

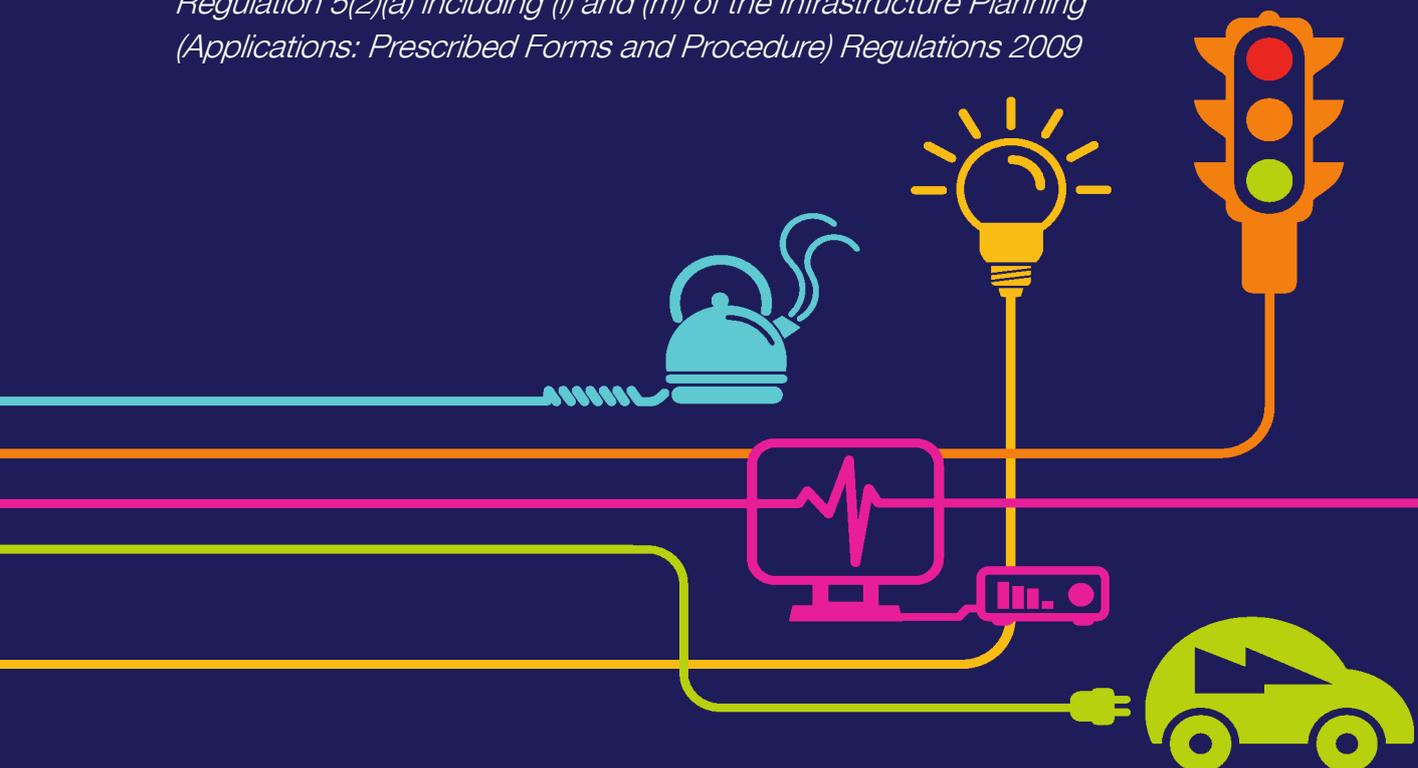
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Project Descriptions – Wylfa Newydd Power Station

Chapter 20 – Appendix 1

National Grid (North Wales Connection Project)

*Regulation 5(2)(a) including (l) and (m) of the Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009*



national**grid**

North Wales Connection Project

Volume 5

5.20.2.1 Appendix 20.1 Project Descriptions – Wylfa Newydd Power Station

National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

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Author	Jane Knowles		
Approved by	Nigel Pilkington		
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1 Introduction

1.1 INTRODUCTION

1.1.1 Horizon Nuclear Power (HNP) is proposing to install two UK Advanced Boiling Water Reactors (UK ABWR) with a combined electrical output of approximately 2,700 Mega Watts (MW) at the Wylfa Newydd Power Station Site located on the north coast of Anglesey adjacent to the Existing Power Station and west of Cemaes.

1.1.2 A Development Consent Order (DCO) was submitted for the project in June 2018. The application was accompanied by the Wylfa Newydd Project Environmental Statement (ES) (Ref 20.1). The information presented in this appendix (**Document 5.20.1.1**) is based on the information in the Wylfa Newydd Project Environmental Statement (ES) (Ref 20.1). Indicative locations of the main components of the application are shown on Figure 20.1 Indicative locations of Wylfa Newydd Power Station Developments (**Document 5.20.1.1**).

1.1.3 The Wylfa Newydd Project includes the following:

- Power Station: the proposed new nuclear Power Station, including two UK ABWRs to be supplied by Hitachi-GE Nuclear Energy Ltd., supporting facilities, buildings, plant and structures, and radioactive waste, spent fuel storage buildings and the Grid Connection;
- Other on-site development: including landscape works and planting, drainage, surface water management systems, public access works including temporary and permanent closures and diversions of public rights of way (PRoW), new Power Station Access Road and internal site roads, car parking, construction compounds and temporary parking areas, laydown areas, working areas and temporary works and structures, temporary construction viewing area, diversion of utilities, perimeter and construction fencing, and electricity connections;
- Marine Works comprising:
 - Permanent Marine Works: the Cooling Water, Marine Off-Loading Facility breakwater structures, shore protection works, surface water drainage outfalls, waste water effluent

outfall (and associated drainage of surface water and waste water effluent to the sea), fish recovery and return system, fish deterrent system, navigation aids and Dredging;

- Temporary Marine Works: temporary cofferdams, a temporary access ramp, navigation aids, temporary outfalls and a temporary barge berth;
- Off-site Power Station Facilities: comprising the Alternative Emergency Control Centre (AECC), Environmental Survey Laboratory (ESL) and a Mobile Emergency Equipment Garage (MEEG);
- Associated Development: the Site Campus within the Wylfa Newydd Development Area (WNDA); temporary Park and Ride facility at Dalar Hir for construction workers (Park and Ride); temporary Logistics Centre at Parc Cybi (Logistics Centre); A5025 Off-line Highway Improvements; A5025 and wetland habitat creation and enhancement works at Ty du, Cors Gwawr and Cae Canol-dydd.

1.1.4 Horizon is also proposing to undertake enabling works for the project which include:

- Site Preparation and Clearance (SPC) works to prepare the site for the main construction stage. Permission for these works will be sought both in the DCO and separately as a Town and Country Planning Act (TCPA) planning application (Ref 20.2); and
- On-line Highways Improvements work to improve the existing A5025 (including widening, reconstructing and resurfacing the road from Valley to the Power Station Site). These are not included within the DCO application. A separate planning application was submitted in November 2017 (Ref 20.3).

2 Development Description

2.1 POWER STATION

2.1.1 The power station site would comprise a range of buildings, structures, facilities and features. These include the following:

- main plant – buildings that are located in and around the single power island and contain the plant that is particularly important for safe generation of electricity. The main plant forms part of the Power Station that are unitised, meaning that there would be one for each Unit and therefore two of each within the Power Station Site. These include the reactor buildings, control buildings, turbine buildings, heat exchange buildings, filter vent buildings and emergency generators;
- common plant – comprising those parts of the Power Station that support the process of generation of power and are shared between the two UK ABWRs. These include the back-up building, service building, auxiliary boilers fuel tanks and water treatment building;
- supporting facilities, buildings, structures and features – including those parts of the Power Station that are integral to the Wylfa Newydd Power Station, but are not process related such as the administration building. These include offices and security facilities; and
- grid connection – apparatus to transfer electricity energy to the National Grid high voltage electricity transmission network.

