



Y Bryn Wind Farm Borrow Pit Management Plan Appendix 10.6

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1. Introduction

This report provides a Borrow Pit Management Plan (BPMP) for x6 borrow pits at Y Bryn Wind Farm (the proposed development). The main objective of this report is to provide details of the proposed borrow pit management during the construction of the proposed development.

On-site borrow pits are proposed as sources of on-site aggregate for use in the construction of wind farm infrastructure. There is an estimated requirement for up to 206,910m³ of aggregate for the wind farm construction. This will be sourced from the on-site borrow pits and from earthwork operations during the construction. The precise volume will not be determined until the detailed design stage is reached and following detailed site investigation. This report confirms that the full aggregate requirement should be met by the on-site Borrow Pit location proposed at the proposed development.

The temporary borrow pits will be developed as part of the wind farm construction phase will consist of the following:

- Expansion to existing borrow pits 'N1' and 'S5';
- x4 new borrow pit workings 'S1, S2, S3, and S4'

The borrow pit locations have been selected with consideration for key stakeholders and the requirement to ensure optimal construction phasing and minimal environmental impact. Figure 1.1 below provides regional context.

Source: Open Street Map



Figure 1.1: Regional context – the proposed development

1.1. Existing Information

A borrow pit search report was completed and submitted as part of Volume 3 Environmental Statement (Technical Appendices). Appendix 10.3 of the ES: 'Y Bryn Borrow Pit Assessment' provides a search report covering the chosen borrow pit locations with further detail on the geological setting including photographs and documented site reconnaissance.

1.2. Borrow Pit Locations

The proposed borrow pits are located within the network of existing forestry tracks across the Proposed Development. The development is located approximately 5 km east of Port Talbot in South Wales. The Site is formed of two proposed turbine arrays separated by the minor road (B4282). The development is located within productive forestry, managed by Natural Resources Wales (NRW). There are several active borrow pits within this area currently serving forestry track construction and maintenance. Access is currently possible from the B4282 road running north of the site at BNG 283708, 191870.

Table 1.1. below shows the BNG grid coordinates centred on the proposed borrow pit locations.

Table 1.1: Borrow Pit Locations

Borrow Pit ID	Easting	Northing
N1	284021	192760
S1	282541	190305
S2	282310	190550
S3	282793	189303
S4	280902	189084
S5	281515	189855

Source: Natural Power

1.3. Proposed Development

Figure 1.1 (found within Volume 2 of the ES) shows the location and extent of the Proposed Development in a regional context. The application is for a wind farm comprising of up to 18 wind turbines with a range of blade tip heights from 206 m up to 250 m. Chapter 4 of the ES: Site Selection and Design Evolution provides details of the design process that resulted in the final proposed layout.

The application is for:

- Up to 18 turbines;
- Turbine foundations;
- External transformer housing;
- Crane pads and hardstand areas;
- Micro-siting allowance of turbines and associated infrastructure of up to 50 m;
- Substation, control building and compound;
- Battery/energy storage infrastructure;
- Construction of approximately 8,934 m of new access tracks.
- Upgrading of approximately 12,580 m of existing tracks;
- Secondary construction routes 8,039 m (no widening required with minor upgrades only used for Heavy Goods Vehicle (HGV)/Light Goods Vehicle (LGV) only);
- Alterations to the public road network;
- New slip road exiting the M4 for Abnormal Indivisible Loads (AIL);
- Underground electricity cables;
- Two permanent wind monitoring equipment locations, expected to comprise of anemometry masts or lidar;
- On site signage;

- **6 temporary borrow pits (local temporary sources of construction aggregate which are solely for the purpose of the wind farm construction);**
- Temporary concrete batching plant(s);
- Appropriate drainage measures across the proposed development site boundary;
- Temporary construction and storage compounds, laydown areas and ancillary infrastructure;
- Habitat Management Plan (HMP) and enhancement measures; and
- A lifetime of up to 50 years

Figure 1.2 depicts the proposed development layout and borrow pit search areas.

Source Natural Power, OpenStreetMap

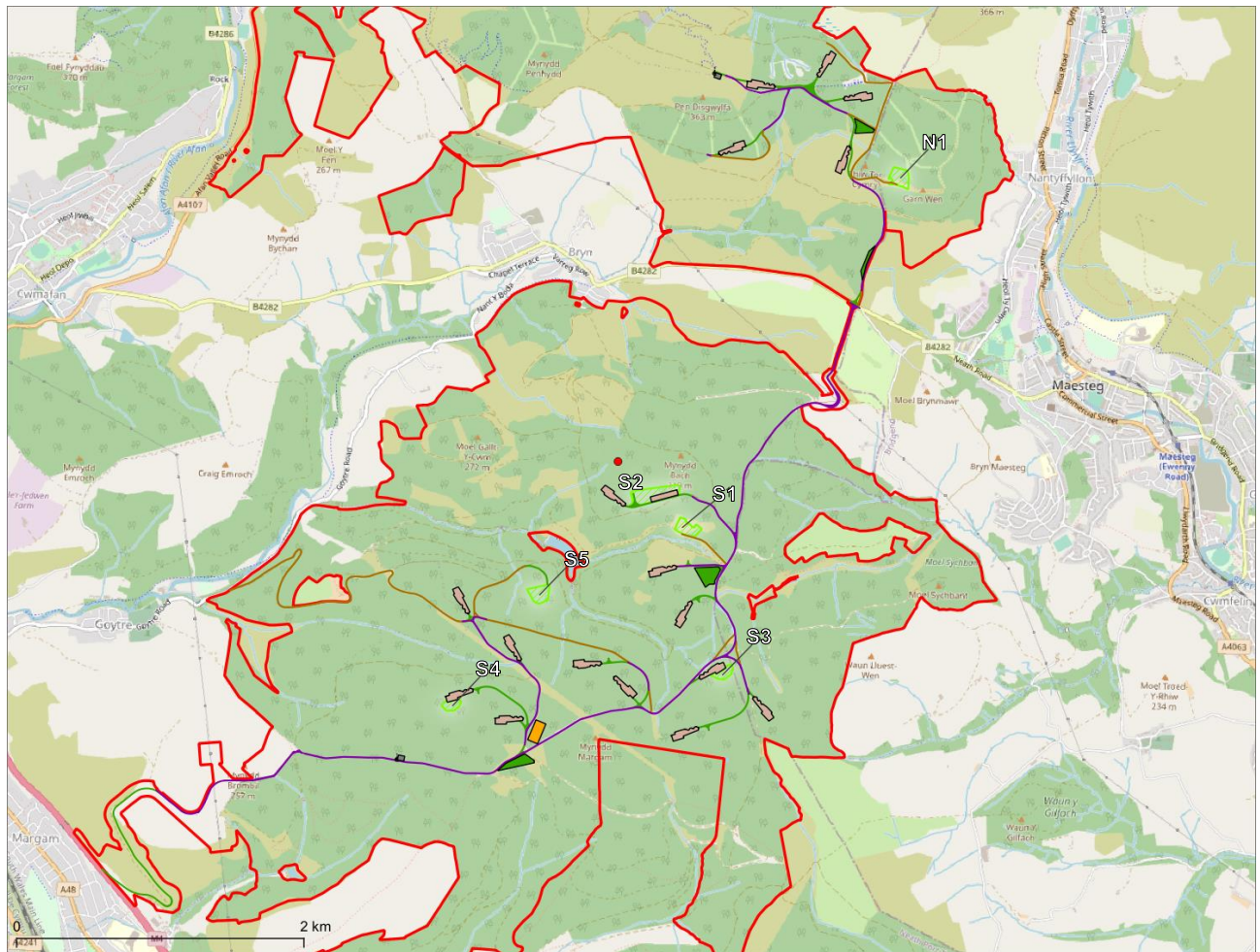


Figure 1.2: Wind Farm & Borrow Pit Layout

2. Geotechnical Desk Study

2.1. Sources

Detailed assessment of the proposed borrow pit locations has been undertaken utilising data collected from the following sources:

- On site walkover survey undertaken by a geotechnical engineer;
- 1m resolution Digital Terrain Model Data (DTM)¹
- National Resources Wales;
- Ordnance Survey mapping at 1:50,000, 1:25,000;
- Historical Ordnance Survey Mapping (online);
- Google Earth Professional and Bing Virtual Earth satellite imagery;
- Infrastructure locations in GIS format;
- British Geological Survey (BGS) Datasets
 - 1:10k/1:50k Geological Map Data²
 - Mining & Sinkhole data³
 - Geohazard Information⁴
 - Historical borehole records⁵
 - Coal Authority Information⁶
 - Regional Memoirs

2.2. Geological Setting

2.2.1. Superficial Geology

According to the British Geological Survey (BGS) The BGS GeoIndex Onshore map depicts sparse superficial soil coverage within the site boundary (the area within which the proposed development will be located) of the proposed development. This could be resultant from a lack of detailed field mapping in the area but more likely due to the presence of shallow / near surface bedrock.

Peat

Sporadic areas of peat are shown in the central portion of the southern section of the site, with only a single zone found north of borrow pit N1 in the northern section. A detailed description of the peat coverage is included within Chapter 10 of the Environmental Statement.

It has been concluded through a combination of probing and coring that the site is predominantly underlain by mineral soils with a minor peat content. There is a very limited presence of organic peat on site and there is extremely limited presence of peat ≥ 0.5 m thickness. Where this deepest peat is present it is situated away from areas of infrastructure and is predominantly confined to the areas of the upland plateaus. The survey indicates that peat depths are also consistently shallow predominantly ≤ 0.3 m across areas of proposed infrastructure including Borrow Pit locations.

¹ [LiDAR viewer | DataMapWales \(gov.wales\)](#)

² [BGS maps portal | OpenGeoscience | Our data | British Geological Survey \(BGS\)](#)

³ [Mining hazard \(not including coal\) coverage - British Geological Survey \(bgs.ac.uk\)](#)

⁴ [BGS GeoSure - British Geological Survey](#)

⁵ [GeoIndex - British Geological Survey \(bgs.ac.uk\)](#)

⁶ [Coal Authority - GOV.UK \(www.gov.uk\)](#)

Glacial Till

Till, Devensian ('Diamicton') is mapped as deposited at the periphery of the two site areas, and within the northern area. The Till is described by the BGS as:

'Unsorted and unstratified drift, generally over consolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape (diamicton).'

Near to the site boundary, Alluvium (Clay, Silt, Sand and Gravel) and Glaciofluvial Deposits (Sand and Gravel) are also mapped by the BGS. Figure 2.1 shows a map of the superficial deposits across the development.

British Geological Survey © NERC 2023 & OpenStreetMap

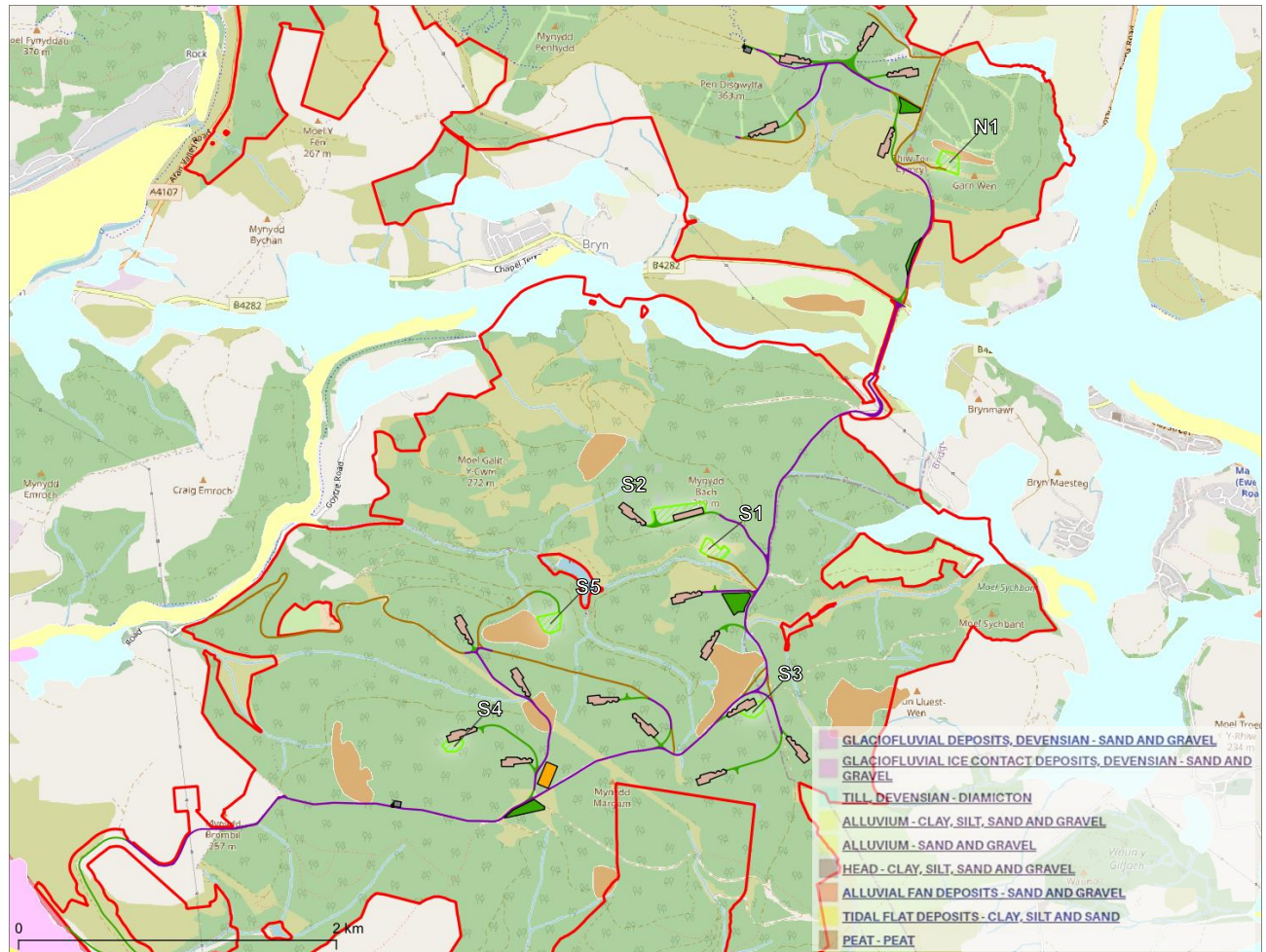


Figure 2.1: Superficial Deposits

2.2.2. Landslide Deposits

Assessed from aerial photography and throughout on-site reconnaissance: there was no evidence of slope instability at borrow pit locations. BGS information plots multiple historic landslides within or near to the site boundary northwest and southwest of the proposed wind farm. Further detail on this has been detailed in a separate Geotechnical Assessment Report (Ref: 1331057). Assessment of soil and rock slope stability will be integral to future ground investigations including borrow pit design and spoil management.

2.2.3. Bedrock Geology

British Geological Survey (BGS) mapping shows the proposed development to be predominantly underlain by the:

- **Llynfi Member** (Sandstone);
- **Rhondda Member** (Sandstone) and;
- **Brithdir Member** (Sandstone)

These rock units are part of the Pennant Sandstone Formation (PES). The Llynfi Member is described by the BGS as: *green-grey and blue-grey, feldspathic, micaceous lithic arenites ('Pennant sandstones') with thin mudstone/siltstone and seatearth interbeds and mainly thin coals.*

The Rhondda Member is described similarly as: *green-grey, lithic arenites ('Pennant sandstones') with thin mudstone/siltstone and seatearth interbeds and mainly thin coals.*

The Brithdir Member varies only slightly, with *green-grey, lithic arenites but with conglomerate lenses at bases of units; thin mudstone/siltstone and seatearth interbeds and mainly thin coals.*

The Llynfi Member is found mostly in the northern part of the site (vicinity of borrow pit N1) whilst the Rhondda Member and Brithdir Member are found commonly across both the northern and southern parts of the site. Across the site, there are thin lenses of the Llynfi, Rhondda and Brithdir Members which are made up of Mudstone, Siltstone and Sandstone. These are orientated approximately east west or form the circumference to several topographic rises indicating a shallow dipping strata.

