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Visual Impact Provision (VIP)
Snowdonia Project
Environmental Summary

March 2020

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Introduction

National Grid is proposing to underground a section of the existing overhead line within and adjacent to the Snowdonia National Park. The project is referred to as the Snowdonia Project (hereon referred to as the Proposed Project) and forms part of the wider Visual Impact Provision (VIP) Project.

The Proposed Project represents a major opportunity to mitigate the visual impact of existing electricity infrastructure at Snowdonia National Park near Minffordd and to conserve and enhance the natural beauty, wildlife and environmental heritage of the area.

Pylons 4ZC030R, 4ZC031 and 4ZC032

National Grid operates the high voltage electricity transmission system in Great Britain and owns the system in England and Wales. The system operates mainly at 400,000 volts (400kV) and 275,000 volts (275kV), connecting the electricity generators to substations where the high voltages are transformed to lower voltages, enabling the power to be distributed to homes and businesses by Distribution Network Operators who operate at a maximum of 132,000 volts (132kV). For more information on National Grid and its operations see http://www2.nationalgrid.com/uk/.

The Proposed Project comprises the permanent removal of an approximately 3.5km long section of existing overhead line that runs from close to National Grid's existing Garth Sealing End Compound on the western side of the Dwyryd Estuary to Cilfor on the eastern side of the Dwyryd Estuary. The overhead line in this area is judged to have landscape impacts of very high level of importance on the Ardudwy Coastal Hinterland and a part of Morfa Harlech landscape, as well as high level visual impacts for users of the Wales Coast Path regional trail, and local public rights of way, open access and cycle routes. Ten existing pylons will be replaced with approximately 3.4km of new underground cable within a tunnel. A new Sealing End Compound and replacement tension pylon will be constructed at the eastern end of the Proposed Project to connect the new underground cable to the remaining existing overhead line and a tunnel head house would be required at each end.

National Grid will be submitting applications for elements of the Proposed Project under the:

- Town and Country Planning Act 1990
- Marine and Coastal Access Act 2009

National Grid will also be undertaking elements of the works under:

- permitted development rights

- exemption regulations
- existing consents

Details of the various consenting regimes for these elements are provided in the table on page 7 and in the section under 'Planning Process'.

It was confirmed on 8 November 2019 that the Proposed Project did not require a formal Environmental Impact Assessment under the Environmental Impact Assessment Regulations. However, to support the applications, an Environmental Appraisal has been undertaken to understand and predict the effects that the Proposed Project may have on the receiving environment and to also meet National Grid's statutory duties. This has considered the effects that the construction, operation and decommissioning stages of the Proposed Project might cause to the existing condition of the environment and takes into account measures incorporated into the project design and other methods (termed mitigation) that will be employed to reduce the significance of those effects.

This document comprises a standalone document that presents a summary of the principal findings of the Environmental Appraisal.

Consultation

Consultation has been integral to the design and development of this stakeholder led project. Stakeholder engagement has involved a range of activities including Stakeholder Advisory Group meetings, Stakeholder Reference Group meetings, direct engagement, third party channels, media relations, public drop-in events, attendance at appropriate local events, and the establishment of a project specific dual language website (http://snowdonia.nationalgrid.co.uk/).

The Stakeholder Advisory Group was established in April 2014. The Group is chaired by environmentalist and broadcaster Chris Baines and comprises senior representation from 15 stakeholder bodies, namely: Cadw, Campaign for National Parks, Campaign to Protect Rural England (CPRE), The Campaign for the Protection of Rural Wales (CPRW), Historic England, the Landscape Institute, the National Association for Areas of Outstanding Natural Beauty (AONBs), National Parks England, National Parks Wales, the National Trust, Natural England, Natural Resources Wales, The Ramblers, Visit England and Visit Wales. These organisations are dedicated to enhancing landscapes and countryside areas throughout England and Wales. They advise the project not only on identifying and developing individual projects, but also on the most effective ways to engage with stakeholders at a local level.

The Stakeholder Reference Group for the Snowdonia Project was established in early 2015 and has been a critical part of National Grid's wider stakeholder engagement and empowerment programme, allowing open dialogues with local stakeholders, keeping them informed about the project, and establishing their priorities for using the Visual Impact Provision funding. Stakeholder Reference Group membership includes representatives from Gwynedd Council, Snowdonia National Park Authority, Gwynedd Archaeological Planning Service, Gwynedd Council Planning Service, National Trust, Natural Resource Wales, Cadw and Network Rail. In 2018, elected member representatives from Penrhyndeudraeth Town Council, Talsarnau Community Council and Maentwrog Community Council were invited to join the Group. The input of local people, from local enthusiasts to residents and technical experts, has been sought throughout the Proposed Project.