Main Plant

The Reactor Buildings and Main Stacks

2.1.2 The reactor buildings and associated buildings are now combined on a single 'power island' (consisting of two reactor buildings, two turbine buildings, two control buildings, one service building and one radioactive waste building). The reactor building would be the tallest buildings on the Power Station Site at up to 49 m in height (67 m above ordinance datum (AOD)). Each reactor building would have an emissions stack (main stack) with a maximum height of 98 m AOD (Unit 1) and 95 m AOD (Unit 2). The main stacks would provide the discharge point for the off-gas system and for

the main ventilation system that would service the main buildings (reactor building, turbine building and radioactive waste building).

- 2.1.3 The reactor building would house the nuclear reactor, main steam supply and part of the steam supply tunnel, various safety systems, fuel handling equipment, suppression pool and spent fuel pool which is used for the storage of new nuclear fuel and the storage of spent fuel immediately after it has been removed from the reactor, prior to transfer to the spent fuel store. The suppression pool would also be inside the reactor building, which is used to cool steam released when depressurising a reactor. The plant in the reactor building would be supported by safety and auxiliary systems, including water cooling systems.

The Control Buildings

- 2.1.4 The control buildings maximum parameters would be 76 m by 50 m by 49 m and includes the main control room for the Units, as well as some of the electrical switchgear and support systems needed to supply electrical power to the Power Station's auxiliary systems.

The Turbine Buildings

- 2.1.5 The two turbine buildings maximum parameters would be 96 m by 121 m by 49 m and would house all equipment associated with the main turbine generator. This includes part of the steam supply system that feeds into the turbine, the turbine generator itself, the main steam condenser and the off-gas system which processes gasses from the steam. The system reduces radioactivity in the gaseous phase prior to discharge via the main stack.

Heat Exchanger Buildings

- 2.1.6 The heat exchanger buildings maximum parameters would be 69 m by 77 m by 49 m, and would be located close to the reactor and turbine buildings in order to reduce pipe runs and response time between them. The system would use seawater to cool essential plant and equipment, including the turbines and generators. Additionally, they would provide reactor cooling during certain emergency scenarios.

Filter Vent Buildings

- 2.1.7 The filter vent buildings maximum parameters would be 23 m by 28 m by 49 m and contain filtration and monitoring equipment to enable gases released within the reactor building in an emergency situation to be vented into the environment.

Standby Power Generations – Emergency Diesel Generators (EDGs), Back-Up Building Generators (BBGs) and Auxillary Standby Generators (ASGs)

2.1.8 Emergency alternating current power generation would be required to provide power to the Power Station safety systems that would support shut down and cooling the reactor in the event of loss of power. To ensure this process, both EDG and a back-up building is required. The following equipment would be installed on the Power Station Site:

- three EDGs per Unit would be required. One EDG would be located in each of the six EDG Buildings. Each EDG would be powered by a diesel-fuelled compression ignition engine rated at 10.4 MW (megawatts electrical output). Each EDG would have a maximum parameters of 35 m by 55 m by 49 m. The EDG stack would have a maximum height of 70 m AOD and a minimum height of 38 m AOD;
- four BBGs would be located in the back-up building and located to provide adequate separation from the reactor buildings and would include separate power and water supplies. The back-up building would include a diverse means of cooling the reactor cores and spent fuel pools. Each BBG would be powered by a diesel-fuelled compression ignition engine rated at 4.8 Megawatt electric (MWe). The BBG stack would have a maximum height of 61 m AOD and a minimum height of 51 m AOD; and
- two ASGs would be housed in the auxiliary standby generator building. Emissions from both ASGs would be via a twin-flue stack in a common windshield. Both ASGs would be powered by a diesel-fuelled compression ignition engine related at 3.6 MWe, situated within acoustic enclosures. The stack would have a maximum height of 51 m AOD and a minimum height of 42 m AOD.

Service Building

2.1.9 The service building would contain functions which are essential the functioning of the Power Station during its operation, for example the personnel monitoring and welfare facilities. It would also contain chemistry and environmental laboratories (maximum parameters 88 m by 41 m by 49 m).

Generator Transformer and Auxiliary Transformers

2.1.10 The electricity produced by each Unit would be transferred to the National Grid extra high voltage transmission network via the existing 400 kilovolts (kV) substation for connection at the existing National Grid substation adjacent to the Power Station Site. Each Unit would therefore have a 'step-up' transformer, located near to the electrical generator.

2.1.11 The auxiliary transformers would reduce the voltage of electricity generated by each Unit, or imported from the National Grid electricity transmission network, to a level suitable for use within the Power Station.

2.1.12 These would not be enclosed. Generator transformer would have a maximum parameter of 59 m by 24 m by 16 m. Auxiliary Transformers would have a maximum parameter of 22 m by 37 m by 11 m.

Condensate Storage Tanks

2.1.13 One condensate storage tank would be provided per Unit which would store demineralised water that would be used in the steam generation systems, suppression pool and fuel storage pond.

Suppression Pool Drain Tanks

2.1.14 Water stored in the suppression pool would be housed inside the reactor building and would condense steam. The condensed steam would then be returned to the reactor or to the condensate storage tank. The suppression pool drain tanks would be used periodically to allow the pool to be drained and inspected.

Industrial Gas Storage Facilities

2.1.15 Facilities to store gases that would be used routinely in operational processes. These gases would be stored in suitably sized tanks or cylinders.

Various Water, Oil and Fuel Tanks

2.1.16 Water would be stored in a number of locations to meet various requirements such as firefighting, potable and welfare uses and process losses.

2.1.17 Lubricating oil for the turbine would be needed and would be stored in tanks within the Power Station Site.

2.1.18 Fuel for the generators and auxiliary boilers would be stored in tanks capable of sustaining several days of operation. Smaller storage tanks would be provided to refuel vehicles based at the Power Station Site.

Common Plant and Supporting Facilities

Biocide Treatment Building

2.1.19 Biological control of the cooling water would be required to discourage the growth of marine organisms within the system. This would be in the circulating water biocide treatment near the cooling water system intake via dosing with chlorine derived from sodium hypochlorite controlled to a level to

ensure an acceptable concentration of residual chlorine at the outfall. The building would have a maximum parameters of 35 m by 24 m by 15 m.

Auxiliary Boiler Building

- 2.1.20 The auxiliary boiler building house would have a maximum parameter of 90 m by 34 m by 17 m (2 m below ground) and would house the auxiliary steam supply boilers and associated equipment that would be used for plant start-up and operation of various loads requiring non-radioactive steam supply. There would be six fuel oil fired boilers in the combustion installation, located in the auxiliary boiler building. Four boilers would discharge emissions through a shared stack containing four flues (north stack), and two boilers would discharge through a shared stack containing two flues (south stack). The auxiliary boiler building serves both Units.
- 2.1.21 The building would have a number of associated support facilities located in the vicinity of the boiler house including fuel oil storage tanks, purified water storage tanks and ancillary equipment inside the building.

Cooling Towers

- 2.1.22 The cooling towers comprise wet cell cooling towers, arranged in two sets (one in each Unit) and would have a maximum parameter of 52 m by 132 m by 31 m. These cooling towers would be used during certain emergency events and support routine operational testing.
- 2.1.23 The cooling towers would be connected directly to the reactor building Cooling Water System in the heat exchanger building, ensuring seawater being discharged back into the Irish Sea does not come into direct contact with any nuclear material.
- 2.1.24 Cooling towers would automatically be deployed to effect the safe shutdown of the reactor.