Running approximately east west where the site boundary narrows between the northern and southern sections, the South Wales Lower, Middle and Upper Coal Measures Formations are mapped by the BGS. The South Wales Lower Coal Measures Formation is described as:

Grey, (productive) coal-bearing mudstones/siltstones, with seatearth and minor sandstones. The South Wales Middle Coal Measures Formation (Sandstone and differentiated Mudstone, Siltstone and Sandstone units) is described similarly by the BGS: Grey (productive) coal-bearing mudstones/siltstones with seatearth and minor grey, quartz-rich sandstones, coals, and ironstones.

Coal seams are inferred widely across the site and are generally orientated east west or form the circumference to several topographic rises indicating a shallow dipping strata. Figure 2.2 depicts the bedrock geology on and around the proposed development.

Several local fault structures are shown across the site with unknown displacement, and these are mostly orientated northeast southwest. Faulting may be associated with increased fracturing and groundwater flow through the rock mass.

- **Borrow Pit N1:** The Llynfi Member (Sandstone) with Mudstone and Siltstone indicated sub-cropping in the northern limits of the borrow pit.
- **Borrow Pit S1:** Rhondda Member Sandstone in the western part and Mudstone and Siltstone in the eastern part. A coal seam is indicated to sub-crop to the extreme north-eastern limits.
- **Borrow pits S2, S3, S4 and S5:** Brithdir Member (Sandstone).

At Borrow Pit S5 a shallow dipping coal seam is anticipated beneath the southern half of the borrow pit search area.

A review of the engineering properties of the rock mass on site yields the following description:

Mudstone and strong Sandstone (Coal Bearing) at all borrow pit locations and this has been visually confirmed at Borrow Pit N1, described as:

Medium strong to extremely strong medium to widely jointed thinly to thickly bedded fine to coarse-grained SANDSTONE may contain slate or mudstone and siltstone beds. Weathers to a loose to very dense sand, gravel, or silty/clayey sand. Low to high permeability flow is through matrix and discontinuities. Includes GREYWACKES.

Highly weathered rock may be excavatable by hard digging. In fresh rock material ripping, hydraulic breaking or blasting is required depending on joint/bedding spacing and orientation. Where fresh to slightly weathered excavated slopes may maintain long-term stability. Suitable as selected granular fill for construction if care is taken in selection and abstraction. It shall be important to determine intact rock strength, spacing, orientation and nature of discontinuities (including water flows) and nature/depth of weathered zone materials during the main phase of site investigation.

British Geological Survey © NERC 2023 & OpenStreetMap

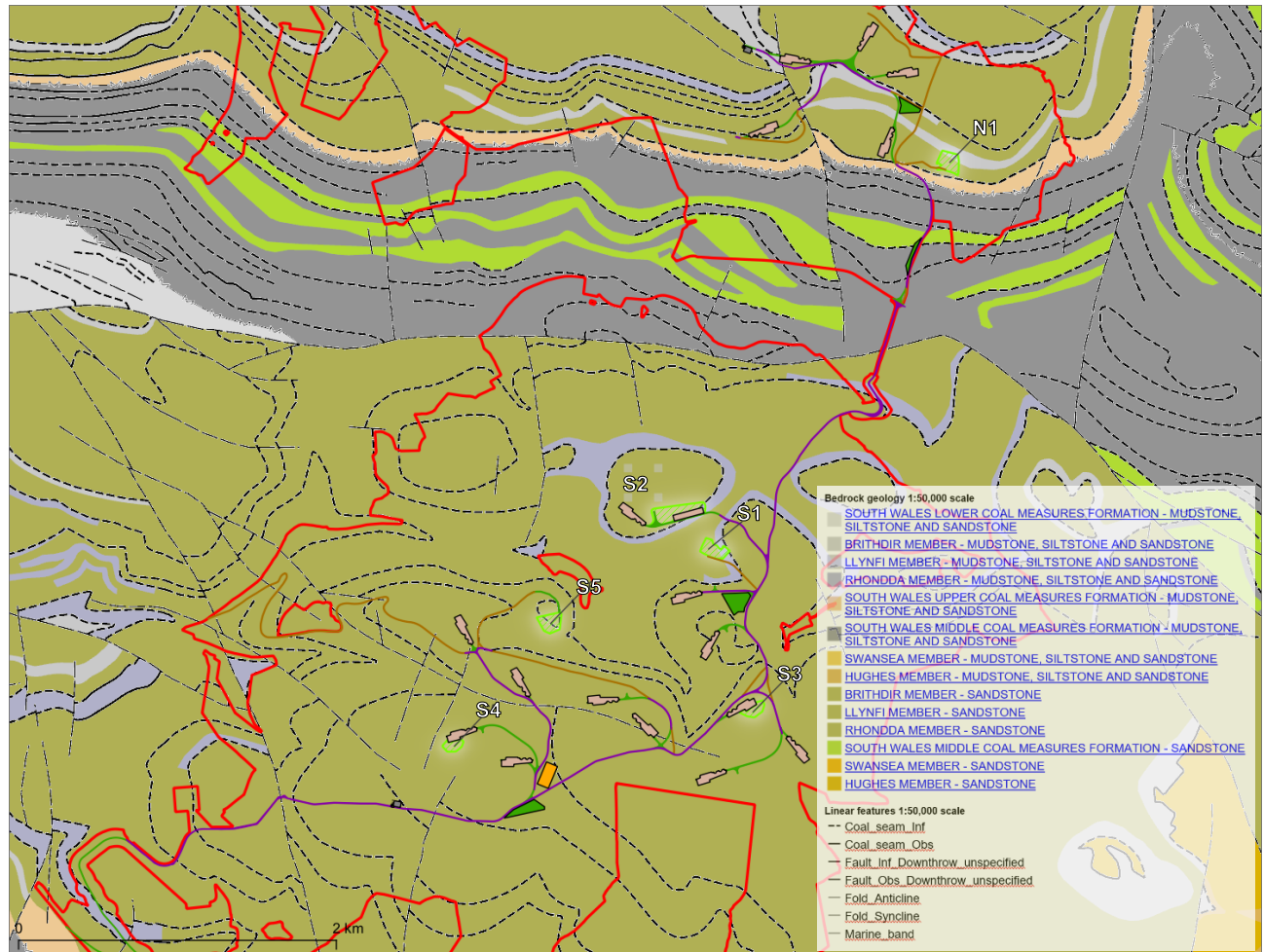


Figure 2.2: Bedrock Geology

2.2.4. Hydrogeology

Chapter 10 of the Environmental Statement (ES) provides additional detail for the Hydrogeological setting. The majority of proposed development is underlain by a moderately productive aquifer associated with the South Wales Upper Coal Measure Formation. The aquifer is a regional, cyclic multi-layered aquifer with moderate yields from sandstones and surface springs, however when associated with mine water: groundwater quality is poor. In the north section, the site boundary is also underlain by the moderately productive aquifer of the South Wales Middle Coal Measures Formation which exhibits the same characteristics as the Upper Coal Measure Formation.

The bedrock units are classified as 'High Vulnerability, Secondary (A) Aquifers'. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. The Cwmwernderi Reservoir is located within the south area of the site (BNG 281686, 190179), particular care must be taken to avoid any contamination of this water supply. Groundwater should be expected in borrow pit excavations but unlikely to be in significant quantities.

The soils and isolated peat underlying the proposed development have been extensively surveyed and sampled as part of the wider environmental impact assessment. The detailed findings are discussed in sub-section 'Soils and Peat' in Chapter 10 of the ES. Surveys identified that generally the site is underlain by a thin peat soil and then clay, which is assumed to extend to the bedrock interface. These soil profiles were observed during the coring exercise and are corroborated by the geological mapping shown above.

Clay subsoils would act as an aquiclude, impeding the emergence of any diffuse groundwater flow meaning that the habitats are nourished by direct rainfall and overland flow. In this regard, the accumulation of surface water and ombrotrophic habitat occur both because of the convergence of these surface flows and limited opportunities for infiltration through the clay and bedrock. This is demonstrated in the predominance of potential Groundwater Dependent Terrestrial Ecosystem (GWDTE) communities to accumulate within artificial drainage features, or areas of constrained topography such as re-entrants, forest rides etc. As such, it is considered that these habitats are not reliant on groundwater and are not actual GWDTEs and therefore the SEPA Land Use Planning System (LUPS) 31 buffers (as no equivalent in Wales) need not apply.

2.3. Required Rock Volumes

Calculations of construction aggregate requirement has been undertaken using details of the track and infrastructure design provided by Coriolis Energy as part of the 3D layout design. The access track has been planned to use and upgrade the existing infrastructure where available to minimise the requirement for new aggregate. An estimation of aggregate volume has been used, with a contingency of 25%. This is to allow for under-estimation in the requirements and for some of the excavated material being unsuitable for construction use. The calculated aggregate requirements are provided in Table 2.1.

Table 2.1: Indicative Construction Aggregate Volumes

Element	Area Calculation Assumptions	Dimensions	Total Volume (m ³)
Access Tracks North	~10.7km of new and upgraded tracks. Includes allowance for widening at bends	New Track Running – 6m New Track Sub-base – 7m Upgraded Running – 2m Upgraded Sub-base – 3m	28,946
Access Tracks South	~10.3km of new and upgraded tracks. Includes allowance for widening at bends	New Track Running – 6m New Track Sub-base – 7m Upgraded Running – 2m Upgraded Sub-base – 3m	35,895
Crane Pads North	Includes temporary and permanent areas	As per 3D Design	31,011
Crane Pads South	Includes temporary and permanent areas	As per 3D Design	41,348
Ancillary hardstand & Temporary Compounds North	Temporary construction compound platform area 3 & 4	As per 3D Design	3,400
Substation Platform & Temporary Compounds South	Substation, Temporary construction compound platform area 1 & 2	As per 3D Design	15,000
Ancillary Access (AIL)	Includes allowance for widening at bends	New Track Running – 5m New Track Sub-base – 6m	5,198
M4 Junction Arrangement		As per 3D Design	4,730
Indicative requirements of stone to be won on-site:			165,528m ³
Indicative Borrow Pit minimum yield (encountering 25% fragmentation loss during extraction):			206,910m³

Source: Natural Power

Following detailed 3D modelling across each location the potential volume of rock excavatable from the proposed on-site borrow pits has been calculated. The results from this are shown in Table 2.2.

Table 2.2: Borrow Pit Volumes

Borrow Pit	Search Area (ha)	Estimated Overburden Soils (m ³)	Estimated Maximum Rock Yield (m ³)
N1	1.4	4,600	60,500
S1	1.3	3,750	47,800
S2	3.0	7,900	86,000
S3	0.8	1,900	13,000
S4	0.7	1,850	6,300
S5	1.4	4,200	46,100
Estimated Total Volume		24,200	259,700

*Source: Natural Power *Estimated maximum yield has been calculated with an assumed 0.5m of unusable overburden at each borrow pit location. Volumes are based on assessment using AutoCAD Civil3D volumetric modelling, see Drawings Appendix A.*

The final size and geometry of the excavation will be defined post consent with a comprehensive intrusive geotechnical site investigation and detailed design phase. Where appropriate there shall be optimisation of the borrow pit design within the confines of the identified search area to reduce the footprint and optimise the rock extraction. Initial modelling indicates less than 10% overburden soils from the borrow pit operations.

Following detailed ground investigation, the highest rock quality locations should be prioritised for extraction. Pending results of the intrusive investigation it is likely that the full extent or not all borrow pit locations will need to be developed in full to meet construction requirements. It is also anticipated that suitable aggregate could be sourced from the earthworks associated with creation of access track and hardstanding. Thus, reducing the overall requirement on borrow pit locations further. The full extent of this secondary onsite source of aggregate will only be determined following detailed ground investigation across the wider infrastructure layout.

The potential excavatable volume of rock shall be sufficient to meet the requirements of the wind farm construction phase. Some aggregate components may need to be imported depending on quality and geochemical requirements. Further information on Traffic & Transport elements is provided in Chapter 11 of the Environmental Statement.

2.4. Ecological Setting

2.4.1. General

In summary the proposed development is concluded not to be located within any statutory site designated for ecological interests; however, one Local Nature Reserve (LNR) (Bryn Tip) is adjacent to the site boundary. The nearest Site of Special Scientific Interest (SSSI) with ecological features listed as an interest is located 2.6 km from the site boundary (Margam Moors) and the nearest Special Area of Conservation (SAC) (Kenfig) with ecological receptors listed as an interest is located 3.7 km from the site boundary.

The borrow pit locations are distributed across the proposed development to allow for phased build out of the wind farm infrastructure. This shall reduce the visual impact of adopting one very large borrow pit excavation.

The borrow pit locations and preliminary design have been selected to minimise impact on any ecological and visually sensitive areas. To discourage construction activities from potentially impacting upon the surrounding environment, the working areas, associated access tracks and material storage areas will be clearly set out and always marked during the operation of the borrow pit. No excursion beyond the delineated boundary will be permitted without authorisation. The Y Bryn Wind Farm Environmental Clerk of Works (ECoW) will undertake pre-construction surveys and will monitor the construction works in accordance with the approved Scope of Works submitted to the Council for the main site.

2.4.2. Ornithology

A detailed Ornithological assessment has been completed by Natural Power for the proposed development as part of the wider Environmental Impact Assessment. Chapter 7 of the Environmental Statement includes a detailed Ornithology Assessment. This assessment includes all areas of the proposed development including the borrow pit areas.

For Nightjar (the ornithological feature for which a moderately negative effect has been predicted: disturbance/displacement during construction), species-specific measures will be applied and shall be listed in the nightjar Ornithological Species Protection Plans (SPP) that shall be written post consent and ahead of construction. Following species-specific mitigation, the effects of disturbance/displacement because of construction activities are predicted to be reduced from moderately negative to low negative and not significant for Nightjar.

By applying effective embedded mitigation measures and following good practice guidelines during construction, the magnitude of residual effects of the proposed development on all ornithological features is assessed as being low/negligible in terms of magnitude, and thus not significant in the professional judgment of Natural Power

Should any evidence of nesting be discovered, a buffer (10 m) will be established and clearly delineated around the nest and works in that area stopped until the birds either fledge or the nesting attempt ends, e.g., as the result of nest predation. All contractors will be required to comply with all relevant ornithological commitments set out above.

2.4.3. Flora and Fauna

Ecological assessment has been completed by Natural Power for the proposed development as part of the wider Environmental Impact Assessment. Chapter 6 of the Environmental Statement includes a detailed Ecology Assessment.

The proposed development is predicted to have an effect that is negligible, or of low negative or moderate negative magnitude, and not significant, for all the features identified as Important Ecological Features (IEFs). Embedded mitigation measures (see Section 6.6 of Chapter 6 in the ES) have been described that will be implemented to ensure the following of good practice guidance and to ensure compliance with legislation.

An additional measure, to be implemented during the operational phase of the proposed development, will be written into the plans for the benefit of bats. This will state that areas of open ground around turbines will be managed to

ensure that they remain free of tree and tall shrub growth to maintain a 50 m buffer between potential bat features and the rotor blade tips.

An outline Habitat Management Plan (HMP) that outlines proposed measures for habitat improvements and biodiversity net benefit within the proposed wind farm areas can be found in Appendix 6.3 of Chapter 6 of the ES. This outline HMP will be subject to agreement with NRW (acting as landowner), Neath Port Talbot County Borough Council and Bridgend County Borough Council.

No location specific floral recommendations apply to the borrow pit locations. Floral mitigation is focussed on ensuring no impacts on surrounding habitats, as set out above.

Appropriate site management practices will be implemented to minimise the risk of encroachment of the construction corridor into adjacent habitats. As far as is reasonably practicable, any notable floral species encountered will be marked with an exclusion zone or translocated to other suitable areas of habitat or stored for reuse in reinstatement of temporary infrastructure. The ECoW contacted will be contacted to organise how to proceed following. The implementation of these measures will reduce the potential for impacts on sensitive habitats.

All contractors will be required to comply with all relevant flora and fauna commitments set out above.

2.5. Protected Sites

The proposed extraction of aggregate from the borrow pit locations will not affect any known archaeological, cultural heritage or geological sites. In the case of Borrow Pit locations N1 & S1, development and expansion of existing quarry sites will be undertaken. Furthermore, given the small scale and temporary nature of the proposed works, it is considered that the proposed development will not give rise to any significant indirect impacts upon archaeological or cultural heritage receptors in the vicinity of the site.

3. Programme of Implementation

An approximate sequence of works is outlined below for Borrow Pit Development. This sequence is in accordance with Minerals Technical Advice Note (Wales) 1(MTAN)⁷.

