscape features.

5.4.36 With regard to landscape character policy, the proposed development would be in a rural area and will have due regard to, and not cause detrimental effect to the landscape character of the area or landscape features such as drainage patterns, pattern of trees and woodland, habitats, or the pattern of settlements. There will be some minor changes to local landform as a result of the construction of the proposed development, however these will be local effects that are limited to within the Generating Facility, and would not cause adverse effects upon the wider landscape character.

5.4.37 With regard to design policy, the proposed development would be related to the existing substation. There would be no adverse effects on residential amenity, and the proposed development takes into account the existing landform and context.

5.4.38 In respect of Policy PS2, the proposed development is in keeping with local infrastructure and is proposed to be sited strategically to minimise landscape and visual effects. The proposed development would have local effects on the landscape character with minimal effects on landscape features, therefore complying with local Policy EC4.

5.4.39 The proposed development includes construction of new acoustic / security fencing which would surround the Generating Facility, behind the existing boundary hedgerow. Accordingly, any vegetation removal necessary for site access would be agreed with WCBC prior to removal. The remainder of the existing hedgerow would remain intact.

5.4.40 The aspect area containing the Application Site is described under the Visual and Sensory classification as ‘enclosed’; however, some close range open views are available, particularly from the south. Field boundary vegetation provides partial screening to the north, east and the west and to a lesser extent from the south.

5.4.41 Due to the small scale and limited nature of the proposed development, there would be limited effects on local landscape character. The proposed development would slightly extend the infrastructure of the existing substation and gas pressure reduction facility, whilst the character

of the site area would change from rural to infrastructure in a rural area, there would be little effect upon the overall local landscape character.

5.4.42 There would be no direct effects on public rights of way as there are none within the Application Site.

5.4.43 There would be some views of the proposed development from the footpath to the east (Footpath 18), and potentially some glimpsed views from the footpath to the north-west (Footpath 15). However the development would be seen in the context of the existing substation and gas pressure reduction facility, and filtered by overlapping layers of hedgerow.

5.4.44 The proposed development would not result in material landscape or visual effects upon Listed Buildings.

5.4.45 There is no intervisibility with Walker Fan House to the south-east of the Application Site, due to intervening vegetation and built form.

5.4.46 The proposed development would not result in material landscape or visual effects upon Scheduled Monuments.

5.4.47 There is no intervisibility with Wynnstay Colliery Walker Fan House to the south-east of the Application Site, due to intervening vegetation and built form.

Mitigation and Enhancement

5.4.48 No additional mitigation is required other than what is proposed in section 2.4 of this report.

Residual Effects

5.4.49 No significant residual effects are anticipated on either visual receptors or landscape character as a result of the proposed development.

Cumulative Effects

5.4.50 There is likely to be only limited intervisibility from of the Application Site and the proposed development of a 5 MW photovoltaic farm on land to the north of the Application Site if it were to be approved.

5.4.51 In taking account of the land use allocation of the site, the planning history of the wider area, (as set out in section 2.5 and 2.6), and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts, with existing or proposed land allocations or development (see section 2.7) within the surrounding area, which would be likely to have any likely significant effects on the environment.

Summary

5.4.52 This landscape and visual appraisal concludes that the proposed development would have limited local landscape and landscape character effects. This is due to its small scale and limited nature, together with the location of the proposed development adjacent to the existing infrastructure of the electrical substation and gas pressure reduction facility. The undulating landform and enclosed character of the landscape would limit the visibility of the proposed development from the wider landscape. The proposed development would have due regard to, and not cause detriment to, the special features or diversity of the landscape character areas.

5.4.53 Visual effects are also limited to local views, and the proposed development would be seen entirely in the context of the existing electrical substation.

5.4.54 In conclusion, landscape and visual effects arising from the proposed development would be local, and the proposal would not cause any detrimental changes to the overall character of the landscape. The proposed development therefore can be accommodated without undue harm to landscape, landscape character or visual amenity.

5.4.55 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW, TAN 12 (Design) and WCBC UDP Policies PS2, PS3, GDP1 (Development Objectives), EC1 (Green Barriers), EC4 (Hedgerows, Trees and Woodland), and EC5 (Special Landscape Areas).

5.5 Geology/Ground Conditions/Water Quality

Introduction

5.5.1 A Phase 1 ground condition assessment has been prepared for the Application Site which comprises a desk study, site walkover and Tier 1 preliminary qualitative contamination risk assessment and land instability appraisal.

5.5.2 The objective of the Phase 1 ground condition assessment is to identify the likely ground conditions and environmental setting which might have associated environmental liabilities or which may affect redevelopment as well as appraising the likely geological or geotechnical hazards at the Application Site.

