PENDERYN QUARRY

Twyn y Glog Ridge Reserves Swap

Environmental Statement
Non – Technical Summary
Volume 3

April 2019

ENVIRONMENTAL STATEMENT

NON TECHNICAL SUMMARY

VOLUME 3

PENDERYN QUARRY

Twyn-y-Glog Ridge Reserves Swap

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1.0 INTRODUCTION

1.1 Background

A planning application has been submitted by Hanson UK (the Applicants) to the Brecon Beacons National Park Authority (BBNPA) which seeks planning permission for a new area of working at the south eastern corner of Penderyn Quarry.

In return, the scheme proposes the relinquishment of the rights to quarry reserves with existing planning permission in the south western area of the quarry along the Twyn-y-Glog ridgeline, referred to in the application documents as the '**Preserved Area**'.

In effect, the application represents a 'reserve swap', albeit the effect would be a net reduction in the available planned reserve at the overall quarry of some 7.4 million tonnes.

There would also be a reduction in the overall quarry operational area, with an Application Site area of 1.77 hectares compared to the proposed 'Preserved Area' of 2.35 hectares

A plan showing the location of the Application Site within the existing Penderyn Quarry land ownership boundary is produced as **Figure 1.1.** This shows the 'Application Site 'edged in red, and the proposed area where existing planning permission is to be relinquished (the 'Preserved Area') shown hatched green.

The objective of the scheme is to deliver a substantial landscape benefit via the retention of the prominent western half of the Twyn-y-Glog ridgeline which would otherwise be quarried and removed as part of the currently permitted quarry development scheme. The Application Site is also in a location which is more remote from residential properties and the village of Penderyn.

The Application Site lies within the boundary of a planning permission for quarrying granted in 1972 (reference 1/8523). However, a planning condition imposed on that permission prevents quarrying taking place within the confines of the current Application Site. Thus, whilst the current planning application intends to create a new area of working, that new area is within the boundary of an existing mineral planning permission area. Whilst quarrying has not taken place within the Application Site, there have been ancillary operations associated with the construction of haulage roads for overburden placement etc within the defined area. A plan showing the boundaries of the existing planning permissions at the quarry is produced as **Figure 1.2**.

In March 2011 an application was submitted to update the planning conditions imposed on the respective mineral planning permissions at Penderyn Quarry (reference Environment Act 1995 Review of Old Mining Permissions, commonly referred to as a 'ROMP Review'). This application provided an opportunity to review the approved development scheme and to propose modernised planning conditions to cater for a proposed updated development scheme. Through this mechanism, Hanson proposed an almost identical 'reserve swap' involving the quarrying of reserves within the area currently excluded from quarrying within the 1972 permission and the relinquishment of permission to extract reserves along the western part of the Twyn-y-Glog ridgeline (covered by a 1958 Planning Permission – reference 1/ 2427). However, the ROMP application has not been determined at the time of submitting this current application as a result of regulatory issues surrounding the dewatering of the quarry workings at depth and the potential groundwater / ecological effects arising from such activities.

The delay in determining the ROMP application has resulted in a posit*ion whereby there are now limited accessible reserves available at the* quarry without either (a) deepening the quarry (as approved) or (b) quarrying the Twyn-y-Glog ridgeline (also as approved). Hanson has concluded that it would be prudent to submit a freestanding application to "extend" the quarry workings into the 'excluded' 1972 planning permission area and promote the 'reserve swap' associated with the preservation of the Twyn-y-Glog ridgeline. In effect, this would deliver the same objective of a 'reserve swop' as proposed as part of the ROMP Review application, but via a different mechanism and application.

Importantly in the context of the current planning Application Site, the quarrying of reserves within the discreet Application Site area would be

confined to levels above the water table (above 265m AOD). Because of this the potential groundwater /ecological effects associated with the wider quarry development (and consideration of the outstanding ROMP Review application) would not apply to the specific development within the 'extension' Application Site.

1.2 The Application Site

The Application Site is some 1.77 hectares in extent, and comprises a narrow rectangular area averaging 340 metres long by 60 metres wide located at the south eastern extremity of Penderyn Quarry. Penderyn Quarry itself has a land area of some 44.6 hectares comprising land to the north, north west and west of the Application Site.

The Application Site comprises an area of upland acid grassland with bracken over areas of previous disturbance comprising piles of loose rock and small areas of rock outcrop. Towards the western end of the area there is an exposure of bare ground where vehicles accessed a historic quarry tipping area to the south and south east of the Application Site. That historic tip, referred to as 'the sinkhole tip' has been fully restored and is dominated by ephemeral short perennial grassland.

The area of Twyn-y-Glog ridge to the west (outside the Application Site but permitted for quarrying) is distinctive in being dominated by south facing rock exposures. This area has more diverse grassland and moss species around the edges of the outcrops within the overall heathland/acid grassland vegetation. The areas are generally unmanaged other than by grazing by rabbits and itinerant sheep, and as a consequence the area has a different character to the pasture in the wider locality where, to the south east, the vegetation changes to largely open moorland dominated by acid grass, heathland and bracken.

The Application Site is at the furthest extremity of Penderyn Quarry in terms of the village of Penderyn, which lies at a distance of some 1.1 km to the west. The western most edge of the Twyn-y-Glog ridgeline within the Preserved Area is at a distance of some 700m from the edge of Penderyn village.

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1.3 The Proposed Development

The scheme would involve a straightforward development of the upper faces and benches along the existing south eastern edge of the quarry into the defined Application Site. The narrow width of the Application Site would restrict the development of the benches above 268m AOD. With the lowest elevation at 268m AOD within the Application Site, the development would be confined above the natural water table at this location and there would thus be no groundwater effects arising from the development within the Application Site.

The faces and benches within the Application Site would be subject to restoration treatment, principally through natural regeneration, but supplemented by the seeding or planting of locally native trees and shrubs where necessary. This is discussed further in Section 2.6 below with the restoration of the Application Site area being integrated into a comprehensive restoration scheme for the overall Penderyn Quarry area.

1.4 The Non-Technical Summary

An Environmental Impact Assessment (EIA) has been undertaken to consider the environmental effects of the proposed development. The results are presented in an Environmental Statement (ES) which accompanies the planning application. This document is a Non-Technical Summary (NTS) of the ES, and presents the main findings of the EIA in non-technical language. The NTS, as the title suggests, provides only a brief summarised account of a large amount of data set out in technical reports in the ES and its accompanying Appendices.

However, it is intended to provide a sufficient overview of the development scheme, and the environmental issues which would be associated with the development, to allow the reader to gain an understanding of the key issues, and the way in which the EIA has informed the preparation of the proposed development scheme.

The NTS comprises Volume 3 of a comprehensive submission which consists of:

- Volume 1: Environmental Statement (ES);
- Volume 2: Technical Appendices; and
- Volume 3: Non-Technical Summary of the ES (i.e. this document).

The planning application is supported by a Planning Application Statement (PAS) which includes the formal application plans which illustrate the details of the proposed development. Selected plans are reproduced in this NTS for ease of reference.

1.5 Technical Studies

The Applicants have held informal discussions with Mineral Planning Officers representing BBNPA, and it has been agreed that the topics to be addressed as part of the EIA can be confined to:

(i) The landscape and visual effects of operations within the Application Site, and the benefits of relinquishing the rights to quarry within the Twyn-y-Glog ridgeline area;

(ii) The hydrological (surface water) effects of the development in terms of surface water flows and effects on the catchment areas to the south of the Application Site (noting that there would be no hydrogeological (groundwater) effects associated with the development); and

(iii) The ecological effects of the development within the Application Site and the ecological benefits of relinquishing the rights to quarry within the more ecologically valuable Twyn-y-Glog ridgeline area.

It has also been agreed that other topics conventionally addressed as part of a mineral development EIA will be briefly assessed, but in the context of the planning and other regulatory controls which are already in place at the quarry relating to noise and blast vibration limits, and air quality / dust mitigation (including controls imposed by the mineral processing and ancillary plant environmental permit).

1.6 Document Availability

The ES volumes are available for inspection at the offices of the Brecon Beacons National Park Authority, Plas y Ffynnon Cambrian Way, Brecon LD3 7HP

Copies may be purchased from the Applicant's Agents SLR Consulting Ltd, Fulmar House, Beignon Close, Ocean Way, Cardiff CF24 5PB (Tel 20920 491010).

The cost of volumes (inclusive of VAT and postage) is:

- ES Volumes 1 – 3 and Planning Application Statement
  Printed versions £100.00
  CD version £5.00

- Volume 3 NTS: (Printed version) £10.00

The application will be the subject of pre-application consultation which will involve:

- Local publicity of the application, including making the application documents available for inspection at Penderyn Community Hall (this NTS, Planning Application Statement, application plans, Environmental Statement (ES), and Environmental Statement Appendices); and

- Undertaking consultations with defined community and specialist consultees, including the use of a web site to facilitate access to the application documents.

The results of the pre application consultation will be reported in a final version of the Planning Application Statement.

Figure 1-1 – Application Site Location Plan (plan TYG1a)