Make-up Water Treatment Building

- 2.1.25 The make-up water treatment building would have a maximum parameter of 21 m by 37 m by 8 m and would comprise the water treatment systems used to make the demineralised water required for various plant systems including the house load (auxillary) steam boilers. Water that is input to the building would be sourced from the local water supply to the Power Station Site. The output from the building would be treated water, which would be sent to the storage tanks and onward to the Power Station Site demineralised water distribution network.

Fire Water Pump houses

- 2.1.26 The fire water pump houses building would have a maximum parameter of 10 m by 15 m by 5 m and would accommodate four firewater pumps and electrical equipment required to supply pressurised water to the fire water main for the Power Station Site. Bulk water storage tanks would be located adjacent to the buildings and would be fed by the local mains water supply system, with at least two independent supply routes to give flexibility and redundancy, should one source of water fail.

Emergency Response Centre

- 2.1.27 Personnel, equipment and vehicles intended to respond to an incident within the Power Station Site, including fire response, would be housed within the emergency response centre. The building would have a maximum parameter of 83 m by 38 m by 16 m.

Garage for mobile emergency vehicles

- 2.1.28 This would house mobile vehicles and equipment that would provide emergency cooling, fire control and emergency power supply (in case the back-up building or EDGs are unavailable). The building would have a maximum parameter of 93 m by 22 m by 15 m.

Conventional Waste Storage

- 2.1.29 The waste and recycling facility would be located within the outer perimeter of the Power Station Site and would be for conventional waste and hazardous waste streams, including a specific area for the storage of hazardous waste. This area would provide facilities for the collection, sorting and temporary holding of waste and recyclable materials generated within the Power Station Site. The building would have a maximum parameter of 74 m by 44 m by 14 m.

Administration Building

- 2.1.30 The administration building would have a maximum parameter of 158 m by 45 m by 23 m and would provide office accommodation for up to 300 permanent personnel and up to 50 visitors. The building would form the main reception for invited visitors to the Power Station, as well as including restaurant facilities, a dosimetry office and the primary document control centre for the Power Station.

Maintenance Facility

- 2.1.31 The maintenance facility would have a maximum parameter of 100 m by 45 m by 20 m and would incorporate workshop spaces for heavy and light mechanical, electrical, control and instrumentation activities and a laboratory. It would also provide office, welfare and occupational health

space for maintenance staff, as well as meeting facilities, a permit office, stores and maintenance planning facilities.

Stimulator and Training Building

- 2.1.32 The stimulator and training building would have a maximum parameter of 145 m by 85 m by 21 m and would house two full scope simulators of the Power Station Units, as the primary tool for training operators. The building would also house classrooms and related training facilities, and would be used as soon as it is available during main construction for staff training. Once operational the site would be used up to 24 hours a day.

Outage Building

- 2.1.33 The outage building would have a maximum parameter of 140 m by 43 m by 19 m and would provide canteen facilities, changing room facilities and welfare for day and night shift personnel. It would also house a control centre, maintenance control centre, permit office, store and management office. The building would be brought into use during periods of outage and planning, implementation and close out; however, the building would be permanently manned, including times between outages.

Cylinder Storage House

- 2.1.34 A gas storage house would be located on the Power Station Site in order to store gases that would be used routinely in operational processes. These gases would be stored in suitable sized tanks or cylinders. The storage house would have a maximum parameter of 30 m by 30 m by 7 m.

Switchgear Buildings

- 2.1.35 There would be one switchgear building per Unit that would house the 6.9 kV switchgear; and heating, ventilation, and air conditioning plant. The building would have a maximum parameter of 70 m by 32 m by 49 m. Switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

Plant Logistics Warehouse

- 2.1.36 A warehouse provided for receiving deliveries and would have a maximum parameter of 35 m by 105 m by 13 m.

Fuelling Station

- 2.1.37 The fuelling station would have a maximum parameter of 41 m by 38 m by 11 m and comprise an area of hardstanding within the southern part of the Power Station, which would contain a fuel pump for refuelling site vehicles.

Foul Water Pumping Station

- 2.1.38 The foul water pumping station would have a maximum parameter of 12 m by 12 m by 5 m and would comprise of a buried chamber with package pumps for the pumping of foul water from the WNDA to the existing Dŵr Cwmru Welsh Water Cemaes waste water treatment plant.

Intake Screen Structure for Auxillary Service Water System

- 2.1.39 The auxiliary service water system intakes and screening would be located either side of the Cooling Water intake with the pumping installation for these systems located in the heat exchanger building. A skiller wall would be located up to 50 m in front of the intake screens.
- 2.1.40 The auxiliary service water system provides cooling to auxiliary systems in the Power Station and also removes the heat generated within related equipment and rooms. The circulating water and auxiliary service water system would draw water directly from the Irish Sea at the Porth-y-pistyll foreshore.
- 2.1.41 The intake water structure, including auxiliary service water structure would have a maximum parameter of 174 m by 97 m by 25 m.

Reserve Ultimate Heat Sink

- 2.1.42 The Irish Sea is the ultimate heat sink. Should the cooling system become impaired, a cooling tower facility, based on focused draft wet cell cooling towers, would be called into service. There would be no additional discharge from this facility into the marine environment.

Radioactive Waste Facilities

- 2.1.43 The Power Station Site layout includes a number of radioactive waste buildings and structures.

Radioactive Waste Building

- 2.1.44 The purpose of the radioactive waste building is to house the Liquid Waste Management System (LWMS) and the wet intermediate level waste (ILW) and low level waste (LLW) buffer storage tanks. The building would have a maximum parameter of 82 m by 68 m by 49 m and would be a combined facility for both reactors, comprising of collection tanks, treatment systems, sample tanks and storage tanks. The facility would vent any radioactive gaseous discharges via the main stack of Unit 1, in accordance with the limits established through the Environmental Permit that Horizon would need to hold. Processed effluent would be returned to storage tanks for re-use, but on occasion effluent would be discharged to sea via the Cooling Water

System outfall after sampling and monitoring to demonstrate that it was within discharge limits specified in the Environmental Permit.

- 2.1.45 The radioactive waste building would be constructed during the Main Construction stage and would be available for use during commissioning, operation and decommissioning.

Wet LLW Processing and Wet ILW Processing Facilities

- 2.1.46 The wet LLW and wet ILW processing facilities would process the waste by immobilising it in cement using in-drum mixing. This facility would vent gaseous discharges via the main stack.

Solid LLW Processing and Temporary Storage Facility

- 2.1.47 Dry LLW generated across the Power Station Site would be taken to this dry LLW processing facility, where it would be processed and packaged for disposal.

Radioactive Waste Storage Buildings

- 2.1.48 Lower Activity Radioactive waste (LAW) storage facility would provide the capability for the management of dry solid LAW. There would be one shared LAW management facility for the two Units. As LAW would be transported from site to treatment and/or disposal facilities that hold appropriate Environmental Permits, the on-site storage would be limited to the collation of transportable quantities of waste, with some in-built contingency should any off-site route be temporarily unavailable. The facility would also include floor space to enable the construction of modular containment systems to support any ad-hoc small scale waste production.
- 2.1.49 As there is no available UK disposal facility for Higher Activity Radioactive waste (HAW), the Power Station has designed and incorporated a facility and capabilities to manage the production, processing and storage of HAW. Two other radioactive waste storage buildings would serve the Power Station, namely: the ILW storage facility (maximum parameters would be 150 m by 49 m by 19 m, with a 3 m stack to aid ventilation); the dry High Level Waste (HLW) decay and spent fuel storage facility (maximum parameters would be 150 m by 190 m by 29 m, a 3 m stack to aid ventilation may also be required).
- 2.1.50 The ILW storage facility would provide long-term on site storage for packages of solidified wet solid ILW produced in the radioactive waste building. There would be one ILW storage facility for the two Units.
- 2.1.51 The spent fuel storage facility would provide a long-term storage for shielded dry storage casks containing spent fuel and HLW. HLW is stored until such

time as the radioactive content has reduced ('decayed') sufficiently to be categorised as ILW. The facility would comprise a simple overbuilding to provide environmental and security protection for the casks. There would be one shared spent fuel storage facility for the two Units.