Policy Context

WCBC Unitary Development Plan

5.5.3 The following policies from Wrexham Council's Unitary Development Plan (UDP) have also been taken into consideration:

- Policy EC2, which states that "*Development on agricultural land of grades 1, 2 or 3a will only be permitted if it does not lead to the irreversible loss of that land. It is confirmed here that the intention is to re-instate the site to agricultural land following decommissioning of the proposed development after 25 years*".

- Policy EC14 which states that "*Development which would have an unacceptable adverse impact upon the capacity, flow, quality or availability of controlled waters and associated land will not be permitted*".

- Policy MW9 which states that "*Resources of sand and gravel, and clay will be safeguarded from non-mineral development in order to prevent the sterilisation of unworked minerals deposits. The identification of mineral resource areas gives no presumption in favour of the working of any deposits. Within such areas non-mineral development will be strongly resisted unless a resource assessment (or other information) is provided to demonstrate that no exploitable reserves exist within the development site. Where non-mineral development which materially prejudices minerals resources is granted planning permission on land holding minerals deposits, provision should be made for the prior removal of mineral deposits*".

Methodology

5.5.4 The PBA methodology for ground condition assessment is presented in Appendix 5.5.1. In accordance with guidance presented in CLR 11 (EA Model Procedures for the Management of Land Contamination) a staged approach to risk assessment was adopted and this report presents a preliminary Tier 1 assessment.

5.5.5 The underlying principle is the evaluation of pollutant linkages in order to assess whether the presence of a source of contamination could potentially lead to harmful consequences. A pollutant linkage consists of the following three elements:

- a source of contamination or hazard that has the potential to cause harm or pollution;
- a pathway for the hazard to move along / generate exposure; and
- a receptor which is affected by the hazard.

5.5.6 For each potential pollutant linkage identified the risk is estimated through consideration of the magnitude of the potential consequences and the likelihood or probability of an event occurring.

5.5.7 This report identifies potential sources (hazard identification), potential pathway and receptor identification and risk estimation and assessment for the proposed development.

Sources of Information

The following sources of information were used in the preparation of this report:-

- Landmark Envirocheck Report and historical maps (Landmark 2015, ref 68492097_1_1);
- PBA walkover inspection – photographs are presented in Appendix 1.1;
- BGS Geology Map held by PBA; and
- PBA Cavity Databases (non-coal mining and natural cavities).

5.5.8 The historical land use information is based on Ordnance Survey (OS) maps and aerial photography provided by emapsite.

Baseline Conditions

5.5.9 The Application Site setting is described in section 2.2 above.

Summary of Off-Site Historical Land Use

5.5.10 The earliest available OS map (1874) shows that the Application Site lies in a largely agricultural setting with fields surrounding the site on all sides. Plan Bennion Road forms the western boundary. A coal mine/shaft is present some 200 m to the southwest of the Generating Facility Site boundary, with a further coal mine/shaft located 250 m to the north of the Application Site boundary. Plas Madoc Village lies some 220 m to the southwest of the Application Site boundary, with a railway line some 100 m to the southwest.

5.5.11 No off-site land use changes are marked on the OS maps until 1912, whereby the coal mine to the south of the Generating Facility Site appears to have undergone expansion with numerous spoil heaps located around the mine shaft location. The closest spoil heap is now marked some 50 m to the south of the Generating Facility Site boundary. A small building is also noted to be present adjacent to the northern boundary of the Generating Facility Site.

5.5.12 The coal mine to the southeast of the Generating Facility Site is noted to be abandoned in around 1953, with the spoil heaps becoming vegetated with woodlands by 1963. The railway line to the southwest of the Application Site is marked as being dismantled.

5.5.13 The electrical substation adjacent to the northern boundary of the Generating Facility Site is first marked on the OS maps on the 1963 edition.

5.5.14 The 1972 OS map shows significant residential development 120 m to the southwest of the Generating Facility Site around Hampden Way. The site of the former coal mine and spoil heaps appears to have been levelled and is noted to be undeveloped land.

5.5.15 Between 1989 and 1991 the coal mine site to the southwest of the Generating Facility Site is shown to have been developed into Wynnstay Technology Park, comprising several large warehouse/commercial units.

5.5.16 No notable off-site land use changes were noted on the OS maps between 1991 and the present day.

Geology – Published Information

5.5.17 The 1:50,000 British Geological Survey (BGS) geology map (Sheet 124, Wrexham) of the local area indicates the following sequence of strata:-

- Superficial – Glacial Till of Devensian age. Stratum is described as sedimentary unsorted sediment of gravel in a fine mud matrix.
- Solid – Pennine Lower Coal Measures Formation and Pennine Middle Coal Measures Formation of Carboniferous age described as mudstone, siltstone and sandstone.

5.5.18 The closest available borehole record (SJ24SE6) is sited approximately 70 m to the west of the Application Site boundary. The borehole recorded sand and gravel to 23 m depth, underlain by sandstone to 34 m bgl. The sandstone was underlain by interbedded layers of clayey shale, shale, ironstone and coal to 44.5 m below ground level (m bgl) and then by sandy shales to 61 m bgl. The shales were underlain by 'Cefn Coal' to the base of the borehole at 64 m bgl.