Public drop-in events were held in July 2016 in Snowdonia National Park Authority Head Quarters in Penrhyndeudraeth, and Holy Trinity Church Hall in Penrhyndeudraeth. Additional drop-in events were also held in November 2018, at accessible public venues in Snowdonia Park Authority Offices, the Neuadd Goffa Penrhyndeudraeth and Talsarnau Village Hall. The

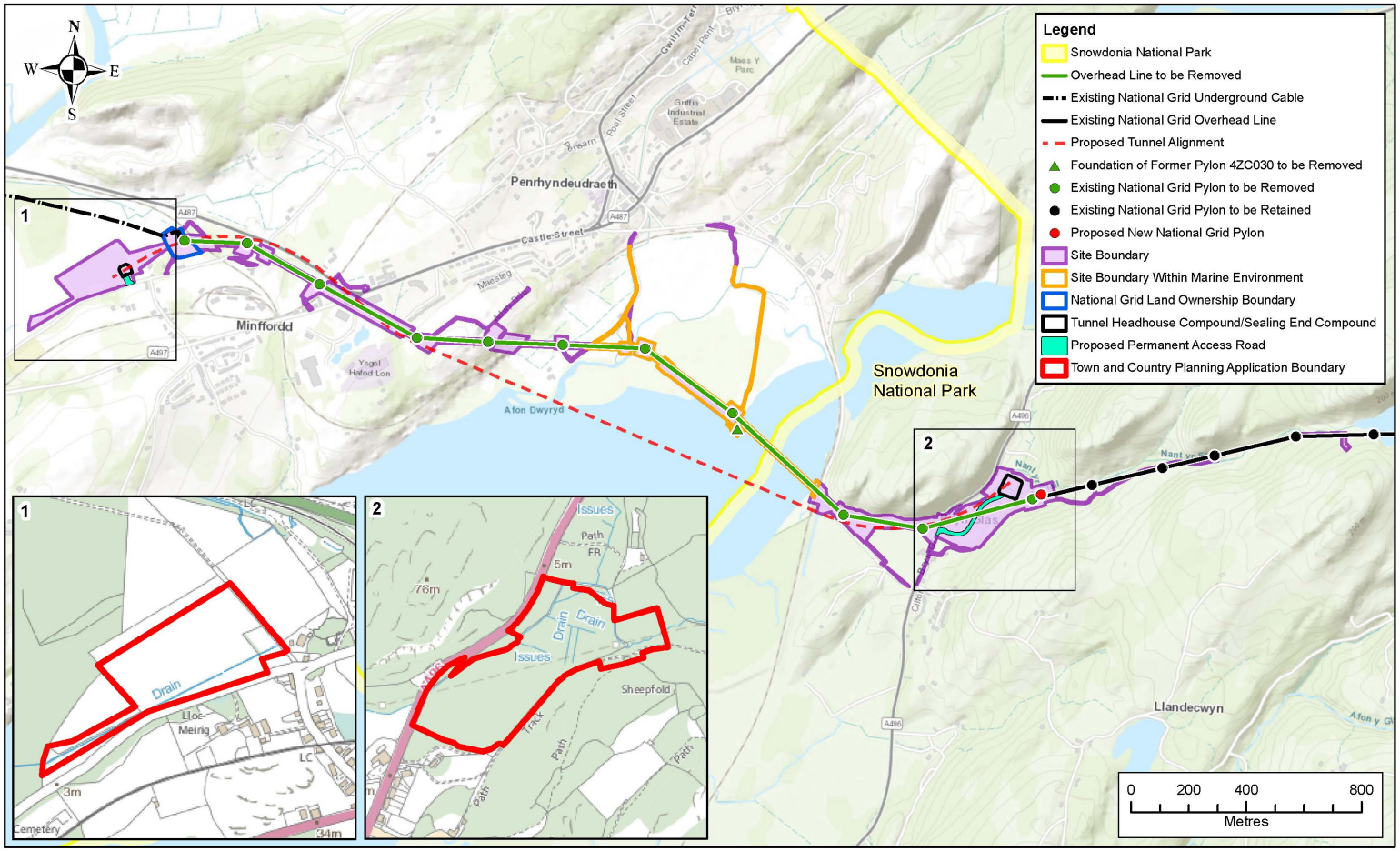
events were attended by members of the VIP team together with relevant professional advisers who updated the local community on the progress of the project and gave details given on the construction plans. Printed and online feedback forms were available at the events to provide feedback via the website or freepost at a later date. A further drop-in event was also held at the Snowdonia National Park Authority Offices in December 2019 during the pre-application consultation period. Attendees included representatives of Snowdonia National Park Authority, CPRW, North Wales Wildlife Trust, the Snowdonia Society, Ffestiniog Railway, local business owners and residents and landowners.

VIP Snowdonia Public Consultation event, November 2018

Project Overview

The Proposed Project would remove a section of National Grid's existing electricity transmission line in Snowdonia National Park near Minffordd (see Overview Map below). The overhead line to be removed runs from National Grid's existing Garth Sealing End Compound on the western side of the Dwyryd Estuary. The overhead line travels across the Dwyryd Estuary, crossing the Snowdonia National Park boundary, reaching Cilfor on the eastern side and continues north east.