During the construction phase of the proposed development the Borrow Pit works will be confined to daytime operating hours defined as 07:00-19:00 hours.

Table 3.1: Sequence of Works Outline Implementation

Construction Stage	Consideration
Set out borrow pit area working limits with suitable survey equipment (high-precision GPS receiver with sub-centimetre accuracy).	Environmentally safe marker equipment, e.g., limiting use of spray paints and only using untreated wooden stakes and fencing.
Fencing off working area prior to works commencing.	Do not block access around borrow pit area which may be used for public amenity.
Set out and install Sustainable Drainage Systems (SuDS) around the borrow pit working area prior to works commencing.	The use of sustainable drainage systems (SuDS) will ensure that downstream catchments are not affected, and the borrow pit floor does not become ponded during or after the works. Cut off ditches shall be of minimal length, depth and gradient, and silt traps and buffer strips shall be utilised to minimise erosion, sedimentation, and peak flows.
Removal of top vegetation layer and suitable storage of topsoil for future restoration of disturbed ground.	Soil stripping should be minimised between October and the end of April unless weather conditions are suitable. In addition, stripping operations should cease when the soil becomes wet during normal rainfall events and should not recommence until it has dried sufficiently. In general, the summer months of July, August and September are optimal for soil stripping. Topsoil and vegetation shall be retained and stored in accordance with the Construction Environmental Management Plan (CEMP) and reinstated on all areas of stripped ground as soon as possible to prevent erosion and leaching. Storage mounds shall not exceed 1.5 m in height to minimise compaction and shaped to promote shedding of water.
Extraction of rock, using overburden to form surface water diversion bund adjacent to cut-off drain. Any additional overburden will be appropriately stockpiled within the limits of the borrow pit area.	Excess material will, if suitable, be re-used to help backfill the borrow pits. A system of daily reporting of excavations will be established during construction and utilised to monitor the geotechnical performance of slopes including sub-soil and bedrock.
Ripping, hydraulic breaking and/or blasting could be implemented dependent on competency of bedrock. A	Face height will not exceed 5m or 70 degrees slope angle and will generally follow HSE The Quarry

⁷ <https://www.gov.wales/minerals-technical-advice-note-mtan-wales-1-aggregates>

Construction Stage	Consideration
productive bench will be made, and pattern blasting shall be used to loosen rock where required to extend borrow pit.	Regulations (1999) guidance where appropriate. The peak of the existing land formation will not be removed. Prior to restoration a mid-face bench may be required to ensure long term slope stability due to the horizontal and occasional sub-vertical rock mass discontinuities which may daylight the working face.
Crushing/screening/grading of extracted aggregate and overburden material before stockpiling.	Control of noise, vibration and dust emissions will be utilised as outlined in Sections 4.5 to 4.7 of this report.
Stockpiles of aggregate or overburden shall be placed in designated temporary storage areas beyond the existing topography of the borrow pit location.	Suspension material found in surface run-off will be diverted to the SuDS.
Excavation on steep-sided profiles will incorporate a gently graded slope consistent with those of the existing landscape and	This will mitigate potential effects of the extraction on visible amenity at the most elevated and potentially visible faces in each pit.
Restoration will proceed, using overburden material but also any local peat (although not anticipated) where appropriate to backfill the depressions to near ground level.	Reinstatement to be consistent with surrounding landforms as far as practicable.
Vegetated material will be placed in areas where excavation faces are exposed.	This will be carried out as quickly as possible to allow re-vegetation process to be sped up. Re-seeding and planting with local species shall also be a primary consideration.

Source: Natural Power

4. Operational Activities

4.1. Extraction Methods & Controls

All Borrow Pit workings shall conform to relevant legislations including MTANs, principles of The Quarries Regulations 1999⁸ and the Groundwater Regulations 1998⁹. The site drainage should consider any possible negative effects on site tracks and surrounding infrastructure. The reinstatement profile of borrow pits shall complement the surrounding area ensuring continuity of hydrological and vegetation cover.

All excavations where required shall be monitored and measures taken to prevent collapse and the destabilising of soil deposits adjacent to excavations. A system of daily reporting of excavations will be established during the construction phase and utilised to monitor the geotechnical performance of slopes including sub-soil and bedrock. Condition of stability of temporary material stockpiles shall also be undertaken. This shall be implemented and undertaken by a suitable, experienced, and trained site engineer.

Suitable fencing and/or protection barriers will be installed around the proposed borrow pit excavation area on the slope to ensure the safety of both people working within the excavation area and anyone who may be within the proposed development area.

Due to the nature of the rock the excavation is likely to be achieved through ripping, hydraulic breaking and blasting. An assessment of blasting times should be undertaken to allow adequate notice of on-site vibrations. Typical pattern of blasting includes the use of drilled holes on a grid layout. A progressive system of blasting shall be adopted from the borrow pit proposed entrances towards the rock face created.

Prior to restoration a mid-face bench may be required to ensure long term slope stability due to the horizontal and occasional sub-vertical rock mass discontinuities which may daylight the working face. The final contractor's design may require stability assessment by a geotechnical engineer as the excavation progresses. If the excavation is assessed as stable the bench widths and wall face angle can be amended to the most optimum design whilst ensuring the area is safe and stable.

Where appropriate, temporary interception bunds and drainage ditches shall be constructed upslope of the borrow pit to minimise surface run-off ingress. These cut off ditches shall be of minimal length, depth and gradient, and silt traps and buffer strips shall be utilised to minimise erosion, sedimentation, and peak flows. Interception bunds and drainage ditches will be monitored regularly throughout the construction works by an appointed Environmental Clerk of Works (ECoW).

Where coal seams are encountered, for example at borrow pits S1 and S5, gas monitoring is recommended to record levels of natural ground gas. Accumulations of gas in excavations could be a potential health and safety risk where not effectively monitored and controlled. Coal Authority Permissions will be required for any extraction of shallow incidental coal seams. Any incidental coal will be separated for later reinstatement into the Borrow Pit excavation.

4.2. Working Faces, Floors, and Spoil Types

During operation borrow pit faces are anticipated to have a maximum angle of 70 degrees and a maximum face height of 5m. The borrow pit profiles around the site will be restored to a safe profile. The borrow pit floor will be free draining; surface water will freely drain to settlement ponds and from there to soakaways or to a wider drainage network.

Excavated materials not suitable for backfill (spoil) will be disposed of appropriately, this is outlined under Section 4.4 (Waste Management) of this report. Excavated peat (not expected) or peaty soil, topsoil and subsoil will be

⁸ <https://www.hse.gov.uk/pubns/books/l118.htm>

⁹ <https://www.legislation.gov.uk/ukxi/1998/2746/contents/made>

reused within the works either as part of backfilling or reinstatement operations or used to form landscaping verges. Materials will generally be stockpiled close to the location of reuse to limit vehicle movements on-site.

4.3. Access and Traffic Management

Traffic associated with the borrow pit works will be contained entirely within the proposed development except for the delivery of plant to extract and transport material around the Site.

During the operation of the borrow pit works, vehicles accessing the areas will be limited to the vehicles used by persons working within the site, site visitors and the HGVs required to deliver plant and materials or transport the aggregate from the borrow pit to the construction working areas. All access tracks and entry routes will be kept free of obstacles and well maintained; barriers are to be installed at access points and within excavation, along with appropriate safety signage. Stop blocks and edge protection will be used with reversing of vehicles up to an excavation.

4.4. Waste Management

Although there is no anticipated waste material from the borrow pit works, all activities undertaken during the works will follow best practice guidelines to minimise effects on the environment and will follow the Environmental Protection Act (1990)¹⁰. Waste management aims to minimise raw materials used, reduce waste, reuse materials, and recycle waste and send minimal amounts of waste to landfill. A Site Waste Management Plan (SWMP) will be developed at an appropriate stage of pre-construction and prior to borrow pit development.

Waste management will adhere to the following legal compliances of the duty of care requirements within the EPA (1990):

- Prevent unauthorised or harmful deposit, treatment, or disposal of waste;
- Prevent a breach (failure) by any other person to meet the requirement to have an environmental permit, or a breach of a permit condition;
- Prevent the escape of waste;
- Provide an accurate description of the waste when it is transferred to another person by using the European Waste Codes and documentation;
- Keep waste to a minimum. Do everything you reasonably can to prevent, reuse, recycle or recover waste, rather than dispose of it;
- Make sure the waste is sorted and stored safely and securely;
- The organisation receiving the waste will be properly authorised to accept it. They will be a registered waste carrier or have the correct permit or exemption in place;
- A waste transfer note will be completed for each transfer of non-hazardous waste;
- For hazardous waste, a consignment note will be used.

During the works, where feasible, drip trays will be used to contain potential hydrocarbon leaks from static plant. Materials shall be disposed of according to the site rules. Once used, drip trays shall be cleaned using appropriate materials and disposed of in accordance with Control of Substances Hazardous to Health (COSHH)¹¹ regulations. Regular checks and cleaning of drip trays to be carried out.

Spill kits will be stationed within each Borrow Pit working and contain materials and spill response items appropriate to the scale of works and items of plant anticipated to be working within the excavation. Operatives shall be trained in spill response.

¹⁰ <https://www.legislation.gov.uk/ukpga/1990/43/contents>

¹¹ <https://www.hse.gov.uk/coshh/>

4.5. Controls on Noise and Vibration

Where aggregate extraction and related operations occur close to areas that are sensitive to noise, particularly residential areas, noise impact must be minimised to acceptable levels. The effects of noise shall be fully considered and monitored throughout the permitted mineral activity at each Borrow Pit location. Noise will be controlled following Minerals Planning Guidance Note 11: The Control of Noise at Surface Mineral Workings (1993)¹² Part III of the Environmental Protection Act 1990. The following controls will be established for each Borrow Pit working:

- Noise limits shall relate to the background noise levels, subject to a maximum daytime noise limit of 55 dB(A) where background noise levels exceed 45 dB(A). 55 dB(A) is the lower limit of the daytime noise levels where serious annoyance is caused. Where background noise is less than 45 dB(A), noise limits will be defined as background noise levels plus 10 dB(A). Night-time working limits will not exceed 42 dB(A) at noise sensitive properties. Daytime working is defined as 0700-1900 hours and night-time as 1900-0700 hours.
- Blasting will take place at regular times within the working week, that is, Mondays to Fridays. Blasting on Saturday mornings will be a matter for negotiation between the operator and the MPA considering the views of any nearby residents. No blasting will take place at any other time, that is, Saturday afternoons, Sundays, Bank or National holidays;
- Ground vibration due to blasting operations will not exceed a peak particle velocity of 6 mms⁻¹ ppv in 95% of all blasts measured over any 6-month period. No individual blast will exceed a peak particle velocity of 10 mms⁻¹ ppv;
- Blasting can give rise to both ground-borne vibration and airborne pressure waves, referred to as air overpressure. Blast-generated air overpressure levels are not anticipated to be high at residential locations due to the separation distances involved;
- Approval of a scheme of vibration monitoring so that compliance within set limits can be adequately demonstrated by the operator at any time.

The borrow pits are all located a sufficient distance away from residential buildings to ensure the successful implementation of the above control measures. The closest residential areas are approximately 750 m from borrow pit N1 (the village of Nantyffyllon) and 700 m from S1 (a single group of farm buildings).

4.6. Controls on Dust and Air Pollution

Dust emissions can arise from blasting, ripping, processing, loading-out and stockpiled material. Dust generation is sensitive to weather conditions, typically being worst in dry and windy weather. Water sprays shall be available on site for use in dust suppression in dry and windy conditions, to control and minimise dust emissions. Any processing plant used within the borrow pits shall have integral dust suppression systems to control dust emissions during processing. Effects from dust shall be limited to active excavation at the borrow pits, notably during ripping, processing and loading-out of oversized and processed material. With appropriate controls in place, effects from dust emissions shall therefore be negligible. Effects during rock extraction from dust shall be minimised by keeping the use of processing plant to a minimum. Processing plant shall be operated only for short periods of time, as necessary to provide the aggregate requirement for construction works.

4.7. Bunding and Screening

Temporary bunding will be provided as required around the outer edge of the excavation, to divert surface flow and reduce the risk of oil or chemical spills to the natural drainage system.

The bund will also provide screening to the area on the three sides whilst the excavation is taking place. The bund will have side slopes not exceeding 1:2.5 and will not exceed 1.5 m in height. This will require continued assessment. The placement area for the material will need to be assessed and confirmed as suitable for loading by a suitably experienced and qualified geotechnical engineer.

¹² <https://www.gov.wales/sites/default/files/publications/2019-01/minerals-planning-guidance-11.pdf>

5. Soil Management

Topsoil and vegetation shall be retained and stored in accordance with a Site-Specific Spoil Management Plan and reinstated on all areas of stripped ground as soon as possible to prevent erosion and leaching.

Excavated peat, topsoil and subsoil will be reused within the works either as part of backfilling or reinstatement operations or used to form landscaping verges. Materials will generally be stockpiled close to the location of reuse to limit vehicle movements on-site. The vegetated layer will be stripped from the area of the excavation and stored locally with the growing side up. The remaining organic topsoil and subsoils will be excavated down to formation level, or a suitable stratum, and again will be stored local to the point of excavation but shall remain segregated to avoid mixing of materials. Topsoil shall be stored in mounds which do not exceed 1.5m in height, to retain the integrity of the topsoil.

Where practicable, soil making material can be gained from the recycling of on-site quarry and other waste materials.

Based on peat survey results (Environmental Statement Chapter 10), the site is predominantly underlain by mineral soils with a peat content. There is a very limited presence of organic peat and there is an extremely limited presence of peat ≥ 0.5 m.

5.1. Soil Stripping

Soil stripping operations shall be undertaken only when physical conditions minimise the likelihood of damage. Soil strength is greatest when soil materials are very dry, and compaction is caused when handling during wet conditions. On areas previously covered by trees, stumps and roots should be pulled out and shaken to separate them from soil materials. The stumps, roots and brash must be disposed of in accordance with plans agreed by the Mineral Planning Authority. Soil stripping operations should be carefully planned and closely supervised. As a general principle, no traffic should be allowed on unstripped soil except that necessary to perform the operation. Effort should be made to demarcate areas set aside for stripping with appropriate signs and/or fencing to prevent wanton access. Where native soils are present with little disturbance to them, it is important to strip and store topsoil and subsoils separately from one another. Where contrasting soils are present on site, these should also be stored separately.

A strip system should be set up, to enable effective synchronising of operation between the plant used. Plans of the method of working should be drawn up, with written systems of work or method statements to reinforce the procedure. The width of the strip should usually be between 3 to 6 m wide and is determined by the length of the excavator boom less the standoff to operate. The excavator should stand on ground from which the full soil thickness (including soil-forming material as necessary) has previously been stripped. Dump trucks should only travel over areas of ground that have previously been stripped. A grading bucket should be used to strip soils to enable each soil horizon to be removed cleanly.

5.2. Soil Storage

Topsoil, peaty soils, subsoil, and soil-forming materials will be stored separately from one another, so the risk of cross contamination is minimised, and the success of safe storage and swift reinstatement is maximised. Stores will be located carefully on the site so that there is no risk of excessive handling, or of loss of soil by slippage or erosion into the void. Cut-off drains will be installed upslope of storage mounds if there is a risk of flooding. Soil materials will be stripped from areas designated for soil storage so that soils are tipped directly on overburden materials.

Stacked topsoil will not exceed a height that enables the topsoil to breakdown. The maximum height for stacked material will be agreed in advance with a maximum height likely to be 1.5 m. Storage areas will be located away from watercourses (minimum of 50 m, where practical) protected from run-off from adjacent areas.

Soil mounds should have side slopes of about 25° from the horizontal. The top of the mound should be domed, or slope so that rainwater is shed. Hollows should be avoided as these will fill with water after rain. Light grading of the mound side slopes is permitted to reduce water penetration into the soil. Attention to mound contours should take place daily. Mound formation should cease in wet conditions.

If soil erosion is occurring during periods of heavy rain, stockpiles will be covered where reasonably practicable. Storage areas should be reinstated to their original condition on completion of their use for storage. Any silt fencing or other mitigation around the base of the stockpile will be monitored and replaced as necessary. In periods of dry weather watering to reduce dust and potential nuisance will be monitored. Consideration will be given to storage on top of a geotextile mat and storage duration shall be minimised.

If space does not allow storage and the surplus is to be stored elsewhere on the site, the Environmental Clerk of Works will be consulted in advance to agree appropriate areas.