5.5.19 The borehole record confirms the likely geological conditions expected from the published records. The shallow sand and gravel is likely to represent Glacial Till which was proven to 23 m bgl. This was underlain by interbedded layers of shale, ironstone and coal to the base of the borehole that are considered to represent the underlying Pennine Lower and Middle Coal Measures.

Landfill Records

5.5.20 According to the Envirocheck Report (Appendix 5.5.2) there are four landfill sites within 1 km of the Application Site boundary.

5.5.21 The closest landfill is located some 750 m to the southwest of the Application Site named Woodwards Rock at Plas Madoc. It is reported that the landfill received inert, industrial, commercial, household, special waste and liquid sludge. The license was issued in 1968 and surrendered in 1978.

Substantiated Pollution Incidents

5.5.22 The Envirocheck Report has not identified any substantiated pollution incidents, or sites determined as contaminated land under Part 2A of the Environmental Protection Act within 500 m of the Application Site boundary.

Controlled Waters - Groundwater

5.5.23 Table 5.5.1 summarises information recorded in the Envirocheck report regarding hydrogeology and groundwater vulnerability.

Table 5.5.1 Summary of Hydrogeology and Groundwater Vulnerability Related Information

Item	Details
Aquifer Classification	Bedrock (Coal Measures) – Secondary A Aquifer Superficial (Glacial Till) – Unproductive Strata
Depth to Groundwater	Unknown assumed to be around 4 m bgl on the basis of the level of the adjacent stream
Groundwater Flow Direction	Assumed to be towards the southeast
Source Protection Zone (SPZ)	Not within 500 m of a SPZ
Groundwater Abstraction	Two groundwater abstractions are recorded within 2 km of the site; closest is recorded 934 m to the northwest of the site for general industrial use.

Controlled Waters - Surface Water

5.5.24 Table 5.5.2 summarises the information recorded in the Envirocheck report regarding hydrology.

Table 5.5.2 Summary of Surface Water Related Information

Item	Description
Name	Unnamed stream 12 m to east of Application Site boundary
Quality	Unknown
Abstraction	One recorded within 2 km of the Application Site boundary, approximately 1970 m to the northeast of the site at Afon Goch, Carlisle used for effluent/slurry dilution.
Pollution Incidents	See Section 3.4
Discharge Consents	Two recorded within 500 m of the Application Site boundary. The closest recorded operator (120 m, NW) is Adrian Jones at Grange, Plas Bennion Road for an unspecified discharge into an unnamed watercourse.
River Flood Risk *	Application Site is not within a flood zone
Groundwater Flood Risk*	Unknown
* The scope of this report does not include a flood risk assessment.	

Potential Effects

Conceptual Site Model

5.5.25 The Tier 1 Preliminary Risk Assessment includes the development of a conceptual site model (CSM). The CSM describes the types and locations of potential contamination sources, the identification of potential receptors and the identification of potential transport/migration pathways.

5.5.26 For a pollutant linkage to be identified a connection between all three elements (source-pathway-receptor) is required.

Geoenvironmental Hazard Identification

5.5.27 The Application Site is currently an agricultural field, and historical map information suggests it has never been developed or used for anything other than agriculture. Surrounding adjacent land-uses include an electrical substation, and agricultural use.

5.5.28 Available information suggests the adjacent substation was constructed in the 1960's. During the walkover, the infrastructure was noted to be recent in age and in good overall condition, no evidence of ground contamination associated with the substation was noted, and any ground contamination (arising from e.g. oils or polychlorinated biphenyls) within this infrastructure will be the responsibility of the operator. With this in mind, and considering the infrastructure is off-site and noted to be in good condition it has been ruled out as a potential source of contamination that could give rise to on-site hazards or liabilities.

5.5.29 Potential sources of contamination have therefore not been identified on-site or in the immediate area surrounding the site.

5.5.30 The potential for contamination to be present based on the past and present site use is assessed as classification score '1'; Very Low. (See Table 1, Appendix 5.5.1).

Hazard Assessment and Risk Estimation

5.5.31 From the Tier 1 assessment there is considered to be a very low risk of potential human health and controlled water hazards associated with the on-site ground conditions. Potential pollutant linkages have not been identified because no on-site or feasible off-site potential sources of contamination have been identified from the Tier 1 assessment.

5.5.32 Based on the known current and historical land uses, the overall potential for significant or widespread contamination to be present on the Application Site is considered to be Very Low. Based on the available information on ground conditions, the potential for any deleterious material producing hazardous ground gases to be present is also considered to be Very Low.

5.5.33 Since there are no potential sources of contamination that have been identified at this stage, the Tier 1 preliminary risk assessment has not been taken further.