2.1.52 The storage facilities would be positioned together in the south-west corner of the site and would provide safe and secure facilities at the Wylfa Newydd Power Station for housing certain categories of radioactive wastes in the interim period prior to disposal to the UK Government's planned geological disposal facility. They would need to remain in situ beyond the end of power generation.

2.2 OTHER ON-SITE DEVELOPMENT

Temporary Development at the Power Station Site

2.2.1 In addition to the temporary laydown areas and structures required during construction, a temporary construction viewing area for visitors will be provided for members of the public to observe construction and there is a need for temporary accommodation for key workers at the Power Station Site.

Landscaping Works

2.2.2 The permanent Power Station development would be subject to a landscaping scheme.

2.2.3 The Landscape Environmental Management Plan focus on the following:

- creating a new landscape setting, in conjunction with an appropriate architectural design;
- use natural resources efficiently, for example by retaining excavated material on-site to create building platforms and landscape mounding;
- retaining and enhancing existing woodland, scrub, hedgerows and grassland habitats where possible;
- providing a range of wildlife habitats for biodiversity improvements;
- provide effective visual screening (and biodiversity benefits), for example planting new woodland to supplement visual screening provided by landscape mounding;
- providing a network of new footpaths to replace routes closed due to construction;

- providing a safe temporary viewing area for visitors to view construction activities;
- providing buffer zones where necessary, for example, between the proposed landscape mounds and Tre'r Gof SSSI and other sensitive receptors;
- developing a phased construction sequence to provide early landscape mitigation on the outer parts of the WNDA;
- considering opportunities for the sensitive return of land to agricultural use, in conjunction with biodiversity improvements; and
- Strengthen the landscape character and restore the field boundary pattern wherever practicable, including hedgerows, cloddiaue and dry-stone walls.

Public Access

2.2.4 A number of PRoWs, including the Wales Coast Path, would be affected by construction activities, necessitating the creation of diversions and some closures. The existing Cemlyn Road, which is part of the Copper Trail cycle route, would also need to be closed through the Power Station Site. Nanner Road provides an alternative access to Cemlyn Bay from the A5025.

2.2.5 Diversion of the Wales Coast Path will be inland of the existing and proposed Power Stations due to technical, safety and security considerations. To help mitigate the inland diversion, a network of footpaths will be created within the WNDA, to provide alternative sea views and other attractive routes for recreational walkers during operation of the Power Station. These will include a route along the Afon Cafnan and a route over the new drumlin landform. This network of footpaths would link to Cemlyn Bay, Wylfa Head and the re-opened Fisherman's Car Park. In addition, a dual footpath and cycle path would be created linking the Copper Trail to Cemaes, via Penrhyn.

Internal Roads

2.2.6 A network of internal roads and pedestrian walkways would be provided.

Lighting

2.2.7 It is likely that lighting would be required for permanent roadways and car parks, for office buildings and for perimeter lighting of the security fence, which is a statutory requirement for nuclear sites. In addition, there would

be a low level of pedestrian amenity lighting required across the Power Station Site to aid safe pedestrian movement.

- 2.2.8 Operational lighting would be designed to be appropriate to local needs and conditions. Excessive lighting levels would be avoided, LED and high efficiency bulb use would be promoted and, wherever practical, bulb dimming functions would be incorporated into lamps. Lamp selection would aim to prevent light spill and sky glow through the use of directional lighting and accessories such as barn door shields. Roadway lamps with a zero upward light component would be selected.

Power Station Access Road

- 2.2.9 There would be a single, principal point of access for staff and the majority of vehicles approaching the Power Station under normal operational conditions. This would approach the Power Station at the south-east corner, connecting to the A5025 via a proposed new roundabout junction to the south of Tregele.

Car Parking

- 2.2.10 The Power Station Site layout includes car parking in three locations. There would be 200 parking spaces at the simulator and training building, 200 permanent parking spaces and a maximum 650 temporary spaces in the northern car park and a further 700 parking spaces (including 20 disabled parking spaces) in the southern car park.

Site Perimeter Fence and Entrance Buildings

- 2.2.11 There would be an inner security fence and an outer security fence.
- 2.2.12 The fences would be monitored by alarm systems and CCTV, and would have permanent perimeter lighting.
- 2.2.13 Both the inner and outer security fences would have a main gatehouse as well as a secondary gatehouse, forming the entrance buildings to the Power Station Site.

2.3 MARINE WORKS

Marine Off-Loading Facility

- 2.3.1 The Marine Off-Loading Facility (MOLF) would be required to facilitate the construction of the Power Station through delivery of key freight by sea, and would therefore be constructed early on in the programme and be operational throughout the Main Construction phase. MOFL would offset

the need for the delivery of a considerable quantity of construction materials by road and, therefore, would reduce the volume of road traffic.

- 2.3.2 The MOLF would provide two purpose-built quays. A bulk quay (with two berths) would extend between the eastern breakwater and the Ro-Ro quay and comprise two berthing platforms. A Roll-on-Roll-off (Ro-Ro) quay would extend eastwards from the southern end of the bulk quay (i.e. towards the shoreline) comprising of a quayside used primarily for Ro-Ro vessels and List-on Lift-off vessels.
- 2.3.3 The MOLF would be located in Porth-y-pistyll, directly to the south-west of the Existing Power Station.
- 2.3.4 The MOLF infrastructure would be incorporated into the design of the Eastern Breakwater. The Eastern Breakwater and the Western Breakwater are required to maintain suitable and safe wave conditions for the intake of the Cooling Water System. The breakwaters have the additional benefit of offering protection for vessels berthing at the MOLF, particularly in stormy conditions, enhancing its availability for deliveries.
- 2.3.5 Dredging in front of the Porth-y-pistyll shoreline using a temporary cofferdam (semi-dry construction).

Cooling Water System

- 2.3.6 A seawater, once-through Cooling Water System will be the primary means to remove 'waste heat' produced as a by-product of power generation. The sea currents around Wylfa provide very good mixing of water that would effectively disperse localised heating of the sea associated with discharged cooling water (CW).
- 2.3.7 The Cooling Water System requires the following:
- CW intake structure and pumphouse (to draw water in from the sea), including screening and fish protection and return systems. This will be located behind the Port-y-pistyll foreshore. The CW intake would be situated within the CW intake channel located in the south-east corner of Porth-y-pistyll;
 - breakwater structures at Port-y-pistyll to offer necessary weather protection to the CW intakes, including calming the water to reduce wave heights during stormy conditions;
 - underground CW pipes from the intake structure and pumphouse to the turbine buildings - there would be a set of these for each Unit;

- reactor building service water system/turbine building service water system pipes from the intake structure to the heat exchanger building where both the pumps and heat exchangers are located;
- seal pits (to prevent vacuum conditions in the Cooling Water System during low tide periods) - one for each Unit;
- underground outfall tunnels, to transfer water from the seal pits to the outfall structure - there would be a set of these for each Unit; and
- CW outfall structure (to return water to the sea). This will be in the same location as the Existing Power Station outfall at Porth Wnal.