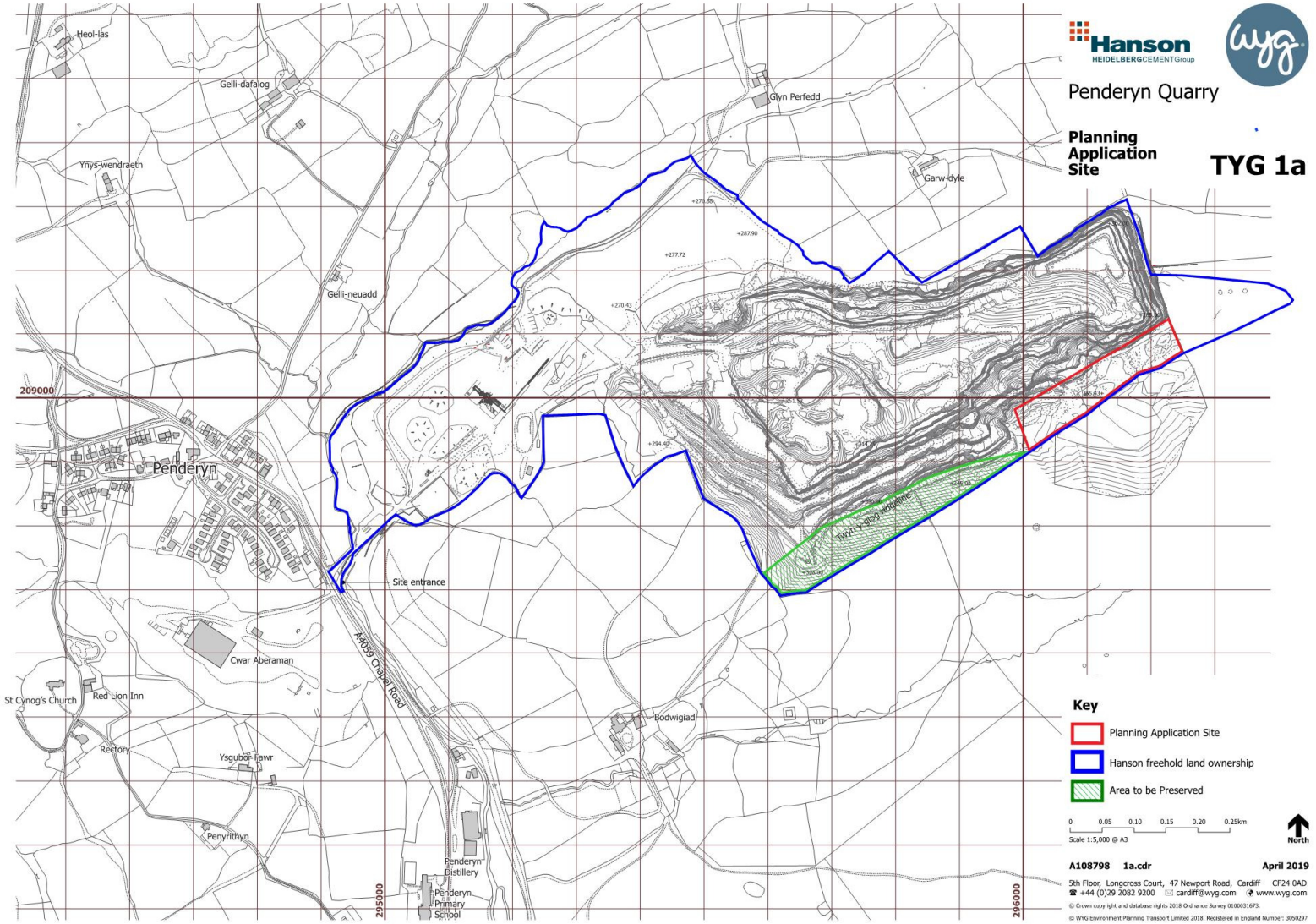
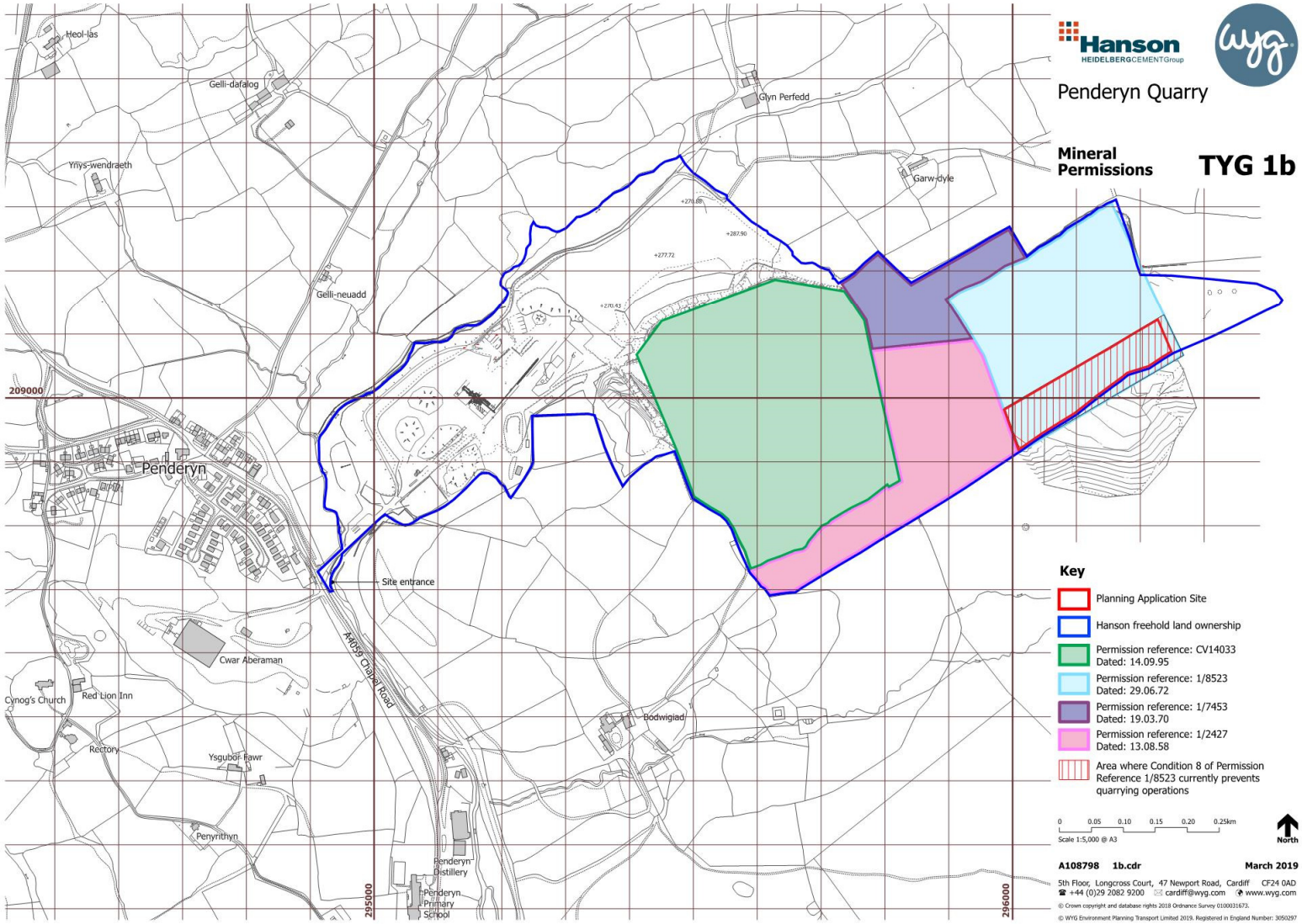


Figure 1-2 Mineral Permissions (plan TYG1b)



2.0 THE PROPOSED DEVELOPMENT

2.1 Quarry Development Scheme

The scheme would involve the development of the faces and benches in a generally easterly direction from the existing quarry into the defined Application Site. The anticipated configuration at the end of Year 5 is shown on plan ref TYG3 which shows benches at the 328, 316 and 300m AOD levels, with a haul road running from the south western side of the Application Site into the existing quarry area and on to the processing plant site. Plan TYG3 is reproduced at a reduced scale for ease of reference as **Figure 2.1** at the end of his chapter.

Plan ref TYG4 (reproduced as **Figure 2.2** at the end of this chapter) shows the anticipated progress of the development at the end of year 15, with all faces and benches worked back to the final positions, with the lowest bench within the Application Site at the 268m AOD level which would be integrated with the wider quarry development scheme for the remainder of the quarry.

Plan TYG5 shows the final quarry layout based upon the scheme submitted as part of the ROMP application (ref **Figure 2.3** at the end of this chapter). The wider quarry development scheme does not form part of the current planning application, but plan TYG5 has been prepared to illustrate the way in which the development at the Application Site would relate to the future development scheme within other parts of the quarry.

The quarry development scheme within the discrete boundaries of the Application Site would provide access to limestone reserves in substitution for those within the Preserved Area. However, overall, the scheme would not alter the general pattern of working within the quarry, the aggregate products supplied, or the rate of output. The scheme would simply provide an alternative source of limestone for extraction, having a significantly reduced landscape and visual impact.

2.2 Processing Plant

It follows from the above that the development at the Application Site would not be associated with any change to the existing processing arrangements at the quarry, or to the ancillary plant utilised at the existing plant site (asphalt plant and ready mixed concrete plant). These would continue to operate as at present, based upon existing planning and permitting controls.

2.3 Hours of Operation

Similarly, quarrying operations within the Application Site would be undertaken in accordance with the existing hours of working limitations and eventually, subject to the determination of the ROMP application, in accordance with updated and probably more restrictive hours of working .

2.4 Output and Traffic Movements

Recent and historic output at Penderyn Quarry has averaged some 500,000 tonnes per annum. The payloads of lorries leaving the site varies but averaging not less than 18 tonnes. On this basis, and using a notional 275 day working year, this equates to an average of 101 loads per day, or 202 movements. The majority of traffic movements are to and from the south, via the A4059 to the A465.]

There would be no change to this established pattern as a consequence of the proposed development within the Application Site.

2.5 Alternatives

The two alternatives assessed in this case have comprised the currently approved quarry development scheme, referred to as **'Scenario A'**, and the alternative scheme which forms the subject of the current planning application and this ES as **'Scenario B'**, which includes the retention of the Preserved Area'.

The **'Scenario A**' approved development scheme would have the effect of removing the central and western areas of the Twyn-y-Glog ridgeline. This

approved 'Scenario A' development scheme is illustrated on Plan TYG8 and would release total reserves of approximately 29.7m tonnes (as at December 2018). Plan TYG 8 is reproduced at the end of this chapter as **Figure 2.4**

The Landscape and Visual Impact Assessment (LVIA - ref ES Chapter 5.0) describes the effects of the removal of this prominent landscape feature as 'significant adverse', with the visual changes described as 'moderate '/ major adverse'. These changes to the landform are shown on photomontages (Plans TYG12 and TYG14) which are produced as **Figures 2.5 and 2.6**.

The **'Scenario B'** proposed development is illustrated on Plan TYG9 (produced as **Figure 2.7**) and would release total reserves of approximately 22.2 million tonnes (as at 31st March 2019 i.e. some 7.4 million tonnes less than Scenario A. There would thus be a further consequence of Scenario B in shortening the life of the permitted quarry development by some 15 years (at 500,000 tpa).

Photomontages TYG 13 and TYG15 (produced as **Figures 2.8 and 2.9)** confirm that the Scenario B development would substantially retain the central and western areas of the Twyn y Glog ridge. The LVIA describes these landscape and visual effects as 'minor adverse / negligible'.

'Scenario B' also has the advantage of developing an alternative area which has already been subject to some disturbance (lying between the current quarry and the Sinkhole Tip on its southern side).

The firm conclusion which has emerged from the review of alternative working schemes is that 'Scenario B' has considerable merit in comparison to the currently permitted 'Scenario A' in that it would allow the retention of the much more prominent and visually interesting central and western area of the Twyn-y-Glog ridgeline.

There would also be minor benefits in terms of hydrology and cultural heritage, as explained below in sections 3.3.4 and 3.9.4 respectively.

2.6 Restoration Strategy

The principles of a restoration strategy are illustrated on the Restoration Strategy Plan TYG7 (reproduced at the end of this chapter as **Figure 2.10**). This shows the Application Site edged in red in the context of the restoration strategy for the overall Penderyn Quarry area.

From the overall restoration design principles and objectives set for the wider quarry as part of the ROMP Review restoration strategy, the key design principles of relevance to the Application Site are:

(i) Quarry waste would form the basis of the soil forming material to be used for the restoration. Clay, silt and mud recovered from pockets within the limestone during quarrying will supplement the quarry waste by creating suitable growing conditions. Opportunities will be taken to salvage rootable fines and soil forming materials from existing quarry waste tips as working progresses.

(ii) Quarry benches and faces would be progressively restored during quarry phases, where consistent with operational requirements, with a focus on natural recolonisation, supplemented by planting in selected areas to enhance the ecological and landscape value of the site.

In view of the recognised ecological potential of restored mineral workings, the main objectives of the restoration proposals are ecological enhancement and nature conservation.

2.7 Restoration Details

The restoration strategy has been based on the anticipated final form of the overall quarry upon completion of quarrying. Detailed specifications and proposals for the treatment of individual quarry faces and benches will be produced during the development of the quarry when the respective faces and benches are formed and available for restoration. This will allow the physical nature of the faces, benches and slopes to be assessed at a more detailed level. Detailed proposals for the individual faces and benches would therefore be determined, when the structure of the rock exposures

become evident, but those finer details would be based upon the overall restoration strategy which includes the treatments set out below.

Outside the Application Site, the final water level within the quarry void following the cessation of dewatering will be at or below 265 m AOD. All progressive and final restoration will occur above this level on upper quarry benches, on land adjacent to the quarry void and on the plant site. In terms of the Application Site, restoration will be carried out on the quarry faces and benches above the 265m OAD level.

2.7.1 Quarry Faces: Restoration Treatments

The upper faces along the southern side of the quarry void will offer opportunities to retain attractive rock outcrops as crags, and to retain naturally occurring crevices and pockets in which different types of vegetation can establish. Species rich limestone grassland will naturally colonise rocky outcrops, which has occurred on the thin soils along the Twyn-y-Glog ridgeline. Quarry faces would generally be left to regenerate naturally, which will in part be encouraged by low scree slopes and crushed rock placed at the toe of faces.