VIP Snowdonia Overview Map



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The Proposed Project will comprise the following main elements:

- A tunnel with a shaft and tunnel head houses with a permanent access at either end of the tunnel. Electrical infrastructure to be laid within tunnel;
- Removal of a section of existing overhead line and ten pylons (VIP Subsection), including partial removal of the foundations of the previously dismantled pylon 4ZC030 within the Dwyryd Estuary;
- An underground buried cable to connect into the existing Garth Sealing End Compound from the tunnel head house on the western side of the Dwyryd Estuary;
- Reconfiguration of equipment at the existing Garth Sealing End Compound;
- Construction of a new Sealing End Compound adjacent to the proposed tunnel head house on the eastern side of the Dwyryd Estuary;
- Removal and replacement (at adjacent location) of one pylon adjacent to the proposed new Sealing End Compound on the eastern side of the Dwyryd Estuary;
- Diversion of third-party assets to enable the above works to proceed;
- Temporary access routes (with potential highways improvements) and construction compounds/ laydown areas to facilitate construction activities; and
- Minor works on pylons 4ZC026 to 4ZC023 to ensure that the overhead line is made safe for conductor and pylon removal in the VIP Subsection.

Planning Process

National Grid is seeking to secure full planning permission for specific elements of the Proposed Project by way of a planning application to be submitted jointly under the Town and Country Planning Act 1990 to Snowdonia National Park Authority and Gwynedd Council. Other elements will constitute permitted development under the Town and Country Planning (General Permitted Development Order) 1995 (as amended), are covered by an exemption under the Electricity Act for works to the overhead line, or make use of existing consents held by National Grid.

Marine licence applications will be submitted to Natural Resources Wales for works within the marine environment of the Dwyryd Estuary under the Marine and Coastal Access Act 2009 including the construction of the tunnel beneath the marine environment, including the laying of the cable within the tunnel and pylon and foundation removal including the dismantling of pylons (4ZC030R and 4ZC031), and the foundations of the previously dismantled pylon 4ZC030.

Due to the technical specification of the works involved with the Proposed Project, National Grid are seeking confirmation from Snowdonia National Park Authority (also acting on behalf of Gwynedd Council) that the Proposed Project would be exempt from the Electricity Act 1989.

A summary of the relevant consenting regimes for the Proposed Project is provided in the table below.

Summary of Primary Consenting Regimes

Works Element	Consenting Regime
Western side of the Dwyryd Estuary	
Western tunnel head house (including the associated construction compound) Permanent access	Planning permission required under Town and Country Planning Act (1990)
Section of underground buried cables to connect existing Garth Sealing End Compound to western tunnel head house Tunnel shaft Tunnel (and cable within) from tunnel shaft to Mean High Water Spring Temporary access Reconfiguration of Garth Sealing End Compound	Permitted development rights under Town and Country Planning (General Permitted Development) 1995. Part 17, Class G
OHL and pylon removal, associated access tracks and working areas (terrestrial)	Under existing consent - Electricity Act 1947/57
Estuary/Marine	
Tunnel (and cable within) (marine) OHL and pylon removal, associated access tracks and working areas (marine)	Marine licence required under Marine and Coastal Access Act 2009
Tunnel construction	Permitted development rights under Town and Country Planning (General Permitted Development) 1995. Part 17, Class G
OHL and pylon removal, associated access tracks and working areas (marine)	Under existing consent - Electricity Act 1947/57
Eastern side of the Dwyryd Estuary	
Eastern tunnel head house (including the associated construction compound) Sealing End Compound and permanent access track	Planning permission required under Town and Country Planning Act (1990)

Works Element	Consenting Regime
Tunnel shaft Tunnel (and cable within) from tunnel shaft to Mean High Water Spring Access to pylons 4ZC026 to 4ZC023 to undertake alteration to conductors	Permitted development rights under Town and Country Planning (General Permitted Development) 1995. Part 17, Class G
New pylon 4ZC027 and overhead line works connecting to new Sealing End Compound	Section 37 Exemption under Electricity Act 1989 To be confirmed through a separate notification process.
OHL and pylon removal, associated access tracks and working areas (terrestrial)	Under existing consent - Electricity Act 1947/57

Alternatives

The National Grid Visual Impact Provision Snowdonia Options Appraisal Study 2019 describes the options considered during project development between 2015 and 2018, and follows on from previous reports including the Snowdonia Options Appraisal Study (2015) and National Grid Visual Impact Provision Landscape and Visual Impact Assessment of Existing Electricity Transmission Infrastructure in Nationally Protect Landscapes in England and Wales – Technical Report (2014) and National Grid Visual Impact Provision Policy Document (2013, reviewed 2017). This suite of documents provides the detailed background to the VIP Project and contains relevant information on how overhead line 4ZC subsection, which connects Pentir and Trawsfynydd 400kV substations, was selected for further consideration. The Options Appraisal Study 2019 considers alternative methods for crossing the Dwyryd Estuary, alterative tunnel alignments, siting options for infrastructure on the western and eastern sides of the estuary, and pylon removal options

Overview of Key Project Components

Shaft Construction

In order to construct the tunnel, vertical shafts will need to be constructed at the start and end points of the tunnel on eastern and western sides of the Dwyryd Estuary. Construction compounds will be required at each shaft location.