Natural and Non-Coal Mining Cavity Records – Cavity Searches

5.5.34 A search of the PBA Natural and Non-Coal Mining Cavities Databases indicates that there are no known cavity locations within 2 km of the Application Site boundary.

5.5.35 While there are no records pertaining to natural or mining cavities within the Application Site, we note that the absence of existing records for the Application Site should not be considered as conclusive.

Coal Mining

5.5.36 On the basis of the information reviewed to date it is apparent that the Application Site lies within an area that has been affected by coal mining. The historical maps indicate that coal mine shafts were historically present some 200 m to the southeast and 300 m to the northwest of the Application Site.

5.5.37 A Non-Residential Coal Authority Mining Report was commissioned due to the proximity of the Application Site to the two shafts. The report notes that the property is in the likely zone of influence from five seams of coal at 140 m to 300 m depth, and these were last worked in 1927. The property is not in the likely zone of influence of any present underground coal workings and is not in an area and is not in an area for which the Coal Authority is determining whether to grant a licence to remove underground coal.

5.5.38 The mining report states that any ground movement from the historical workings is likely to have stopped by now. PBA agree with this assessment and would conclude that risk of surface stability hazards arising from the collapse of subsurface workings is low.

Naturally Occurring Geological Hazards

5.5.39 An assessment of potential geological hazards that may give rise to instability or adverse foundation or construction conditions as supplied by the British Geological Survey (BGS) from their National Geoscience Information Service (NGIS) are provided by the Envirocheck Report (Appendix 5.5.2). The generic assessment is generated automatically based on digital geological maps and the scope and the accuracy is limited by the methods used to create the dataset and is therefore only indicative for the search area.

5.5.40 The information contained in the Envirocheck Report has been reviewed and where considered necessary reassessed considering the specific information available for the Application Site. The modified assessment of the potential for geological hazards to be present on the site is summarised in Table 5.5.3 below.

Table 5.5.3 Summary of Geological Hazards from Envirocheck Report

Hazard	BGS-NGIS Assessed Hazard Potential	PBA Assessment
Coal Mining Affected Areas	Area affected by coal mining	Agree
Collapsible Ground Stability Hazards	Very Low	Low
Compressible Ground Stability Hazards	No Hazard	Agree
Dissolution Hazard	No Hazard	Agree
Landslide Ground Stability	Very Low	Agree
Running Sand	Very Low	Low
Shrinking or Swelling Clay	Very Low	Agree

5.5.41 The BGS-NGIS hazard assessment for the site indicates that it is at a low or very low risk of being affected by geological hazards arising from ground instability. There may be a higher risk of excavation instability caused by running sand if groundwater is proven to be shallow within the underlying glacial till.

5.5.42 Given the nature of the underlying geology, PBA would agree with this assumption.

Mitigation and Enhancement

5.5.43 Given the above findings, no site specific mitigation measures are considered necessary over and above what is set out in section 2.4.

Residual Effects

5.5.44 No residual effects are anticipated as a result of construction or operation of the proposed development.

Cumulative Effects

5.5.45 In taking account of the land use allocation of the Application Site, the planning history of the wider area (as set out in section 2.5 and 2.6), and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts, with existing or proposed land allocations or development within the surrounding area, which would be likely to have any likely significant effects on the environment.

Summary

5.5.46 The Application Site appears to have never been developed; the land surrounding the site has current and historic agricultural usage. An area of land bounding the northwest of the site is occupied by an electrical substation, which during the walkover the infrastructure was noted to be of recent construction and in good overall condition. Any ground contamination arising from

oils or polychlorinated biphenyls within this infrastructure would also be the responsibility of the current operator. With this in mind and considering the infrastructure is off-site and in good condition the substation has been ruled out as a potential source of contamination that could give rise to on-site liabilities.

5.5.47 From the Tier 1 assessment there is considered to be a very low risk of potential human health and controlled water hazards associated with the on-site ground conditions. Potential pollutant linkages have not been identified because no significant on-site or plausible off-site potential sources of contamination have been identified from the Tier 1 assessment. It is not considered that an intrusive investigation is required to characterise the risks at this site as potential sources of contamination have not been identified.

5.5.48 The Application Site is not likely to be determined as Contaminated Land under Part 2A of the Environmental Protection Act (1990).

5.5.49 Given the likely underlying geology and local geomorphology it is unlikely that the ground conditions at the Application Site will present any abnormal or unusual geotechnical constraints that will need to be considered during the development of the site. It is possible that shallow groundwater may be present within the site owing to the nearby spring located some 10 m to the east of the Application Site boundary. If this is proven to be the case any excavations made below the water table are likely to be unstable in the short term and may require shoring and/or groundwater control measures.

5.5.50 The Application Site is within the likely zone of influence from coal mine workings, however the underlying coal seams were last worked in 1927 and therefore PBA would generally conclude that the site has a low or very low potential for being affected by the majority of geological hazards.