Where possible a suitably low fertility growing medium will be deposited into natural crevices and cracks on the lower sections of the upper face of the quarry to promote vegetation establishment. This material would be deposited during bench soiling operations when the lower sections of the quarry face are safely accessible and within the reach of a 360° excavator. The growing medium would consist of quarry waste and fine-grained material derived from voids within the limestone bedrock. This material would be placed in suitable locations across the face, assisting natural regeneration of a diverse range of species. Similarly, localised small scree slopes and pockets of loose rock at the base of the quarry face would create different conditions with a variable and uneven surface texture creating suitable ground conditions to facilitate ecological succession. The resulting variety of vegetation types would avoid uniformity of restoration treatment, which would increase biodiversity, geodiversity and landscape interest.

2.8 Restoration Management

All restoration work will be governed by detailed method statements, which will be issued to site contractors, and closely supervised. These method statements will detail soil handling, storage and placement procedures, and the locations selected for each restoration treatment.

The restoration would be monitored throughout the quarry phases to identify any further management and/or improvements required. The monitoring programme would be designed to draw upon experience which could be applied in devising cost-effective restoration proposals for the remainder of the quarry including the success achieved by planting / colonisation/succession.

A wider quarry management plan will be prepared for the restored areas to include the Application Site, with proposals for the management and enhancement of restoration works outside the Application Site including existing established perimeter vegetation and previous grassland restoration, as well as new proposed restoration both during quarrying operations and in the longer term following final restoration of the site.

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Figure 2-1 5 Year Development Plan (Plan TYG 3)

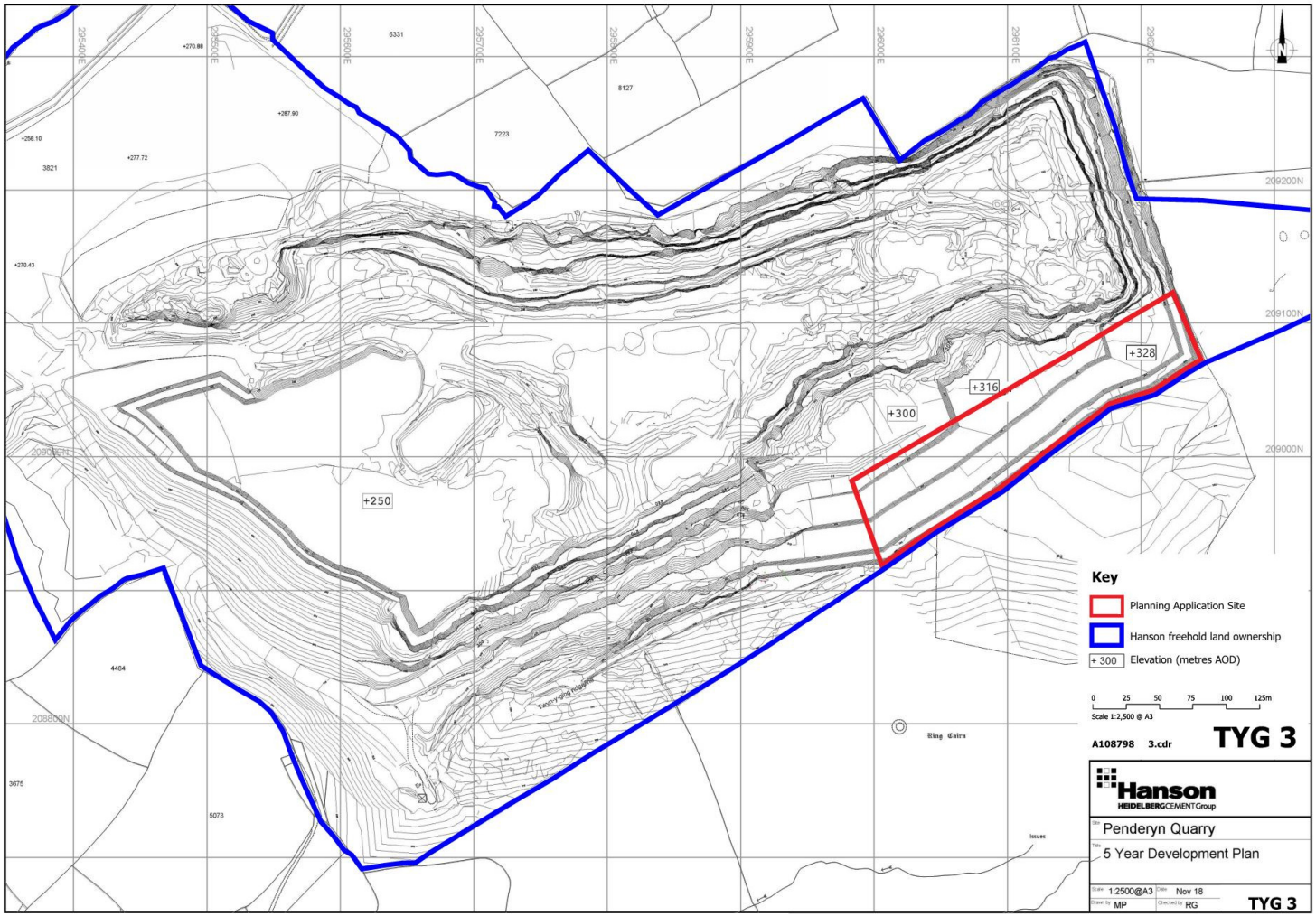


Figure 2-2 15 Year Development Plan (Plan TYG 4)

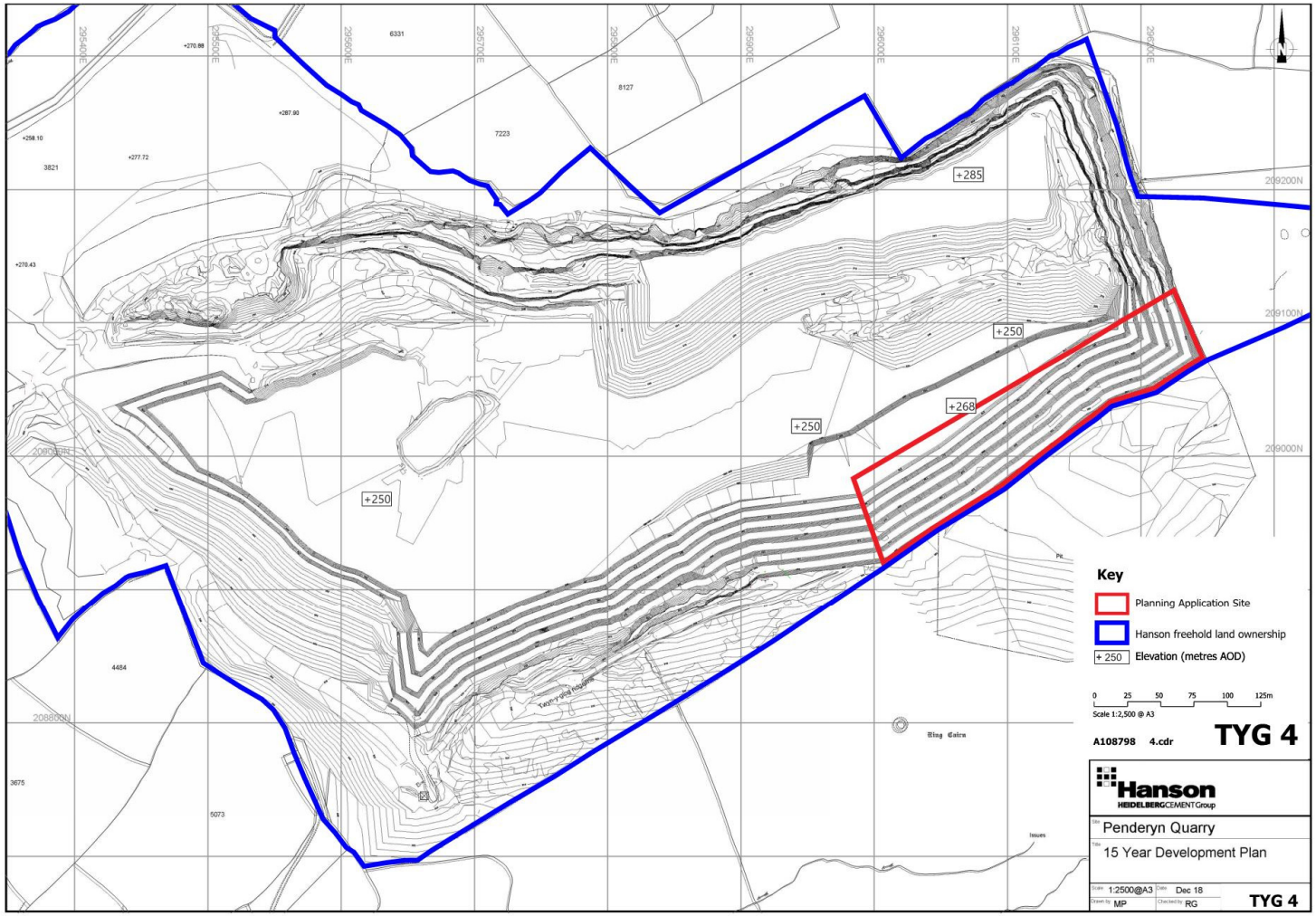


Figure 2-3 Final Quarry Development (Plan TYG 5)

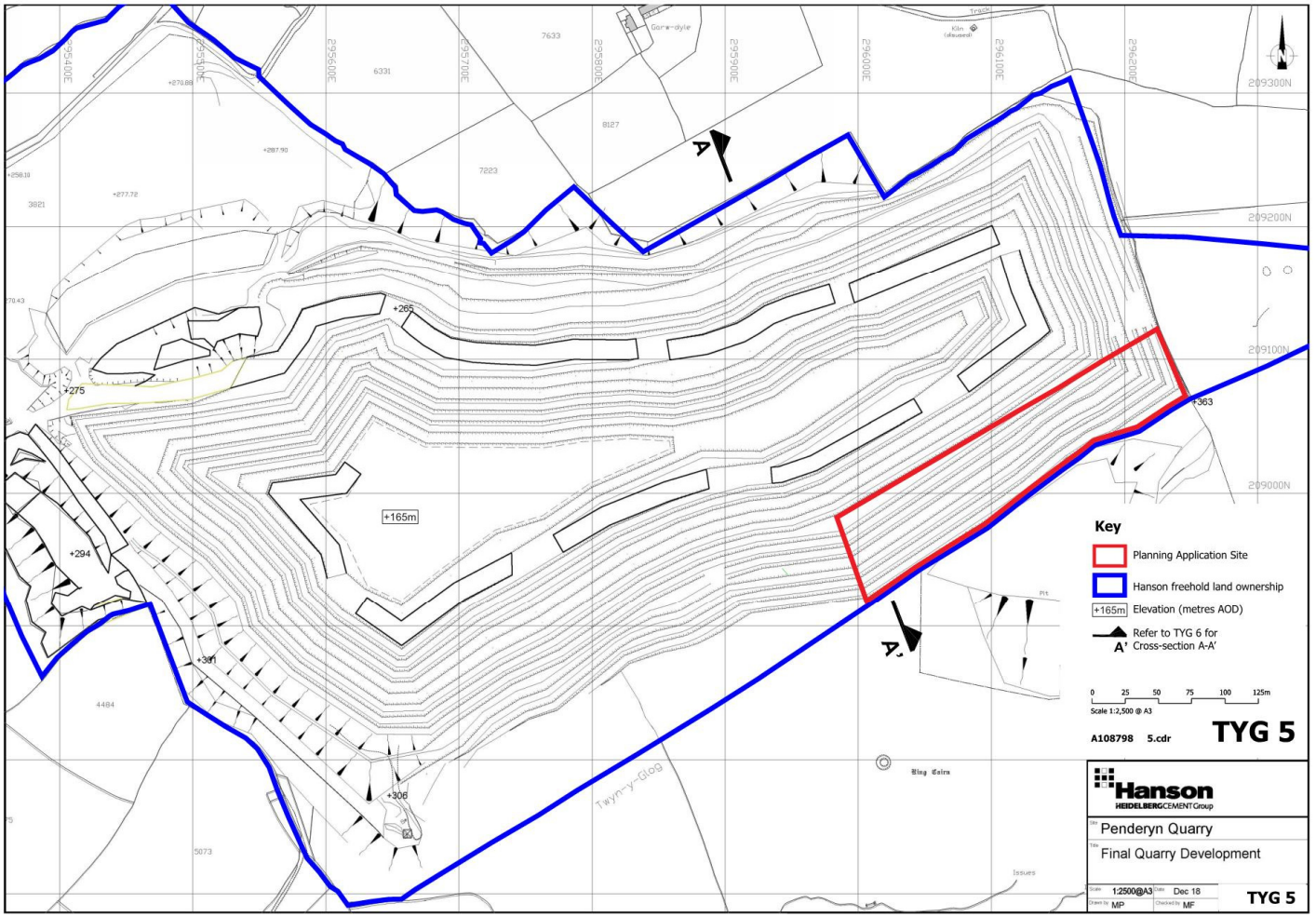


Figure 2-4 View of 'Scenario A' (plan TYG8)