2.3.8 Horizon has elected for a once-through circulating water system, using seawater abstracted from the Irish Sea.

2.3.9 A CW outfall facility would be constructed in Porth Wnal adjacent to the Existing Power Station outfall and would be fed by two discharge tunnels to their outlet into the Irish Sea. The CW outfall has been designed to maximise the momentum of the discharge, promoting mixing and dispersal of associated biocide products to the north of Wylfa Head where the offshore currents would aid the dispersion to reduce the risk of recirculation.

2.4 OFF-SITE POWER STATION FACILITIES

2.4.1 Off-Site Power Station Facilities are part of the emergency planning arrangements for the power station site. They are physically separate from, but local to, the Site. These are required by the Office for Nuclear Regulation (ONR) in respect of emergency planning.

2.4.2 The Off-Site Power Station Facilities consist of the Alternative Emergency Control Centre (AECC), Environmental Survey Laboratory (ESL) and the Mobile Emergency Equipment Garage (MEEG). These will be located onto a single site at Llanfaethlu.

2.4.3 Facilities would be shared between the buildings and would include a small sewage treatment unit, access and delivery areas, and underground fuel tank and ancillary/plant buildings.

2.4.4 There would be 13 staff car spaces provided on the hardstanding portion of the site (including two disabled spaces) and two motorcycle spaces.

2.4.5 Additionally, there would be an overspill car park for 54 spaces provided in the southern portion of the site. This would be used during an incident or training exercise, and would be paved in 'grasscrete', a permeable paving material.

- 2.4.6 The ESI would be staffed day-to-day role for routine sampling analysis (normal business hours). The MEEG/AECC would not be staffed day-to-day but would be accessed for training events, periodic vehicle checks, maintenance and during an emergency response event.

Mobile Emergency Equipment Garage and Alternative Emergency Control Centre

- 2.4.7 The combined MEEG and AECC building would be a single storey structure with the approximate maximum dimensions of 13 m in length, 24 m in width and 53 m in height.
- 2.4.8 The MEEG would enable Horizon to store a number of specialist vehicles at a location close to but separate from the Power Station Site, allowing them to be rapidly deployed if needed to support an incident. The MEEG could also be used as a marshalling point for support arriving on Anglesey before onward dispatch to the Power Station Site in an emergency situation.
- 2.4.9 The AECC would provide back-up command and communications facilities that would be used to remotely manage an incident at the Power Station in the extremely unlikely event the primary facilities on the Power Station Site were unavailable.
- 2.4.10 The MEEG and the AECC would not usually be staffed. Should there be an incident or training however, there could be a combined workforce of approximately 85 working at the MEEG and AECC.

Environmental Survey Laboratory

- 2.4.11 The ESL would perform a normal operating function for environmental monitoring and, as such, would contain facilities such as radiation monitoring equipment to conduct radiological surveys in the local area. There would be equipment for analysing samples and assessing the implications for the public and the environment under normal operation and during an emergency situation.
- 2.4.12 The ESL building is proposed to be a single storey structure with approximate maximum parameters of 30 m by 18 m by 8 m.
- 2.4.13 The total number of vehicle movements per day during the operational stage is approximately five vehicles arriving and five vehicles departing per day. This figure will increase during an incident or training.
- 2.4.14 It is expected that three staff would work at the ESL on a regular basis.

2.5 ASSOCIATED DEVELOPMENT

On-site Campus Providing Temporary Workers' Accommodation (Site Campus)

2.5.1 A temporary construction campus to accommodation construction workers would be built in phases on the Power Station Site. The Site Campus will provide an independent living space for each worker, with shared campus-style amenities.

2.5.2 The preferred proposals for the temporary Site Campus comprise:

- accommodation for up to 4,000 workers in 'campus' style modular form (providing an independent living space for each worker) buildings. Buildings would be between four and seven storeys in height, with each building providing between 128 and 228 bed spaces;
- amenity and welfare building including cafeteria, café, reception area, gym, bar, shop, first aid facilities and other social space;
- site Campus Medical Centre;
- secondary substation, compactor, cycle store and bin store;
- outdoor recreation including two multi-use games areas, outdoor seating and informal amenity spaces;
- Site Campus access road (from the site to the A5025);
- disabled parking spaces (staff only) and parking for light vans/minibuses;
- temporary parking for workers during the initial phases of construction, consisting of 400 spaces internal access ways for pedestrians, service vehicles and emergency vehicles;
- internal access ways for pedestrians, service vehicles and emergency vehicles;
- a dedicated bus service and/or dedicated walking routes to transfer the temporary Site Campus residents to their place of work within the WNDA;
- 2.4 m high Paladin type fence around the perimeter; and
- Soft landscaping works.

- 2.5.3 During the peak operational stage of the Site Campus, up to 400 members of staff would be employed on-site for management, welfare and security services.
- 2.5.4 It is expected that the Site Campus would be operational some two years following grant of development consent, and be operational for five years, with peak occupation levels occurring across the last two years of operation. However, the Site Campus would be designed to have a service life of a minimum of 10 years.

Dalar Hir Park and Ride Facility

- 2.5.5 A Park and Ride facility is proposed at Dalar Hir, immediately to the north-east of Junction 4 of the A55. This would act as a hub for the transfer of construction workers from private vehicles to buses.
- 2.5.6 The Park and Ride Facility at Dalar Hir would be 15.5 hectares (ha) in size and would comprise:
- secure parking for up to 1,900 cars, as well as spaces for 10 disabled car spaces, 55 minibuses, 35 motorbikes and 25 bicycles;
 - a bus waiting pick up and drop off zone for up to 15 buses with additional parking for approximately 8 buses; and
 - a Bus Terminal Facility Building.
- 2.5.7 The Bus Terminal Facility Building would provide transport information, waiting area, welfare facilities, a bus driver canteen, cycle store and management office facilities. It would be manned 24 hours a day with lighting, secure fencing and CCTV. An electricity substation to distribute power to the site (approximately 10 m by 11 m by 6 m) would also be constructed.
- 2.5.8 The car parking areas would use a permeable paving type product. Roads and the bus drop off area would be traditional macadam surface to withstand the traffic volumes and types of vehicle that would be using them. The proposed design would incorporate Sustainable Urban Drainage Systems (SUDS).
- 2.5.9 A watercourse crossing would be constructed to the east end of the site.
- 2.5.10 Access to the proposed facility for buses and workers' vehicles would be via a new roundabout located in close proximity to the existing A55-A5 junction (Junction 4) at the western tip of the site. Pedestrian access and pedestrian crossing points would be clearly marked within the parking areas.

2.5.11 The Park and Ride Facility would be used during the construction phase of the Power Station to transport and manage the flow of some of the construction workforce to and from the WNDA, reducing the number of vehicles on the road.

2.5.12 At the end of the construction period, the Park and Ride Facility would be removed and the site reinstated to agricultural use. The existing hedge line and proposed new hedge line to the west of the site, along with tree and shrub planting, using native species, on the southern boundary would be retained as a legacy benefit.

Parc Cybi Logistics Centre

2.5.13 A Logistics Centre is proposed at a site within Parc Cybi close to Junction 2 of the A55, south of Holyhead. This facility is intended to control the timing of construction related traffic movements to the Power Station Site. Construction deliveries would be directed to this facility for registration and holding prior to onward movement to the WNDA

2.5.14 The design of the Logistics Centre includes:

- a welfare/office building;
- security kiosk at the entrance/exit of site;
- driver instructor point;
- covered inspection bay;
- a heavy goods vehicle (HGV) scanner;
- parking spaces for 100 HGVs and 12 staff parking bays (including one disabled space); and
- security features including paladin fencing (2.4 m high) with controlled access barriers and systems, CCTV and lighting.