5.3. Soil Reinstatement

So far as is reasonably practicable, all disturbed areas which require reinstatement will be reinstated with the same soil and vegetation types as exist at present, thereby ensuring minimum disruption to the surrounding landscape. Preference shall always be to reinstate using natural site won materials. The reinstatement and storage of any excavated materials will involve replacement of previously stripped soils, vegetated layers, or turves.

Initial backfilling shall be completed using superficial overburden (if encountered) to raise the base of the borrow pit working to an adequate level and geometry onto which soil can be placed. Stripped soil will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics. Subsoil, topsoil and turfs will be replaced in the same order as they were removed. Unless otherwise agreed, turfs will be reinstated following the works and orientated vegetation side up. Reinstatement will be carried out as soon as is possible following stripping to ensure integrity of material is maintained. Where turfs are not available, areas will be left to re-vegetate naturally. Consideration will be given to re-seeding and planting of local species. If there is not sufficient turf to completely cover an area, then turf will be spread in smaller sections to offer some protection and spread the seed bank rather than leave larger exposed areas. The reinstatement of the construction areas will be undertaken to a high standard, using the existing soil and vegetation material wherever possible, in accordance with industry good practice.

Loose tipping method will be implemented using truck and shovel. Dump trucks are used to transport and drop soil materials, and a tracked hydraulic 360° excavator is used to spread them. The excavator stands on the overburden, and the re-laid soil is not traversed by earth moving machinery. This method entails working to a strip system, replacing soils sequentially on the site. The width of the strip is determined by the excavator arm length and is typically 5-8 m. If there are to be more than one soil layer (i.e., if both topsoil and subsoil are both available for replacement) then the whole length of the strip should be restored with subsoil before the process is repeated with topsoil. If materials are massive in structure, the spreading operation will be used to break up blocks, using the excavator bucket to break them up. Large stones and clasts can be removed during the levelling operation and collected on the overburden for later removal, or placed so that they are buried by the next drop of subsoil.

Any contaminated soil will not be used for reinstatement but will be disposed of to a licensed waste disposal site in accordance with legal requirements.

6. Drainage & Surface Water Management

All the proposed borrow pits and search areas are located over 50 m away from watercourses marked on a 1:50,000 scale Ordnance Survey. However, particular care will be required during the works at borrow pit locations S1, S2 and S5 which each have watercourses approximately 50 to 70 m from their aerial limits that flow to the Cwmwernderi Reservoir.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Ditches shall be created prior to any operations to control water flow. Diverted surface flow will also be retained and treated through a sustainable drainage system (SuDS) settlement sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly. Construction personnel will be briefed on the location of these features and importance of preventing water run-off from exiting the borrow pit and will be given regular toolbox talks about the risks of working near water and the potential to cause pollution.

The source of any water used to suppress dust will be in accordance with legal requirements and if doubt exists about what is permissible consultation with Natural Resources Wales will occur.

7. Material Handling

Stockpiles of aggregate will be stored temporarily as close as possible to the crusher at each Borrow Pit Location. To reduce the environmental impact, the works will be split into smaller working areas so that stockpiles will be temporarily stored near to their point of extraction. All these locations will be at least 50 m from the nearest watercourse.

To minimise environmental impact, the borrow pit will be worked in discrete cells. As such, the location of the processed material stockpiles will be transient according to the working phases, however all these locations will be at least 50 m from the nearest watercourse. Aggregate stockpiles will be formed to a maximum height of 5 m above surrounding topography. They will be shaped during their build-up to allow for free drainage and sit at an angle no greater than its natural angle of rest.

8. Safety & Security

8.1. Safety

The Principal Contractor will be responsible for ensuring that a construction phase health and safety plan is prepared and implemented on-site. All work will be carried out in accordance with:

- The Health and Safety at Work etc. Act 1974¹³;
- The Construction (Design and Management) Regulations 2015¹⁴; and
- All applicable third-party safety guidelines.

Safety requirements & rules shall be displayed on site and be readily available for all employees to see, with delivery of toolbox talk records provided by the contractor. Contractors shall ensure that all site attendees complete a site induction prior to starting works. Safe Systems of Work for all significant risk activities shall be provided, including; Risk Assessments, Method Statements and Permits to Work - work will not be permitted without these being in place.

First aid facilities and a designated first aider will always be present on site. The provision of first aid will be the responsibility of the contractor unless agreed otherwise. First aid treatments must be reported and logged, no matter

¹³<https://www.hse.gov.uk/legislation/hswa.htm>

¹⁴<https://www.hse.gov.uk/construction/cdm/2015/index.htm>

how small. Notification of first aid arrangements shall be displayed and employees and other 3rd parties shall be informed of the arrangements. All accidents shall be reported and recorded in the appropriate site accident book / recording system provided by the contractor. Any notifiable accidents, specified injuries or conditions, or dangerous occurrences which are reported by the contractor under RIDDOR¹⁵ regulations, shall be reported without delay to the Site Manager.

No mechanical excavation work shall take place within one metre of live High Voltage Cables, nor within 500mm of any known live utility services. Contractors shall provide early notice of their intended work near live services, confirming the location of underground services and preparing safety document controls, barriers around all opening, trenches, excavations to prevent access into the areas.

Drilling spikes or posts are to not to be driven into the ground without a permit to break ground as issued by the Site Manager. Warning lights and reflective surfaces shall be placed on barriers around excavation works. Segregation of plant and pedestrians shall be maintained; barriers are to be installed at access points and within excavation, along with appropriate signage. Stop blocks to be used with reversing of vehicles up to an excavation.

8.2. Security

Stringent security shall be ensured across all Borrow Pit location. All site users will use the provided means of access and egress on the site, daily site records of employees will be recorded to aid in safety and security in the event of an emergency or any other incident on site. If security is deemed necessary on site, measures may take the form of locking barriers borrow pit access, CCTV and/or security personnel. Training/induction will be undertaken for all site staff prior to working on site.

Plant shall be stored to minimise risk of collision, run-away and vandalism, with a flexible pipes, taps or valves provided with an appropriate lock for security when not in use. Temporary lighting will be required at the construction compounds for security purposes and to ensure that a safe working environment is provided to construction staff. No lighting is envisaged at the borrow pit locations however this will remain under review.

9. Site Inspection

During operation of the Borrow Pit workings, an on-going system of formalised assessment will be completed by a suitably qualified Geotechnical Engineer. They will be responsible for monitoring site workings and responding to changing ground conditions accordingly. Environmental inspections are to be carried out by personnel based at the borrow pits and by the project's Environmental Clerk of Works (ECOW).

Following the completion of the borrow pit works, a final inspection of the Site will be undertaken and in circumstances where reinstatement using vegetation and/or topsoil is unsuccessful alternative methods will be considered. The inspection will also ensure that any drainage features retained within the site are functioning properly and that the site is in good condition.

Table 9.1 below provides an example of a daily check that will be implemented during the works.

¹⁵ <https://www.hse.gov.uk/riddor/>

Table 9.1: Daily Checks Example

Daily Check	Description
Weather Forecast	Local weather forecasts will be checked prior to starting work each day to identify likely weather / chance of adverse conditions
Sensitive Receptor	Identify which sensitive receptors (local catchments) may be affected by watercourse pollution from the Site
Wet Weather	Ensure SuDS are in optimum working order and clear of debris or fines build-up and that the water sump is available to keep the working area dry.
On-site activities	Undertake regular visual checks of drainage measures, spill kit sufficiency and condition of temporary storage areas throughout the working day.
Notifications	If there is an environmental incident such as a spill into a watercourse, the Site Manager will be notified as soon as possible, and the incident will be acted upon following the emergency contamination spill procedure. All work will cease until the spillage is controlled and appropriate measures are put in place and signed off by the Site ECoW and/or any relevant organisation. If there is a risk of pollution off-site despite the above management measures being put in place, inform neighbours in advance of risk and what management measures have been put in place. Actively monitor pollution management and where surface water pollution is likely to affect neighbours, cease all activities until suitable management procedures can be implemented.
Complaints	A record will be kept on site of any spill-related complaints and remedial action taken. If required, staff will be briefed on changes required to working practices to ensure the incident is not repeated.

Source: Natural Power

10. Restoration & Aftercare Plan

10.1. Indicative Restoration Profile

Reclamation means the treatment of land affected by mineral workings in such a way as to restore the land to a satisfactory state and is defined in the Town and Country Planning Act 1990¹⁶ to include both restoration and aftercare. Borrow pit restoration profiles (cross-section and plan view) for each borrow pit location are provided in Appendix A of this report.

The restoration and aftercare plan follows the guidance of the MTANs and use phased/progressive restoration methods as set out in Section 5 (Soil Management) of this report. Phasing shall follow a logical sequence, but restoration should be implemented as soon as is practical after each borrow pit extraction has been completed. It has been requested that the expansion of existing NRW borrow pits e.g., N1 and S5 may be retained by NRW following the wind farm construction for further development associated with the forestry management. It is anticipated that under such circumstances NRW would be responsible for the restoration and aftercare at these locations but would be expected to follow principles and plans set out in this report.

The excavations will initially result in steep sided voids and exposed extraction faces. Where unrestored this can result in loss of visual amenity and ecological interest. To avoid this the borrow pits will incorporate gently graded slopes consistent with those of the existing landscape and will remove the most elevated and potentially visible faces in each pit.

Initially, the excavation void will be partially filled by selected moisture retentive overburden released from both the borrow pit excavation and, if necessary, from construction works elsewhere from the proposed development. Restoration of the gentle slope will be undertaken by direct translocation of 'in-situ' turf and substrate. The borrow pit will be enclosed by suitable stock-proof fencing to prevent incursions. Although not anticipated at the borrow pit locations, any peat material present will be placed and surfaced with translocated acrotelmic peat turfs from the excavation and will be hydrologically restored to adjoining areas by breaking out any impermeable barriers.

Restoration margins shall be included in the design of the working scheme to provide a transition between the quarry and its surroundings. This provision may well increase the environmental potential for after-use of the quarry. The dimension of the margin and the amount of land-take will depend on final restoration, the geological stability of the margins, the final depth and landform of the mineral workings (to achieve the required angle of slope) and the intended after-use.

10.2. Restoration Materials and Re-use

Stripped soils from the borrow pit works will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics. Remaining and unusable aggregate material from the excavations can also be recycled to soften the final borrow pit profile for restoration.

10.3. Retained and Proposed Planting

If required, reseedling, with seed appropriate to the local habitat, will be carried out to aid revegetation. Direct seeding may present some scope on sites restored for nature conservation particularly as a means of augmenting natural recolonisation. However, direct seeding offers an alternative to the planting of nursery grown trees but its use on reclaimed sites must be very carefully considered due to potential problems such as unpredictability of germination, and wide spatial variation in seedling density.

New tree planting may be carried out following loss from felling activities at the borrow pit area or to enhance nature conservation on the development and will follow an approved planting scheme. For example, planting on quarry

¹⁶ <https://www.legislation.gov.uk/ukpga/1990/8/contents>

faces and on benches will help disguise the quarry face. This shall be undertaken within the first tree planting season following construction of the proposed development. Trees will be protected against grazing using tree guards and fencing. After planting, the trees will undergo a period of maintenance works including weeding, fertiliser application and replacement of any failed trees.

It should be noted that for the restoration plan for individual borrow pits, proposed tree planting will be weighed up against the option of tree removal to improve visibility and connection in the wider landscape in agreement with NRW.

10.4. Aftercare and Monitoring Regime

The preparation of an aftercare scheme will begin at least six months prior to commencement of aftercare on all or part of the proposed development with the submission of outline proposals to the Mineral Planning Authority. This scheme will provide an outline strategy of commitments for a five-year aftercare period and detail a programme for the forthcoming year. The restored borrow pit sites will be subject to a programme of annual aftercare throughout the operational timeline of the proposed development. This will provide habitat and hydrological monitoring for each borrow pit location and allow for any necessary mitigation measures.

The aftercare scheme will consider the following steps:

- Timing and pattern of vegetation establishment – the sequence of vegetation establishment over the full aftercare period;
- Cultivation practices;
- Secondary treatments – for example, subsoiling and stone picking;
- Drainage – timing of installation work, commitments to carry out necessary maintenance works or temporary drainage measures;
- Management of soil fertility and control of weeds – application rates, methods of maintenance of required soil fertility;
- Irrigation and watering – equipment specifications, siting of installations, and criteria for determining irrigation rates.

10.5. Phasing of Works

Phases of the borrow pit works are included in the design plans appended to this report. The following section provides information relevant to the working of each proposed borrow pit area.

Borrow Pit N1

Topsoil stripping and storage:

Moderate amounts of felling will be required to extend this borrow pit. Peat probing results record an average depth of less than 0.1 m and the coring (provided in the Hydrology, Geology and Hydrogeological Assessment in Chapter 10, document reference 1260374) shows that peaty soils rather than peat are dominant on the Site. There is ample space in the pre-existing compacted ground for safe storage of material.

Rock Extraction:

The borrow pit is located close to the site entrance of the northern area of the development. Outcropping rock is good quality sandstone and slightly weathered. The back face of the existing borrow pit is approximately 8.0 m high and this backwall can be extended north if greater quantities of material are required. Given the current elevation change from the base of the pit to the limit of the borrow pit area to the north exceeds 10 m, a mid-face bench may be required for extension. Bedrock is visible at the surface suggesting thin overburden thickness. This location is a large existing/active borrow pit location with plentiful reserves of extracted and processed material.

The village of Nantyffyllon are situated over 700 m to the east of the borrow pit working area, so extra consideration will be required to minimise noise disturbance from the works on residential areas (discussed in Section 4.5 of this report).

Drainage:

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow.

Restoration:

Borrow pit N1 is an existing quarry and will be left open in a safe condition in accordance with the mineral agreement and not reinstated (not designated as Habitat restoration area or infilled with excavated material) at the end of the construction period. The borrow pit will be passed into the care of NRW for later reinstatement and aftercare.

Borrow Pit S1 Development

Topsoil stripping and storage:

Moderate amounts of felling of young trees (approximately 1 m tall) will be required to allow for excavation of this historic working pit. Peat or peaty soil present, if any, is not anticipated to be more than 0.1 m deep, based on the peat probing data available. It is possible that the historic works finished by backfilling with superficial soils.

Stripped overburden soils shall be stored in peripheral bunds at a safe distance from the working area. Bunds shall be no more than 1.5 m in height with 1 in 1.5 slope batters. The final location and geometry of temporary storage bunds shall be confirmed by a qualified geotechnical engineer during construction.

Rock Extraction:

The back face of the historic quarry is approximately 12 m higher than the present-day base of the working area, therefore a mid-face bench may be required for expansion of this quarry. There is suitable access to the borrow pit from the pre-existing construction track. Bedrock is anticipated to comprise the Rhondda Member Sandstone with Mudstone and Siltstone. A coal seam is indicated to sub-crop the extreme north-eastern limits of this search area. Visible material is likely to excavate as subangular very fine to coarse sandy Cobbles with fine to coarse subangular gravel and boulders of medium strong medium sandstone.

A cluster of farm buildings are situated approximately 700 m to the east of the borrow pit working area, so extra consideration will be required to minimise noise disturbance from the works on residential areas (discussed in Section 4.5 of this report).

Drainage:

There is a watercourse approximately 50 m steeply downhill to the south on the opposite side of the existing track and flows to the west into Cwmwernderi Reservoir. Probable high sand and fines content of exposed material will require active management to prevent siltation of run-off.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow. Diverted surface flow will also be retained and treated through a SuDS settlement sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly.

Restoration:

It is anticipated that S1 shall be fully restored at the end of the construction period. Excavation edges shall be softened by ripping and any unusable material from the excavation shall be used to create slopes and shallow areas. Stripped soils will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics.

Borrow Pit S2 Development

Topsoil stripping and storage:

Considerable felling of commercial forestry will be required to clear the area. Peat or peaty soil present, if any, is not anticipated to be more than 0.2 m deep based on several peat probes recorded in the borrow pit area.

Stripped overburden soils shall be stored in peripheral bunds at a safe distance from the working area. Bunds shall be no more than 1.5 m in height with 1 in 1.5 slope batters. The final location and geometry of temporary storage bunds shall be confirmed by a qualified geotechnical engineer during construction.