5.5.51 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW and WCBC UDP Policies GDP1 (Development Objectives), EC12 (Development and Flood Risk), EC13 (Surface Water Run-Off) and EC14 (Protection of Controlled Waters).

5.6 Traffic and Transport

Introduction

5.6.1 This section reviews the proposed site access and vehicular movements both to and from the Generating Facility Site during the construction stage and comprises:

- a review of the current national and local policy context;
- baseline conditions in respect of the highway network;
- construction activity, traffic routeing and assessment of site access;
- potential effects relating to traffic and transport arising as a result of the proposed development;
- traffic management and mitigation measures, and
- summary and conclusions.

Policy context

5.6.2 The following Policy of the UDP has been considered:

PS8: Transport: The transport network will be developed by providing an integrated range of travel options to and from principal residential, commercial, employment and education centres by making the best use of the existing road and rail network, including, where necessary, the provision of facilities for both passenger and freight interchange and by the encouragement of public transport, cycling and walking.

Methodology

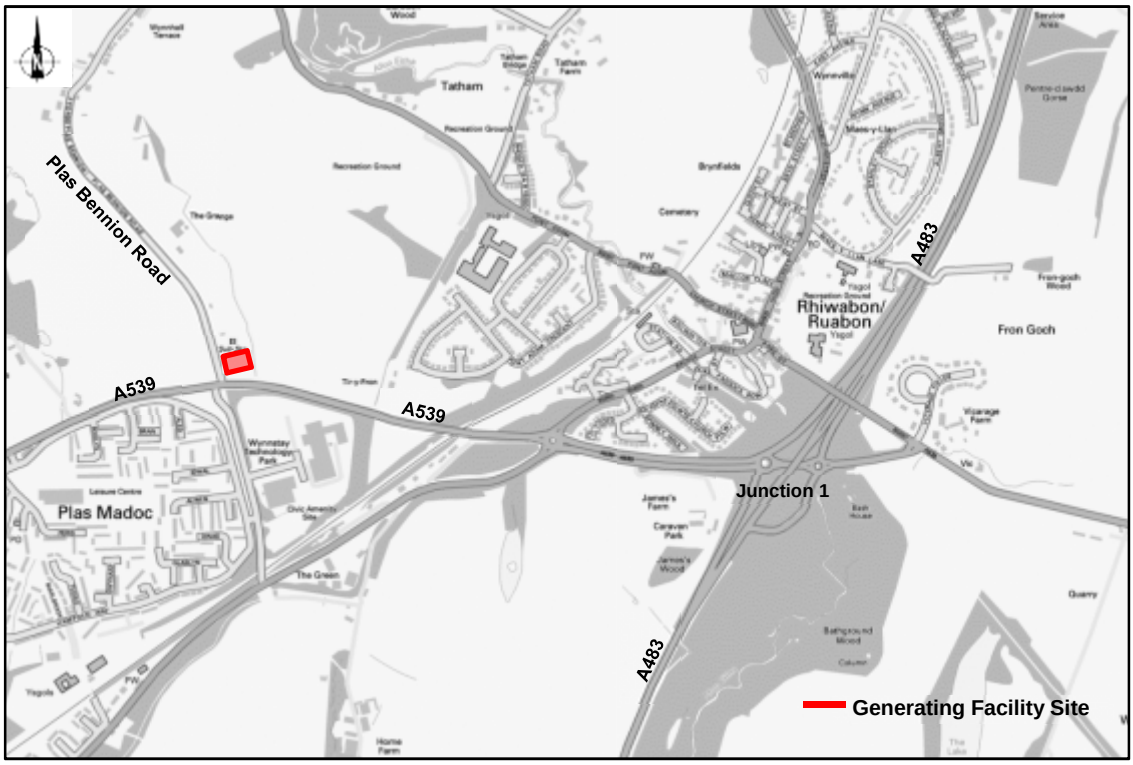
5.6.3 This study has been undertaken as a desk based appraisal, looking at the most suitable routes to the Application Site, suitability of access and increases in traffic flows on the local network. Data for anticipated traffic movements generated by the proposed development have been supplied by contractors who have undertaken similar developments.

Baseline Conditions

5.6.4 The Application Site is described in Chapter 2.

5.6.5 The surrounding local highway network to the proposed development site is shown in Insert 5.6.1.

Insert 5.6.1 – Local Highway Network



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Plas Bennion Road

5.6.6 Plas Bennion Road is a two-way rural road, bordering the western edge of the Application Site, subject to the national speed limit with a carriageway width of approximately 6.5 m. There is also a 2 m wide footway on the western edge of the carriageway. Plas Bennion Road routes north from the A539, servicing a small number of rural residential properties before leading to Penycae.

A539 (Ffordd Llangollen)

5.6.7 Approximately 30 m south of the Application Site, Plas Bennion Road connects to the A539 (Ffordd Llangollen) via a ghost island right turn (GIRT) junction. The A539 provides connection to Cefn Mawr town centre and Llangollen to the west and the A483 to the east at Junction 1.The A483 provides a strategic connection from the A5 and Oswestry to the south and Wrexham, Chester and the national highway network via the A55 and M56.