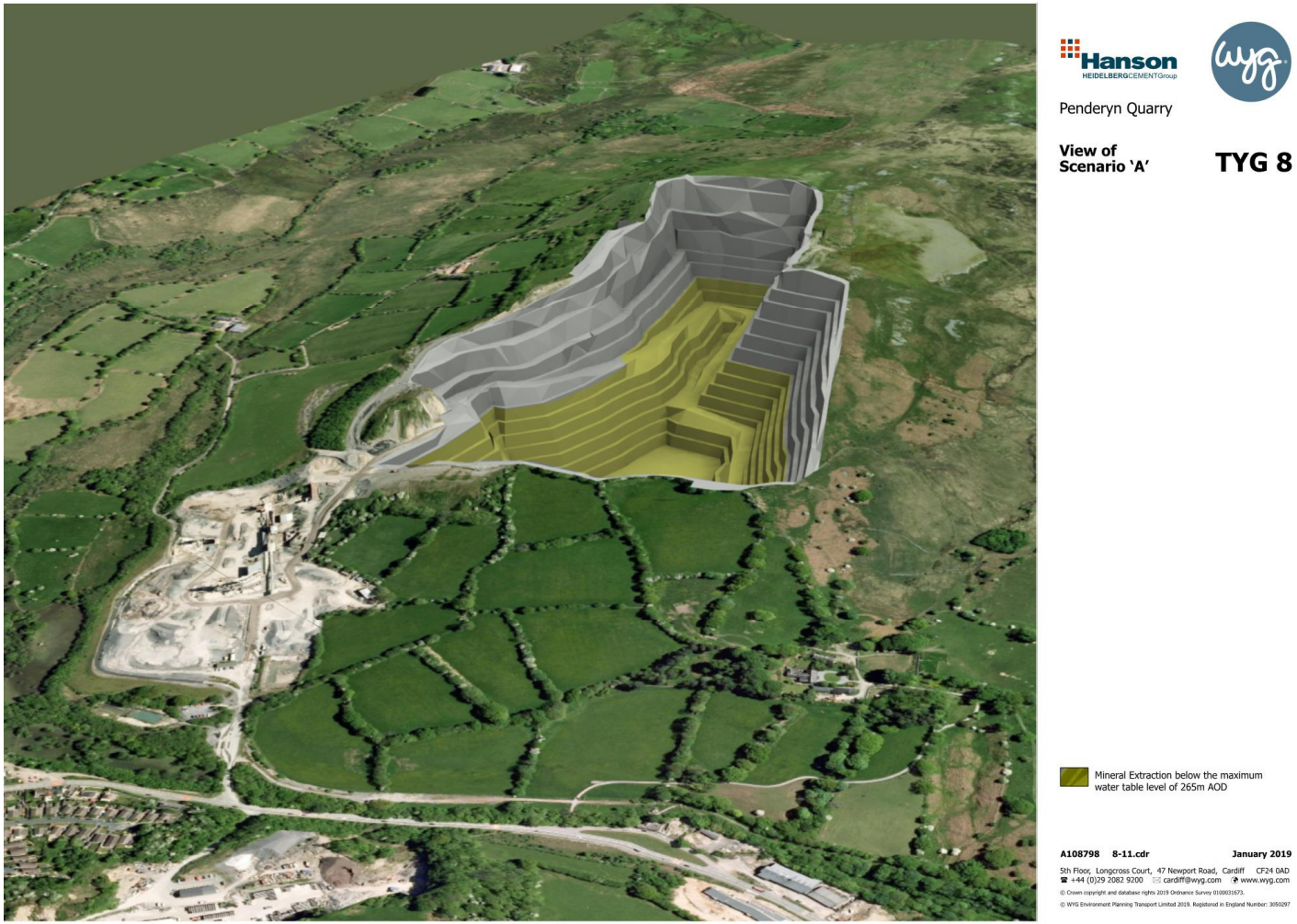
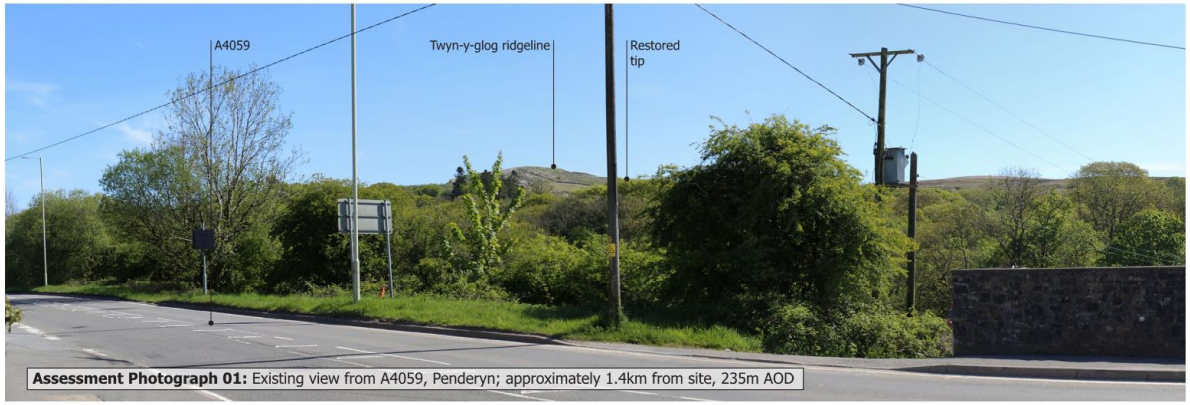
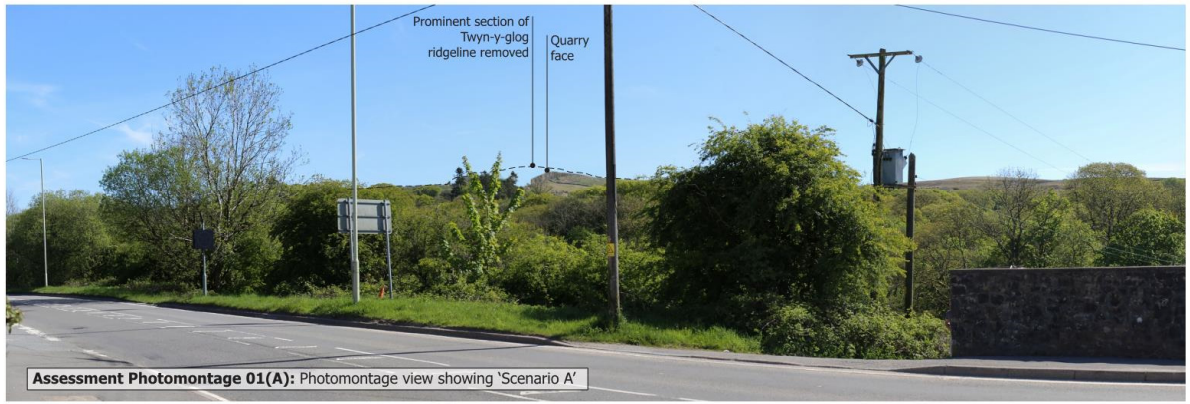


Figure 2-5 View of 'Scenario A' from A4059 Penderyn (plan TYG12)



Assessment Photograph 01: Existing view from A4059, Penderyn; approximately 1.4km from site, 235m AOD



Assessment Photomontage 01(A): Photomontage view showing 'Scenario A'

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View of 'Scenario A' from A4059, Penderyn

TYG 12

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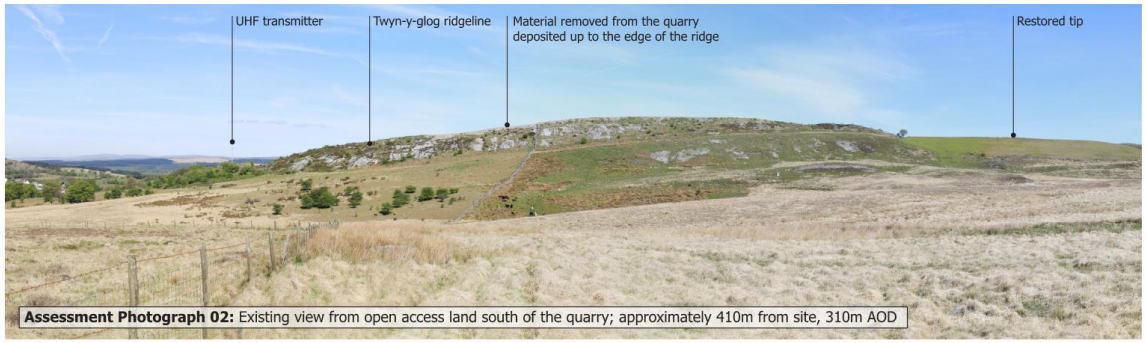
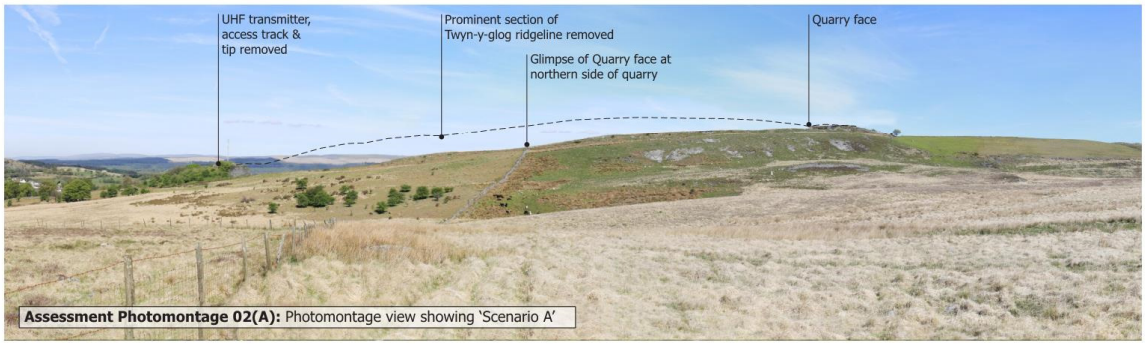
Figure 2-6 View of Scenario A from the south (plan TYG 14)



Assessment Photograph 02: Existing view from open access land south of the quarry; approximately 410m from site, 310m AOD



Assessment Photomontage 02(A): Photomontage view showing 'Scenario A'