Rock Extraction:

Located within productive forestry, no rock outcrops are visible on the aerial photography, but the Brithdir Member Sandstone is anticipated at the location. Pre-construction ground investigation shall determine the nature of the material and appropriate excavation methods and uses. New access tracks from the west are required for this borrow pit area. The elevation across the borrow pit area ranges from 319 to 327 m Above Ordnance Datum (AOD). Expanding areas of cut north to form this borrow pit will require a robust design to ensure long term stability of any remaining rock cut slopes. The proposed location of borrow pit S2 is on gently rising and slightly undulating ground and so a phased excavation using benches could be incorporated.

Drainage:

There is a watercourse approximately 60 m steeply downhill to the east of the borrow pit area that flows to the west into Cwmwernderi Reservoir.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow. Diverted surface flow will also be retained and treated through a SuDS settlement sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly.

Restoration:

It is anticipated that S2 shall be fully restored at the end of the construction period. Excavation edges shall be softened by ripping and any unusable material from the excavation shall be used to create slopes and shallow areas. Stripped soils will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics.

Borrow Pit S3 Development

Topsoil stripping and storage:

Considerable felling of commercial forestry is required in the borrow pit area. Peat or peaty soil is recorded consistently as 0.2 m deep across the borrow pit area.

Stripped overburden soils shall be stored in peripheral bunds at a safe distance from the working area. Bunds shall be no more than 1.5 m in height with 1 in 1.5 slope batters. The final location and geometry of temporary storage bunds shall be confirmed by a qualified geotechnical engineer during construction.

Rock Extraction:

Located within productive forestry no rock outcrops are visible on the aerial photography. Bedrock is anticipated to comprise the Brithdir Member Sandstone. Pre-construction ground investigation shall determine the nature of the material and appropriate excavation methods and uses. New access tracks from the west are required for this borrow pit area. The elevation across the borrow pit area ranges from 289 to 310 m Above Ordnance Datum (AOD). Expanding areas of cut south to form this borrow pit will require a robust design to ensure long term stability of any remaining rock cut slopes.

Drainage:

There is a watercourse approximately 80 m to the southwest of the borrow pit area that flows to the west into Cwmwernderi Reservoir.

During excavations, joints and fractures in the zone below the target extraction level could potentially be opened up and create a flow pathway for rainfall to infiltrate the borrow pit. Therefore, given the relatively flat profile of the area, groundwater monitoring shall be undertaken prior to excavation, and if deemed necessary, a water collection sump shall be available within the excavation, where water shall be pumped into the settlement pond to maintain a dry working area.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow. Diverted surface flow will also be retained and treated through a SuDS settlement sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly.

Restoration:

It is anticipated that S3 shall be fully restored at the end of the construction period. Excavation edges shall be softened by ripping and any unusable material from the excavation shall be used to create slopes and shallow areas. Stripped soils will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics.

Borrow Pit S4 Development

Topsoil stripping and storage:

Considerable felling of commercial forestry required in borrow pit area. Peat or peaty soil present, if any, is not anticipated to be more than 0.2 m deep, based on a single peat probe point within the borrow pit and the nearest surrounding data available.

Stripped overburden soils shall be stored in peripheral bunds at a safe distance from the working area. Bunds shall be no more than 1.5 m in height with 1 in 1.5 slope batters. The final location and geometry of temporary storage bunds shall be confirmed by a qualified geotechnical engineer during construction.

Rock Extraction:

Located within productive forestry no rock outcrops are visible on the aerial photography. The borrow pit area has a relatively flat profile, ranging from 303 to 308 m AOD. Bedrock is anticipated to comprise the Brithdir Member Sandstone. Pre-construction ground investigation shall determine the nature of the material and appropriate excavation methods and uses. Expanding areas of rock cut to form this borrow pit will require a robust design to ensure long term stability of any remaining rock cut slopes. New access tracks from the north are required for this borrow pit area.

Drainage:

During excavations, joints and fractures in the zone below the target extraction level could potentially be opened up and create a flow pathway for rainfall to infiltrate the borrow pit. Therefore, given the relatively flat profile of the area, groundwater monitoring shall be undertaken prior to excavation, and if deemed necessary, a water collection sump shall be available within the excavation, where water shall be pumped into the settlement pond to maintain a dry working area.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow.

During excavations, joints and fractures in the zone below the target extraction level could potentially be opened up and create a flow pathway for rainfall to infiltrate the borrow pit. Therefore, groundwater monitoring shall be undertaken prior to excavation, and if deemed necessary, a water collection sump shall be available within the excavation, where water shall be pumped into the settlement pond to maintain a dry working area.

Restoration:

It is anticipated that S4 shall be fully restored at the end of the construction period. Excavation edges shall be softened by ripping and any unusable material from the excavation shall be used to create slopes and shallow areas. Stripped soils will be reinstated as close to where it was removed as possible. This will help to maintain a local seed base and the local geological/hydrological characteristics.

Borrow Pit S5 Development

Topsoil stripping and storage:

Moderate amounts of felling of commercial forestry are required in the borrow pit area. Several peat probing points in the borrow pit area show peat or peaty soil is recorded as no more than 0.1 m deep.

Stripped overburden soils shall be stored in peripheral bunds at a safe distance from the working area. Bunds shall be no more than 1.5 m in height with 1 in 1.5 slope batters. The final location and geometry of temporary storage bunds shall be confirmed by a qualified geotechnical engineer during construction.

Rock Extraction:

The existing borrow pit in front of borrow pit search area S5 has numerous mechanically exposed faces of sandstone of variable quality across multiple levels where phased excavation took place. Bedrock is comprised the Brithdir Member Sandstone and a shallow dipping coal seam should be anticipated beneath the southern half of the new borrow pit search area. The rock present in the pre-existing pit is generally moderately strong to strong with x4 different joint sets. Occasionally silty with slight weathering but predominantly fresh. On visual inspection it appears the borrow pit may be extended south into the back wall. Bedrock exposure at the surface is indicative of reduced overburden thickness. Given the elevation change from ground level at the base to the upper limit of the working area exceeds 10 m, a mid-face bench may be required for the development of this borrow pit.

Drainage:

There are two nearby watercourses in the area around the borrow pit. The first is approximately 60 m to the southeast which flows to the north into Cwmwernderi Reservoir. The second is approximately 60 m to the northwest and flows to the west into Nant Cwmwernderi.

Natural slope runoff shall be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches shall be created as necessary to control water flow. Diverted surface flow will also be retained and treated through a SuDS settlement sequence. No water from excavations and dewatering activities will be allowed to enter surface waters directly.

Restoration:

Borrow pit S5 is an existing quarry and will be left open in a safe condition in accordance with the mineral agreement and not reinstated (not designated as Habitat restoration area or infilled with excavated material) at the end of the construction period. The borrow pit will be passed into the care of NRW for later reinstatement and aftercare.

11. References

- The Construction (Design and Management) Regulations 2015. Health and Safety Executive.
- Control of Substances Hazardous to Health (Sixth edition). The Control of Substances Hazardous to Health Regulations 2002. Approved Codes of Practice and guidance L5 (Sixth edition) HSE Books 2013.
- Environmental Protection Act 1990.
- The Groundwater Regulations 1998.
- The Health and Safety at Work etc Act 1974. Health and Safety Executive.
- Health and safety at quarries. The Quarries Regulations 1999. Approved Code of Practice. Health and Safety Executive.
- Minerals Planning Guidance Note 11: The Control of Noise at Surface Mineral Workings (1993)
- Minerals technical advice note (MTAN) Wales 1: aggregates (2004).
- RIDDOR – Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013).
- Town and Country Planning Act 1990.

12. Appendix A – Drawings

18211_BP_4000-RevA-BORROW PIT N1 DRAWING

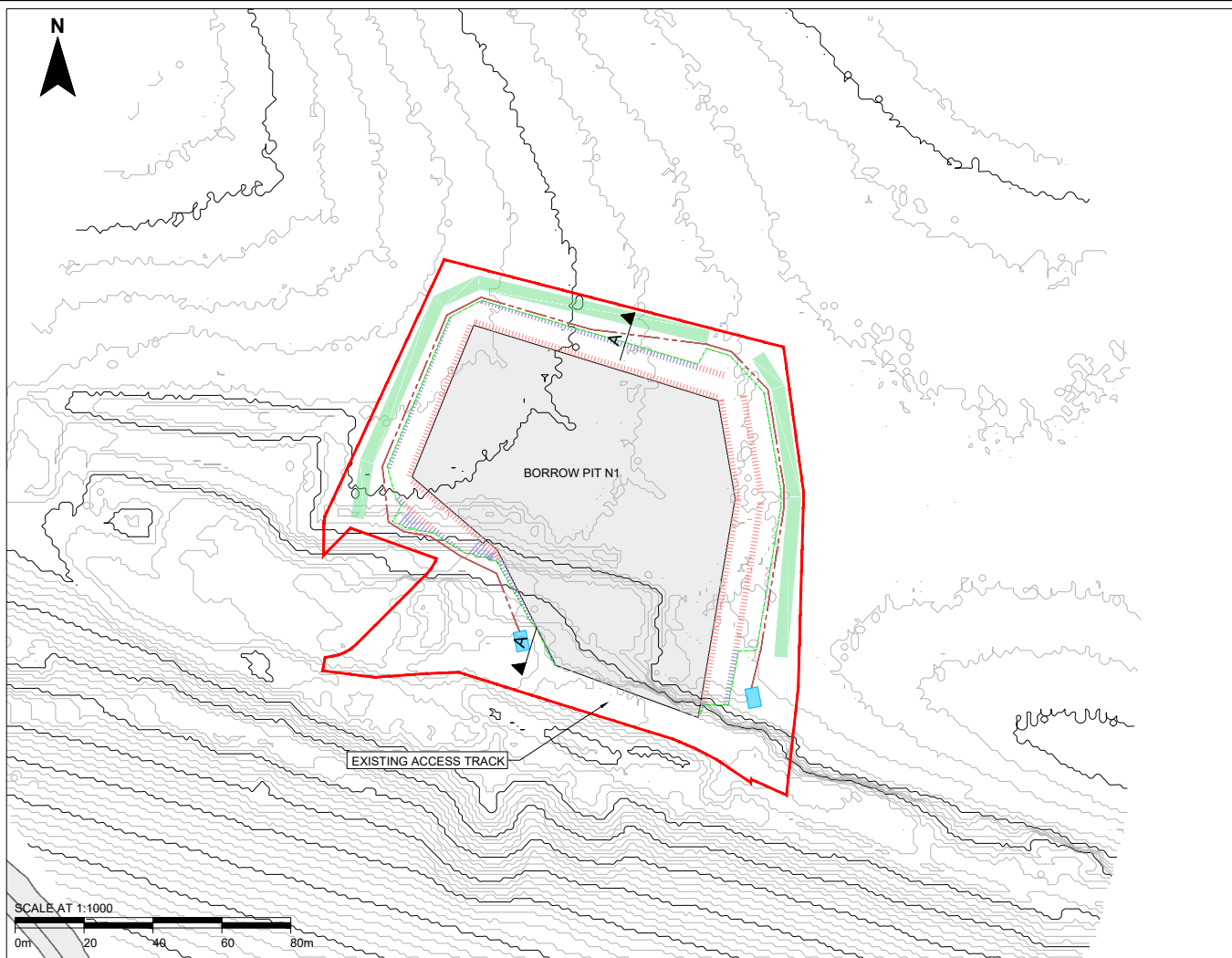
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18211_BP_4002-RevA-BORROW PIT S2 DRAWING

18211_BP_4003-RevA-BORROW PIT S3 DRAWING

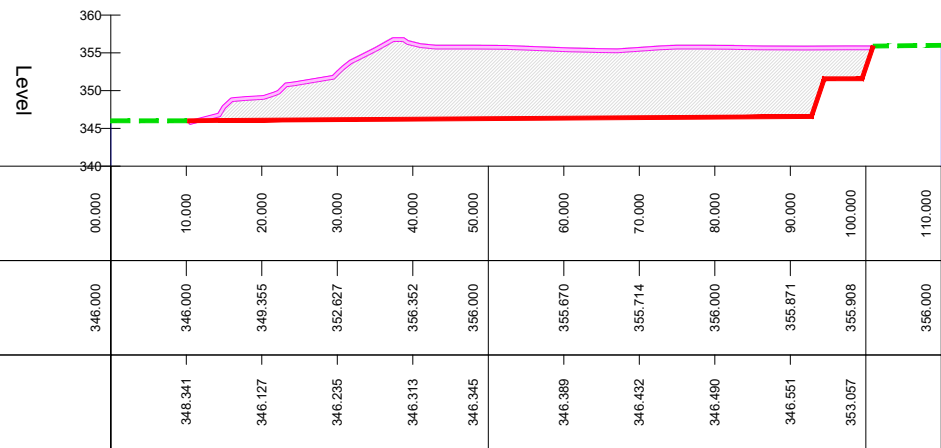
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18211_BP_4005-RevA-BORROW PIT S5 DRAWING

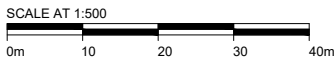


BORROW PIT PLAN - BORROW PIT N1
SCALE 1:1000

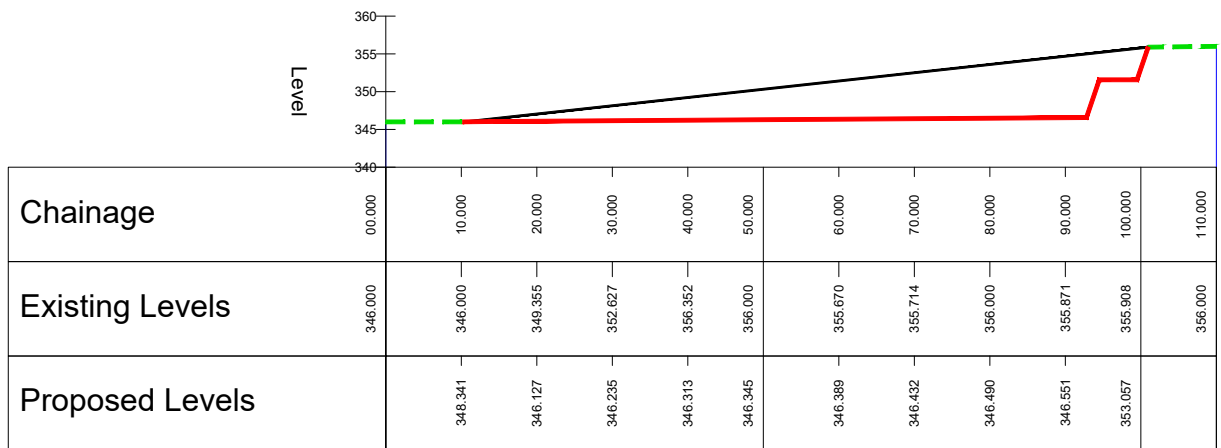
BORROW PIT N1 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 4,622.620 m3
ROCK MATERIAL VOLUME = 60,586.850 m3



BORROW PIT N1 - SECTION A-A
SCALE 1:500



BORROW PIT PLAN - ALL BORROW PITS
SCALE 1:15,000



BORROW PIT N1 - SECTION A-A, INDICATIVE RESTORATION PROFILE
SCALE 1:500

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NOTES:

1. DEPTH OF OVERBURDEN IS INDICATIVE AT THIS STAGE AND ASSUMED TO BE AN APPROXIMATE 0.5m LAYER FROM THE SURFACE. BORROW PIT ROCK YIELD AND OVERBURDEN SOIL VOLUMES SHALL BE REFINED FOLLOWING THE DETAILED SITE INVESTIGATION PHASE.
2. OVERBURDEN SOILS SHALL BE REMOVED, CLASSIFIED, SEPARATED, AND STORED IN PERIPHERAL BUNDS AT A SAFE DISTANCE FROM THE WORK AREA. THE FINAL LOCATION AND GEOMETRY OF THE TEMPORARY STORAGE AREA BUNDS SHALL BE CONFIRMED BY A QUALIFIED GEOTECHNICAL ENGINEER DURING THE CONSTRUCTION PHASE. NOMINALLY THESE SHALL BE SET AT 1.5m HIGH WITH SIDE SLOPES OF 1IN2.5.
3. CUT ROCK FACES SHALL NOT EXCEED 5m HIGH WITHOUT A HORIZONTAL BENCH OF 5m.
4. THE SLOPE STABILITY CONDITION OF THE CUT ROCK FACES, SOIL STORAGE BUNDS AND BACKFILL MATERIALS SHALL BE VERIFIED AND MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER DURING OPENING, WORKING AND RESTORATION PHASES OF EACH OF THE BORROW PIT WORKING.
5. THE PERIMETER OF THE BORROW PIUT SHALL INCORPORATE APPROPRIATE SAFETY EDGE PROTECTION SUITABLE TO RISK OF PERSONNEL AND ANY ADJACENT VEHICULAR MOVEMENTS.
6. THE FLOOR OF THE BORROW PIT SHALL SLOPE AWAY FROM THE WORKING FACE TO ALLOW RUN-OFF TO BE PROCESSED THROUGH A SUITABLE DRAINAGE SYSTEM.
7. THE RESTORATION PROFILE SHALL COMPRISE OF A NATURALLY UNDULATING SLOPE OF 10-15 DEGREES OR OTHERWISE TO BLEND INTO THE SURROUNDING TERRAIN. THE RESTORATION PROFILE IS INDICATIVE AND WILL BE CONTROLLED BY THE DEPTH OF THE OVERBURDEN SOILS ENCOUNTERED AND THE SOIL MECHANICAL PROPERTIES OF THE BACKFILL MATERIAL. ALL EARTHWORKS' OPERATIONS SHALL BE MONITORED AND CONTROLLED IN ACCORDANCE WITH A SUITABLE EARTHWORKS SPECIFICATION. THIS SHALL BE DEVISED FOLLOWING DETAILED SITE INVESTIGATION.
8. INITIAL BACKFILLING WOULD BE COMPLETED USING UNSUITABLE ROCK SPOIL FOLLOWING BY OVERBURDEN SOILS (GLACIAL SUBSOILS). THIS MATERIAL WOULD BE USED TO RAISE THE BASE OF THE BORROW PIT TO A SUITABLE LEVEL AND GEOMETRY ONTO WHICH TOPSOIL AND PEAT SOILS CAN BE PLACED TO ACHIEVE THE FINAL RESTORATION PROFILE. RE-SEEDING AND PLANTING WILL BE CARRIED OUT IN ACCORDANCE WITH THE CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN (CEMP)
9. ALL RELATED DRAINAGE FROM SURFACE RUN-OFF AND GROUNDWATERS SHALL BE DISCHARGED IN AN ENVIRONMENTALLY COMPLIANT MANNER THROUGH A SUSTAINABLE DRAINAGE SYSTEM AND MANAGED IN ACCORDANCE WITH ALL APPLICABLE POLLUTION CONTROL MEASURES.
10. ALL BORROW PITS SHALL BE SUBJECT TO LOCATION SPECIFIC MONITORING AND AFTERCARE REGIME.
11. TOPOGRAPHICAL DATA HAS BEEN DERIVED FROM WELSH GOVERNMENT LIDAR, 1m RESOLUTION ELEVATION DIGITAL TERRAIN MODEL (DTM) DATA. THIS IS DATED 2020-2022.

KEY:

- PLANNING BOUNDARY (BORROW PIT)
- BORROW PIT FLOOR (EXCAVATED)
- PROPOSED BORROW PIT MATERIAL
- EXISTING OVERBURDEN MATERIAL
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT N1 (NORTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

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IFS DOC NO.: 1334753 IFS ACTIVITY: 301115

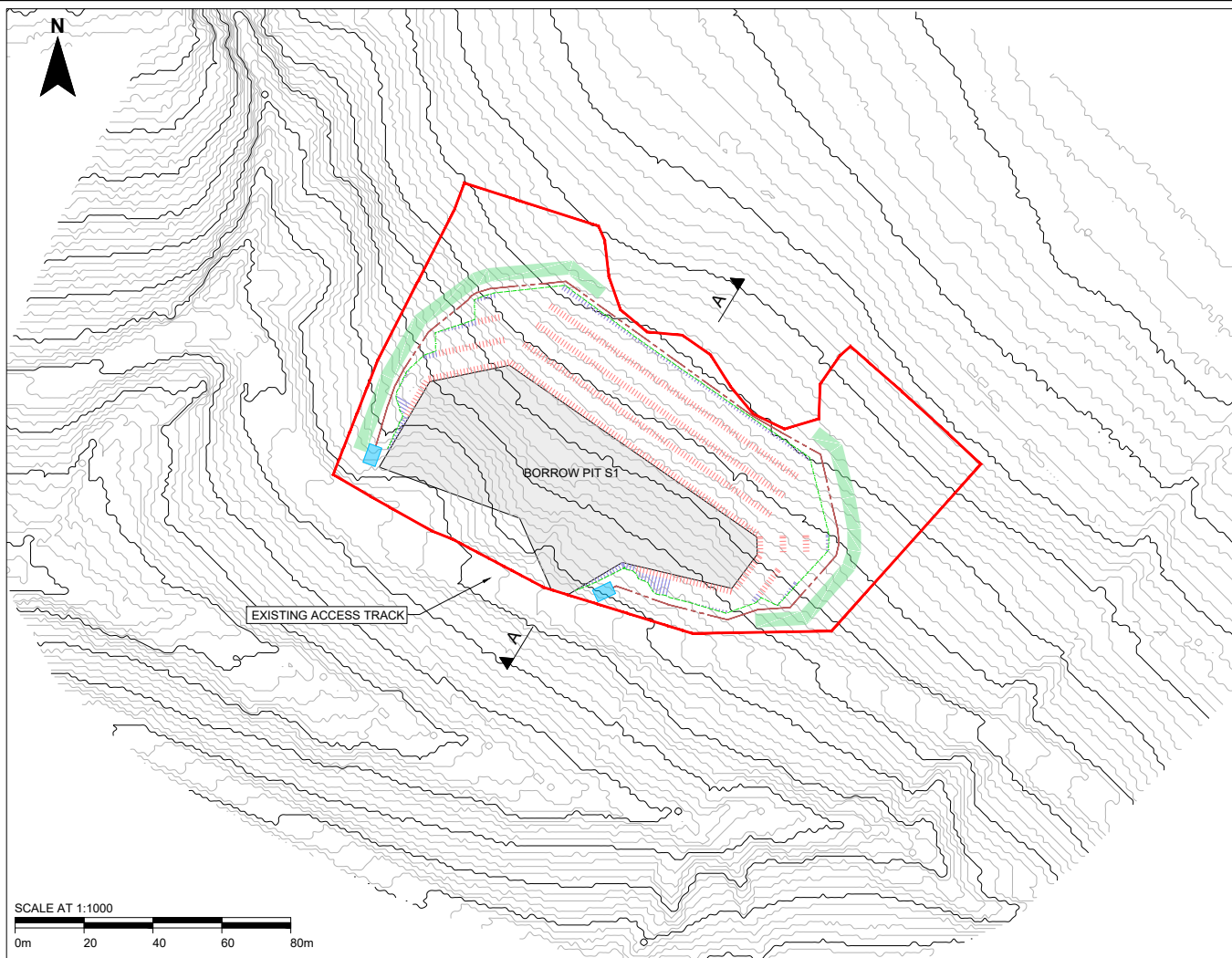
SCALE: VARIOUS @ A1 SHEET NO.: 1 OF 6

STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - N1
BORROW PIT DESIGN &
RESTORATION

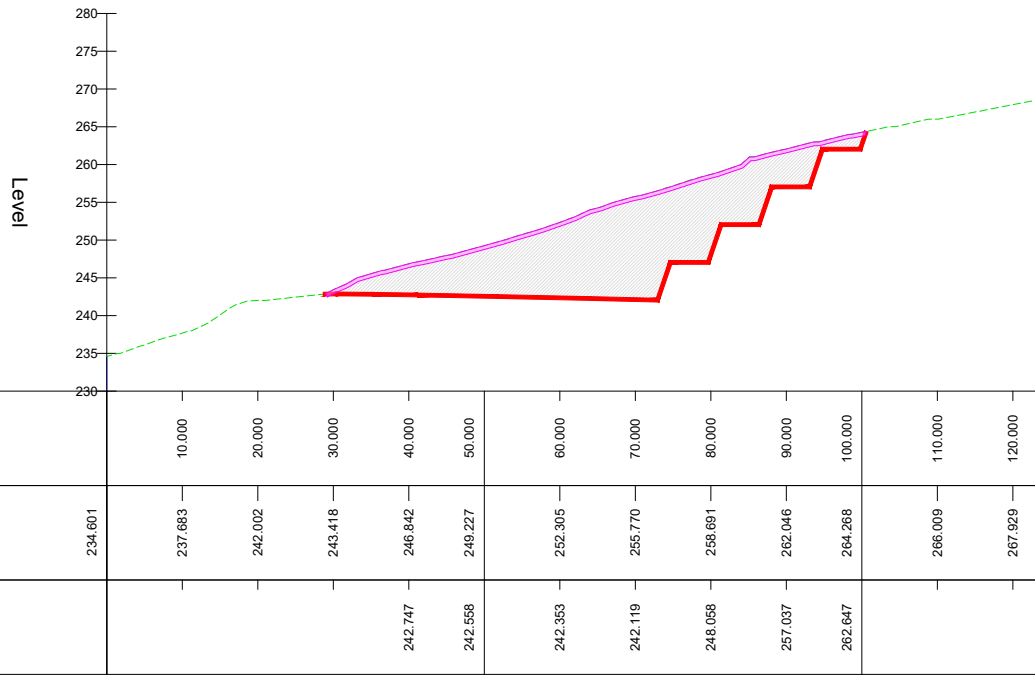
DRAWING NO.: 18211_BP_4000 REVISION **A**



BORROW PIT PLAN - BORROW PIT S1

SCALE 1:1000

BORROW PIT S1 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 3,747.135 m3
ROCK MATERIAL VOLUME = 47,832.372 m3



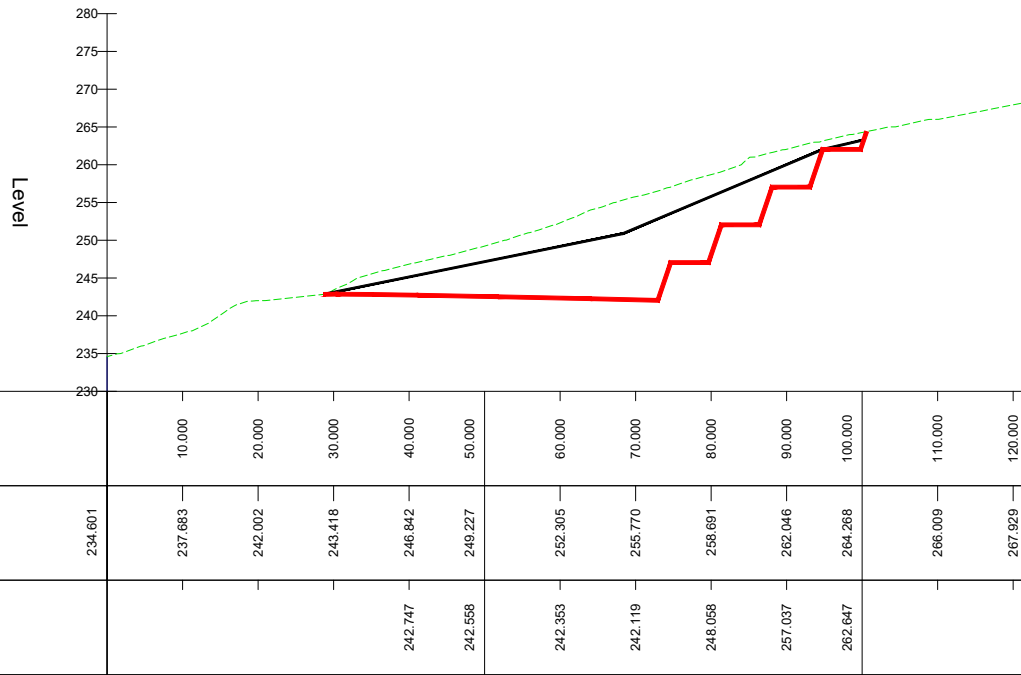
BORROW PIT S1 - SECTION A-A

SCALE 1:500



BORROW PIT PLAN - ALL BORROW PITS

SCALE 1:15,000



BORROW PIT S1 - SECTION A-A, INDICATIVE RESTORATION PROFILE

SCALE 1:500

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KEY:

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- BORROW PIT FLOOR (EXCAVATED)
- PROPOSED BORROW PIT MATERIAL
- EXISTING OVERBURDEN MATERIAL
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT S1 (SOUTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

CLIENT: Y BRYN WIND FARM LIMITED

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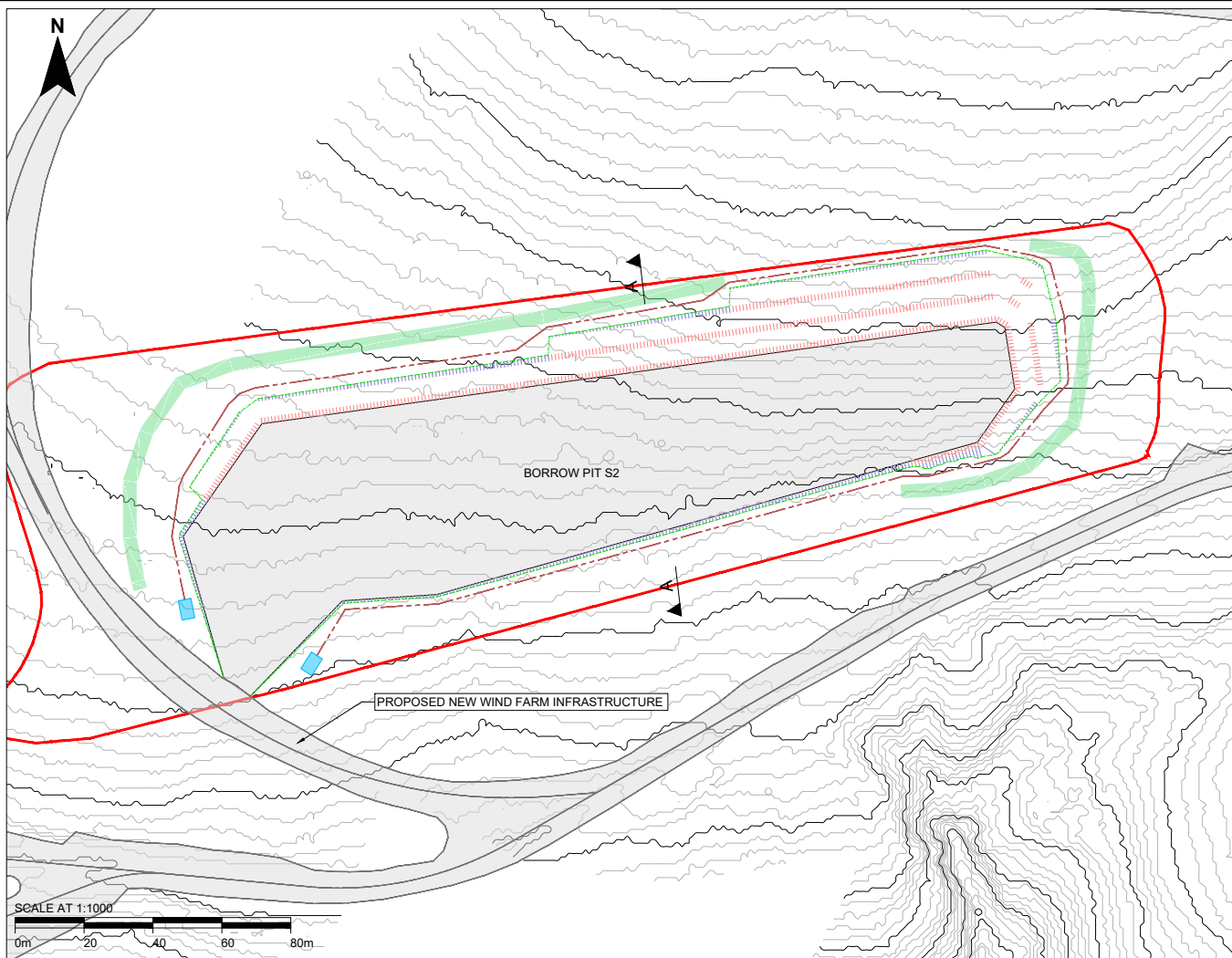
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SCALE: VARIOUS @ A1	SHEET NO.: 2 OF 6

STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - S1
BORROW PIT DESIGN & RESTORATION