Site Access

5.6.8 The proposed vehicular access to the Generating Facility Site will be from Plas Bennion Road, approximately 65 m to the north of the Plas Bennion Road/A539 junction. The approximate carriageway width of 65 m is sufficient for two-way construction vehicle traffic to access the Generating Facility Site.

5.6.9 Construction traffic would enter and exit the Generating Facility Site in forward gear with sufficient space provided on-site allowing turning manoeuvres to be made by the HGVs.

5.6.10 All construction vehicle traffic will park on the Generating Facility Site and none shall be left unattended along Plas Bennion Road.

5.6.11 Figure 5.6.1 demonstrates the proposed site access layout for the proposed development.

Potential effects

Construction Traffic Movements

5.6.12 It is anticipated that the hours of operation for the development site will be 8 am to 6 pm on weekdays and 8 am to 1 pm on Saturdays. The construction site would not be operational on Sundays or Bank Holidays.

5.6.13 Table 2.1 shows the indicative dimensions of the main plant items to be delivered and used on-site. This determines the approximate number of construction movements generated by the proposed development. It is noted that there will be no wide/ abnormal loads to be delivered.

5.6.14 The anticipated total construction vehicle (HGVs) movements are shown in Table 5.6.1 and estimated weekly frequency of light vehicles is shown in Table 5.6.2.

Table 5.6.1 – Anticipated total Construction Vehicle (HGVs) Activity and Movements

Construction Activity	Number of Units to be Delivered	Vehicle Movements
Delivery of diesel generators	14	28
Delivery of switch gear container	1 container	2
Delivery of a crane	1 crane	2
Delivery of fuel tanks	3 tanks	6
Delivery of 11 kV Transformers	14 transformers	28
Delivery of 33 kV Transformer	1 transformer	2
Delivery of equipment for earthworks such as minor excavation	4 excavators	8
Delivery of aggregates and removal of spoil from the site	20 loads	40

Delivery of Welfare units	2 units	4
Delivery of security walls and acoustic fences	5 loads	2
	Total	**122**

Table 5.6.2 – Estimated Frequency of Light Vehicles visits per week

Week	Light Vehicles (visits per week)	Vehicle Movements
1	16	32
2	16	32
3	16	32
4	22	44
5	22	44
6	16	32
7	16	32
8	16	32
9	16	32
10	16	32
11	22	44
12	22	44
Total	**216**	**432**

5.6.15 The maximum number of vehicle movements during construction over any one week is 44 (weeks 4, 5, 11 and 12). This does not represent a significant increase in comparison to existing traffic flows on the local network, and as such, no significant issues are anticipated.

Operational Traffic Movements

5.6.16 Once the construction phase is complete, the on-going operation of the Generating Facility Site will require minimal vehicle activity, with a twice weekly delivery of diesel to the Generating Facility Site likely to be undertaken by HGV (articulated or rigid dependent on operator requirements).

5.6.17 In addition, there would be a maximum of 2 operatives on-site at one-time for equipment maintenance or security, with the parking of their associated vehicles accommodated within the Generating Facility Site. This would result in no material increase in traffic in the area of the site and no effect on local traffic patterns or infrastructure.