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View of 'Scenario A' from the south

TYG 14

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Figure 2-7 View of 'Scenario B' (plan TYG9)

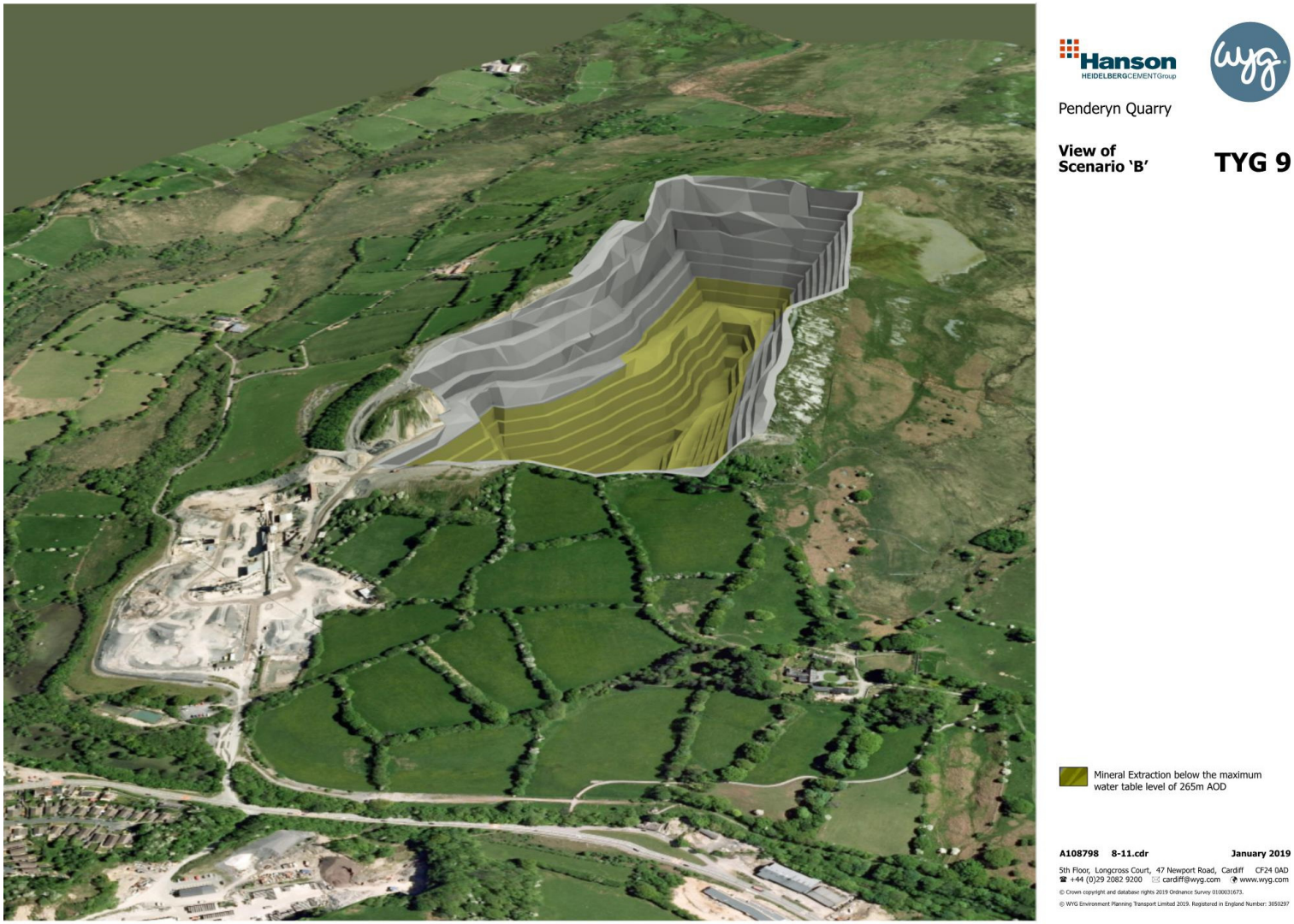

Figure 2-8 View of Scenario B from A4059 following proposed 'reserve swap' (plan TYG13)

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View of 'Scenario B' from A4059, Penderyn following proposed reserves swap

TYG 13

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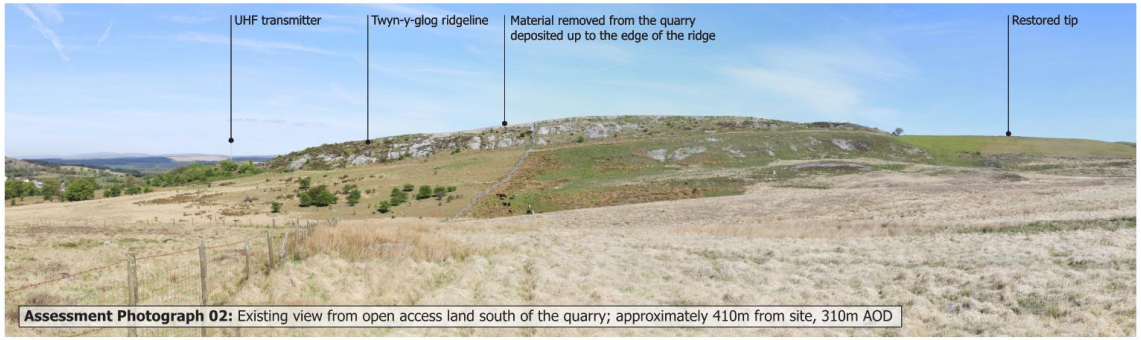
Figure 2-9 View of 'Scenario B' from the south following proposed reserve swap (plan TYG 15)



Assessment Photograph 02: Existing view from open access land south of the quarry; approximately 410m from site, 310m AOD

Assessment Photomontage 02(B): Photomontage view showing 'Scenario B', following proposed reserves swap

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View of 'Scenario B' from the south following proposed reserves swap

TYG 15

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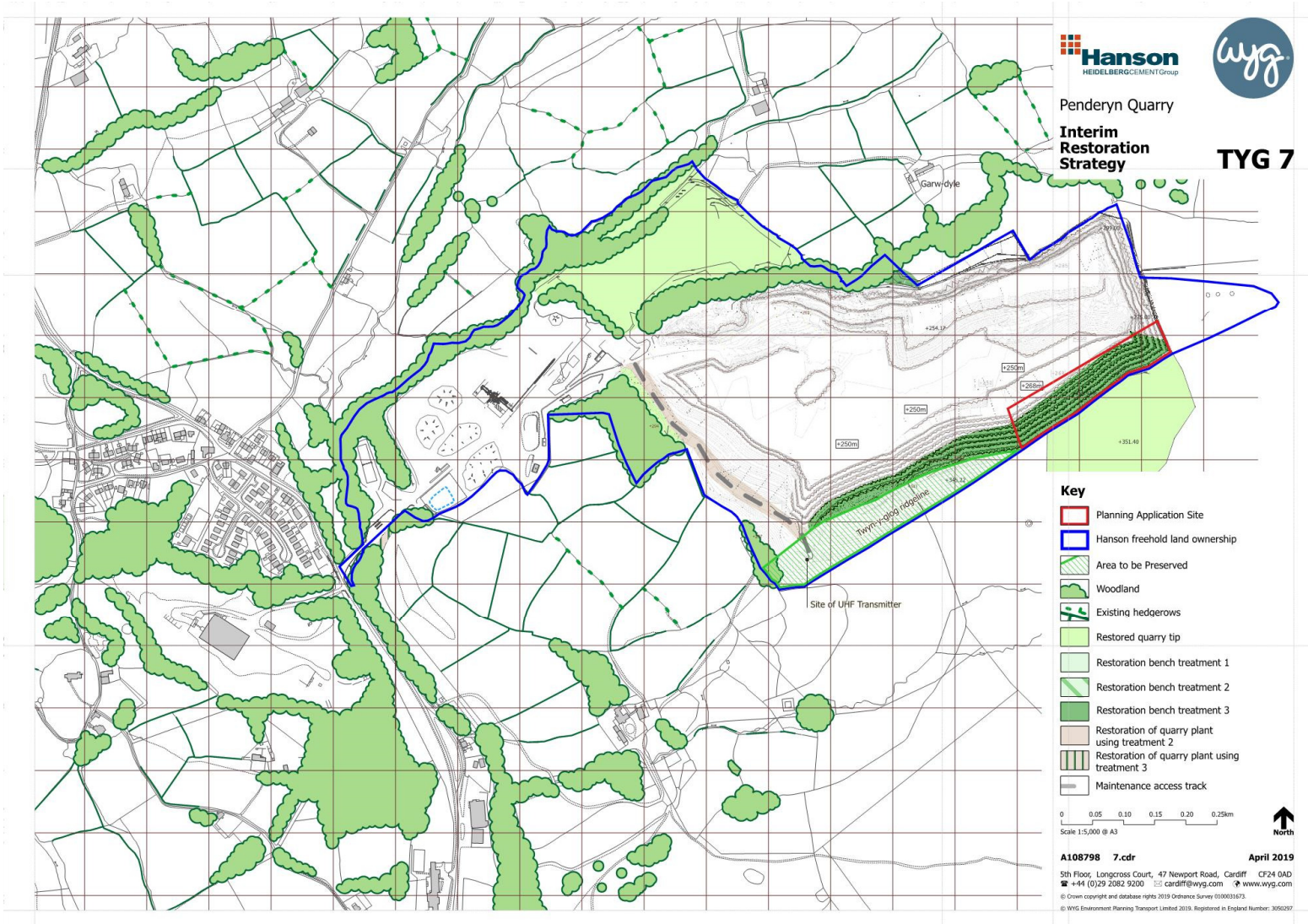
Figure 2-10 Interim Restoration Strategy (Plan TYG 7)



3.0 SUMMARY OF ENVIRONMENTAL ISSUES

3.1 Introduction

The main Environmental Statement (ES) has considered the potential environmental effects of the proposed development within the Application Site and the proposed relinquishment of reserves within the 'Preserved Area'

Based upon the studies and content of the individual chapters, the underlying conclusion of the EIA is that the development would deliver significant landscape benefits via the proposed reserve swap, and that all other environmental issues are capable of being regulated in a way which would satisfactorily minimise environmental effects.

These issues are set out below as a summary of the main findings of the ES and the conclusions which are drawn. For each topic, the summary describes the key elements of the study which has been undertaken, the mitigation measures which have been incorporated into the development scheme or which will be implemented as part of the ongoing development, and the conclusions which are reached regarding environmental effects.

3.2 Landscape and Visual Effects

3.2.1 LVIA Study

The key focus of the Landscape and Visual Impact Assessment (LVIA) has been to assess the landscape and visual amenity issues associated with quarrying and restoration within the Application Site in the eastern area of the Twyn y Glog ridgeline, and the differences compared to the implementation of the currently approved quarry development scheme involving the removal of the central and western areas of the Twyn y Glog ridgeline.

These alternatives are referred to in the LVIA as:

- **'Scenario A'** which represents the currently approved quarry development scheme; and
- **'Scenario B'** which comprises the current planning application scheme involving a small expansion of the current working area into the south eastern corner of the quarry land and the relinquishment of planning permission for quarrying within the 'Preserved Area'.

The respective areas are shown on Figure 1.1 (plan TYG 1a) with the Application Site shown edged red, and the Preserved Area shown hatched green.

The LVIA considers the landscape and visual effects of Scenarios A and B and the effects of not quarrying the Preserved Area, and reaches an overall conclusion based on the balance between the associated effects in each case.

3.2.2 Landscape Effects: Key Findings

Landscape Features

The Twyn-y-Glog ridgeline is locally important, being a significant element of the wider pattern of landform and providing screening of quarrying activities from the south.