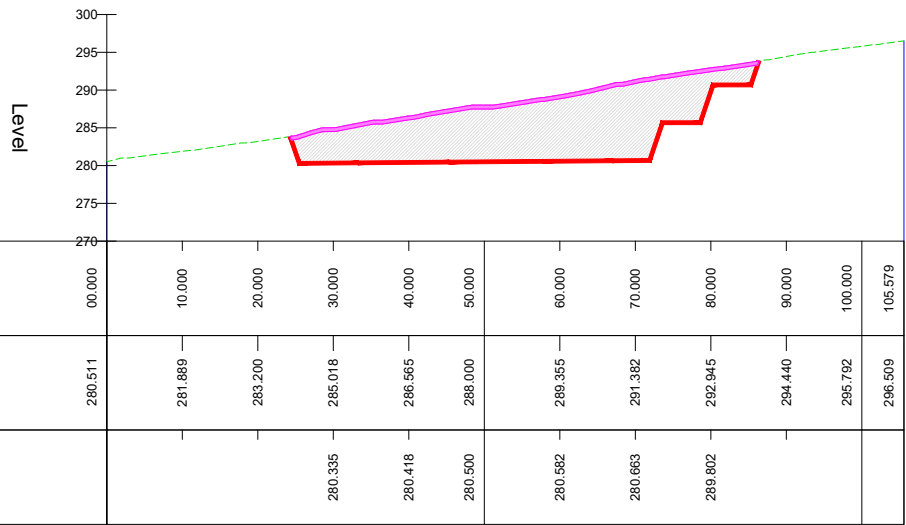
DRAWING NO.: 18211_BP_4001	REVISION A
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BORROW PIT PLAN - BORROW PIT S2

SCALE 1:1000

BORROW PIT S2 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 7,914.299 m3
ROCK MATERIAL VOLUME = 86,004.814 m3



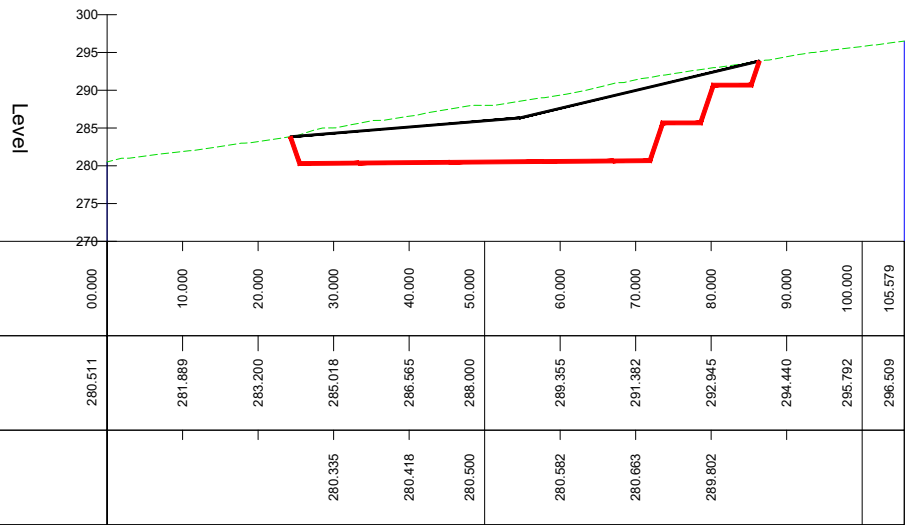
BORROW PIT S2 - SECTION A-A

SCALE 1:500



BORROW PIT PLAN - ALL BORROW PITS

SCALE 1:15,000



BORROW PIT S2 - SECTION A-A, INDICATIVE RESTORATION PROFILE

SCALE 1:500

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NOTES:

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10. ALL BORROW PITS SHALL BE SUBJECT TO LOCATION SPECIFIC MONITORING AND AFTERCARE REGIME.
11. TOPOGRAPHICAL DATA HAS BEEN DERIVED FROM WELSH GOVERNMENT LIDAR, 1m RESOLUTION ELEVATION DIGITAL TERRAIN MODEL (DTM) DATA. THIS IS DATED 2020-2022.

KEY:

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- BORROW PIT FLOOR (EXCAVATED)
- PROPOSED BORROW PIT MATERIAL
- EXISTING OVERBURDEN MATERIAL
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT S2 (SOUTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

CLIENT: Y BRYN WIND FARM LIMITED

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IFS DOC NO.: 1334755 IFS ACTIVITY: 301115

SCALE: VARIOUS @ A1 SHEET NO.: 3 OF 6

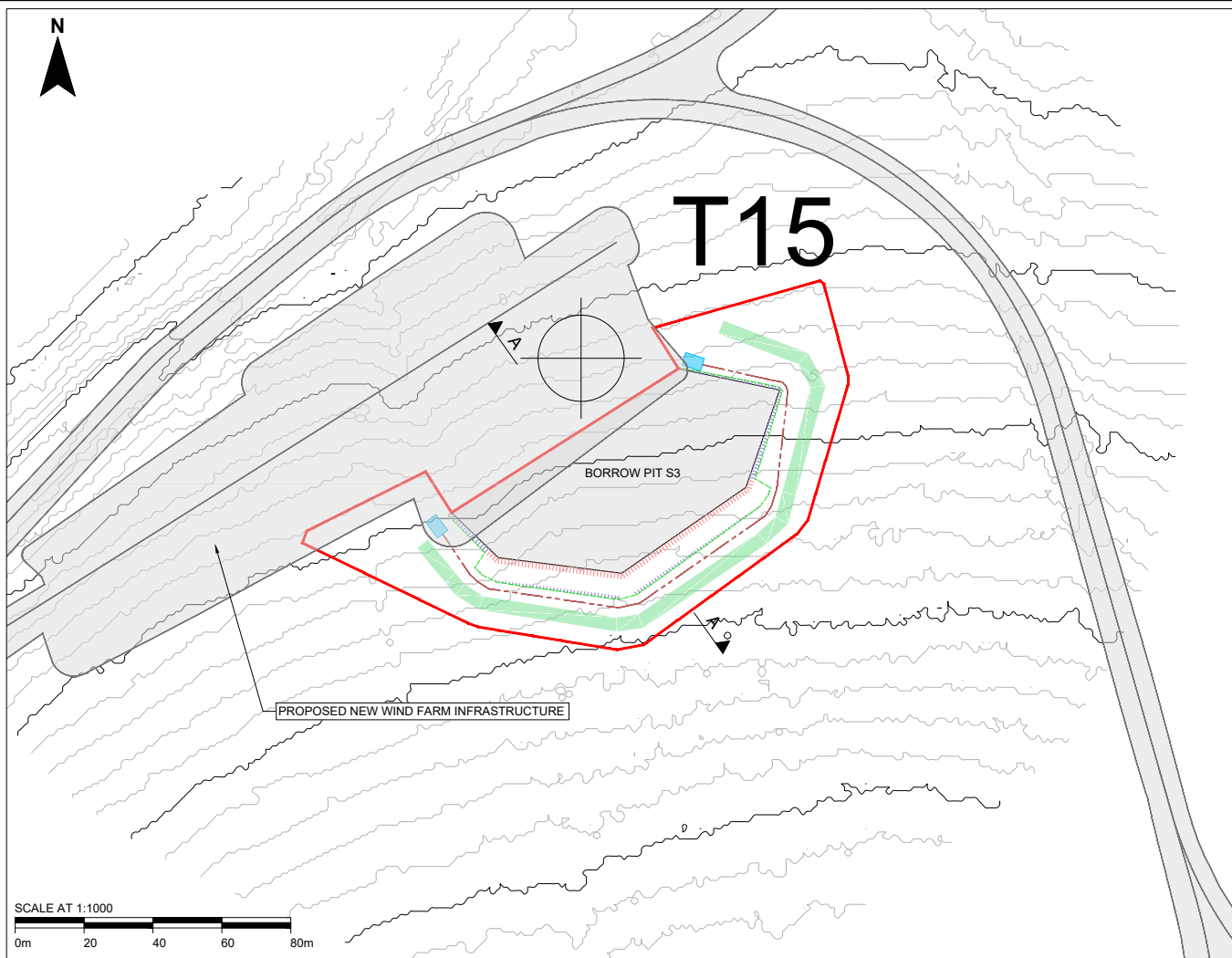
STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - S2
BORROW PIT DESIGN &
RESTORATION

DRAWING NO.: 18211_BP_4002 REVISION **A**



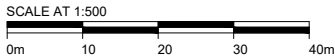


BORROW PIT PLAN - BORROW PIT S3
SCALE 1:1000

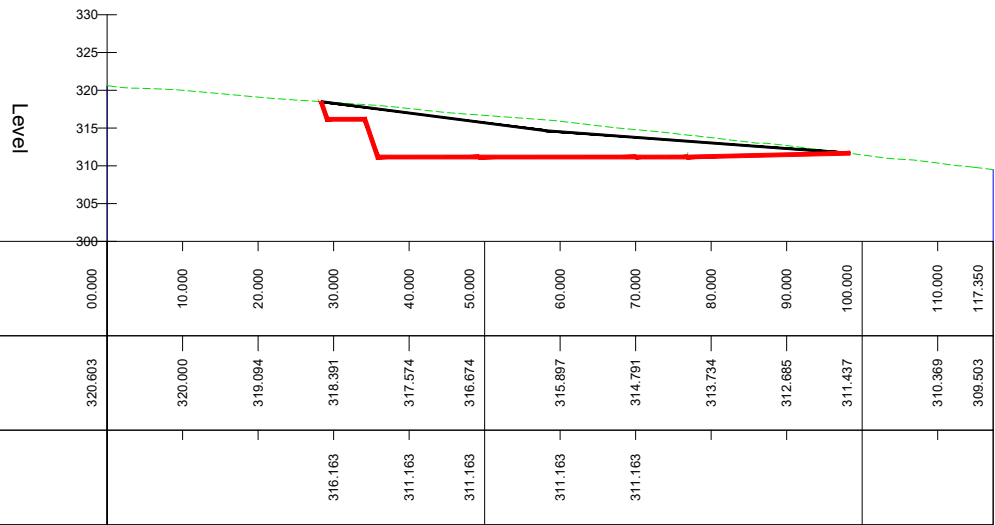
BORROW PIT S3 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 1,938.296 m3
ROCK MATERIAL VOLUME = 13,070.923 m3



BORROW PIT S3 - SECTION A-A
SCALE 1:500



BORROW PIT PLAN - ALL BORROW PITS
SCALE 1:15,000



BORROW PIT S3 - SECTION A-A, INDICATIVE RESTORATION PROFILE
SCALE 1:1000

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NOTES:

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- OVERBURDEN SOILS SHALL BE REMOVED, CLASSIFIED, SEPARATED, AND STORED IN PERIPHERAL BUNDS AT A SAFE DISTANCE FROM THE WORK AREA. THE FINAL LOCATION AND GEOMETRY OF THE TEMPORARY STORAGE AREA BUNDS SHALL BE CONFIRMED BY A QUALIFIED GEOTECHNICAL ENGINEER DURING THE CONSTRUCTION PHASE. NOMINALLY THESE SHALL BE SET AT 1.5m HIGH WITH SIDE SLOPES OF 1IN2.5.
- CUT ROCK FACES SHALL NOT EXCEED 5m HIGH WITHOUT A HORIZONTAL BENCH OF 5m.
- THE SLOPE STABILITY CONDITION OF THE CUT ROCK FACES, SOIL STORAGE BUNDS AND BACKFILL MATERIALS SHALL BE VERIFIED AND MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER DURING OPENING, WORKING AND RESTORATION PHASES OF EACH OF THE BORROW PIT WORKING.
- THE PERIMETER OF THE BORROW PIT SHALL INCORPORATE APPROPRIATE SAFETY EDGE PROTECTION SUITABLE TO RISK OF PERSONNEL AND ANY ADJACENT VEHICULAR MOVEMENTS.
- THE FLOOR OF THE BORROW PIT SHALL SLOPE AWAY FROM THE WORKING FACE TO ALLOW RUN-OFF TO BE PROCESSED THROUGH A SUITABLE DRAINAGE SYSTEM.
- THE RESTORATION PROFILE SHALL COMPRISE OF A NATURALLY UNDULATING SLOPE OF 10-15 DEGREES OR OTHERWISE TO BLEND INTO THE SURROUNDING TERRAIN. THE RESTORATION PROFILE IS INDICATIVE AND WILL BE CONTROLLED BY THE DEPTH OF THE OVERBURDEN SOILS ENCOUNTERED AND THE SOIL MECHANICAL PROPERTIES OF THE BACKFILL MATERIAL. ALL EARTHWORKS' OPERATIONS SHALL BE MONITORED AND CONTROLLED IN ACCORDANCE WITH A SUITABLE EARTHWORKS SPECIFICATION. THIS SHALL BE DEVISED FOLLOWING DETAILED SITE INVESTIGATION.
- INITIAL BACKFILLING WOULD BE COMPLETED USING UNSUITABLE ROCK SPOIL FOLLOWING BY OVERBURDEN SOILS (GLACIAL SUBSOILS). THIS MATERIAL WOULD BE USED TO RAISE THE BASE OF THE BORROW PIT TO A SUITABLE LEVEL AND GEOMETRY ONTO WHICH TOPSOIL AND PEAT SOILS CAN BE PLACED TO ACHIEVE THE FINAL RESTORATION PROFILE. RE-SEEDING AND PLANTING WILL BE CARRIED OUT IN ACCORDANCE WITH THE CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN (CEMP)
- ALL RELATED DRAINAGE FROM SURFACE RUN-OFF AND GROUNDWATERS SHALL BE DISCHARGED IN AN ENVIRONMENTALLY COMPLIANT MANNER THROUGH A SUSTAINABLE DRAINAGE SYSTEM AND MANAGED IN ACCORDANCE WITH ALL APPLICABLE POLLUTION CONTROL MEASURES.
- ALL BORROW PITS SHALL BE SUBJECT TO LOCATION SPECIFIC MONITORING AND AFTERCARE REGIME.
- TOPOGRAPHICAL DATA HAS BEEN DERIVED FROM WELSH GOVERNMENT LIDAR, 1m RESOLUTION ELEVATION DIGITAL TERRAIN MODEL (DTM) DATA. THIS IS DATED 2020-2022.