Construction of Tunnel Head Houses

Each tunnel shaft will require a permanent tunnel head house to allow controlled safe and secure access into the shafts, provide enclosure for ventilation, to locate associated mechanical and electrical equipment and to house control equipment for the cable circuits. The overall rationale of the VIP Project is to mitigate the visual impact of existing electrical infrastructure in nationally protected landscapes, therefore tunnel related above ground structures have been designed to minimise their visual impact. The tunnel head houses have been sized to accommodate only the required equipment for the operation of the tunnel. Each has been designed in a way to fit in with the environment and surroundings.

Tunnel Construction

Using a tunnel boring machine, a tunnel will be constructed between the two shafts. The tunnel boring machine will be launched from the west and received from the shaft at the eastern end of the tunnel. Tunnelling works are expected to take place for approximately 17 months.

Cable Installation

Two High Voltage electrical systems (400kV and 132kV) will be installed within the tunnel. The work to install the High Voltage Systems will largely be completed underground with some activities on the surface at each end to connect the cables to the existing electrical infrastructure.

A short section of cable, approximately 200m, will be buried to connect the High Voltage System in the tunnel to the existing cables at Garth Sealing End Compound (western side of Dwyryd Estuary). Following completion of the cable ducting, the ground would be returned to its previous use. Hedgerows and other field boundaries would be reinstated. Trees felled would not be replanted over the buried cable but would be replaced locally elsewhere.

Construction of Sealing End Compound

On the western side of the Dwyryd Estuary, the existing Sealing End Compound at Garth will be retained, although existing gantries will be removed. The existing permanent access to Garth Sealing End Compound will be used during its operation, however during construction access to Garth Sealing End Compound will be along the section of cable connecting the tunnel head house to the existing Sealing End Compound.

A new permanent Sealing End Compound will be required on the eastern side of the Dwyryd Estuary, near Clifor, to achieve the transition from an underground connection to overhead line. The Sealing End Compound is likely to require piled foundations. A terminal pylon will also be required (Pylon 4ZC027R) which will replace the existing Pylon 4ZC027. The Sealing End Compound will require the construction of a new permanent road access which will also service the adjacent tunnel head house.

Removal of Existing Infrastructure

As part of the Proposed Project, approximately 3.5km of existing 400kV and 132kV overhead lines will be permanently removed, along with 10 pylons (from Pylon 4ZC027 to 4ZC037).

The overhead line fittings, such as dampers and spacers will need to be removed from the conductor spans. The spacers and dampers will be collected and lowered down at the pylons. The conductors between pylons may be removed by lowering them to the ground and reeling them onto wooden transport drums, or alternatively using continuous tension stringing whereby the conductor is replaced under tension by a light bond which is used to reel the conductor onto drums for removal from site. The light bond would be lowered to the ground and reeled in at the receiving pylon site. This method will have minimal impact on anything at ground level.

Pylon dismantling and removal will be carried out using a variety of methods depending on the pylon type, location and access. Pylon dismantling methods will include:

- Using a large mobile hydraulic crane - pylons will be lowered to the ground, cut using steelwork breakers and placed into waste skips.

- Winch and Derrick method – the derrick will be raised to the top of the pylon and supported with four stay wires. The pylon will act as scaffold and will be dismantled into small sections from the inside. The winch and derrick will lower small sections of pylon to the ground.

Once pylons are dismantled, hydraulic breakers will be used for foundation removal within the terrestrial environment. Broken concrete will be removed form the site as waste and the void will be backfilled with a non-cohesive fill from a local source, overlain by the soil previously set aside.

Typical Pylon Dismantling

Within the marine environment, in-situ redundant foundations from a pylon (4ZC030) taken down in 2013 will be removed as far as possible as part of the project. The method of removal for the redundant foundations involves building a working platform so that an excavator with a hydraulic breaker can be located close to the foundations. The foundations furthest away from shore (outer pile caps) will be broken up and removed first before the size of the working platform is reduced and the remaining foundations (inner pile cap) will be broken up and removed.