2.5.15 The proposed design would incorporate SUDS. A grassed boundary buffer zone around the site, inside the fence is also proposed to keep with the character of the local area.

2.5.16 Lighting would be required but it would be designed to minimise light spill into the surrounding area. Lighting would be provided within the boundary of the site and would generally be pole mounted (typically at 8 m around the perimeter and 12 m towards the centre of the site).

- 2.5.17 The final design of the Logistics Centre would accommodate the route of the Lon Trefignath cycle path or a suitable minor diversion is provided. A direct connection into the site is proposed.
- 2.5.18 HGV movements to and from the Power Station Site and the Logistics Centre shall generally be restricted to 07:00 to 19:00. During peak periods, a maximum of 40 goods vehicles would be arriving at, and departing the Logistics Centre per hour. It has been assumed all these vehicles are HGVs. The total number of vehicle movements per day would be approximately 160 vehicles arriving and 160 vehicles departing per day.
- 2.5.19 Approximately 14 staff would be employed at the Logistics Centre. It is anticipated that the Logistics Centre site would be operational for a period of approximately 10 years and would be operational 24 hours per day, covering the period for the construction phase of the Power Station Site. At the end of the construction period, the Logistics Centre would be made available for an alternative use or development, subject to any required permissions being obtained by a future occupier.

A5025 Off-line Highway Improvements

- 2.5.20 Construction traffic for the proposed development would have to use the A5025 from the A55 Junction 3 to the north of Valley to get to the WNDA. Improvements will be made due to the condition of this section of road between Valley and the Power Station Site. Off line improvements will comprise new sections of bypass and improvements to straighten bends in some locations, specifically:
- A5/A5025 Valley Bypass - a four-arm roundabout junction connecting the A5 with the A5025;
 - Llanfachraeth Bypass (A5025) - a new 2 kilometre (km) highway to provide a bypass to the east of Llanfachraeth village;
 - Llanfaethlu Bypass (A5025) - proposed to eliminate two existing substandard bends near the Black Lion pub and the Old Coffee Shop through Llanfaethlu village;
 - Cefn Coch Bypass (A5025) - proposed to eliminate two existing substandard radius bends in Llanrhydrus between Llanrhyddlad and Cefn Coch; and
 - Power Station Access Road Junction - provide a new junction from the A5025 to link with the proposed Power Station Access Road.

A5/A5025 Valley Junction

- 2.5.21 The proposed Valley Bypass to the east of the village, between the A5 (south of Valley) and a new junction with the A5025 to the north of Valley. A four-arm roundabout at the southern extent would connect the A5 with the A5025. The roundabout would be situated on-line of (to be constructed as part of the existing A5 highway).
- 2.5.22 The inclusion of cycling and pedestrian provisions to the south of the roundabout and away from the carriageway edge is proposed, and this would provide safe routes around the bypass for such users.

Llanfachraeth Bypass

- 2.5.23 A new 2 km highway to provide a bypass to the east of Llanfachraeth village is proposed. The northern section of the bypass would be constructed in a cutting to minimise noise pollution and vibration levels. The design includes an overbridge to accommodate the side road that would be crossed by the bypass. The side road overbridge would be constructed off-line of the existing side road to minimise disruption to the local highway network throughout the construction period.
- 2.5.24 The design also includes an elevated viaduct allowing traffic to cross the Afon Alaw. The design allows cattle and pedestrians to cross underneath the structure adjacent to the River Alaw as well as allowing space for a footpath.

Llanfaethlu Improvements

- 2.5.25 At Llanfaethlu, a bypass is proposed to eliminate two existing substandard bends near the Black Lion pub and through Llanfaethlu village. A new footpath would be provided to the west of the highway to allow pedestrians to access Llanfaethlu village from the properties to the north of the bypass. A safe crossing point would be provided across the A5025.

Cefn Coch Improvements

- 2.5.26 The Cefn Coch bypass is proposed to eliminate two existing substandard radius bends in Llanrhwydrus. Constructing a bypass at Cefn Coch stops up the road leading to Llanfechell to the east of the proposed bypass and removes the existing staggered cross-roads along the A5025 between Llanrhwydrus and Llanfechell.
- 2.5.27 The design includes an accommodation overbridge approximately half way along the bypass to facilitate the safe movement of cattle.

Power Station Access Road Junction

2.5.28 A new roundabout junction will be designed to provide access to the proposed Power Station Site via a new access road. The roundabout junction will be designed off-line (set back from the highway) with highway alignment improvements from the A5025 to the new roundabout.

Electrical Connection from the Power Station to the National Grid substation

2.5.29 The Power Station would be connected to the 400 kV grid via the existing substation adjacent to the Existing Power Station. The connection between the Power Station and the substation would form part of the Wylfa Newydd Power Station application for a DCO.

2.5.30 This is likely to be via XLPE cable or Gas Insulated Line (GIL) by one of the following methods: directly buried; placed in tunnels or ducts; or installed above-ground either at ground level in a secure enclosure or on steelwork at height.

2.6 OTHER CONNECTED WORKS

Site Preparation and Clearance

2.6.1 Horizon has submitted applications for planning permission for the Enabling Works under the TCPA 1990 to the Isle of Anglesey County Council (IACC).

2.6.2 The application for the SPC Proposals includes an ES that reports the findings of the EIA of the SPC Proposals. The SPC proposals have also been included in the application for development consent. The SPC would extend across the WNDA and include preparatory activities and works to facilitate the construction of the Power Station, such as site clearance and levelling, associated earthworks and drainage, along with the permanent closure and diversion of a section of Cemlyn Road and various PRowS. Main SPC activities are set out in the following paragraphs.

2.6.3 Establishing the main site compound, comprising:

- temporary structures providing offices, welfare and mess facilities, a fuel store and parking for office-based staff and the site workforce; and
- an overflow parking area (currently the area used as the car park serving the Wylfa Sports and Social Club) would be used when necessary and a new footpath link formed between it and the main site compound.

2.6.4 Establishing road crossings, comprising:

- a new vehicular crossing of the Existing Power Station access road for the access and egress of construction vehicles to the north of the site from the main site compound; and
- an existing vehicular crossing of Cemlyn Road, which will be formalised for use by construction vehicles.

2.6.5 Other activities, comprising:

- a remediation processing compound, within which contaminated material will be treated;
- establishing additional compounds, for the storage of plant and materials;
- treating invasive non-native species;
- erecting construction fencing around the perimeter of the SPC application site;
- realigning a tributary of Afon Cafnan;
- managing protected species, including translocation;
- clearing buildings and all other existing above ground structures; and
- clearing vegetation.

2.6.6 If the DCO is not granted or the Wylfa Newydd Project does not proceed, all Project related structures would be removed and the affected land would be subject to a scheme of restoration to return it to an acceptable condition once agreed with IACC.

On-line Highway Improvements

2.6.7 A separate planning application for the proposed On-line Highway Improvements was submitted to IACC in November 2017 under the TCPA 1990.