The proposed Scenario A quarrying scheme would remove the western and central section of the Twyn-y-Glog ridge. The scheme would result in a locally substantial adverse impact on the landform pattern of the area during quarrying and following restoration of the site.

In contrast, the proposed quarrying scheme based on Scenario B would retain the crest and southern flank of the Twyn-y-Glog ridge, minimising the potential for adverse landscape impacts.

Landscape Amenity

The Scenario A quarry development would be a prominent feature in the landscape and disturbance would be perceptible within the wider landscape, particularly to the south. Ongoing activity and disturbance within the site as a consequence of the Scenario A quarrying scheme would result in a moderate adverse impact on landscape amenity, increasing to substantial within 1km of the Twyn-y-glog Ridge.

In contrast, during the quarrying under Scenario B, overall area of disturbance would not increase to a degree that would be perceptible within the wider landscape. Ongoing activity and disturbance within the site as a consequence of the proposals would result in only a minor adverse impact on landscape amenity, reducing to a negligible impact following restoration, as the quarry site becomes steadily integrate into its landscape setting.

3.2.3 Visual Effects: Key Findings

Six viewpoints were identified as representative of the most sensitive views available, and the impact of the proposed development were assessed against the baseline of the permitted scheme and existing quarry.

The visual impacts for the approved Scenario A scheme would range from minor adverse (viewpoints 01 and 02), through to moderate adverse (viewpoints 03, 04 and 05), to major adverse (viewpoint 06). The moderate and major adverse conclusions relate to views towards the site from the south where the removal of the Twyn-y-Glog ridge would result in the loss of a landmark feature. These effects are depicted on the photomontages produced at the end of chapter 2.0 of the NTS which show the substantial visual changes to the landform which would arise from the approved Scenario A scheme, compared to the retention of these important landscape and visual features via the Scenario B scheme.

The proposed Scenario B scheme results in the western and central section of the Twyn-y-Glog ridge being retained, offering effective screening of the quarry void from the south.

The visual impact of the Scenario B scheme is assessed as varying between minor adverse to negligible during initial phase of quarrying, given the scale of the changes and the sensitivity of the views.

The retention of the western and central section of the Twyn-y-Glog ridge would avoid potential visual effects from the south, retaining a locally significant landscape feature which adds to the visual diversity and attractiveness of views available from south.

3.2.4 Mitigation Measures

The primary mitigation measure under the Scenario B proposal is to relinquish the rights to extraction of the western and central section of the Twyn-y-Glog ridgeline. This section of the ridge offers effective screening of the quarry operations from the south and the ridge itself is an important element in defining landscape character.

Secondary mitigation measures relating to the upper quarry benches and faces along the southern side of the quarry are based on progressive restoration, where consistent with operational requirements.

3.2.5 LVIA Conclusions

The Scenario A quarrying would remove a prominent section of the Twyn-y-Glog ridgeline resulting in significant adverse effects on the pattern of landform and landscape character, particularly to the south of the quarry. The Scenario A quarrying would result in locally significant adverse effects on landscape receptors. In contrast, 'Scenario B', would mitigate the adverse effects on the local landform pattern and would significantly reduce the effects of the quarry on landscape character to minor / negligible effects.

The visual effects of the Scenario A scheme would range from moderate to major adverse when viewed from the south as a result of the removal of a prominent landmark feature. The Scenario B scheme results in the western and central section of the Twyn-y-Glog ridge being retained, offering effective screening of the quarry void from the south.

The visual impact of the Scenario B scheme is assessed as varying between minor adverse to negligible during initial phase of quarrying, given the scale of the changes and the sensitivity of the views.

3.3 Ground and Surface Water

3.3.1 Ground and Surface Water Study

A Hydrological (surface water) and Hydrogeological (groundwater) Impact Assessment (HIA) has been undertaken, together with a Flood Consequences Assessment (FCA)

The scope of the HIA has included:

- a review of the baseline hydrogeology of the site and surrounding area;
- identification of potential receptors;
- the preparation of a hydrogeological conceptual model;
- assessment of potential impacts to the identified potential receptors;
- a comparison of the potential impacts associated with the currently approved scheme and the development which is the subject of the current application; and
- recommendations for mitigation measures, if required.

In addition to the main surface water feature in the area, the Bogwigiad Stream to the south east of the site, the HIA identifies three key potential receptors:

(i) Licensed Water Abstractions

The closest licenced abstraction to the site is operated by Hanson for use within Penderyn Quarry. The licence allows for water to be abstracted from the un-named tributary of the Nant Cadlan at a point adjacent to the northern boundary of the quarry. This licence allows for abstracted water to be utilised in the manufacture of ready-mixed concrete.

The next closest licenced abstraction is operated by Welsh Water (DCWW). Surface water is abstracted from the Bodwigiad Stream and Nant y Bwllfa. Water is transferred from the abstractions to Penderyn Reservoir (which has no natural inlet or outlet) where water is taken for public water supply purposes.

The third licenced abstraction is also operated by DCWW for public water supply purposes from a groundwater borehole located south-west of the Application Site. The borehole from which the supply is sourced takes groundwater from the limestone aquifer.

(ii) Private Water Supplies

The closest private water supply to the site is located at the farmstead of Bodwigiad and is taken from a mixed spring and groundwater source some 775m to the south west of the Application Site. The mean daily rate is small at some 1.8m3 / day.

The Penderyn Distillery abstraction, some 1km to the south west is from a borehole installed within the limestone aquifer, with abstraction rates reported to be less than 20m3 / day. With the exception of the Penderyn Distillery abstraction, all supplies are utilised for domestic purposes.

(iii) Designated Environmental Sites

The closest designated site to the site is Cwm Cadlan National Natural Reserve (NNR). Much of the NNR is also designated as a Site of Special Scientific Interest SSSI and Special Area of Conservation (SAC). Cwm Cadlan is designated for the species-rich grassland habitats at the site which include molina meadows. These habitats are primarily supported by surface water with some spring flushes.

The next closest designated site is the Blaen Cynon SAC (including component Woodland Park and Pontpren and Cors Bryn – Y – Gaer SSSIs). These sites are primarily designated for a diverse range of habitats that support the Mash fritillary butterfly. Dyffrynoedd Nedd a Mellte SSSI also lies within 2 km of the site and is designated for geological outcrops showing structural features and the geological sequence as well as a diverse range of habitats and vegetation.

3.3.2 Proposed Development

It is proposed to work the Application Site down to an elevation of 268m AOD (corresponding to a depth of around 85 m) which would be above the level of the water table.

3.3.3 Potential Effects

Changes to surface water catchment

A catchment divide runs north-east to south-west through the Application Site. Runoff from the site either flows into the Penderyn Quarry void (north of the catchment divide) or discharges to the Bodwigiad Stream (south of the catchment divide). Quarrying will push the catchment divide further south-westwards and all runoff from the Application Site will discharge to the quarry void.

Impacts on nearby abstractions

As dewatering at the site will not be required, groundwater-dependent receptors could only be impacted by a reduction in recharge to Carboniferous Limestone body. However, given the small area of the site compared to the entire limestone aquifer the net effect on recharge to the limestone aquifer is considered to be negligible.

It follows that the degree of effect on neighbouring licenced and private groundwater abstractions (including those from springs) is therefore classified as negligible producing a negligible degree of impact. This includes the licenced DCWW public water supply groundwater abstraction.

In terms of licensed surface water abstractions, only the Bogwidiad Stream has the potential to be affected by the development. As noted above, DCWW is licenced to abstract water from locations on the Bodwigiad Stream and Nant y Bwllfa watercourse under the same licence. There will be negligible effects on abstractions sited outside the Bodwigiad Stream catchment and the degree of impact on other such abstractions would similarly be negligible.

The predicted loss of effective catchment area to the licenced DCWW abstraction due to quarrying is 0.39% of the total 199 ha available to both the Bodwigiad Stream and Nant y Bwllfa abstractions. This is considered to be a negligible level of effect and impact.

For comparison the predicted loss of effective catchment area to the licensed DCWW abstraction due to quarrying the Preserved Area would be 0.87ha, equating to 0.44% of the combined 199ha catchment area. There is, therefore, a lesser reduction in effective catchment area of 0.1ha and a slight net benefit of working the Application Site when compared to working the Preserved Area

Recent monitoring visits indicate that the Bodwigiad Stream has been dry downstream of the DCWW abstraction point over the 2018 summer period. This information, together with the much greater catchment area of the Nant y Bwllfa (over three times greater) means it is probable that DCWW relies more on the abstraction from the Nant y Bwllfa than from the Bodwigiad Stream. Abstraction from the Nant y Bwllfa is hence inferred to be much more significant for topping up levels in the Penderyn Reservoir than abstraction from the Bodwigiad Stream. Information from DCWW indicates that they use their licenced groundwater abstraction borehole to supplement these abstractions during low flow conditions over the summer months.

A private water supply from a spring partly dependent on surface water runoff is also located at Bodwigiad. The loss of effective catchment area would be 0.77 ha. Whilst the total catchment available to the Bodwigiad private water supply is estimated to be approximately 57 ha, the loss of effective catchment in relation to the available catchment area for the abstraction is small (1.4%). Therefore, particularly as the private water supply is partly dependent on a spring (which would be unaffected) as well as the stream, the degrees of effect and impact are expected to be negligible.

Impacts on Sensitive Sites

Cwm Cadlan SSSI/SAC is the closest designated site to the Application Site. Surface water does not drain northwards towards Cwm Cadlan and the groundwater flow direction is to the south away from the SAC with all quarrying within the Application Site to take place above the level of the natural water table. There is also no direct pathway between the Site and the SAC. No effects will therefore occur on the SAC.

Impacts on watercourses and waterbodies

Changes in baseflow could affect watercourses that are downgradient of the site. This includes the Bodwigiad Stream and Nant y Bwllfa. However, effects on neighbouring watercourses are considered to be negligible.

3.3.4 Ground and Surface Water Conclusions

The Application Site is to be worked to a level of not less than 268 m AOD and the excavations at the site will not require groundwater dewatering.

Potential impacts to neighbouring abstractions, surface water bodies, water quality and sensitive sites have been assessed. The closest receptors include a licenced DCWW surface water abstraction, the Bodwigiad Stream, private water supplies at Bodwigiad, and the limestone aquifer.

Impacts from working the Application Site are expected to be negligible. Impacts from working the Preserved Area would be expected to be similarly negligible and not significant; however, the loss of effective catchment area from working the Application Site is less than that lost from working the Preserved Area. Therefore, working the Application Site is expected to yield a slight net relative benefit, i.e. a lesser (but still negligible) impact on neighbouring receptors when compared with the Preserved Area.

3.4 Ecology

3.4.1 Ecology Study

Statutory and non-statutory designated sites

The Application Site is not affected by any statutorily designated nature conservation areas. The closest statutory European designation is the Cwm Cadlan Special Area of Conservation (SAC) / National Nature Reserve (NNR) which lies to the north of the existing Penderyn Quarry site, some 450m from the Application Site boundary, and separated from the Application Site by the existing Penderyn Quarry void. The Cwm Cadlan SAC is designated because of its examples of purple moor grass meadows and short sedge mire communities.

Some 1.3km to the south of the Application Site is the Blaen Cynon SAC designated because of its population of marsh fritillary butterfly, and some 3km to the north west is the Coedydd Nedd a Mellte SAC designated as an example of sessile woodland.

SSSI's are constituent parts of the above SAC's with additional SSSIs at Woodland Park and Pontpren, some 1.3km south west of the Application Site, again designated for the interest provided by the marsh fritillary butterfly, and Cors Bryn y Gaer, some 2.5km south east of the Application Site designated for its lowland bog.

There are no non-statutory sites of nature conservation importance within 2km of the Application Site.