Redundant 4ZC030 foundations in the Dwyryd Estuary

Pylon 4ZC030R foundations and cofferdam at the edge of the estuary channel

In addition, two functioning pylons and associated foundations will be removed as far as possible. Pylon 4ZC030R consists of single steel tube pile leg foundations surrounded by a cofferdam consisting of sheet piles. The foundation collars will be removed using a hydraulic breaker. The preferred approach to removing the single steel tube pile leg foundations and cofferdam is to use a Leader Pile Rig which will grip the pile and remove it vertically with a vibrating action. Once removed, sheets will be cut into manageable sizes and lifted out using a crane. The reinforced concrete will be disposed of and the redundant steelwork removed for recycling. As this area is tidal the void in the ground will fill naturally with local material by tidal action.

4ZC031 Pylon on saltmarsh (2019)

Pylon 4ZC031 is situated on saltmarsh and will be removed using the Piled Foundation method. Soil will be excavated around each foundation, pile caps will be removed, and the void will be backfilled with soil set aside during excavation.

Temporary Construction Compounds

Construction compounds, laydown areas, and temporary access tracks will be required to facilitate construction activities

Construction Programme

The overall construction period for the Proposed Project will be approximately 5 - 6 years. First site access is expected in 2021 subject to gaining all necessary approvals. Removal of the existing overhead line will take place following construction of the new Sealing End Compound and installation and commissioning of the new cable connection.

Environmental Effects and Mitigation

Experts from a wide range of disciplines have undertaken an appraisal of environmental effects of the Proposed Project. Studies have been undertaken in accordance with scopes agreed with the appropriate statutory consultees and nature conservation bodies and following established standards and best practice guidance.

The Proposed Project and its associated mitigation measures have been designed to minimise adverse environmental effects. The principal findings of the Environmental Appraisal are summarised in the following sections.

Landscape and Visual

The Proposed Project will result in substantial improvement to landscape character and visual amenity of the western edge of Snowdonia National Park and its highly valued coastal

fringe setting characterised by the Glaslyn and Dwyryd Estuaries and the distinctive Minfordd Penninsula which separates them.

The existing infrastructure (VIP Subsection) has previously been identified as having a high level of adverse landscape and visual effects, the permanent removal of approximately 3.5km of 400kV overhead line including 10 pylons and the existing gantry at Garth Sealing End Compound and subsequent restoration of the landscape contributes towards a large number of greatly beneficial landscape and visual effects.

Construction activities associated with the Proposed Project will have some short-term negative effects on the character of the landscape and visual amenity of very localised areas. In the context of the scale of the Proposed Project and the existing landscape, the requirements for tree removal would be minimal. With the exception of a relatively modest amount of tree loss, construction effects would be short term, temporary and reversible. Furthermore, tree removal would be minimised as much as possible and tree protection measures would be put in place to ensure that all trees to be retained are protected. Replacement and additional native tree and scrub planting would comprise an appropriate mix of species that would enhance and complement the landscape. This would ensure that effects of construction would be mitigated as far as practicably possible in the medium to long term as planting matures.

The Proposed Project lies within a typically highly valued area of landscape on the edge of the Snowdonia National Park. The relatively well contained topography of the landscape to the north of Cilfor would limit the extent of the operational landscape and visual effects of the proposed eastern tunnel head house, sealing end compound and access road and the new replacement/terminal pylon would be viewed as a replacement of an existing pylon. The landscape currently has levels of human influence, the most notable being the existing 400kV OHL and Garth Sealing End Compound. The proposed infrastructure to the west and infrastructure to the east of the Dwyryd Estuary would be viewed as smaller, isolated features in the landscape than the VIP Subsection which they would replace. Over time the replacement and addition of native trees and shrubs around the proposed infrastructure would help assimilate the buildings and associated compounds and access tracks into the landscape and frame and filter views of them. Furthermore, the adverse effects would be balanced against the beneficial effects of removing the VIP Subsection.

Terrestrial Ecology

An ecological assessment has been undertaken to identify and assess the potential construction, operational and decommissioning effects resulting from the Proposed Project on ecological features (designated sites, species and habitats). The assessment has identified all valued ecological features and the effects of the Project, and in turn has outlined appropriate mitigation and compensation measures to avoid, reduce or offset any effects. Where opportunities exist, measures to provide beneficial effects have been outlined.

The Proposed Project will result in predicted effects on statutory sites and the species for which they are designated including Meirionnydd Oakwoods and Bat Sites Special Area of Conservation (SAC), Bron Y Garth Site of Special Scientific Interest (SSSI) and Glaslyn SSSI. With mitigation incorporated during and after construction the direct and indirect effects upon these sites has been avoided, reduced or mitigated.

During construction, the proposed access routes, works compounds and construction zones will have potential effects on a number of habitats and protected species including salt-marsh, valley mire habitat (peat), semi-natural woodland, badgers, bats, reptiles and breeding birds and toads. Mitigation measures will include appropriate timing of works, re-instatement of important habitats, landscape planting and limited night working and

appropriate lighting designs. Following the incorporation of mitigation and compensation measures, including prompt reinstatement, it has been possible to avoid, reduce or offset any effects as far as practically possible.