2.6.1 The On-line Highway Improvements on the A5025 predominantly relate to carriageway widening in locations where the constrained nature of the carriageway could restrict two-way HGV movements. The works include the replacement of the existing carriageway and minor widening within or adjacent to the highway boundary. It is proposed to:

- reconstruct and widen parts of the existing carriageway in sections;

- improve the existing pavement in sections;
 - modify and improve road signage and markings;
 - provide a temporary construction compound adjacent to the A5025;
and
 - accommodate the existing National Cycle Network, PRow and private means of access (e.g. driveways), including some localised improvements.
- 2.6.2 A new agricultural access road directly to the A5025 has been proposed to provide a chainage 840 m to allow for vehicular transportation of cattle along the bypass. Verges are required to be widened in this area to accommodate a 2.4 m by 160 m visibility splay for vehicles emerging from this new access.
- 2.6.3 A number of Private Means of Access (PMA) would be affected by the proposed bypass and these would be replaced or improved. The existing farm access at the southern and northern end of the bypass would be widened to allow easier access for HGVs and large agricultural vehicles.
- 2.6.4 Resurfacing would involve surface dressing the existing road by using hot rolled asphalt.
- 2.6.5 The National Cycle Network intersects the A5025 in a number of locations and new crossing points and sections of surfaced cycleways would be provided as part of the improvement works.
- 2.6.6 Where PRowS intersect or terminate at the A5025, the improvements have been designed so as not to affect their operation. There are four PRowS (49/014/2, 27/018/1, 27/020/1 and 27/012/1) during construction which would require temporary closures. However, the vast majority terminate at the A5025 and require users to travel alongside the A5025 to continue and make a connection with another PRow. Sufficient verge width at the intersections with the A5025 would be provided to keep pedestrians away from the carriageway edge.
- 2.6.7 Reconstruction involves removing and replacing the layers which make up the highway surface.

All waste and materials would be managed in a responsible manner with the intention of applying the principles of the waste hierarchy and legislative requirements. This would reduce the volume of material required to be removed from the site and increase the reuse, recycling and recovery of waste off-site.

2.6.8 Horizon has completed improvements to Nanner Road allowing Nanner Road to cater for the additional traffic movements following the closure of Cemlyn Road (which leads from the A5025 at Tregele to Cemlyn Bay).

Replacement Alternative Emergency Control Centre (AECC) and District Survey Laboratory (DSL)

2.6.9 The WNDA includes a building, accessed from Cemlyn Road, currently used as an AECC and DSL in support of the Existing Power Station. This building is required to be removed to facilitate the construction of the new Power Station.

2.6.10 Planning permission (granted conditional approval in June 2016) has been obtained to replace the existing AECC and DSL on land to the north of Tregele. The development includes a secure compound comprising a single storey main building with ancillary sample preparation room, new access from the public highway and external landscaping works.

3 Development Boundary

3.1 POWER STATION SITE AND SURROUNDING

- 3.1.1 The WNDA is located on the north coast of Anglesey, covering 409 ha of land and extending into the Irish Sea at Porth-y-pistyll.
- 3.1.2 The Power Station Site is the indicative area of land and sea within which the majority of the permanent Power Station buildings, plant and structures will be located. This includes the two nuclear reactors, steam turbines, the cooling water system intake, outfall structures, breakwaters and the MOLF.
- 3.1.3 The WNDA is the indicative areas of land and sea including the Power Station Site, and the surrounding areas that will be used for construction and operation of the Power Station. It will also include the Site Campus. This area is representative of the maximum area that will be physically affected by construction activities related to the Power Station and used to form the setting and landscaping features of the operational Power Station.

Visitor and Media Reception Centre

- 3.1.4 The proposed site for the Visitor and Media Reception Centre is at the proposed junction of the A5025 and new Power Station Access Road, just under a kilometre south of Tregale. The site is largely undeveloped, with some derelict agricultural buildings along its boundaries.

Training and Simulator Building

- 3.1.5 The preferred location for this building is within the Power Station Site boundary, adjacent to the A5025 and south of Tregale.

3.2 OFF-SITE POWER STATION FACILITIES

- 3.2.1 The Off-Site Power Station Facilities consist of the AECC, Survey Laboratory (ESL) and the Mobile Emergency Equipment Garage (MEEG) will be located on a single site at Llanfaethlu.
- 3.2.2 The site at Llanfaethlu is located adjacent to the A5025, approximately 7.5 km from the WNDA.

3.2.3 The site comprises existing commercial garages and workshops together with associated hard standings, and is used as a bus depot and associated motor maintenance facilities in conjunction with the running of the current business.

3.3 ASSOCIATED DEVELOPMENT

On-site Campus Providing Temporary Workers' Accommodation (Site Campus)

3.3.1 The Site Campus comprises approximately 15 ha of greenfield land within the WNDA to the north-east of the Power Station Site and to the east of the Existing Power Station.

Dalar Hir Park and Ride Facility

3.3.2 The location of the Park and Ride Facility is at Dalar Hir, immediately to the northeast of Junction 4 on the A55. The Dalar Hir site is a 15.5 ha largely greenfield site, located approximately 1 mile to southeast of Bodedern, a small village. It adjoins the northern boundary of the A55. The site has easy access to the A55 and A5025.

Parc Cybi Logistics Centre

3.3.3 A site for the Logistics Centre has been identified at Parc Cybi close to Junction 2 of the A55, south of Holyhead. The site is located within a wider employment area on the edge of Holyhead. The site is located to the south east of the main settlement of Holyhead town, near existing industrial and retail developments. The site is bounded by the A55 to the north, the Parc Cybi service road to the south, a substation to the west and open countryside to the east.

A5025 Off-line Highway Improvements

3.3.4 The A5025 between Valley and the Power Station Site is approximately 16.5 km in length and can broadly be explained as 8 sections. Sections 1, 3, 5 and 7 relate to the sections where Horizon is proposing Off-line Highway Improvements.

3.3.5 The sections comprise:

- Section 1 – A5 east of Valley Junction to north of Valley Junction (A5/A5025);
- Section 2 – north of Valley Junction (A5/A5025) to north of Llanynghenedl;

- Section 3 – north of Llanynghenedl to north of Llanfachraeth;
- Section 4 – north of Llanfachraeth to south of Llanfaethlu;
- Section 5 – south of Llanfaethlu to north of Llanfaethlu;
- Section 6 – north of Llanfaethlu to north of Llanrhyddlad;
- Section 7 – north of Llanrhyddlad to north of Cefn Coch;
- Section 8 – north of Cefn Coch to Power Station Access Road Junction; and
- Power Station Access Road Junction – north of Cefn Coch.

3.4 OTHER CONNECTED WORKS

Site Preparation and Clearance

- 3.4.1 The SPC application site comprises approximately 300 ha and covers the majority of the WNDA.

A5025 Highway Improvements

- 3.4.2 The A5025 between Valley and the Power Station Site is approximately 16.5 km in length and can broadly be explained as 8 sections as outlined in Paragraph 3.3.5. Sections 2, 4, 6 and 8 relate to the sections where Horizon is proposing On-line Highway Improvements.

Nanner Road

- 3.4.3 Horizon has completed improvements on Nanner Road as part of the A5025 On-line Highway Improvements.

Replacement AECC/DSL

- 3.4.4 This facility would be located at Llanfaethlu, located at a point immediately adjacent to the main road network (A5025, A55, A5), in a zone of low seismic activity and in area upwind and between 1.5 km and 5 km of the Power Station Site. The AECC facility would be added as a mezzanine level to the Mobile Emergency Equipment Garage building.

4 Construction

4.1 POWER STATION SITE AND SURROUNDING

Main Construction (Stage 2)

4.1.1 The Power Station Main Construction stage would start once the DCO had been secured. Activities would comprise the following:

- remaining clearance activities;
- settlement ponds and drainage channel provision and the stripping and storage of topsoil;
- establishing the construction site, including the construction of temporary buildings and infrastructure;
- major civil works, including bulk earthworks to create building platform levels, deep excavation to allow the reactor buildings and associated main plant to be constructed on hard rock, and initial landscaping works to help mitigate noise and visual impacts;
- marine construction, including construction of the breakwaters and the MOLF;
- building construction and mechanical and electrical installation, which includes the construction of the reactor buildings and other buildings. The extensive use of cranes will be necessary at this point, including two very heavy lift cranes up to 270 m high, one mobile heavy lift crane up to 220 m high, and approximately 40 tower cranes up to 192 m high and a large number of smaller cranes; and
- final landscaping and demobilisation, where the construction plant and machinery is removed and the final landforms are completed.