Phase 1 Habitat Survey

The habitat survey undertaken as part of the ROMP ecology assessment included the full area of Penderyn Quarry and the immediately adjoining land.

The land within the Application Site is predominantly acid grassland with bracken over areas of previous disturbance comprising piles of loose rock and fractured outcrop. Towards the western end of the Application Site, there is an expanse of bare ground where vehicles accessed the adjacent 'Sink Hole' tip. There is also tipped quarry waste that has started to be colonised by a range of acid and calcareous grassland species that are found in adjacent undisturbed areas and includes species such as carline thistle, bird's foot trefoil, wild thyme and salad burnet.

The area of Twyn-y-Glog ridge to the west (the proposed 'Preserved Area') is distinctive in being dominated by south facing 45^{o} rock exposures. These slabs are quite extensive and massive but where there are fractures and around the edges there are mosses and species encroaching from the surrounding heathland/acid grassland vegetation. It is here, and where the soil is shallowest, that the more diverse grassland occurs

In the south west corner of the quarry, the rock outcrops end in a steep slope covered in rocks with heather, short scrub and acid grassland.

3.4.2 Species

The ROMP ecological survey noted the presence of a number of large trees around the perimeter of the quarry which have the potential for roosting bats, but that there are no suitable trees which will be disturbed by future quarrying. The survey noted that there is suitable foraging/commuting habitat for bats

around the perimeter of the quarry, particularly the northern boundary where there is a wooded watercourse with fields and hedgerows to the north. However, the southern and eastern boundary of the quarry (the Application Site) is exposed with little cover and beyond is extensive moorland that is generally of a lower quality for foraging.

The study recorded reptiles (common lizard) in the undisturbed Twyn y Glog ridge area, and a confidential badger report highlighted the presence of badgers.

3.4.3 Updated Surveys and implemented measures

The updated ecological input has focused on:

(i) The implementation of a reptile translocation exercise;
(ii) An updated badger survey; and
(iii) A bat survey of the quarry face which would be affected by the proposed extension development.

Reptile Translocation

The Application Site was enclosed with reptile exclusion fencing in July 2016. The area was trapped in the period 15th August – 12th October 2016 with a total of 34 reptiles moved from the exclusion area. All reptiles were captured in suitable weather conditions and translocated to areas to suitable habitat to the east and west of the site. Five days without capture was achieved in October 2016.

The carrying capacity of the habitat used for translocation will be increased by introducing stone pile refugia (for winter hibernation).

The reptile exclusion fencing is being maintained, and the Application Site is thus considered to be clear of constraints in terms of reptiles.

Bat Survey

The existing quarry face along the north western edge of the Application Site has two cracks that could potentially be two small caves that could have potential for use by roosting bats. A bat detector was used to monitor the presence of bats in 2016, but no bats were recorded.

It is thus concluded that the cracks / caves are unlikely to be suitable for roosting bats.

Badger Survey

Field surveys were carried out throughout August and September 2016 while undertaking the above-mentioned reptile translocation exercise. All areas within the development area were searched for signs of Badger activity, with attention to sett holes, footprints, latrines, hairs and paths which constitute characteristic evidence that badgers are present.

The study identified a hole beneath a large rock within the Application Site, which has been designated as a partially used sett. The entrance to the hole has grown over with tall ruderal plants and clearly hasn't recently been used. A subsequent survey found no badger activity at the set, and the hole has thus been destroyed.

3.4.4 Ecology Conclusions

The Application Site comprises predominantly acid grassland with bracken over areas of previous disturbance comprising piles of loose rock and fractured outcrop. Towards the western end of this area, there is an expanse of bare ground where vehicles accessed the adjacent 'Sink Hole' tip.

In contrast, the remaining area of Twyn y Glog Ridgeline where the rights to quarry are proposed to be relinquished comprises a more ecologically diverse area dominated by south facing 45º rock exposures. The exposures are quite extensive and massive with mosses and species around the edges, and with a diverse grassland encroaching from the surrounding heathland/acid grassland vegetation, with lichens forming patches over the rocks.

Species surveys confirmed that the Application Site contained a population of reptiles (common lizard). These have been captured and translocated to surrounding suitable habitats, with the Application Site provided with reptile exclusion fencing. There are no other species constraints to the development.

The site is not constrained by any statutory or non-statutory sites of nature conservation interest, and the development would have no indirect effect on designated sites of nature conservation interest in the general vicinity of the Application Site.

3.5 Noise

3.5.1 Site Context

The Application Site at the south eastern extremity of Penderyn Quarry is remote from residential property at a distance of some 1.1km from the village of Penderyn,at its closest point.

The closest residential property lies at Garw-Dyle, some 380m to the north of the Application Site, but separated from the Application Site by the existing operational quarry area and intervening undisturbed land to the north of the operational area.

The property at Bodwigiad lies some 750m to the south west, separated from the Application Site by the Twyn y Glog ridge, with the Penderyn Distillery some 1.05 km to the south west.

3.5.2 ROMP Review Noise Assessment

The noise study undertaken as part of the ROMP review EIA considered the effects of noise at residential properties around the overall Penderyn Quarry site, but in the context of the overall quarry operation including mineral processing and ancillary operations in the plant site area.

Much of this previous assessment is not relevant to the specific development within the current Application Site, but the assessment did include the current Application Site as part of the quarry development scheme, and thus, where relevant, the noise effects of extraction within the current Application Site, were included as part of the assessment.

This included consideration of the noise effects at what is the closest property to the current Application Site, to the north at Garw-dyle. The assessment included taking background noise measurements at the property using both an installed metre which recorded noise levels at 1 hour intervals over a period of one week, and a series of spot sample measurements.

The study also recommended a noise limit at Garw Dyle of 45dB based on Welsh Government Guidance relating to noise from quarrying operations. The calculated noise from quarrying operations in the Application Site predicted at Garw Dyle Farm is 41 dB and thus within the suggested noise limit of 45 dB LAeq.

3.5.3 Noise Conclusions

The Application Site lies in a remote location, at distance from residential and other sensitive noise receptors. The noise crierion of 45 dB LAeq at the closest residential property at Garw-Dyle Farm, referred to above, is relied upon for the purposes of the current noise assessment.

The defined operations within the Application Site could be undertaken within the noise criterion which has been suggested, and there should thus be no noise constraints to the development proceeding.

3.6 Blast Vibration

3.6.1 Effects of Blasting

Ground Vibration

The detonation of explosives within a confined borehole generates stress within the rock in the form of seismic waves causing localised vibration, distortion and/or cracking. This type of ground vibration is always generated, even in the most carefully designed blasts, and will radiate seismic waves away from the blast, attenuating as distance increases.

A typical blast consists of a number of boreholes containing explosive charges. Each charge is detonated individually using a series of detonators with differing millisecond delays. The resulting blast-induced vibration is measured in terms of unfiltered particle velocity time histories in three component planes from which the peak values can be obtained.

Ground vibration arising from blasting is calculated in terms of 'peak particle velocity' (PPV) and is measured in millimetres per second (mms-1). Detailed research has determined that vibration levels well in excess of 50 mms are necessary to produce structural damage to residential type properties. For human perception, Welsh Government advice is that levels should be set in the range of 6-10 mms-1.

Vibration levels between 0.6mms-1ppv and 50.0mms-1ppv are routinely experienced inside a property in everyday life and are considered wholly safe. It is apparent though, when similar levels are experienced due to blasting operations, it is not unusual for such a level to give rise to subjective concerns.

Table 3.1 gives examples of vibration levels routinely generated in a property.

Table 3-1 - Vibration Levels Generated in Everyday Activities

Activity	Vibration Level, mms^{-1}ppv
Walking, measured on a wooden floor	1.0 - 2.5
Door slam, measured on a wooden floor	2.0 - 5.0
Door slam, measured over the doorway	12.0 - 35.0
Foot stamps, measured on a wooden floor	5.0 - 50.0

Vibration is also generated within the atmosphere where the term 'air over pressure' is used to encompass both its audible and sub audible frequency components. Again, experience and knowledge of blast type and design enables prediction of levels and an assessment of their significance.

However, unlike with ground vibration, predictions of air overpressure can be made less certain by the fact that air over pressure levels may be significantly influenced by atmospheric conditions. Hence, the most effective method of control is its minimisation at source.

It is important to realise that for any given blast it is very much in the operators interest to always reduce vibration, both ground and air borne to the minimum possible in that this substantially increases the efficiency and hence the economy of blasting operations.

3.6.2 Welsh Government Guidance on Blast Vibration:

Minerals Technical Advice Note 1: Aggregates (MTAN 1) provides advice on suitable planning conditions to control the environmental impact of blasting operations at quarries, including acceptable days for blasting operations: acceptable times of blasting operations: and maximum levels of ground vibration at sensitive locations which should not exceed a peak particle velocity of 6mms-1 ppv in 95% of all blasts measured over any six month period, and no individual blast should exceed a peak particle velocity of 10 mms-1 ppv.

3.6.3 Penderyn Quarry current blast vibration limits

The principal planning permission dated 14th September 1995 at Penderyn Quarry (ref CV 14033) contains conditions specifying the days and times for blasting and sets higher ground vibration limits than those recommended in MTAN1 which post-dates the 1995 permission.

3.6.4 ROMP Review Blast Vibration Assessment

The blast vibration study undertaken as part of the ROMP review EIA concluded that with attention to charge weights and blast design, it would be possible to continue blasting operations and comply with a criterion of of 6mms PPV at a 95% confidence level.

The study also concluded that with such low ground vibration levels, accompanying air overpressure would also be of ~~a~~ very low and hence acceptable levels, although possibly perceptible on occasions at the closest of properties.

The study thus recommended that an updated planning condition should be drafted to reflect the MTAN1 recommended limit of 6 mms-1 peak particle velocity at a 95% confidence level (with an upper limit of 10mms-1 PPV).

3.6.5 Blast Vibration Conclusions

Blasting operations within the proposed extension area would represent a continuation of well-established practices within the existing quarry.

The Application Site lies in a remote location, at distance from residential and other receptors who might be sensitive to blast vibration.

The defined operations within the Application Site could be undertaken within the limit recommended in MTAN 1, and there should thus be no blast vibration constraints to the development proceeding.

3.7 Dust /Air Quality

3.7.1 Air Quality

The Air Quality Regulations prescribe National Air Quality Strategy objectives (AQOs) to be achieved for a range of pollutants. Under the Regulations, Local Authorities are required to review the existing and projected airborne concentrations of these pollutants and to compare them with the AQOs.

The pollutants of potential concern in connection with quarrying activity and processing operations are particulate matter less than 10µm (microns) (PM10) and particulate matter less than 2.5µm (microns) (PM2.5). (A micron is a unit of measurement where 1 micron = one thousandth of a millimetre).

The relevant AQOs are listed in Table 3.2.

Table 3-2 Air Quality Objectives

Pollutant	Objective	Date
PM10	40 µg/m3, annual mean	31 December 2004
	50 µg/m3, 24 hour mean, not to be exceeded more than 35 times per annum	31 December 2004
PM2.5	25 µg/m3, annual mean	2020
	15% reduction, urban background	2010 - 2020

The mapped local air quality background data for 2015 for the grid squares covered by the quarry and access roads are summarised in the Table 3.3.

Table 3-3 Summary Background Air Quality Data

Location	OS Grid Square	Mean pollutant concentration (µg/m3)	
		PM10	PM2.5
		2015	2015
North of site	SN 955 095	10.9	7.2
South of site	SN 955 085	10.9	7.3
% NAQS objective		27	29

The data indicate that in 2015, the key pollutant concentrations were predicted to be well below the respective AQOs.