Terrestrial Archaeology & Cultural Heritage

An archaeological and cultural heritage appraisal has been undertaken to assess the potential construction, operational and decommissioning effects resulting from the Proposed Project on the archaeological features of the area.

The removal of infrastructure within the VIP subsection will result in permanent beneficial indirect effects for those assets in the surrounding landscape which currently have visibility of the pylons and conductors.

Within the western compound and cable route, impacts upon below-ground archaeological remains may potentially occur associated with a Roman road alignment and peripheral activity at the margins of the Glaslyn Estuary. The potential for the presence of any such remains within the Proposed Project footprint is low, however an archaeological watching brief will be undertaken during construction to observe groundworks and provide an opportunity for the archaeological investigation and recording of any deposits of significance which are exposed.

Within the eastern compound, impacts upon below-ground archaeological remains may potentially occur associated with a Holocene peat deposit infilling a former palaeochannel, and potentially any peripheral human activity at the margins of the Dwyryd Estuary. In order to mitigate the impact on these deposits, a programme of archaeological work will be undertaken, commencing with investigation of the palaeoenvironmental significance of the peat deposit in advance of construction. This initial phase will inform the subsequent mitigation response to construction groundworks and may include a watching brief during construction in order to observe the groundworks and record any deposits of significance that are exposed.

Where temporary works, including ground-breaking, are undertaken for the creation of accesses and crane pads for the removal of pylons 4ZC033, 4ZC034 and 4ZC035, a watching brief will be carried out in order to record the presence of any previously unknown archaeological remains.

In all instances where archaeological remains are identified the creation of a permanent record, including public dissemination of the results prior to their removal, would offset the development impact and result in no residual effect.

Water Resources & Flood Risk

An appraisal of the potential impacts of the Proposed Project on water resources has been undertaken including consideration of surface and groundwater resources, hydromorphology, water quality, flooding and drainage, and Water Framework Directive objectives.

The implementation of a Construction Environmental Management Plan (CEMP) and embedded mitigation measures are considered sufficient to reduce the main water resources impacts of the Proposed Project during the construction, operational and decommissioning phases to an acceptable level. Additional mitigation measures will be provided to address surface water drainage and water quality considerations for the new access roads to the western and eastern tunnel head house compounds and to manage pumped groundwater discharges to avoid increasing flood risk or morphological damage to the receiving watercourses.

Geology, Soils and Contaminated Land

A geology, soils and contaminated land assessment has been undertaken to assess the potential construction, operational and decommissioning effects resulting from the Proposed Project, and to identify measures required to protect the hydrogeological and geological environment.

The assessment identified potential impacts from the hazardous accumulation of ground gas potentially effecting both human health and buildings, structures and services, and the potential for contaminated or aggressive soil conditions (elevated sulphate and or pH) to affect the underground structures. Mitigation will include a gas monitoring programme and potential remediation of contamination encountered.

An Outline Waste Management Plan has been prepared as part of the Project which sets out a series of principles and standard measures for waste management, as well as a commitment to the production of Site Waste Management Plans and where appropriate, Materials Management Plans for each of the principal construction elements of the Project.

Agriculture and Land Use

An assessment of the potential effects on agriculture and land-use as a result of the construction, operation and decommissioning of the Proposed Project has been undertaken. The assessment has focused on the soil types present, the quality of the agricultural land and farming practices. The majority of the land comprises pastoral farmland. The land is of better quality on the western side of the Dwyryd Estuary where the soils are drier. On the eastern side the ground is very wet and peat deposits are present. The main effects of the Proposed Project relate to temporary effects on agricultural practices, and the permanent loss of approximately 0.76ha of land, along with the potential for increased disturbance to livestock as a result of the temporary construction activities. The design of the project, the way in which best practice construction techniques and approaches will be adopted, along with compensation discussions, will minimise potential effects on agriculture and land use to acceptable levels.

Traffic and Transport

The main traffic and transport effects associated with the Proposed Project will relate to an increase in traffic flows from construction vehicles on the surrounding traffic and transport network which would occur over a period of around five years between 2021 and 2026. The local traffic and transport network that has the potential to be affected by the Proposed Project includes Major (A Roads), Minor (B Roads and Classified Unnumbered 'C' roads, sections of the national cycle route and the public rights of way network. The peak construction activity in terms of traffic generation is expected to relate to the excavation of rock and soil during tunnelling. Forecasts indicate that tunnelling will generate in the order of 30 loads per day, (60 two-way HGV movements). During this period, worst-case forecasts indicate that tunnelling activities could generate 160 two-way Light Goods Vehicles (LGV) movements spread across three shifts. Tunnelling works are expected to take place for approximately 17 months.