KEY:

- PLANNING BOUNDARY (BORROW PIT)
- BORROW PIT FLOOR (EXCAVATED)
- PROPOSED BORROW PIT MATERIAL
- EXISTING OVERBURDEN MATERIAL
- OVERBURDEN MATERIAL STORAGE
- SETTLEMENT POND
- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT S3 (SOUTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

CLIENT:

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IFS DOC NO.: 1334756 IFS ACTIVITY: 301115

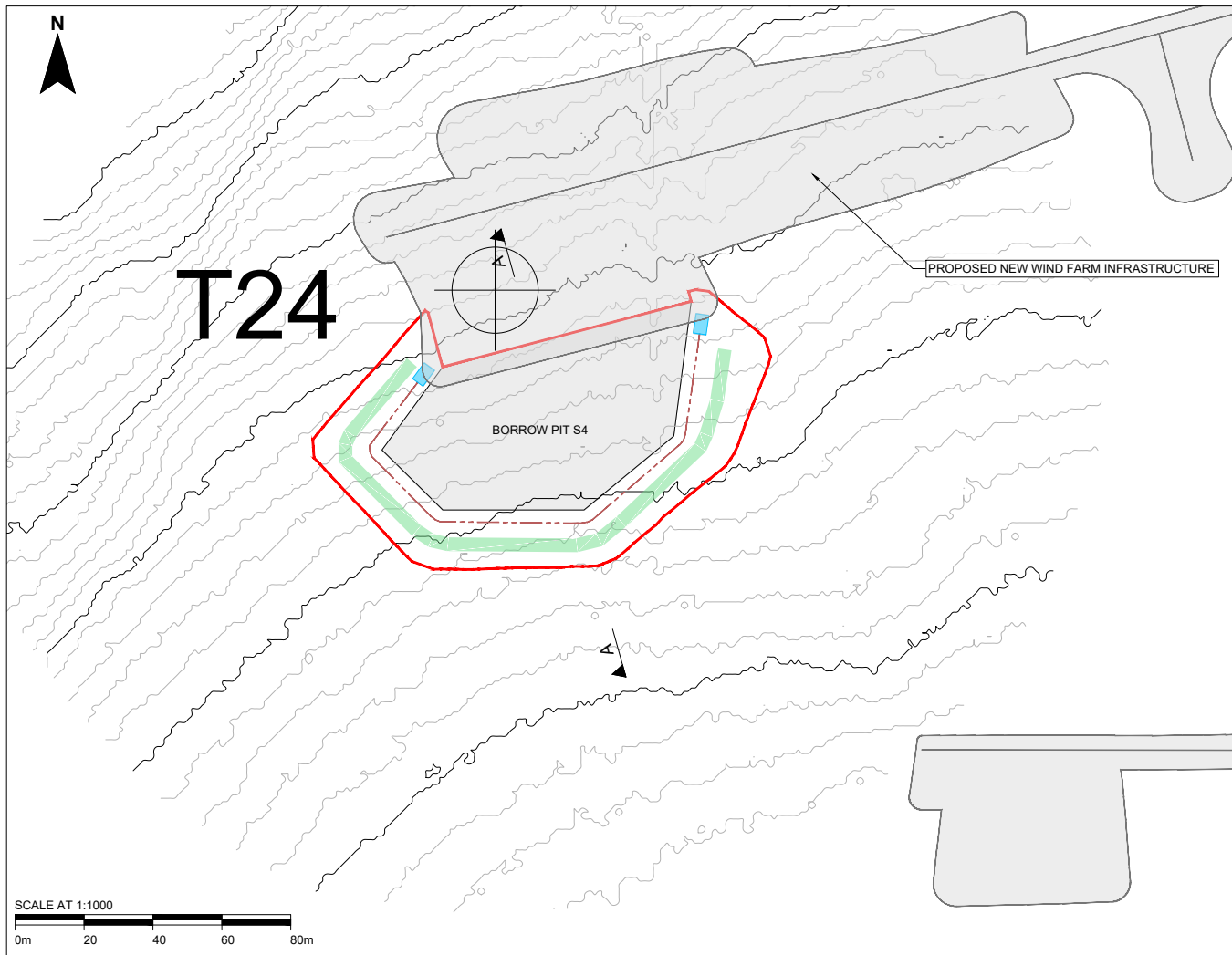
SCALE: VARIOUS @ A1 SHEET NO.: 4 OF 6

STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - S3
BORROW PIT DESIGN &
RESTORATION

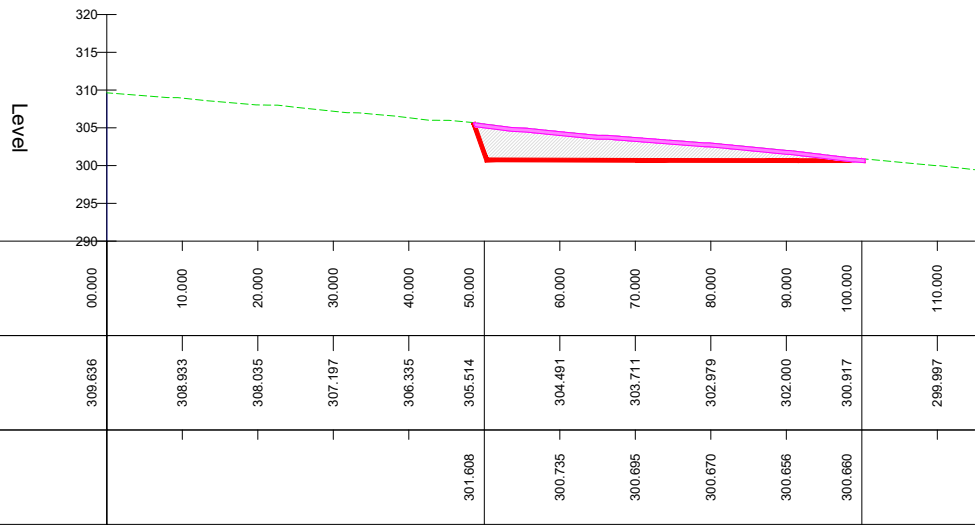
DRAWING NO.: 18211_BP_4003 REVISION **A**



BORROW PIT PLAN - BORROW PIT S4

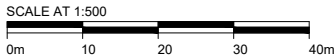
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BORROW PIT S4 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 1,862.274 m3
ROCK MATERIAL VOLUME = 6,275.204 m3



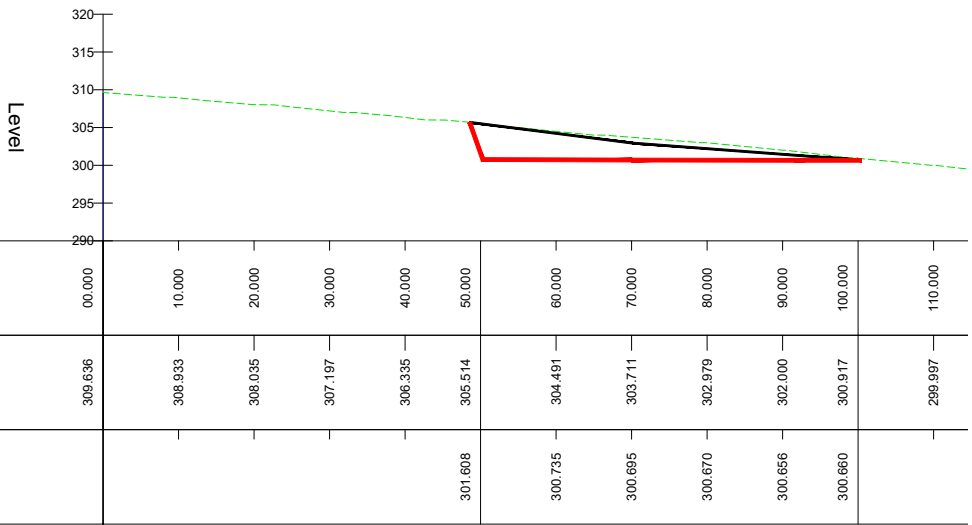
BORROW PIT S4 - SECTION A-A

SCALE 1:1000



BORROW PIT PLAN - ALL BORROW PITS

SCALE 1:15,000



BORROW PIT S4 - SECTION A-A, INDICATIVE RESTORATION PROFILE

SCALE 1:1000

LEGAL: NATURAL POWER CONSULTANTS LTD TAKE NO RESPONSIBILITY FOR THE ACCURACY OF DATA PROVIDED BY THIRD PARTIES.

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NOTES:

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2. OVERBURDEN SOILS SHALL BE REMOVED, CLASSIFIED, SEPARATED, AND STORED IN PERIPHERAL BUNDS AT A SAFE DISTANCE FROM THE WORK AREA. THE FINAL LOCATION AND GEOMETRY OF THE TEMPORARY STORAGE AREA BUNDS SHALL BE CONFIRMED BY A QUALIFIED GEOTECHNICAL ENGINEER DURING THE CONSTRUCTION PHASE. NOMINALLY THESE SHALL BE SET AT 1.5m HIGH WITH SIDE SLOPES OF 1IN2.5.
3. CUT ROCK FACES SHALL NOT EXCEED 5m HIGH WITHOUT A HORIZONTAL BENCH OF 5m.
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5. THE PERIMETER OF THE BORROW PIUT SHALL INCORPORATE APPROPRIATE SAFETY EDGE PROTECTION SUITABLE TO RISK OF PERSONNEL AND ANY ADJACENT VEHICULAR MOVEMENTS.
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10. ALL BORROW PITS SHALL BE SUBJECT TO LOCATION SPECIFIC MONITORING AND AFTERCARE REGIME.
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KEY:

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- BORROW PIT FLOOR (EXCAVATED)
- PROPOSED BORROW PIT MATERIAL
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- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT S4 (SOUTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

CLIENT: Y BRYN WIND FARM LIMITED

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IFS DOC NO.: 1334757 IFS ACTIVITY: 301115

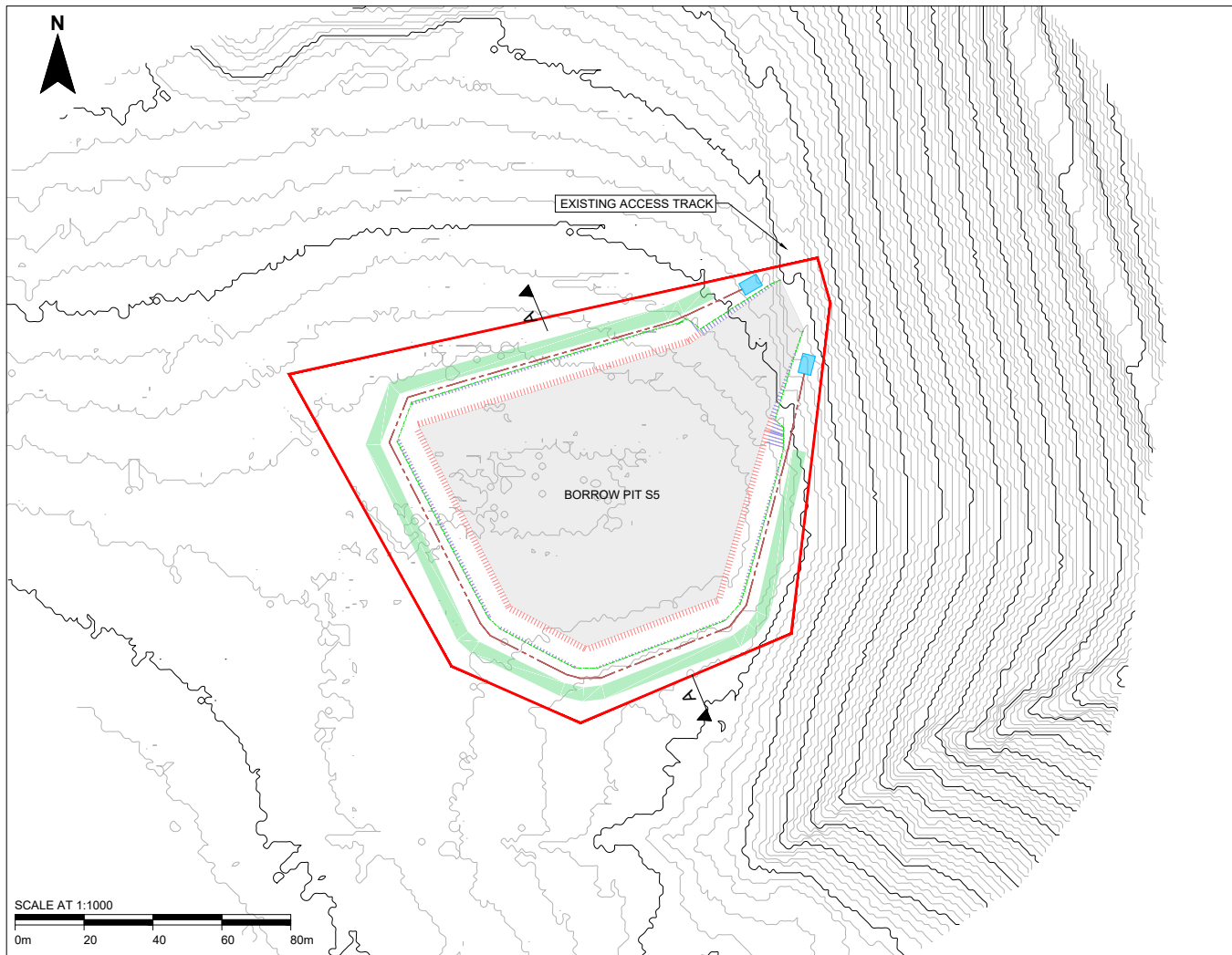
SCALE: VARIOUS @ A1 SHEET NO.: 5 OF 6

STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - S4
BORROW PIT DESIGN &
RESTORATION

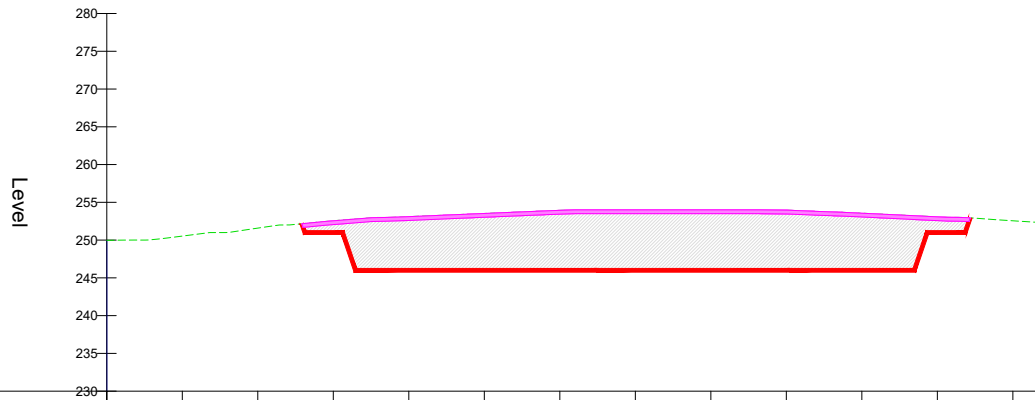
DRAWING NO.: 18211_BP_4004 REVISION **A**



BORROW PIT PLAN - BORROW PIT S5

SCALE 1:1000

BORROW PIT S5 VOLUMES:
OVERBURDEN MATERIAL VOLUME = 4,196.689 m3
ROCK MATERIAL VOLUME = 46,097.176 m3



BORROW PIT S5 - SECTION A-A

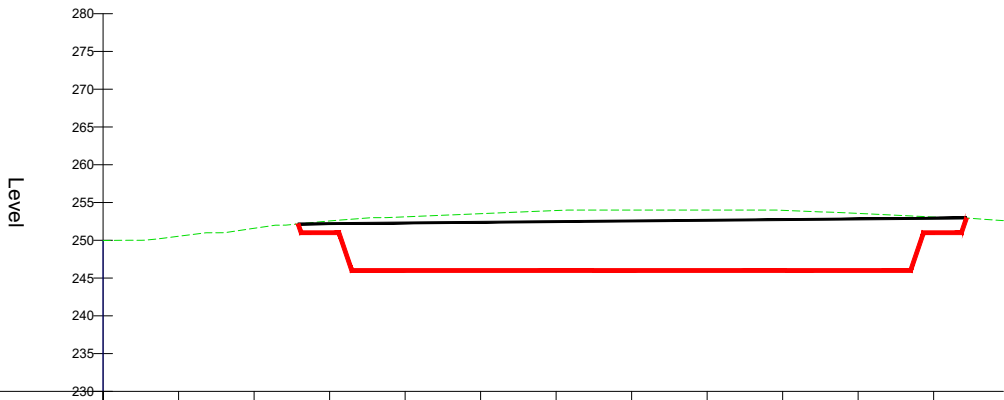
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Chainage	230	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000
Existing Levels	249.969	250.533	251.589	252.559	253.103	253.524	253.939	254.000	254.000	253.967	253.560	253.076	252.556
Proposed Levels				251.000	246.000	246.000	246.000	246.000	246.000	246.000	246.000	251.000	



BORROW PIT PLAN - ALL BORROW PITS

SCALE 1:15,000



BORROW PIT S5 - SECTION A-A, INDICATIVE RESTORATION PROFILE

SCALE 1:500

Chainage	230											
		10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000
	249.969	250.533	251.589	252.559	253.103	253.524	253.939	254.000	254.000	253.967	253.560	253.076
Proposed Levels				251.000	246.000	246.000	246.000	246.000	246.000	246.000	246.000	251.000

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- PROPOSED GROUND PROFILE
- INDICATIVE RESTORATION PROFILE
- BORROW PIT S5 (SOUTHERN SITE AREA)
- SOIL HEAP STORAGE LOCATIONS
- NEW CUT OFF DITCH
- NEW SETTLEMENT PONDS

A	INITIAL DWG	GC	GG	GG	12/12/2023
REV	DESCRIPTION	BY	CH	APP	DATE

CLIENT:

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IFS DOC NO.: 1334758 IFS ACTIVITY: 301115

SCALE: VARIOUS @ A1 SHEET NO.: 6 OF 6

STATUS: **FOR INFORMATION**

PROJECT: Y BRYN WIND FARM

DRAWING TITLE: BORROW PIT - S5
BORROW PIT DESIGN &
RESTORATION

DRAWING NO.: 18211_BP_4005 REVISION **A**



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naturalpower.com
sayhello@naturalpower.com



For full details on our ISO and other certifications, please visit our website.

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