4.1.2 The Power Station Access Road would be constructed early in the Main Construction stage, providing a link to the A5025 via a new junction to the south of Treglele.

Open Top Construction Methodology

- 4.1.3 An open top construction methodology will be used. When using the open top method, the building walls are constructed then major items of equipment or modules, such as the reactor vessel, are placed into position through the temporary open top in the building. The floor above is then constructed and further equipment placed on that floor through the open roof while mechanical and electrical installation, piping and cabling, continues on the floor below.

Commissioning and Operation (Stage 3)

- 4.1.4 The following activities would be undertaken:
- a progressive period of construction including pre-operational testing, followed by commissioning of the plant (start-up testing);
 - operating the Power Station for approximately 60 years;
 - each Unit is planned to operate on an 18-month fuel cycle: 17 months at high power and one-month shutdown. Fuel cycles for the two units would not run concurrently. The scheduled outages would be for approximately 30 days allowing some of the fuel assemblies to be replaced;
 - a longer shut down of each Unit once every 10 years for more significant maintenance; and
 - construction and operation of spent fuel and waste storage and processing facilities.

Decommissioning (Stage 4)

- 4.1.5 The Power Station would be decommissioned following approximately 60 years of operation and the approach would be consulted upon in accordance with the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999, as may be amended.
- 4.1.6 The operational radioactive waste storage facilities and any additional decommissioning waste management facilities (if required) would provide safe and secure facilities at the Power Station for housing certain categories of radioactive wastes in the interim period prior to disposal to the UK Government's planned geological disposal facility.

Construction Programme

- 4.1.7 The overall programme for site construction at Wylfa Newydd is anticipated to commence following grant of development consent. The Main Construction stage is anticipated to take 7 years, with the first Unit operational seven years after grant of development consent. The second Unit is anticipated to be operational two years later. A phased approach to the detailed planning and scheduling of the overall construction works (from Enabling Works, through Main Construction and on to full operation of the Wylfa Newydd Power Station) would be adopted.
- 4.1.8 Bulk earthworks, deep excavations, rock excavations and the MOLF construction would commence in the first year following grant of development consent. Construction activities, concrete production, distribution and placing, steel reinforcement works, carnage, access to structures and related site logistics would likely peak during year 4 following grant of development consent.
- 4.1.9 Certain tasks will require periods of 24 hour working. The following site operation hours and shift patterns are expected for initial activities during Main Construction:
- Earthworks – daylight hours only (single day shift – 7 days/week assumed for assessment purposes);
 - Marine (dredging) – 24 hour operation, 7 days a week;
 - Marine (activities other than dredging) – single day shift – 7 days/week assumed for assessment purposes; and
 - Large concrete pours during the construction phase – yet to be confirmed but likely to be a 24 hour operation, 7 days a week.
- 4.1.10 The MOLF would therefore be constructed early on in the programme and be operational throughout the Main Construction phase.
- 4.1.11 The Training and Simulator Building would need to be constructed early on in the programme allow sufficient time for the first set of operational staff to be fully trained in readiness for the commissioning activities. The facility would be used as soon as it is available during Main Construction for staff training.
- 4.1.12 The commissioning of Unit 1 and Unit 2 would commence in year 2 following the grant of development consent. Unit 1 Construction, Commissioning and Start-up would take 5.5 years to construct, being operational in year 8 following the granting of development consent. Unit 1 Construction,

Commissioning and Start-up would take 7 years to construct, being operational in year 9 following the granting of development consent.

4.1.13 The spent fuel and waste storage and processing facilities will take approximately 1 year to construct.

4.2 OFF-SITE POWER STATION FACILITIES

Alternative Emergency Control Centre and Environmental Survey Laboratory

4.2.1 The construction period is expected to last three years. The facilities would then be operational until the Power Station is decommissioned.

4.3 ASSOCIATED DEVELOPMENT

On-site Campus Providing Temporary Workers' Accommodation (Site Campus)

4.3.1 Construction of the Site Campus would commence following the grant of development consent, and would be fully operational in year 5 following grant of development consent.

4.3.2 The main phases would be as follows:

- Phase 1: Approximately 1,000 bed spaces and 400 temporary parking spaces on land within the site adjoining the first phase;
- Phase 2: Approximately 1,500 additional bed spaces and 400 additional temporary parking spaces. The 400 temporary parking spaces provided at Phase 1 would become the temporary accommodation site for Phase 2 and so would be replaced by 800 temporary parking spaces at a location along the access road; and
- Phase 3: Approximately 1,500 additional bed spaces.

4.3.3 Outdoor recreation would be provided in the first phase of the development and the modular amenity and welfare building would be provided in equal proportions alongside the accommodation.

Dalar Hir Park and Ride Facility

4.3.4 It is expected that construction work for this facility would commence in the first year following grant of development consent and that construction activity on the site would last for approximately 18 months. This construction period is based on Horizon incrementally providing additional parking spaces as the demand increases.

- 4.3.5 The construction workforce for the Park and Ride Facility would be a maximum of 70 workers on the construction site at any one time. Construction work would be limited to 08:00 to 18:00 hours weekdays and 08:00 to 13:00 hours on Saturday.

Parc Cybi Logistics Centre

- 4.3.6 Construction of the Logistics Centre would commence once the development consent order (DCO) for the Wylfa Newydd Power Station is received. It is anticipated that the construction of the Logistics Centre would take up to 15 months.

- 4.3.7 The construction workforce for the Logistics Centre would number a maximum of 50 workers on the construction site at any one time, working in shift patterns 07:00 – 19:00 Monday to Friday and 07:00 – 13:00 on Saturdays. Once operational, the Logistics Centre would have an operational workforce working up to 24 hours a day, 7 days a week, in order to support the shift pattern on the construction of the Power Station Site.

A5025 Off-line Highway Improvements

- 4.3.8 Highway Improvement works would commence in the first year following award of development consent. It is anticipated that works would take up to 18 months.

4.4 OTHER CONNECTED WORKS

Site Preparation and Clearance (Stage 1)

- 4.4.1 The construction of the WNDA Development would be carried out firstly through SPC works. It is anticipated that SPC would take approximately one year to complete, and would be completed in year two following the granting of development consent. The detailed programme and sequence will vary depending on seasonal constraints for some of the works, construction methods and processes adopted by the contractor, mitigation requirements and operational practicalities.

A5025 Highway Improvements

- 4.4.2 The full construction programme for the A5025 Off-line Highway Improvements would be approximately 18 months.
- 4.4.3 As the A5025 On-line Highways Improvements are subject to a separate planning application which was submitted in November 2017, the timeframe for the delivery of these works was omitted from Horizon's ES. The Design and Access Statement for Wylfa Newydd Project A5025 On-line Highway

Improvements suggests, including landscape improvements, the programme could take up to three years.

Nanner Road

- 4.4.4 Horizon has completed improvements to Nanner Road as part of the A5025 On-line Highway Improvements.

Replacement AECC/DSL

- 4.4.5 The construction of this facility would commence following the completion of the A5025 Highway Improvements.

5 References

Ref 20.1 Horizon Nuclear Power, June 2018, Wylfa Newydd Project Environmental Statement, Volumes A to J.

Ref 20.2 Horizon Nuclear Power, June 2017, Wylfa Newydd Project A5025 On-line Highway Improvements Environmental Report.

Ref 20.3 Horizon Nuclear Power, August 2017, Wylfa Newydd Project Site Preparation and Clearance Environmental Statement.