Heavy Goods Vehicle (HGV) traffic will be required to enter the road network from the A487 either from the east (via the Porthmadog Bypas) or from the west. HGVs will then be required to follow prescribed routes. No use of the A497 through Porthmadog will be permitted by HGVs. The southern section of the A496 would only be used by HGVs as a contingency should one of the preferred construction traffic routes became unavailable (e.g. due to closure by the highway authority or the police). The location of access points, and the routes used by construction traffic have been selected to minimise any potential negative effects on local communities and other road users. These measures form part of the

embedded mitigation incorporated into the design of the Proposed Project to minimise potential environmental effects.

There are a number of road sections, including the section between A497 and the existing Garth Sealing End Compound which includes National Cycle Route 8, and the A497 between Minffordd Roundabout and National Cycle Route 8 that are anticipated to result in impacts on accessibility.

An Outline Construction Traffic Management Plan has been prepared which sets out measures which have been included within the design of the Proposed Project and would be implemented, where required, to reduce effects of traffic during the construction phase of the Proposed Project. The final plan will be developed by the appointed contractor. Taking these measures into account, the assessment concludes that all roads were assessed as having no unacceptable effects.

Socio-Economics and Tourism

An assessment of the likely significant effects on socio-economic features associated with the construction, operation and decommissioning phases of the Proposed Project has been undertaken. This included consideration of the following:

- Tourism: potential impacts on tourism businesses and the tourism sector, such as changes in access and/or amenity;
- Recreation: potential impacts on recreational receptors, such as changes in access and/or amenity;
- Community amenity: potential amenity effects on community settlements and residents;
- Employment: direct and indirect employment generation on a local and regional basis; and
- Supply chain: expenditure within the local and national supply chain.

Construction of the Proposed Project has the potential to generate direct and indirect positive effects through the creation of new jobs. The majority of construction work would require the appointment of approved contractors. These highly trained specialists are likely to be located throughout the UK and Europe with experience of moving from site to site as new projects are developed. Therefore, the positive employment and induced spending effects from these workers would be realised at a regional and national level rather than a local level. Local employment opportunities would be expected in sectors including site security, construction labouring, plant hire, haulage, landscaping, fencing and drainage. However, the effect on local employment is predicted to be minor beneficial and not significant.

Construction workers are likely to stay in local accommodation during the construction phase; this is expected to generate some short-term benefit to the local economy. There would also be further indirect economic benefits arising from expenditure by the work-force on subsistence and consumables in the local area.

Further details on the potential effects on tourism, recreation and amenity can be found in the Environmental Appraisal.

Noise and Vibration

An assessment of the potential effects upon sensitive receptors to noise and vibration associated with the construction, operation and decommissioning of the Proposed Project has been undertaken. The assessment methodology for the construction noise and vibration

is based on the assessment guidance in the relevant British Standard (BS5228). Baseline noise survey locations and survey methodology was agreed with Gwynedd Council.

Construction works are generally of short duration, with most of the works, such as construction of the access roads and the removal of existing overhead line infrastructure being transient in nature. With mitigation in place the effects are predicted to be within acceptable limits for most construction works. Construction works at the tunnel head compounds will be of longer duration. The Contractor will be required to adopt Best Practicable Means (BPM) to manage and mitigate construction noise and vibration levels to the lowest levels reasonably possible.

BS5228 identifies construction noise levels at which residential dwellings and other property types, such as schools are likely to experience adverse effects. The method uses these limits to identify whether measures are needed to reduce construction noise in order to avoid effects on sensitive receptors, such as people living in close proximity to the construction activities. Mitigation measures to be implemented include using quieter plant and less intrusive construction methods, acoustic screening and locating noise plant as far as possible from receptor locations.

Most construction activities are not significant sources of vibration. Activities such as earth-moving, crane activities, pylon removal and concrete pouring would produce relatively low levels of ground borne vibration (vibration that travel through the ground). Piling activities (the insertion of materials such as steel into the ground to create foundations) could produce noticeable levels of vibration, depending on the method used. Piling works associated with the construction of the tunnel shafts at Garth and Cilfor are predicted to be at a level that may be just perceptible in residential environments, but below a level which would cause complaint.

The alignment for the tunnel has been selected to consider proximity to property and structures. The depth of the tunnel and the alignment means that during construction of the tunnel using a tunnel boring machine, nearby properties will not experience significant levels of vibration.

Operational noise effects relate to the operation of the ventilation fans at the Cilfor tunnel head house, the Sealing End Compound at Garth and Cilfor and the section of overhead line between the proposed Sealing End Compound and replacement pylon 4ZC027R at the Eastern Compound. Mitigation in the form of attenuators, acoustic louvres and acoustic doors has been incorporated into the design of the tunnel head house and no adverse noise effects are predicted for tunnel head house operations.

Marine Ecology

An appraisal of the potential effects of the Proposed Project on marine ecology has been undertaken with a focus on the qualifying feature (Atlantic salt meadows / saltmarsh) of the Pen Llyn a 'r Sarnau / Lleyn Peninsula and the Sarnau Special Area of Conservation and Morfa Harlech Site of Special Scientific Interest.