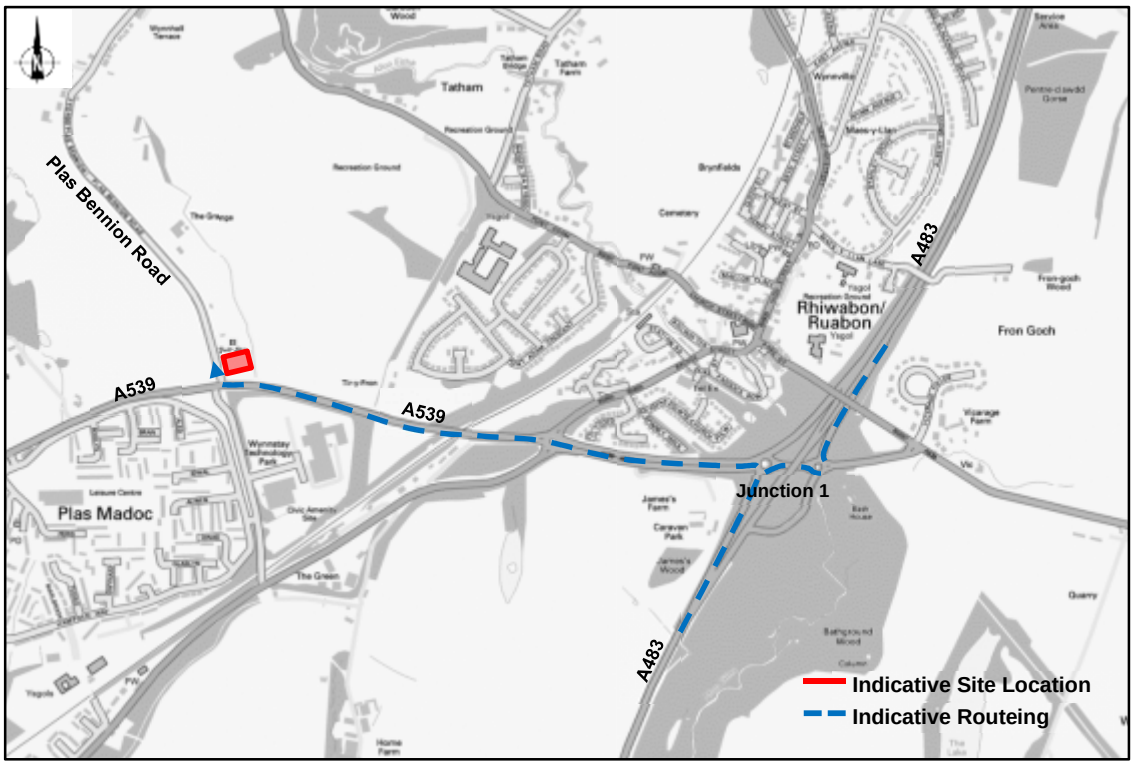
Swept Path Analysis

5.6.18 To demonstrate that the construction site can be accessed by HGVs, swept path analysis of a 16.5 m max legal articulated vehicle has been undertaken, which presents the largest vehicle likely to require access to the Generating Facility Site shown in Figure 5.6.2. The swept path analysis demonstrates that HGVs (16.5 m max legal articulated vehicle) can enter and exit the site in a forward gear; therefore all turning manoeuvres will be carried out within the construction site.

Routeing

5.6.19 It is anticipated that the majority of the construction traffic arriving / departing the Application Site will be from the A483. The most direct route from the A483 to the development site will be exiting at Junction 1 towards A539 (Ffordd Llangollen) and into Plas Bennion Road, as shown in Insert 5.6.2. This is the most direct route to/from the site and all of the roads within this route can easily accommodate HGV vehicles.

Insert 5.6.2 – Anticipated Vehicle Routeing



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Mitigation and Enhancement

5.6.20 Mitigation measures relating to traffic and transport are set out in section 2.4.

Residual Effects

5.6.21 No significant residual effects relating to traffic and transport are anticipated as a result of the proposed development.

Cumulative Effects

5.6.22 In taking account of the land use allocation of the Application Site, the planning history of the wider area (as set out in section 2.5 and 2.6), and the scale and nature of the proposed development, it is considered that there would not be any cumulative impacts, with existing or proposed land allocations or development within the surrounding area, which would be likely to have any likely significant effects on the environment.

Summary

5.6.23 This appraisal has been prepared to accompany the application and demonstrate the likely level of construction traffic, the routeing and types of vehicles but also management measures and processes that will be enforced to limit the impact of the construction period on the surrounding area and local highway network. The following can be concluded:

- The construction site would have a sole vehicular access from Plas Bennion Road.
- It is envisaged that the construction period would be completed within approximately four months.
- Approximately 61 HGVs (122 movements) are expected to visit the Generating Facility Site during the four month construction period (approximately 10 movements per week) – including deliveries and removal of material from site, as well as vehicles leaving site to refuel and/or for maintenance. Noting that these movements will likely occur outside the peak traffic periods.
- Approximately 216 light vehicles are expected on site during the four month construction period (varying throughout the construction phase depending on the programme of works) which is expected to equate to approximately 16 to 22 light vehicle visits per week (32 to 44 light vehicle movements per week). Noting that these movements will also be likely to occur outside the peak traffic periods.

5.6.24 On the basis of the above, it is considered that the proposed development accords with the guidance set out in PPW as well as WCBC UDP Policies PS4, PS8, GDP1 (Development Objectives), T8 (Parking) and T9 (Walking, Cycling and Horse Riding Routes).

6 Design and access

6.1 Introduction

6.1.1 This chapter sets out the design principles and concepts that will be applied to the proposed development. The purpose of this chapter is to show how the design approach has considered relevant national planning policy as well as policies in the local development plan, and to demonstrate how the proposal has addressed the design objectives set out in government advice, much is the same way as a Design and Access Statement would do.

6.1.2 The proposed design principles and concepts to be applied to the proposed development are therefore set out under the subheadings of: amount, layout; scale; landscaping and appearance. Relevant information on how safe and efficient accesses have been considered as part of the proposed development is included in Section 5.6.

6.2 Policy

TAN 12: Design

6.2.1 TAN 12 (Design) was published in July 2014 sets out the Welsh Government's overarching policy guidance in respect of the design of new development.