3.7.2 ROMP Review Air Quality Assessment

The assessment provided an overview of operations undertaken at the quarry with particular reference to the activities which have the potential to give rise to dust emissions; the dust suppression measures which are in place at the quarry; the background air quality conditions; and the controls which are in place at the quarry, notably via the dust and air quality management and monitoring requirements set out in the quarry's Environmental Permit and Hanson's own Environmental Management System.

The assessment identified the principal potential sources of dust of which those relevant to the current application are confined to:

- soils stripping, storage and restoration,
- drilling and blasting,
- loading and tipping,
- site haulage, and
- wind blow across bare ground.

In terms of potentially sensitive receptors, the ROMP ES provided an assessment of the risk of dust impact to receptors in the vicinity of the quarry, of which the property at Garw–Dyle is the closest to the current Application Site. The study noted that this property is some 160m to the north of the quarry at

the closest point, but that the property is screened by the elevated crest of the quarry wall and intervening trees and hedges. The upper northern side of the quarry will remain undisturbed by future working, which will take place in the base of the quarry and southern side wall.

The 'southern side wall' referred to is the current Application Site, which lies at a minimum distance of some 380m from Garw-Dyle, where a combination of distance and the intervening quarry area are such as to render the potential for fugitive dust impacts at Garw Dyle as negligible.

3.7.3 Dust Mitigation Measures

The ROMP ES confirmed a range of dust control mitigation measures, of which the following are relevant to the proposed development within the Application Site:

- *use of clean water for dust suppression, to avoid re-circulating fine material,*
- *high standards of house-keeping to minimise track-out and wind blown dust;*
- *effective staff training in respect of the causes and prevention of dust, and monitoring procedures; and*
- *damping down of haul roads using water bowser in dry weather conditions*
- *dust suppression by regular spraying from fixed spray points in dry conditions;*
- *regular compaction, grading and maintenance of the haul road;*
- *setting a site speed limit of 10 mph;*
- *fitting all site vehicles and plant with upswept exhausts and radiator fan shields;*
- *evenly loading vehicles to avoid spillages; and*
- *All site traffic will keep to the designated haul routes;.*
- *Water for dust suppression will be provided from the existing quarry sump.*
- *The effects of wind blow across stripped surfaces and other areas of bare ground will be minimised by ensuring that loose soils and other materials are not left untreated on the ground. During dry conditions, water will be applied as necessary to stabilise any loose bare surfaces. Where surfaces within redundant areas of quarrying are likely to remain bare for a long period then these should be restored by the promotion of vegetation growth.*

3.7.4 Dust and Air Quality Conclusions

The above existing good management practices will ensure that quarrying and restoration operations within the Application Site will not give rise to any material dust or air quality effects.

3.8 Traffic

3.8.1 Introduction

Penderyn Quarry is located approximately 8km to the north of Aberdare, to the east of the A4059 Hirwaun to Brecon road and has direct access to the A4059 in the form of a simple priority T junction.

The ongoing operation of Penderyn Quarry is anticipated to reflect the current and historic activities in terms of the annual output remaining at around 500,000 tonnes, with processed limestone being distributed by HGV via the existing access on the A4059. In addition to the limestone extraction, processing and distribution, there is also a coated roadstone plant and a ready mixed concrete plant within the quarry complex.

The proposed 'reserve swap' would have no implications in term of output or traffic movements: it would simply mean that a proportion of the reserves within the overall quarry complex would be partly sourced from the Application Area rather than from the Preserved Area.

However, the indirect effect of the development would mean a reduction in overall reserves by some 7.4 m tonnes. At output rates of 500,000tpa, this would shorten the overall duration mineral extraction at the site by some 15 years.

3.8.2 ROMP Review Traffic Assessment

A traffic impact assessment undertaken as part of the ROMP Review EIA concluded that the existing site access operates satisfactorily, and accommodates the daily traffic associated with the ongoing operations.

The existing highway network was found to retain a significant level of reserve capacity with the existing operations in place during the period of peak flow. It thus concluded that given that the ongoing and future activities at Penderyn Quarry are predicted to remain at the current levels then it is not anticipated that the continuing operations will have a significant impact on the ability of the local highway network to function efficiently.

A review of accident data revealed that there are no inherent characteristics of the highway network that result in compromised safety for or as a result of existing HGV use. Again, given that the ongoing operations are not anticipated to change, and the proposed reserve swap would have no implications for output or traffic movements, then it is concluded that the proposed development would have no significant detrimental impact in terms of highway safety.

There would however be a minor net benefit in highway terms arising from the shortening the duration of the currently permitted operation and related traffic flows by some 15 years (7.4m tonne reserve reduction).

3.8.3 Traffic Conclusions

Given that the proposed reserve swop would have no implications in terms of output or traffic movements, it is concluded that the proposed development would have no highway capacity, safety of traffic impact implications.

3.9 Cultural Heritage

3.9.1 ROMP Review Cultural Heritage Assessment

A cultural heritage assessment undertaken as part of the ROMP Review considered the effects of the overall quarry development on below-ground archaeological resources, extant built heritage remains, and historic landscape. The assessment related to the full extent of the existing permitted Penderyn Quarry, the Application Area and a wider study area in a 500m radius around the site.

The study noted that there are no recorded archaeological features within the Application Site. Historic cartographic sources record a dry-stone wall in the western area of the Twyn y Glog ridge. This boundary is part of a long, sinuous boundary wall that is first depicted in 1840.

Elsewhere, the study noted that small sheep pens and a field system of drystone walls have been identified within the quarry boundary from historic cartographic sources and historic aerial photography. These have been removed by subsequent quarrying. The extensive limestone quarrying of the majority of the site will have also removed any previously unrecorded archaeological remains.

The outer edge of the Twyn y Glog ridge has remained undisturbed, with the study noting that the ridge is a relatively prominent landscape feature, situated on the periphery of the Mynydd-y-Glog prehistoric landscape. No archaeological features were identified during the site visit, and gritstone frequently outcrops throughout the ridge, suggesting a limited potential for unrecorded archaeological deposits.

There are two scheduled ancient monuments to the south and south east of the Application Site. These comprise a ring cairn and a round cairn. Barrows/cairns are the defining features of the Bronze Age in the Welsh uplands and several Scheduled examples are recorded within the study area.

East Fforest Fawr and Mynydd-y-glog is included within the Register of Landscapes of Special Historic Interest in Wales1. It forms a narrow, but distinctive natural block of upland lying on the boundary between the former counties of Brecknock and Glamorgan. There is widespread and diverse, well-preserved archaeological evidence of occupation and land use from the prehistoric period to the recent past. There are several important groups of ritual monuments and significant evidence of early agriculture and medieval settlements. As noted above, there are numerous ring cairns throughout the local area which are designated as Scheduled Monuments

Cadw was consulted as part of the assessment process who confirmed that the quarry is mainly outside of the East Forest Fawr and Myndd-y-Glog Landscape of Special Historic Interest and the proposals would have no direct impacts on the Registered area, with 'apparently negligible indirect impacts'.

3.9.2 Cultural heritage value

The drystone boundary wall recorded within the Preserved Area of the site is of low value, The remaining wall would not be impacted by the proposed development within the Application Site but the wall would be removed if the currently approved quarry development scheme is implemented (within the Preserved Area).

The magnitude of non-physical (visual) impact upon the Scheduled Monuments closest to the site to the south-east, will be negligible. The proposed development in the Application Site within the south eastern corner of the quarry would allow the retention of the Twyn y Glog ridgeline in the Preserved Area and thereby preserve the setting of the Scheduled Monuments.

The swapping of the extraction areas will not impact upon the inter-visibility of these two monuments, or their relationship with the wider prehistoric landscape of Mynydd-y-Glog to the east and south.

The proposal involves a net reduction in the footprint of mineral excavations within an existing large quarry and the retention of an important landscape feature. This will not compromise the integrity of the prehistoric landscape but assist in retaining the character of that landscape.

3.9.3 Mitigation

The mitigation strategy devised as part of the ROMP Review EIA was to undertake an appropriate level of photographic and written recording of the surviving drystone wall within the quarry boundary. This would mitigate the impact of any partial removal (outside the Application Site), noting that the entirety of the wall would be lost if the currently approved quarry development scheme is implemented.

3.9.4 Cultural Heritage Conclusions

There are no recorded archaeological features within the Application Site or wider quarry area. Historic cartographic sources record a dry-stone wall, considered to be of low value, within the currently permitted Twyn y Glog Ridge area. The wall would not be affected if the 'reserves swap' proposal proceeds. Cadw advised that the proposals would have no direct impacts on the Registered Landscape, with 'apparently negligible indirect impacts'. The magnitude of non-physical (visual) impact upon the Scheduled Monuments closest to the site will also be negligible.

[1] Register of Landscapes of Special Historic Interest in Wales, 2001 and Register of Landscapes of Outstanding Historic Interest in Wales, 1998; CADW, CCW and ICOMOS UK,

4.0 CONCLUSIONS

This document comprises a Non-Technical Summary of an Environmental Statement which provides a detailed and objective analysis of the potential environmental effects which would be associated with a proposal for a new area of working at the south eastern corner of Penderyn Quarry, but with the scheme proposing the relinquishment of the rights to quarry permitted reserves in the south western area of the quarry along the Twyn-y-Glog ridgeline, in effect ' a reserve swap'.

The consequence of quarrying within the Application Site compared to the currently permitted area proposed to be relinquished (the Preserved Area) would be a net reduction in the available planned reserve at the overall quarry of some 7.4 million tonnes.

The objective of the scheme is to deliver a substantial landscape benefit via the retention of the prominent western half of the Twyn-y-Glog ridgeline which would otherwise be quarried and removed as part of the currently permitted quarry development scheme. The Application Site is also in a location which is more remote from residential properties and the village of Penderyn.

The Application Site lies within the boundary of a planning permission for quarrying granted in 1972 (reference 1/8523). However, a planning condition imposed on that permission prevents quarrying taking place within the confines of the Application Site. Thus, whilst the current planning application intends to create a new area of working, that new area is within the boundary of an existing mineral planning permission area where ancillary operations associated with the construction of haulage roads for overburden placement etc. have taken place within the defined area.

A ROMP Review application (March 2011) proposed an almost identical 'reserve swap', but the ROMP application has not been determined at the time of submitting this current application as a result of regulatory issues associated with the dewatering of the quarry workings at depth and the potential groundwater / ecological effects arising from such activities.

The current application seeks to deliver the same objective of a 'reserve swap' as proposed as part of the ROMP Review application, but via a different mechanism and application.

Importantly, the quarrying of reserves within the discreet Application Site area would be confined to levels above the water table (above 265m AOD). The consequence would be that the potential groundwater / ecological effects associated with the wider quarry development (and considerations associated with the outstanding ROMP Review application) would not apply to the specific development within the Application Site.

The ES has focused on the key issue of the landscape and visual effects of the development in the Application Site and the benefits of retaining the 'Preserved Area'. The LVIA concludes that there would be significant landscape and visual benefits associated with the scheme which would protect the prominent Twyn y Glog ridgeline, replacing a 'major' adverse effect associated with the permitted scheme, with a 'minor adverse / negligible' effect associated with the proposed scheme and the retention of the 'Preserved Area'.

All other potential environmental and amenity effects have been considered, and the ES concludes that no significant adverse effects would arise from the proposed development. Where relevant, the technical chapters make recommendations for measures to mitigate the environmental and amenity effects of the development which draw upon existing, well established and effective controls at the quarry.

In the light of the above considerations, it is concluded that the proposed development could proceed in an environmentally acceptable way, with significant landscape and visual benefits associated with the retention of the 'Preserved Area'.

These benefits are re-enforced by the planning policy analysis undertaken within the Planning Application Statement which concludes that the development could proceed in accordance with the development plan and national planning policy.

In all these circumstances it is considered that there should be a firm presumption in favour of permission being granted.