Full or partial removal of the pylon and foundations associated with 4ZC030R is in-line with the conservation objectives to restore the structure and function of the estuary and will result in a beneficial effect. At pylon 4ZC031, foundation excavation works will cause a small area of direct loss of habitat within the footprint of the works. Mitigation measures will be implemented to restore the habitat in the short-term ensuring that there is no loss of range of the habitat. Other mitigation measures include a pre-construction survey of access routes and the employing an Ecological Clerk of Works to ensure that effects on rare plant species are avoided.

Marine Archaeology

An appraisal of the potential effects of the Proposed Project on marine archaeology has been undertaken. No recorded historic assets are present within the footprint of the Proposed Marine Works, with the only identified asset of marine archaeological interest comprising the wreck of an amphibious vehicle located to the south of the overhead line. There is some potential that as yet unidentified buried archaeological remains may be encountered during the removal of the pylon foundations, within areas of adjacent ground which were not subject to disturbance during the pylon installation. The effects of this upon potential archaeological remains will be addressed through the implementation of a Protocol for Archaeological Discoveries during the construction phase. In addition, an Archaeological Exclusion Zone is proposed to mitigate any potential effects upon the recorded amphibious vehicle wreck.

Marine Physical Processes

An appraisal of the potential effects of the Proposed Project on marine physical processes has been undertaken. The approach to undertaking the work in the marine environment has been discussed with Natural Resources Wales and the proposed works have been designed to align with Natural Resources Wales conservation objectives for the estuary. At 4ZC030 the redundant foundations are located in the main estuary channel where deep local scouring has developed around the foundation legs. It is predicted that partial removal of the foundations will enable the scour holes to infill naturally and unlock the natural behaviour of channel migration at this location helping to restore the estuary to it natural status.

The foundations at 4ZC030R are surrounded by a cofferdam and are located at the edge of the saltmarsh adjacent to the estuary channel. Deep scouring has been observed along the southern side of the cofferdam within the channel. If full removal of the foundations and cofferdam is achieved it is predicted the scour holes will infill and the ability of the channel to freely migrate in an unconstrained manner at this location will return. Partial removal is predicted to result in the structures remaining to a height approximately 1m above the natural channel depth. Should the channel continue to migrate northwards over this site, any scouring is likely to be less severe than that already observed and temporary until the channel migrates past this structure.

Pylon 4ZC031 is located far back on the saltmarsh where tidal inundations are infrequent. Historical data suggests that the estuary channel has never migrated as far as site 4ZC031. Partial removal of the foundations is predicted to be deep enough to enable any long-term channel migration over this site should the channel ever migrate this far.

It is concluded that the Proposed Marine Works will result in beneficial effects in helping to restore the estuary to it natural status.

Electric and Magnetic Fields

National Grid have provided an assessment of the likely significant health and environmental effects of electric and magnetic fields (EMFs) associated with the construction, operation and decommissioning of the Proposed Project to be submitted alongside the Environmental Appraisal.

Whilst there are no statutory regulations in the UK limiting the exposure of the general public from EMFs the Government, acting on the advice of authoritative scientific bodies, has put in place appropriate measures to protect the public. These core measures are incorporated in National Policy Statement NPS EN-5 which give clear guidance on the EMF requirements for all electricity infrastructure projects.

The assessment concluded that the assets associated with the Proposed Project would be fully compliant with the Government policy. Specifically, all the EMFs produced would be below the relevant exposure limits. Therefore, no mitigation measures are necessary and there would be no significant EMF effects resulting from the Project.

Environmental Management during Construction

Mitigation measures set out in the Environmental Appraisal will be secured, implemented and managed using best practice methods and legal obligations. A Construction Environmental Management Plan (CEMP) will be implemented for the Proposed Project. This will set out various management, survey and monitoring procedures that will be implemented on site to help prevent local disruption and minimise environmental impacts during construction.

Conclusion

The Proposed Project represents a major opportunity to mitigate the visual impact of existing electricity infrastructure within and adjacent to Snowdonia National Park and to conserve and enhance the natural beauty, wildlife and environmental heritage of the area.

The Environmental Appraisal identifies potential effects on the environment which may occur as a result of the Proposed Project and sets out measures to avoid or minimise these effects.

Further Information

The planning application documents, including the Environmental Appraisal and this Environmental Summary will also be available to download electronically from the Snowdonia National Park Planning Authority website.

The full Environmental Appraisal, including this Environmental Summary, is available by writing to the address below at a cost of £290 (to cover production costs including a delivery charge) for a hard copy format or free on DVD.

Post: National Grid VIP Project
C/o Camargue
11 Waterloo Street
Birmingham
B2 5TB

or

Email: visualimpact@nationalgrid.com

Further hard copies of this Environmental Summary are available free of charge from the same address.