6.2.2 Paragraph 4.16 confirms: "*Achieving good design is the responsibility of all those involved in the design process. It is the physical expression of the design objectives (development on the ground) that impacts on the quality of our lives and is the focus of judgment of whether the design objectives have been successfully achieved. Some issues which will be relevant in meeting the objectives when devising proposals are set out below*."

6.2.3 Part a) of WCBC UDP Policy GDP1 (Development Objectives) states that new development should: "*Ensure that built development in its scale, design and layout, and in its use of materials and landscaping, accords with the character of the site and makes a positive contribution to the appearance of the nearby locality.*"

6.3 Amount, Scale and Layout of the Project

Amount

6.3.1 The Application Site covers an area of approximately 0.44 ha and is sufficient to accommodate all plant items required. Table 2.1 shows the likely number and dimensions of the key plant items that will be required on the Generating Facility Site. It is anticipated that the plant will most likely comprise 14 separate containerised diesel generators. The external container wall would house a cooling radiator, exhaust and air intakes.

6.3.2 Other ancillary infrastructure at the Generating Facility Site needed to generate electricity would comprise:

- Welfare facilities;
- Fuel storage tanks;
- Electrical transformers;
- Security cameras and lighting;
- Switchgear; and

- Security fencing.

Layout

6.3.3 Figure 1.2 'Site Layout' shows the layout of the plant items within the site. As outlined above, the proposed development can be accommodated within the 0.44 ha area identified for the Application Site.

6.3.4 The sole immediate neighbour to the Application Site is the existing DNO 33 kV substation. The proposed development would relate appropriately to the existing substation being of a similar size, scale and appearance. The layout of the site, in terms of proximity to the substation, takes account of both operational and aesthetic considerations, removing the need for extensive electrical cabling and complex connections often associated with power generation facilities.

Scale

6.3.5 The proposed development would be relatively small in both scale and mass. The maximum dimensions of the plant items to be used are indicated in Table 2.1. No elements of the proposed development would be higher than 4.7 m. Due to the limited number of operational hours and inherent design that limits emissions. There is no requirement for a large stack, unlike for plants which are constantly operational. The findings of the appraisal of Landscape and Visual Impacts undertaken for the proposed development are that the development would be viewed in the context of the surrounding electrical infrastructure which limits the visual impact.

6.4 Design and Appearance

6.4.1 The selection of materials to be used for the proposed development takes into account necessary operational requirements whilst also seeking to minimise potential visual impacts. It is recognised that there are inherent limitations as to how far the appearance of plant items can enhance the visual interest of the surrounding landscape, however consideration is given to mitigating any adverse visual impacts as far as possible.

6.4.2 The choice of materials for plant items has taken into account the need to reduce potential noise and vibration impacts. The generators chosen for the site will be of the type whereby all of the components of the engine are enclosed within a containerised acoustic enclosure. The acoustic enclosure is specifically designed to limit noise emissions.

6.4.3 It is common for this type of generator to be left in the open given the acoustic enclosures around the engines and the cooling requirements. At the back of the engines will be fuel supply pipe work, together with the wiring and switch gear needed to control the engines. The exhaust system and heat exchangers (radiators needed to maintain the engine temperatures) and sound baffles are supported on the top or behind the generators.

6.4.4 Lighting to be used on site will be selected with consideration given to minimising any potential adverse impact on nearby receptors. A security light will be placed at each corner of the site. Motion sensitive lights will be used and lights will be directed downwards to avoid light spill.

6.4.5 The choice of the type of fencing used to enclose the Generating Facility will take into account both considerations of safety and security as well as the need to minimise visual and noise impacts. It is suggested that wood panel fencing is an appropriate option that will best help integration into the wider landscape.

6.5 Landscape planting

6.5.1 To limit views of the site from the south, new native species hedgerows containing trees would be planted along the Generating Facility Site boundary adjacent to the acoustic / security fence and adjoining existing hedgerows where practical. Appropriate management of the existing boundary hedgerows to the west will provide some visual mitigation of the development, and promote biodiversity enhancement.

6.6 Access

6.6.1 The transport analysis included as Section 5.6 above outlines the baseline transport conditions and sets out the detailed access arrangements during both construction and operation of the site.

6.6.2 The site will be accessed from the east via Plas Bennion Road; a publically accessible single carriageway road.

6.6.3 During construction, access would be directly from Plas Bennion Road via a new temporary access. Construction is anticipated to last for approximately four months. A range of construction vehicles would be required to access the site including a crane and rigid lorries (up to 16.5 metres). Vehicles would use the A539 and then turn onto Plas Bennion Road. There would also be workers required on site, who would access the site via the same route.

6.6.4 The operational phase would require a permanent access from Plas Bennion Road to the Generating Facility Site. This access would be the same as required during construction. Vehicle movements to the site by operational staff would be infrequent (approximately once every 2 weeks for routine visits and once every six months for service visits). There would be approximately 2 deliveries of diesel per week.